

Transactions
of the
Dumfriesshire and Galloway
Natural History
and
Antiquarian Society



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EDITORIAL

After careful consideration the Council has concluded that the annual index of contents served little useful purpose, owing to the diversity of the Society's interests, and it has therefore been decided that it be discontinued. The useful subject and author index will, however, continue to be published periodically. This volume contains the triennial list of members, also a copy of the Rules as amended at the Annual General Meeting held on 14th October, 1966.

Contributions are invited on the Natural History, Antiquities, Archæology or Geology of South-West Scotland or the Solway Basin, and preference is always given to original work on local subjects. It may, however, not be possible to provide space for industrial archæology. Intending contributors should in the first instance apply to the Editors for "Instructions to Contributors." Each contributor has seen a proof of his paper and neither the editors, nor the Society, hold themselves responsible for the accuracy of scientific historical or personal information.

Presentations and exhibitions should be sent to the Hon. Secretary and exchanges to the Hon. Librarian, Ewart Library, Dumfries, from whom enquiries regarding purchase of Transactions should also be made. New members are invited to purchase back numbers—see rear cover. Off prints of individual articles may also be available. Payment of subscriptions should be made to the Hon. Treasurer, who will be pleased to arrange Bonds of Covenant, which can materially increase the income of the Society without, generally, any additional cost to the member.

The illustration on the front cover is from an article: "The Early Church in Dumfriesshire," by the late W. G. Collingwood in Vol. XII (1924-25) of these Transactions. It is of the Wamphray Graveslab, which dates to about 950 A.D. and which is unusual in having the Scandinavian dragon side by side with a pattern derived from Anglian leaf scrolls.

This volume is made with the assistance of a generous Carnegie Grant. In addition, a substantial treasury grant is being made towards the cost of the article on Balnabraid Cairn, while the article on the Aquatic Fauna of the Isle of May, also outside the Society's area, has the greater part of its cost paid by a subvention.

ADDITIONAL RECORDS OF BRITISH PERMIAN FOOTPRINTS

By J. B. DELAIR

Introduction.

In 1966, the writer reviewed the history and characters of what were then generally believed to be all the known specimens of vertebrate tracks and footprints from the Permian sandstones of Dumfriesshire (4). A further series of early, but hitherto unrecorded, Permian tetrapod tracks from the same county came to light, however, during the latter half of that year, although unfortunately too late for inclusion in the paper just cited. In addition to these, two further footprint-bearing slabs of the same age have since been found in other palaeontological collections, and these also originally came from Dumfriesshire.

The present essay deals with this additional evidence, and, as well as noting the occurrence of more recently discovered tracks of similar age and character in neighbouring Cumberland, embodies details of a number of previously overlooked obscure references to material discussed in 1966.

The New Material (Dumfriesshire).

The series of additional Dumfriesshire tracks mentioned above date from the early part of the last century, for they include specimens once associated with the Rev. Henry Duncan, who was the first to scientifically describe tracks of this kind; other specimens are associated with Dr Duns, another little-known early collector. All these specimens were acquired sometime last century by the Free Church Museum, Edinburgh (now long defunct), and seem for many years to have been quite unknown to science. They were certainly never examined by Hickling, who, in 1909, published his important survey of British Permian ichnites (8). These specimens were acquired by the Royal Scottish Museum, Edinburgh, during September 1966, and may be conveniently summarised as follows.

- 1966.40.100 *Chelichnus duncani*, (Owen). A slab showing a section of a poorly preserved track; from Cornockle Muir. Formerly a part of Dr Duns' collection.
- 1966.40.101. *Chelichnus duncani*, (Owen). A slab showing seven imprints or parts thereof. Same locality and history.
- 1966.40.102. *Chelichnus plagiostopus*, (Jardine). A slab showing a fairly well preserved section of a track. Same locality and history.
- 1966.40.103. *Chelichnus duncani*, (Owen). Part of a broken slab, apparently at one time built into a wall or some other structure (*vide* surviving traces of mortar), showing typical footprints of this form, in which four basally thickened digits of marked definition recur. Formerly a part of Dr Duncan's collection.
- 1966.40.104. *Indeterminate form*. A slab showing a section of a poorly preserved track composed of four, possibly five imprints. Locality and history unrecorded, although the former is probably Cornockle Muir.
- 1966.40.105 *Chelichnus ambiguus*, (Jardine), A slab showing part of a track represented by nine or ten rather indistinct footprints; from Cornockle Muir. Formerly a part of Dr Duns' collection.

- 1966.40.106. *Chelichnus ambiguus*, (Jardine). A slab showing twelve, possibly thirteen poorly preserved indistinct footprints. Same locality and history.
- 1966.40.107. *Chelichnus* ? *ambiguus*, (Jardine). A slab showing two imprints represented by the toe impressions only (i.e., no sole or pad markings), probably on this form. It is uncertain whether these footprints formed a part of a track. Same locality and history.
- 1966.40.108. *Chelichnus ambiguus*, (Jardine). A slab showing part of a track exemplified by four imprints or parts thereof. Same locality and history.
- 1966.40.109. *Chelichnus ambiguus*, (Jardine). A slab showing two well preserved footprints of this form. Same locality and history.
- 1966.40.110. ?*Chelichnus* cf. *titan*, (Jardine). A slab showing one very large depression, believed to be an imprint, and, perhaps, part of a longer but uncollected series of footprints. The outline of the depression is rather obscure, though generally of an obliquely-oval shape. There are no discernible impressions of digits or claws. Its size corresponds closely with imprints named *Chelichnus titan*, although this specimen, if a genuine footprint, probably represents a different form. Locality and history unrecorded; the former, however, is probably Corncockle Muir.
- 1966.40.111. ?*Chelichnus* sp. A slab exhibiting two imprints, evidently a part of a track, and making their nearest approach to footprints described as *Chelichnus*. From Corncockle Muir.

No new forms are represented in this series, although specimens 1966.40.107 and 1966.40.109 are of more than passing interest. Specimen 1966.40.103 is also noteworthy in that it was formerly owned by Duncan, the traces of mortar yet adhering to the slab suggesting that it was one of the specimens known to have been built into the wall of the summerhouse of Duncan's early residence at Ruthwell Manse (5, pp. 195f).

An additional footprint-bearing slab (1967.19.1), unrelated to the above series, has recently been found in the reserve collection of the Royal Scottish Museum. It shows part of a track characterized by the natural casts of six alternating imprints (three of each foot) apparently representing *Herpetichnus robustus* or a closely related form. No records have survived of the precise horizon, locality, and history of this specimen, although the matrix is unquestionably Permian. It is not improbable, moreover, that the locality was situated somewhere in Dumfriesshire.

Another slab from Corncockle Muir, bearing several indistinct footprints of *Chelichnus* sp., is preserved in the Institute of Geological Sciences, London—reg. no.: GSM.103203. The specimen was formerly owned by the otherwise unknown collector Matthew Moggridge, who, on 3rd January, 1874, presented it to the Jermyn Street Museum, where the Geological Survey collection was then housed. Together with other Permian material at present in the London collection of the above Institute, the specimen is shortly to be transferred to the Institute's repository at Leeds.

Yet another slab from Corncockle Muir, showing several imprints similar to those figured as *Herpetichnus bucklandi* by Hickling in 1909 (8, pl. iii, fig. 18), is preserved in the Sedgwick Museum, Cambridge—reg. no.: G. 426 SM. The specimen, which was presented by Sir William Jardine, is of special interest in that the footprints show considerable resemblance to other tracks and three-

toed footprints with well-defined soles or pads from Mansfield. Specimens from the latter district figured by Hickling (8, p. 8, etc.) may be compared with the Cambridge specimen to advantage.

The New Material (Cumberland):

Three slabs exhibiting tetrapod tracks similar to those long known from Dumfriesshire were discovered in the Lazonby Sandstone at Lazonby Fell Quarry, Cumberland, in 1937. Two of the slabs (6.1937.1, and 6.1937.2) were presented to Carlisle Museum and Art Gallery the same year by Messrs William Graves (quarriers) of Carlisle, but the present whereabouts of the third slab is unknown. Of the two slabs now at Carlisle, the first (fig. 1) apparently represents an undescribed form; it unfortunately lacks sufficient diagnostic characters warranting the erection of a new appellation for its reception. The accompanying illustration shows quite clearly the recurrence of three digits in each of the component imprints forming the track, other observed details being of doubtful significance owing to the indifferent preservation of the evidence.

The second of the Carlisle tracks is attributable to *Chelichnus* sp., the faintness of outline of all the constituent imprints precluding finer identification. The specimen is of interest, however, in that it further confirms the wide geographical distribution of British *Chelichnus* footprints, and may prove of some value in future correlations of the Permian sandstones of Dumfriesshire and Cumberland.

Some Additional Early Records:

Subsequent to the writer's previous review of the early literature concerning the celebrated series of fossil tracks from Corncockle Muir (4), further re-

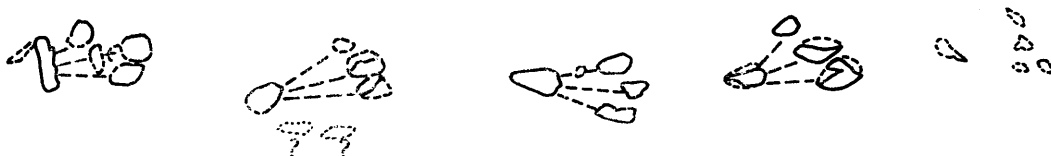


Fig. 1.

Fossil Track (Unnamed). No: 6.1937.1, Carlisle Museum.

$\frac{2}{5}$ Nat. Size.

ferences to these historic specimens have come to his attention; a record of these is appended as follows.

At least three of these early communications (1; 7; 10) dated from the time of the initial descriptions of tracks of this kind by the Rev. Henry Duncan, while two others contained illustrations of one of the tracks originally associated with that scholar (2, pl. following p. 88; 11, p. 78, fig. 84), but afterwards figured by Buckland in his *Bridgewater Treatise* (vol. ii, pl. 26, 1836). All these references, together with Mantell's of 1831 (9), were unanimous in ascribing the tracks to ancient reptiles. Writing about the same period, Fairholme (6, pp. 340-1) added the interesting remark that Sir Everard Home—famous as the author of the first scientific attempts to describe *Ichthyosaurus*, and otherwise unconnected with the Dumfriesshire footprints—considered it probable that the Corncockle Muir tracks had been made by chelonians, a view no doubt reflecting that expressed shortly before by Buckland (3). The chelonian origin of these tracks is, of course, no longer generally upheld.

A Note on the Mode of Occurrence of British Permian Footprints:

In the writer's previous essay on these footprints (4, pp. 20-1), the impression may inadvertently have been given that the ichnites had been created by animals frequenting some ancient sea-coast. This, however, was not intended, and nor is such a conception consistent with the known evidence. The following statement expresses—more clearly it is hoped—the author's conclusions regarding the general physical conditions under which these footprints appear to have been made.

The occurrence of the known British Permian tetrapod footprints (whether as tracks or as isolated imprints) in sandstone strata generally agreed to be of aeolian origin, in places of high salinity or associated with markedly saline deposits, sometimes traversed by petrified sun-cracks, occasionally exhibiting ripple-marks or pitted by markings variously interpreted as having been caused by rain-drops or spray, and almost everywhere devoid of other organic remains, suggests that they were created under predominantly warm and arid conditions, characterized physically by extensive areas of desert or sparse vegetation interspersed by both permanent and transient bodies of shallow water, of which the extent of the former no doubt fluctuated (perhaps rather violently) seasonally. In some case the permanent bodies of water may also occasionally have had direct but tenuous communication with marine lagoons or arms of the sea proper. All these bodies of water—of which the largest may have reached the size of small inland seas—seem to have been subject to very considerable evaporation with the consequent formation of extensive saline deposits. Rain-fall appears to have been erratic, being, in all probability, restricted to certain seasons of the year.

The foregoing factors could not have been favourable to the development of life forms to any marked degree, although, among the reptiles and insects

there have been a few specialized forms flourishing in regions like those described above. We should, therefore, envisage these tracks and footprints as having been made by (a) carnivorous reptiles that must have preyed upon each other or upon such insect life as might then have existed there, or by (b) a variety of reptilian vertebrates, both carnivorous and herbivorous, that may have been in transit between more fertile areas or that may have been attracted to these arid and generally inhospitable districts for other but as yet undiscerned reasons. It is highly probable, however, that the reptilian faunas involved differed in different areas, according to local geographical conditions, the relative distances separating the more fertile regions in any given area, and the diversity of reptilian forms and the actual numbers of individuals composing local reptilian populations: thus a mingling of different reptilian types was no doubt of frequent occurrence on the Dumfriesshire landscape when, some 200 million years ago, these footprints were made. The evidence of the footprints themselves is consistent with such a conclusion.

Acknowledgments:

My sincere thanks are due to the following, whose assistance during the course of these studies has been greatly appreciated: Dr C. D. Waterston and Dr R. S. Miles, of the Royal Scottish Museum, Edinburgh; Dr C. L. Forbes, of the Sedgwick Museum, Cambridge; R. V. Melville, Esq., of the Institute of Geological Sciences, London; and R. Hogg, Esq., of the Museum and Art Gallery, Carlisle.

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NORTH SOLWAY BIRD REPORT, 1965

Edited and Compiled by A. D. WATSON and J. G. YOUNG

This report for Dumfriesshire and Galloway is a successor to bulletins circulated privately in 1963 and 1964. It is hoped to repeat it annually. For the first time records from Wigtownshire are included. The contents deal only with 1965 and do not aim to review the status of any species over a longer period.

The compilers fully realise that this report has many inadequacies. It has not yet been possible to bring together all reliable observations from so large an area. Some localities such as Carsethorn and Loch Ken are much more fully documented than others. There is clearly scope for much further study on the distribution of many species, and it is hoped that this report will stimulate readers to submit notes to the compilers and so help to fill the gaps in our knowledge.

It is emphasised that no attempt has been made to list all the localities where the more widespread species have been seen or found breeding, and in order to save space some have been mentioned only in an appendix. It is important to say, also, that it is not the policy to give numbers and localities of breeding birds if these are scarce and vulnerable to disturbance.

CLASSIFIED NOTES

(D) = Dumfriesshire. (K) = Kirkcudbrightshire. (W) = Wigtownshire.

Black-Throated Diver. Single adult, recorded inland late June.

Great Northern Diver. One, in almost full breeding plumage, but later showing signs of moult, Earlstoun Loch, Dalry (K), 5-19th November.

Red-Throated Diver. Single, Southernness (K), 27th February, one, inland 26th June.

Great Crested Grebe. Many winter and spring records from coasts of all three counties. Pairs in summer at three of the Lochmaben Lochs (D), at Loch Ken, Woodhall, Auchenreoch (where young seen), also once on L. Roan (K), 16th June, pair still on Loch Ken, 20th October, Lochinch (W), pairs in July, September, December.

Red-Necked Grebe. One, Stranraer (W), 6th February, 2 Southernness (K), 13th March, S.B.3, 318.*

Slavonian Grebe. Single, Leffnol Point, 2, the Wig, Loch Ryan (W), 11th March.

Black-Necked Grebe. 2, Loch Ryan (W), 14th January, 3 on 9th February, and as many as 22 were probably there on 6th February.

Little Grebe. Bred all three counties, and recorded more widely in winter.

Manx Shearwater. One, Luce Bay (W), (seen from boat en route for Scar R.), 25th July.

Fulmar. Breeding or prospecting at 5 localities (K), and at 13 (W).

Gannet. At least 240 pairs were estimated to be breeding on the Scar Rocks (W), 25th July.

Cormorant. Many inland records, 300 pairs estimated at Castle L. Mochrum (W), July; 6 pairs, Scar Rocks (W), 25th July; 12 nests, Mull of Galloway (W), 31st May.

Shag. At least 25 pairs, Scar Rocks (W), 25th July, numerous nests, Mull of Galloway (W), May, frequent coastal records (W), especially Stranraer harbour where oiled birds often noted.

Heron. No counts of breeding birds (D), at least 14 nests, Dalskairth (K), several pairs

* This and following references are to the volume and page numbers of *Scottish Birds*.

- bred, Minnigaff (K), at least one pair bred Spottes Hall and Lamloch (K), at least one pair bred Lochinch (W), a pair probably bred at Logan (W).
- Mallard.** Largest numbers counted were: 2000+ Stranraer area, 14th November; 1000+ Carse Bay (K), 30th August; 500 Carse Bay, 6th February; 300+ Lochmaben area (D), 17th October; 280 L. Kindar (K), 18th October; 400 Thornhill area (D), November; 200 Lochside, Sanquhar (D), November; c250, 20th September; 280, 17th October; 250+ 14th November, L. Ken (K).
- Teal.** Bred all three counties. 50+ L. Ken, 8th March (where numbers lower than average).
- Garganey.** Pair, Caerlaverock, 25th April (2nd record for (D)) (S.B.3.367).
- Gadwall.** Two, 27th January, pair 17th October, female 28th November L. Ken (K), 4 Garlieston (W) 9th December (S.B.4.107).
- Wigeon.** Single pairs, at L. Ochiltree (W), L. Ken (K) in June, no proof of breeding. At L. Ken (K) 1000+ 18th and 29th January; 600, 4th February, still several hundred on 3rd April; 6 on 12th September, 15 on 20th, 220+ by 17th October, increasing to 400+ by 14th November; 400 Netherhall, R. Dee (K), 4th February. Flocks widely recorded especially in estuaries and coastal areas in winter; 1000, L. Ryan (W); 250+ White Loch (W), 14th December; 200, Kirkcudbright Bay, 18th February, 250-300 on 26th December; 60 Brighthouse Bay, 18th February.
- Pintail.** Bred L. Ken (K), female with 2 young seen 3rd July; c990, 6th February; 400, 21st February; 6+ 30th August, increasing steadily to 1700 in December Carse Bay/Drumburn (K). At L. Ken (K), c100, 18th January; 30, 14th February; 30+, 8th March; c15, 20th October; 30-40, Luce Bay (W), December.
- Shoveler.** Pairs during May at L. Milton (K), Woodhall L. (K), several L. Ken (K), 3-4 L. Erncrogo (K), Ardwall (W), no broods recorded. Passage and winter numbers not large, maximum 50+ Carsethorn late August.
- Scaup.** Flocks of varying size distributed from Annan (D) to Stranraer (W). 2200 Sandyhills Bay, 200+ Carsethorn (K) 6th February, 150 L. Ryan (W) 14th February, 1 or 2 inland L. Ken (K) 29th January.
- Tufted Duck.** No summer records for (D). Pairs at L. Milton (3-4), Lochrutton (1), L. Erncrogo (5), L. Ken (6-8), Kindar (1), all (K). Whitefields Loch (2), near Clayshant (1), L. Connell (4-5), Dunskey Lochs (6), all (W). Moderate numbers on numerous lochs in winter.
- Pochard.** Pair courting, 12th May (K), breeding not proved. Up to 20, L. Kindar (K) 15th November. Small numbers L. Ken (K) February—March, October—November c30, 28th November in cold weather; very few on Carlingwark L. in winter, compared with some past years. 40-50 L. Connell (W) 14th November.
- Goldeneye.** Widespread, on inland waters in winter (D.K. and W.), small numbers Stranraer harbour (W). Ad. male still at Woodhall L. (K), 12th May. 4 birds at a loch in (W) 5th June.
- Velvet Scoter.** Small numbers reported in winter, Garlieston area (W).
- Surf Scoter.** Ad. male, Southernness (K) intermittently 13th February-16th March, 2 ad. males with one female Porto 'warren (K) 28th February, 6th, 8th, 21st and 28th March. Up to 4 birds Porto-warren, 4th April. Ad. male Luce Bay (W) 23rd February. (S.B.3,364) (first record for (W)). It appears that at least 6 birds were involved in the above records.
- Common Scoter.** Flocks of up to 2-300 regular Southernness (K) October-March. Small flocks near Port William (W), 28th March, 250 17th July.
- Eider.** Four broods seen in June, Knock B. (W) (S.B.3,423). 80 adults, male and female. The Wig, L. Ryan (W) 18th June.
- Red-Breasted Merganser.** Bred all three counties, some evidence of increase (D), especially in tributaries of Nith. Bred Mochrum (W) 3 broods seen, and Lochinch (W) where one female had 22 young in tow, near the Wig L. Ryan (W). (2 pairs and

- 1 brood seen), female L. Ken (K), 3rd July, Recorded on the Firth and estuaries out of breeding season in fair numbers.
- Goosander.** Bred (D) many pairs on Nith and tributaries, despite fairly heavy shooting, bred (K) especially in Glenkens but also further west, breeding success believed to be poor with maximum early autumn flocks only 20-30 on L. Ken. Widespread on fresh water in winter.
- Smew.** Single (red headed), Dunskey Lochs (W) early December.
- Shelduck.** Bred all three counties. Female of pair on cliff top at Mull of Galloway (W) seen entering burrow, 16th May; 50+ Dee estuary, 10th March; 200+ Caerlaverock (D) 150 Glencaple area (D) c400 Powfoot (D) and 300+ Drumburn/Carsethorn (K) 19th October.
- Greylag Goose.** Further extensions noted in distribution of feral breeding stock; 4, flew N. Applegarthtown (D) 14th July (possibly injured birds recovered after full wing moult).
- Nat. Goose Counts: 28th March 700 (D), 3500 (K), 1290 (W). 7th November: 240+ (D), 860 (K), 4120 (W).** (per H. Boyd). c900 Castle-Douglas-Ken Valley, 2nd January. c400 eating turnips Threave (K), 12th January. Last spring flock at L. Ken, 3-400, 3rd April. Early **Autumn arrivals** confused by possible presence of feral birds, 17, flew S. over Lockerbie (D) 17th October. Small parties flew S. over Dalry (K) 6th, 11th and 13th November; 320 L. Ken, 14th November; 75 roosting Kirkcudbright Bay 26th December. Roost at Lochmaben and a new one used in same area of (D). Several roosts noted in (W).
- White-Fronted Goose (Greenland).** January-April; max. L. Ken area 150+; last seen in spring, 27, at Kenmure 21st April; **Autumn arrivals** heard flying S. over Dalry, midnight 30th October, 150+ on 31st October, 350+ 9th November.
- Bean Goose.** Up to 60 in usual areas near Castle-Douglas (K), January-March. Last in spring 35 on 21st March; 8 had arrived on 26th December; and had increased to 37 by 31st.
- Pink-Footed Goose.** Single, near Castle-Douglas, with Beans, 2nd and 12th January.
- Nat. Goose Counts: 28th March, 4000+ (D), 2000 (K), 1300 (Wigtown merse), 7th November: 7800 (D), 50 (W).** 400 still at Glencaple (D) 1st May, **Autumn arrivals** 18, Caerlaverock (D), 11th September; increasing to 75 18th September, and 2-300 by 30th.
- Barnacle Goose.** 2, Threave (K) 2nd January, last in spring 450 at Caerlaverock, 5th May, **Autumn arrivals** 2 on 27th September, increasing to 13, by 29th, at least 2000 by 6th October, and 3700 on 5th November.
- Canada Goose.** Bred, present all year (D), bred from introduction in 1963 (W).
- Mute Swan.**—Bred all three counties. Records include c25 Kirkcudbright harbour 18th February, maximum of 30, Annan, 43 Dumfries (D), 21 Stranraer, December 14th, Maximum of 12, at L. Ken (K) on 12th September, and 30th November. A well grown cygnet of the white Polish variety seen accompanying a pair of adults L. Ken, 28th November.
- Whooper Swan.** Largest numbers noted in (K), especially at Islesteps where maximum of 64 in one herd, 24th February; small parties in many places in central (K) January-March Carlingwark L. (up to 12, 12th January) at L. Ken, Woodhall L., Burgatton L., near Twynholm, Dee estuary (7, 10th March), 8, at Carsphairn Lane, 22nd January 14, south of Newton Stewart (W) January. Last party in spring at L. Ken 3rd April, single late birds (both 2nd year) Lochinvar L., 2nd May, L. Ken, 7th May. **Autumn arrivals:** 4, L. Ken, 17th October, 11, Islesteps 20th, increasing to 47 by 31st December.
- Bewick's Swan.** Single Islesteps (K) with whoopers, 7th February 2, Woodhall L. with whoopers, 27th February.
- Golden Eagle.** Bred, more successfully than in 1964.

- Buzzard.** Bred all three counties. A number of pairs bred successfully in wooded glens in (D) where no evidence of decline. Fairly widespread breeding in (K) but insufficient evidence to compare success with other years. In (W), where it is considered a very local breeder, a nest of eggs was robbed by a farmer. Widespread records outwith breeding season all counties, including one on 9th October, at Killantringan (W) in the extreme west of the county.
- Sparrow Hawk.** A number of breeding records (D), Bred (K), few details known. Lack of breeding records in (W) should not be considered significant. Frequent and widespread records out of breeding season.
- Hen Harrier.** Both sexes recorded rather frequently and widely in autumn and winter, all three counties. Most westerly record one, Killantringan (W) 10th October.
- Osprey.** Single, Tongland (K) 4th September. S.B.3.424.
- Peregrine.** No evidence of further decline in (D) and (K), but breeding success poor in relation to eggs laid. Frequent winter records from shore (D) and (K), especially Carsethorn-Southernness when Knot frequent quarry.
- Merlin.** Bred all three counties, with perhaps slightly increased success (D). Autumn and Winter records from scattered localities, regular Caerlaverock (D).
- Kestrel.** In (D) at least, breeding strength was below 1964 level. Two were found dead beneath a pole trap Dalhabbock Moor (W), 12th July.
- Black Grouse.** Considered to have increased slightly from 1964 in Upper Nithsdale (D), and near New Abbey (K). Considered decreased in one area, High Ken Valley (K), present in strength in main afforested areas in (K), where a lek of 30 cocks, and another of 12-15 recorded in May.
- Partridge.** In many places (K and D) numbers were at a low level.
- Quail.** One calling near Applegarthtown (D), 4th July, two, Jockstown, near Annan (D), 2nd October.
- Golden Pheasant.** Much in evidence in older afforested areas of (K), and noted as very noisy above Woodhall L. in evenings. August-September.
- Water Rail.** Pair bred Caerlaverock area, single birds recorded in winter, Moffat, Crawick (D), Castle-Douglas and Munches (K), near Stranraer (W).
- Spotted Crane.** One calling from same marsh in (K) as in 1963, 7th June.
- Corncrake.** Bred, Waterside Mains (D), Calling Moffat, 14th May, Barr, Sanquhar, 30th May, Park Farm, 13th June, all (D). Freshly dead adult found impaled on barbed wire fence near Applegarthtown (D) and another calling nearby, 5th June. Scarce in Glenkens (K), one Dalry, 12th June, one Kenmure, 7th June. Several reports from (W), including one put up from marsh, Ardwall, 16th May.
- Lapwing.** A good breeding season, with numbers specially in (D) considered to be back to 1962 level in most places. Still scarcer than in 1962 in Glenkens (K). Large flocks in Autumn and Winter, Luce Bay (W). Some hundreds in Dee estuary (K), 18th February. One with white wings in a flock at Brighthouse Bay (K), 18th February.
- Ringed Plover.** An early return to breeding haunts near Thornhill (D), noted 7th February. Bred well Kirkcolm (W). Several displaying Ardwall shore (W), 16th May. 180+ on shingle, Carsethorn (K), 30th August.
- Grey Plover.** Single birds Waterfoot, Annan (D), 3rd January, 17th January, 28th February, and regularly Carsethorn (K), two, Caerlaverock (D), 15th September. Seven, Brow-houses (D), 9th October.
- Golden Plover.** Bred in good numbers at Kirkconnel and Langholm moors (D), bred locally in (K), including several pairs on one moor near Gatehouse, where rather more had bred in 1964, Winter flocks of 300-1000 noted at Gretna, Caerlaverock, Courance (D), Kirkcudbright and Fleet Bays, Luce Bay and Kirkcolm (W).
- Turnstone.** Records include 200+ Waterfoot (D), 20th July, 150+ Carsethorn (K), September. 70-80, Southernness, December.

- Whimbrel.** Regular over Caerlaverock, small numbers May, also August-September. One flew over Dumfries, 1st June, two flew S. Carse Bay (K), 31st August, three Castle Point, Rockcliffe, 1st September, one Browhouses (D), 9th October.
- Black-tailed Godwit.** 60+, 18th April, and one 29th April, Glencaple (D). 30 on 8th July, increasing to 40 on 11th, and to 50-60 by 27th at Glencaple. 52 Carse Bay (K), 27th August, decreased to 3, by 31st. 10, Luce Bay (W), 2nd September, single Caerlaverock (D), 15th September.
- Bar-tailed Godwit.** Records include 370+, Waterfoot, Annan (D), January. 150+, Caerlaverock, 15th September. 2 Sandhead (W), 19th September.
- Green Sandpiper.** Single birds, Caerlaverock (D), 6th July, 21st August, 2 on 15th July.
- Common Sandpiper.** First spring arrivals, 4th April, Portling (K) and River Nith. Return passage noted Caerlaverock, mid-July.
- Redshank.** Large passage noted Carse Bay, 30th August, when considered the commonest wader.
- Greenshank.** Autumn arrivals, one Penwhirn Res. (W), 12th July, Caerlaverock (D), 15th August onwards, 4 Waterfoot, Annan, 11th September-31st October, 3 Browhouses (D), 12th September, 9th October, several flying up River Annan, 28th September, one still present 1st November. At least 4, Piltanton estuary Luce Bay (W), 19th September. At least 6, Kippford (K), in estuary at sunset, 1st September.
- Spotted Redshank.** One Dee estuary (K), 18th February. Single Caerlaverock, 27th July, increasing to at least 15, by 5th September, and to a peak of 60+ by 30th.
- Knot.** A few Dee estuary (K) 18th February. In autumn a few Caerlaverock-Southernness by mid-August. Winter flocks there thought to total c. 10,000. At least 3-400 Luce Bay (W) and 200+ Loch Ryan (W) December.
- Purple Sandpiper.** 5 Scar Rocks (W), 25th July. Up to 7, Southernness, intermittently.
- Little Stint.** 2, Caerlaverock (D), 19th September. Single present on 22nd.
- Temminck's Stint.** A first winter male was shot at Islesteps (K), 16th November, and believed to have been there with possibly another since 10th November. S.B.4,111. Apart from one said to have been shot in (K) last century this is the first record for the Scottish Solway.
- Curlew Sandpiper.** Single Caerlaverock (D), 3rd October.
- Ruff.** The unprecedented numbers of this species were the outstanding feature of the autumn wader immigration; One Bridge-of-Dee (K), 31st March, S.B.3,321. At Caerlaverock singles on 3rd June and 3rd July, increasing to 3 by 6th July to 14th August, and to "hundreds" by 3rd October. During this period there were many reports of single birds on the shore in (D and K). At Browhouses, 11 were in a flooded field on 12th September, increasing to 21 by 18th, and to 30 by 20th.
- Red-Necked Phalarope.** Single Caerlaverock, 15th-21st August.
- Greater Black-Backed Gull.** 2-3 pairs breeding, Mull of Galloway (W), 16th and 30th May; 2 pairs, Scar Rocks (W), 25th July.
- Herring Gull.** Fair numbers of young hatched, Mull of Galloway, 30th May. c. 30 pairs Scar Rocks (W), 25th July. Estimated 2000 pairs Heston Island (K), July.
- Lesser Black-Backed Gull.** Up to 5 wintered Glencaple-Dumfries and one adult seen regularly, Stranraer harbour. Spring arrivals noted by 30th March. Noted as very scarce at Mull of Galloway (W), none seen 16th May and only one 30th May. Estimated, 125 pairs Heston (K).
- Common Gull.** In (K), breeding colonies included 6-8 pairs Lochinvar L. and several pairs L. Skerrow, which had young on 8th July, at least 5 pairs, Heston Island, 2 pairs bred near Sanguhar (D). Bred also (W). On 18th February, winter roost at Manx-mans Lake, Dee estuary (K), over 4000 birds.
- Black-Headed Gull.** The colony at Livingston, L.Ken (K) was large, at least 1500 pairs 7th May, a colony of c100 pairs many with young, at High Elrig L. (W) may be hitherto unrecorded.

- Kittiwake.** 130-170 pairs estimated Scar R. (W), 25th July. In (D) where it does not breed, 81 seen resting on sand at Browhouses, 28th March.
- Common Tern.** At least 5 pairs attempted to return to Heston Is. (K), but all eggs destroyed by gull predation. Thought to be more successful on Rough Is. (K).
- Sandwich Tern.** Spring arrivals, 2 Garlieston (W) 28th March, 5 Southernness (K) 10th April, at least 2 were at Ardwall (W) 16th May. No breeding recorded.
- Razorbill.** Bred (K) (W) c 15 pairs Scar R. (W) 25th July.
- Guillemot.** Bred (K) (W) c 750 pairs Scar R. (W) 25th July.
- Black Guillemot.** At least 3 pairs bred, Portpatrick (W), 5 pairs Mull of Galloway, 2 pairs present Scar Rocks, almost certainly breeding (at least one pair bred 1964). A number of pairs believed to have bred Garlieston-Isle of Whithorn, one pair probably breeding, Balcary Point (K), June.
- Puffin.** At least 4 in Luce Bay (W) and 2 pairs Scar Rocks, 25th July, breeding not confirmed.
- Stock Dove.** In Glenkens (K) bred fairly widely in small numbers, one in "song." Manxman's Lake (K) 26th December. Bred widely (D) where absent in winter from many summer strongholds.
- Collared Dove.** Continued to increase in Dumfries town in parts of which, where food is provided, it is now numerous. Still few records from (K) one at Dalry 22nd April and 1, Kenmure Castle gardens 19th June, 15 in January, and some later on 28th March, Garlieston (W), where there is an established colony. One near Sandhead (W) 19th September. The presence of free flying Barbary Doves in (K) may be worth noting as they could be confused with Collared Dove.
- Barn Owl.** Widespread records (D) and (K), one at Kirkcolum (W) 14th December but absence of further records (W) should not be considered significant. On 27th January one was seen to stoop low at a cat on the road near Gelston (K).
- Long-Eared Owl.** One hunting Carlingwark marsh (K), in early afternoon 2nd January. Reported "still plentiful" in west Wigtownshire. Almost certainly bred (D).
- Short-Eared Owl.** Bred fairly widely but nowhere abundantly (D) and (K) odd birds on moors in winter. Reported as "common" in parts of (W).
- Nightjar.** 2 churring Glen Trool (K) June, at least 2 churring Cairn Edward forest (K) June, one near Woodhall L. (K) 26th August.
- Swift.** Spring arrivals, Dumfries 8th May, Dalry (K) 10th May, near Newton Stewart (K.W.) 14th May. Last seen Sanquhar (D) 16th August.
- Kingfisher.** Recorded and probably bred at one or two localities (K). Reported Glenluce (W) and suspected at two localities (D).
- Hoopoe.** One near Newmills, Moffat (D) for at least 3 days, c 7th June, one Kirkcolum (W) for about a fortnight up to 11th October.
- Green Woodpecker.** Bred (D) and (K) and widely recorded both counties.
- Great Spotted Woodpecker.** Bred widely Nithsdale (D); bred (K), 4 adults seen together near an old nest hole at Slogarie (K) 1st May.
- Swallow.** Spring arrivals; first Kingholm, Dumfries, 11th April, westerly passage on 1st September at Castle Point, Rockcliffe (K), last, 2 at Sandhead (W).
- House Martin.** 5 pairs nested at Clatteringshaws Dam (K), young in nests on cliffs at Douglas Hall, 31st August. Many at Mull of Galloway (W) on 30th May, apparently on passage.
- Sand Martin.** 30 at Nunland (D) 6th April, were the first recorded in spring, at least seven pairs excavated and bred in a "peat banking" Loch Dornal (W).
- Raven.** Bred all three counties.
- Carriion-Crow/Hooded Crow.** The presence of hybrids, some superficially like pure Hooded Crow in (D) and (K) may have led to some false reports of the latter in the recent past. Hybrids in 1965 were one near Talnotrie (K) 28th March and one Kenmure (K) 21st April. (Recent reports indicate that pure Hooded Crows still

- breed in West Wigtownshire and occur occasionally elsewhere. (There is a Dumfriesshire ringing recovery of a Scandinavian bird)).
- Rook.** As usual flocks were seen feeding on moorland at over 1000 feet in (K) June-July.
- Magpie.** Present at a few regular haunts, all three counties.
- Jay.** Locally present in moderate numbers throughout the year, (D) and (K).
- Chough.** Small party present at one coastal locality in April, and also reported at another coastal locality.
- Willow Tit.** Recorded throughout the year (D) and (K), bred both counties. In (K) as in 1964, one or two visited the verandah of a house for nuts.
- Fieldfare.** 1000 Newhills, Moffat (D), 28th March, 150 Thornhill, 5th May, Autumn arrivals; first, 15, Applegarth, 30th September. Large movement 1-10th October widely noted.
- Redwing.** Autumn arrivals: first, 5 at Grange, Tundergarth (D), 28th September. Many arrived with Fieldfares 1-10th October.
- Blackbird.** Large numbers noted in (W) on 14th November, when first winter males were much in evidence, specially numerous in Ken Valley (K), 28th February and 31st October.
- Ring Ouzel.** One Drumlanrig (D), 26th December, S.B.3,322, First spring arrivals were 3 males at Grey Mare's Tail, Moffat, 30th March. Newly-fledged young seen in (K), 27th June, one bird on summit of Corserine (K), 17th July.
- Wheatear.** Spring arrivals: single males at Breconside, Moffat, Beattock (D), and near Port William (W), 28th March, 5 at Grey Mare's Tail, Moffat, 29th March. A leucistic juvenile was seen at Penwhirn Res. (W), 12th July.
- Stonechat.** Although a good recovery has been made since 1963, is still not re-established in all old inland haunts (K). Plentiful along coast of (W), but much former habitat near Port William had been burnt in March. Lack of breeding records (D), is not regarded as conclusive.
- Whinchat.** First in spring, a single at Grange (D), 5th May, one Mossdale (K), 7th May, bred widely all counties. Last in Glenkens (K), 16th September. Last seen near Lockerbie (D), 26th September.
- Redstart.** First in spring, a male, Thornhill (D), 24th April. Bred fairly widely (D) and (K), 2 nests with young at Glenlee (K), were in tree stumps a few inches from the ground, one in open space of felled woodland, 14th June. Single birds, Lockerbie and Keir (D), 19th August.
- Black Redstart.** A fine male was at Portowarren (K), 20th February-6th March.
- Robin.** A very tame bird by L. Ken (K), in snowy weather in March readily entered a parked car for food.
- Grasshopper Warbler.** One or two still in song at Livingston, L. Ken (K), 3rd July. Widely recorded from young forest plantations, local but widespread records from (D).
- Sedge Warbler.** First in Spring, Woodhall L. (K), 7th May, last seen a bird trapped on 20th September (D).
- Blackcap.** A male, in Dumfries town, 3rd-10th March, singing males in at least three localities in (K), in May. Widespread (D) where marked passage in August. None recorded in two summer visits to Lochinch estate (W).
- Garden Warbler.** First in Spring: Keir, Thornhill (D), 1st May. Later numerous in New-Galloway area (K). A nest in a garden at Dalry had a full clutch of 2 eggs on 29th June.
- Whitethroat.** First in spring: a male at Sanquhar (D), 1st May, near Newton-Stewart (W), 3rd May. Last seen Dalry (K), 17th September, Luce Bay (W), 19th September.
- Willow Warbler.** First in spring: Creetown (K), 9th April; Halleaths (D), 10th April; Return passage noted from 26th July, very marked in (D), in mid-August (at ringing sites, Applegarthtown and Waterside Mains).

- Chiffchaff.** First in spring: one Livingston, L. Ken, 29th March. One New Galloway, 1st April, 2 Grange (D), 2nd April, and at 3 localities (D) on 3rd. Widespread by 14th April.
- Wood Warbler.** Bred (K) and (D) where more widespread than in 1964.
- Goldcrest.** One repeatedly visiting bird table, attracted by "soft bill" food, Dalry, 7th January. Influx noted all 3 counties in mid-late September, a few being noted at Mull of Galloway Lighthouse (W).
- Spotted Flycatcher.** First in spring: Dalry area (K), two in different localities, 13th and 19th May. First in (D), Waterside Mains, Keir, 20th May, last seen (K), 17th September.
- Pied Flycatcher.** First in spring: near Sanquhar (D), 28th April. Bred well in nest boxes. Sanquhar, Moffat, Thornhill areas, Crawick Glen (D), where two pairs bred, was a new locality, bred (K).
- Duncock.** Influx noted at (Applegarthtown ringing site) during October.
- Meadow Pipit.** Returning birds in hill country (K), still in small flocks, 3rd April. Many birds Dalry area (K), mid-end September. A number still in Polmaddy glen (young forest) (K), 14th November.
- Tree Pipit.** First in spring: Hensol and Cairn Edward forest (K), 1st May. St Anne's Bridge (D), 9th May. Last seen (D), 16th August.
- Pied/White Wagtail.** 60-70, Sanquhar sewage works, 20th August-14th September. Peak numbers at Dalry (K), 40-50, 17th September. Numerous throughout September. Many at Mull of Galloway (W), 19th. The only definite Whites were 2, at Southernness (K), 19th September.
- Grey Wagtail.** No scarcity of breeding birds in the Glenkens and district (K), nor in Thornhill area (D).
- Waxwing.** The period 20th October-29th November saw the largest numbers yet recorded in (D). From 20th October, reported regularly in seven localities, in Moffat area, in parties up to 15, 40-50 on hawthorns, Kingholm Park, Dumfries, 20th November, 50+ Glencaple, 2nd-15th November, 40-60, Drumlanrig to 20th November, and many other reports of small parties in gardens over a wide area. In (K), first noted on 2nd November; 2 Dundee increased to 6, 3rd November; parties reported during November from Corsock, Cumstoun, Kirkcudbright, and 2 at Earlston, Dalry, 14th November. In (W), at least 12, near Stranraer in October, and 6 at Newton-Stewart, 3rd November.
- Great Grey Shrike.** Single birds, Moss of Cree (W), 7th February, near Mossypaul (D), 14th April, Browhouses (D), 12th October, Laurieston (K), 12th December (S.B.4.114). One regularly at Craigbeck, Moffat (D) during December.
- Siskin.** Considered very scarce in (K) and (D) in winter. Small numbers present (K) in breeding season.
- Twite.** 50-60, Kirkcolm (W), 14th December, (a regular winter haunt). Small flock, Glencaple-Caerlaverock from November onwards, 2 at Piltanton estuary, Luce Bay (W) 19th September.
- Brambling.** 100+ in mixed flock, Crockettford (K), 21st March. First in autumn: several near Dalry (K), 16th October. Single birds at Moffat, Thornhill, 30th October. 60+ Hayfield, Thornhill, 20th November.
- Snow Bunting.** 20, Beef Tub area (D), 28th February. 30-40, Polmoodie, Moffat, 22nd November. Large flocks, Grobdale (K), and many above Forrest Lodge, near Dalry (K), during snow in November.

The following species were also recorded, but due to various limitations are merely listed here.

Red Grouse	Skylark	Starling
Pheasant	Jackdaw	Greenfinch
Moorhen	Great Tit	Goldfinch
Coot	Blue Tit	Linnet
Oystercatcher	Coal Tit	Redpoll
Common Snipe	Long-tailed Tit	Bullfinch
Woodcock	Tree Creeper	Chaffinch
Curlew	Wren	Yellowhammer
Dunlin	Dipper	Corn Bunting
Wood Pigeon.	Mistle Thrush	Reed Bunting
Cuckoo	Song Thrush	House Sparrow
Tawny Owl	Rock Pipit	Tree Sparrow

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APPENDIX

North Solway Ringing Group Ringing Progress List, 1963-1965

Species	1963-64	1965	Total	Species	1963-64	1965	Total
Gannet ...	—	100	100	Woodcock ...	1	—	1
Cormorant ...	—	5	5	Curlew ...	45	15	60
Mallard ...	9	103	112	Common Sandpiper	8	—	8
Eider ...	5	—	5	Redshank ...	15	16	31
Greylag Goose ...	33	94	127	Greater Black-backed Gull ...	—	2	2
Mute Swan ...	85	—	85	Lesser Black-backed Gull ...	70	62	132
Buzzard ...	9	5	14	Herring Gull ...	28	107	135
Sparrow-Hawk ...	7	2	9	Common Gull ...	29	—	29
Peregrine ...	—	3	3	Black-headed Gull	270	179	449
Merlin ...	—	2	2	Kittiwake ...	15	5	20
Kestrel ...	48	16	64	Razorbill ...	—	2	2
Water Rail ...	3	—	3	Guillemot ...	4	93	97
Moorhen ...	—	6	6	Stock Dove ...	5	1	6
Coot ...	1	—	1	Wood Pigeon ...	1	6	7
Oystercatcher ...	16	8	24	Collared Dove ...	—	1	1
Lapwing ...	180	62	242	Barn Owl ...	10	3	13
Ringed Plover ...	6	—	6	Tawny Owl ...	29	4	33
Golden Plover ...	2	2	4				
Snipe ...	1	—	1				

Species	1963-64	1965	Total	Species	1963-64	1965	Total
Long-eared Owl	3	—	3	Blackcap ...	—	12	12
Short-eared Owl	5	—	5	Garden Warbler	—	4	4
Skylark ...	6	18	24	Whitethroat ...	25	71	96
Swallow ...	249	187	436	Willow Warbler	157	543	700
House Martin ...	52	74	126	Willow Warbler			
Sand Martin ...	169	269	438	(Northern) ...	1	—	1
Raven ...	25	5	30	Chiffchaff ...	9	11	20
Carriion Crow ...	3	—	3	Wood Warbler ...	1	1	2
Rook ...	3	3	6	Goldcrest ...	4	17	21
Jackdaw ...	6	3	9	Spotted Fly-			
Great Tit ...	151	66	217	catcher ...	39	22	61
Blue Tit ...	409	239	648	Pied Flycatcher	56	15	71
Coal Tit ...	11	18	29	Dunnock ...	150	262	412
Willow Tit ...	1	23	24	Meadow Pipit ...	12	11	23
Long-tailed Tit	1	56	57	Tree Pipit ...	2	—	2
Tree Creeper ...	3	32	35	Pied Wagtail ...	47	9	56
Wren ...	26	69	95	Grey Wagtail ...	—	4	4
Dipper ...	11	—	11	Starling ...	317	211	528
Mistle Thrush ...	9	14	23	Greenfinch ...	92	187	279
Fieldfare ...	16	—	16	Goldfinch ...	3	2	5
Songthrush ...	86	125	211	Linnet ...	9	—	9
Redwing ...	17	3	20	Redpoll ...	7	41	48
Ring Ouzel ...	13	4	17	Bullfinch ...	1	59	60
Blackbird ...	372	386	758	Chaffinch ...	235	532	767
Wheatear ...	4	6	10	Brambling ...	24	5	29
Whinchat ...	16	—	16	Yellowhammer	34	135	160
Redstart ...	24	21	45	Corn Bunting ...	2	3	5
Robin ...	183	182	265	Reed Bunting ...	129	117	246
Grasshopper				Snow Bunting ...	4	—	4
Warbler ...	—	2	2	House			
Sedge Warbler ...	13	42	55	Sparrow ...	111	48	159
				Tree Sparrow ...	13	53	66

Grand Total 1963 to 1965: 9423 birds of 95 species

Details of all data may be had on application to the secretary J. F. Young,
Waterside Mains, Keir.

Selected Recoveries Reported in 1965.

- 102,4508 Gannet Pull,* Scar Rocks, 25-7-65; Agadir, Morocco, 6-11-65.
(Taken on fishing line, one of 60 taken that day)
- 102,4514 Gannet Pull, Scar Rocks, 25-7-65; Viana de Castelo, Portugal, 23-10-65.
- 102,4546 Gannet Pull, Scar Rocks, 25-7-65; off Oporto, Portugal, 4-10-65.
- AJ8086 Buzzard Pull, Moniaive, 2-6-64; Durisdeer, Thornhill, 23-5-65.
- AJ84776 Buzzard Pull, Sanquhar, 7-6-65; Duncow, Dumfries, 29-11-65.
- CB61.703 Redshank Pull, Sanquhar, 2-6-65; Agon, France, 1-8-65.
- Blackheaded Gull, Denmark, 30-6-62; Annan, Dumfries, 20-1-65.
- 3.057.948 Blackheaded Gull, Holland, 3-5-65; Closeburn, Dumfries, 5-12-65.
- AJ97,565 Barn Owl Pull, Carronbridge, 26-7-65; near Coldstream, 13-11-65.
- 423.221 Raven Pull, Sanquhar, 1-4-64; Eskdalemuir, 18-4-65.
- 423.114 Raven Pull, Scar, Thornhill, 17-4-64; near Girvan, 30-3-65.
- 423.117 Raven Pull, Scar, Thornhill, 17-4-64; Moffat, 23-4-65.
- 302,6801 Carrion Crow Pull, Moniaive, 21-5-60; Sanquhar, 6-6-65.
- AB80,573 Goldfish Pull, Edinburgh, 12-6-64; Kirkconnel, 4-2-65.

* Pullus, i.e. unfledged young when ringed.

THE AQUATIC FAUNA OF THE ISLE OF MAY, FIFE SCOTLAND

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The biology of various islands off the Scottish coast has received considerable attention over the last century and many accounts are now available, usually dealing, however, with only one section of the flora or fauna (e.g. Grimshaw 1906, Balfour-Browne 1952, Hall 1952, Hunter 1953, Jackson 1954, etc.). The inland waters of these islands, often of great potential interest, have been rather neglected by ecologists, though there are some notable exceptions (e.g. Bertram 1939, Hamilton 1963). Owing to the limited capacity for dispersal of many species the aquatic fauna of small islands merits more intensive study and may help further to elucidate geographical relationships between different parts of the country.

The Isle of May in the Firth of Forth, as one of the few islands on the east coast of Scotland and as a major focus for the passage of migrant birds to and from the continent of Europe (notably Scandinavia) is likely to be interesting faunistically. Moreover, as a place visited frequently by biologists, any changes in the ecology of the island are likely to be noted quickly and regularly; thus it is hoped that the present account of the inland waters and their fauna will prove useful in the future assessment of changes affecting these habitats on the island.

No previous study has been published dealing with the aquatic fauna of the Isle of May, though several collectors have worked there in the past. Their notes have been summarised by Eggeling (1960) who gives a complete list of the species of animals and plants known to occur on the island: included in this list are most of the animals recorded by the author, drawn from the unpublished manuscript (Campbell et al, 1958) part of which forms the basis of this paper.

METHODS

In 1958 the author spent a week on the Isle of May, from 20 to 27 June. After a preliminary survey of the island, collections of fauna were made at all inland waters situated above high tide mark, excluding only those which were grossly polluted by bird faeces. Samples were taken by means of small hand nets (18 cms diameter, 30 cms deep, 16 meshes per cm) used for a variable time at each place, adopting whatever collecting method seemed most suitable for the substrate in question. Collections were made at least twice during the week at each station. All material was sorted alive and then preserved for future identification, except flatworms (Platyhelminthes) which were identified alive. Immature specimens of some species (e.g. the bug *Notonecta glauca* L.) were kept alive and reared in the laboratory to the adult stage.

The position of each water located was plotted on a map of the island (Figure 1). An outline diagram of each of the pools was drawn to scale and features of interest noted, especially the species of plant present and their abundance. A series of soundings was taken in the loch on a median transect along its greatest length and on one at right angles to this. These diagrams and data are in the possession of the author and may prove useful in any comparable survey in the future.

The Isle of May forms the subject of an excellent study by Eggeling (1960) in which a general account of the island may be found. Only a short description, therefore, of features directly relevant to the present study will be given here. Lying in the Firth of Forth and included in Fifeshire, the Isle of May is elongate, about two kilometres long by less than half a kilometre broad, its main axis being roughly north-west to south-east (Figure 1). It has a total area of about 60 hectares.

The Isle of May consists basically of an intrusive sill of olivine-dolerite (Geikie 1902). This rock occurs in all parts of the island, forming cliffs over 40 metres high on the west side, most of which is sheer and precipitous; the main slope of the island is from the west down to the east. Some level land on the southern part appears to be the remains of a raised beach. Several gullies traverse the island from west to east, one of these to the north cuts off the largest islet (Rona) whilst another towards the south is the site of the original freshwater loch which has now been dammed and raised. All the shore line of the Isle of May is very rocky and, as noted by Eggeling (1960), nowhere is there a great depth of soil; most of the inland waters on the island are found on the areas of deepest soil. There are numerous rock pools round the coast which are submerged at high tide.

HABITATS

The inland waters of the Isle of May can be divided into the following six groups: (1) The loch, which is situated close to the sea on the west side of the island and protected to the north and south by steeply rising ground. (2) The North Plateau pools which lie on the northern half of the island on ground high above the sea where the vegetation forms grazing for the few sheep and many rabbits found on the Isle of May. There are seven pools here, five of them lying in an almost straight line from west to east (Figure 1). Only two of the pools contained water at the time of the present survey and consequently collections were not made at the other five. (3) The South Plateau pools which lie to the south-west of the island, high above the sea. As with the pools on the North Plateau, these are very exposed and the rate of evaporation from them is high. There are six pools here, one of which was dried up at the time of this survey. (4) The east pools which are situated at the junction of the coastal rock and island soil to the south-east of the island. There are five pools here, two of which were dried up at the time of the survey. (5) The springs,

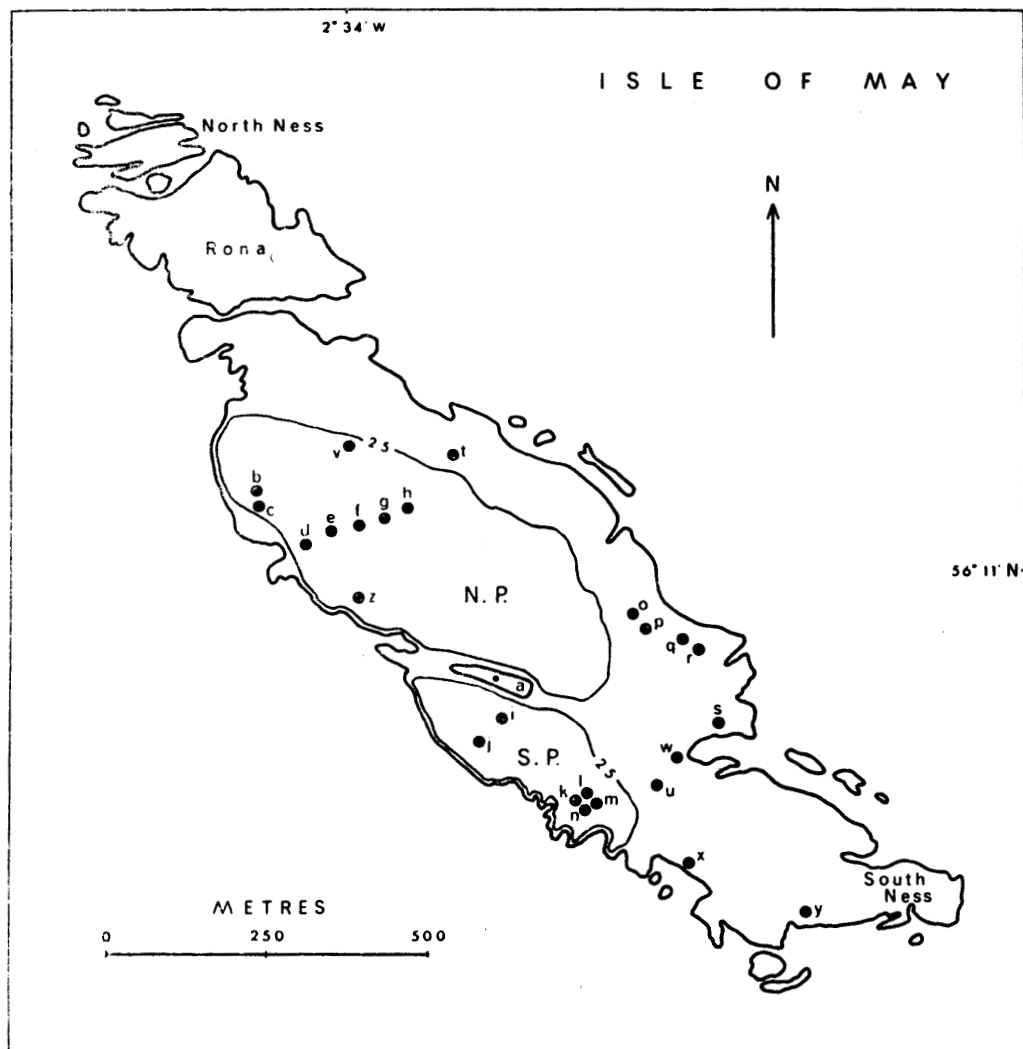


Fig. 1.—An outline map of the Isle of May showing the location of the inland waters mentioned in the text and the 25m contour level.

of which there are two, are found on the east side of the island; both have slow trickles of water through them and this was the only flowing water found during this study. It could not really be classed as running water. (6) The wells, which are all man-made with stone walls. There are six of these but only three were examined during the present survey, the others being completely covered over or otherwise inaccessible.

As previously mentioned, brackish pools occur all round the rocky coastline; these were not examined in detail during the present survey. Many of them contain animals normally regarded as purely marine (e.g. *Littorina saxatilis* Johnston and *Actinia equina* L.), however, most of them contain also a major component of species usually considered to be euryhaline. Thus common plants are *Enteromorpha intestinalis* Link and *Pylaiella littoralis* Kjellm., whilst *Procerodes ulvæ* (Oersted), *Gammarus duebeni* Lilljeborg, *Jæra marina* (Fabricius) and the Three-spined Stickleback *Gasterosteus aculeatus* L., are among the common members of the fauna. It is conceivable that several of these species could colonise fresh waters if occasion permitted.

The freshwater pools found on the North Ness by Callan (1936) have evidently become very brackish and polluted since his study, possibly due to the recent increase in gull colonies (Eggeling 1955), as no fresh water could be found in that area.

For comparative purposes, for use with Table 1, and also for future work in the area, a short description of each of the inland waters examined during the present study is given below. The dimensions of each pool in metres (L=maximum length, B=maximum breadth, and D=maximum depth) are listed, along with the dominant species of macrophyte, type of substrate, etc.

(a) The loch (131.0L, 30.2B, 2.8D) is an artificial dam with a stony shore and a muddy bottom in deeper water. No macrophytes were present at the time of the survey, but the water was thickly clouded by a bloom of algæ. Two families of Eider Duck, *Somateria mollissima* (L.) were present. This body of water, though possibly the one of greatest potential interest on the island, was undoubtedly rather brackish and polluted due to the discharge from the local engine house. Originally a small natural freshwater loch, it was enlarged by a dam constructed at its west end (Eggeling 1960) to provide adequate water supplies for the engine house which powers the light house on the Isle of May. Common Eels, *Anguilla anguilla* L. were recorded from the loch by Sandeman (1894), but none appear to have been seen since then. A series of baited hooks and an improvised eel trap met with no success in June 1958, and though the loch was under observation for considerable periods no fish were seen. Trout, *Salmo trutta* L. were introduced into the loch many years ago, and one large specimen was still present in 1950 (Eggeling 1960); none have been seen since, however.

(b) North Plateau Pool I (17.6L, 10.6B, 0.2D) is a shallow pond near a nesting colony of Lesser Black Backed Gulls, *Larus fuscus* L. The bottom consisted

mainly of bare mud, and the water was very turbid; only a few plants of *Callitriche stagnalis* Scop. were present at the time of the survey.

(c) North Plateau Pool II. Dried up at survey.

(d) North Plateau Pool III. Dried up at survey.

(e) North Plateau Pool IV. Dried up at survey.

(f) North Plateau Pool V. Dried up at survey.

(g) North Plateau Pool VI. Dried up at survey.

(h) North Plateau Pool VII (26.7L, 9.6B, 0.3D). This is a shallow pond with very clear water; the bottom at the time of the survey was muddy but firm due to a well-developed carpet of *Callitriche stagnalis* and *Littorella uniflora* Asch. *Glyceria declinata* Breb. was also present.

(i) South Plateau Pool I—the Moss. Dried up at survey.

(j) South Plateau Pool II—High Tarn (16.1L, 13.6B, 0.1D). This shallow pond with a firm substrate is situated near a nesting colony of Lesser Black Backed Gulls. The bottom was very thickly grown over by vegetation, much of this being emergent; the dominant macrophytes were *Littorella uniflora*, *Glyceria declinata*, *Peplis portula* L., *Callitriche stagnalis*, *Apium inundatum* (L.) and *Rumex crispus* L.

(k) South Plateau Pool III (21.7L, 13.6B, 0.2D) is a shallow pond near a nesting colony of Herring Gulls, *Larus argentatus* Gmelin. The substrate here was mainly soft mud and the only macrophytes present were a few plants of *Callitriche stagnalis*.

(l) South Plateau Pool IV (10.4L, 2.1B, 0.2D) is a shallow pond with a substrate of soft mud. At the time of the survey there was a good growth of vegetation, the dominant macrophytes being *Callitriche stagnalis* and *Glyceria declinata*.

(m) South Plateau Pool V (12.6L, 3.5B, 0.2D). This is another shallow pond with a substrate of soft mud and a strong growth of vegetation, the dominant macrophytes again being *Callitriche stagnalis* and *Glyceria declinata*. Dense masses of the filamentous alga *Spirogyra* were also present.

(n) South Plateau Pool (10.4L, 2.1B, 0.1D) is a shallow pond with a soft mud bottom. A single clump of *Callitriche stagnalis* was the only macrophyte present at the time of the survey—when the pool was almost dried up.

(o) East Pool I (4.0L, 3.5B, 0.3D) is a rock pool near a nesting colony of Lesser Black Backed Gulls. The bottom of this pool was covered by a layer of soft mud and thick growths of vegetation were present, the dominant species being *Callitriche stagnalis*, *Glyceria declinata*, *Apium inundatum*, *Eleocharis palustris* (L.) and *Eleogiton fluitans* (L.).

(p) East Pool II. Dried up at survey.

(q) East Pool III. Dried up at survey.

(r) East Pool IV (8.3L, 3.8B, 0.2D). This shallow rock pool near a nesting colony of Lesser Black Backed Gulls had a firm turf of *Littorella uniflora* covering much of the bottom, while other macrophytes present were *Callitriche stagnalis*, *Apium inundatum* and *Eleogiton fluitans*.

(s) East Pool V (4.3L, 3.3B, 0.3D). Surrounded by high rocks, this pool had very clear water and a bottom of soft mud, most of which was covered over by *Callitriche stagnalis* and *Littorella uniflora*.

(t) Spring I was a very slow trickle of water into a depression thickly grown over by *Glyceria declinata*, *Callitriche stagnalis*, *Rumex crispus*, *Ranunculus flammula* L., and *R. hederaceus* L.

(u) Spring II was a slow trickle of water over bare mud in which were growing a few plants of *Callitriche stagnalis*.

(v) Well I (St Andrews Well) was covered over completely and no large fauna or flora were evident.

(w) Well II (St Johns Well) is a fairly deep well (1.5m) at a depth of 3m below the surface of the ground. No macrophytes were present.

(x) Well III (Pilgrims Well) is another deep well (1m) with a soft muddy bottom. No macrophytes were present.

(y) Well IV (Ladies Well) was not examined.

(z) Well V (Sheep Well) was not examined.

FAUNA

The faunistic results of the present collections are listed in Table 1. It can be seen that some species are common and widespread (e.g. the beetle *Agabus bipustulatus* (L.)) while others are rarer and restricted in distribution (e.g. the snail *Lymnaea truncatula* (Müller)). Only one specimen was collected of certain species (e.g. Phryganeidæ, of which a larval case only was discovered). It was possible to assign specific identity to most of the specimens taken, the main exceptions to this being certain worms and all larval Chironomidæ. Some of the latter are probably referable to the adult species collected on the island in the next month by Pelham-Clinton (1958), e.g. the midges *Chironomus riparius* Meigen and *Cricotopus vitripennis* (Meigen). A full check list of all the invertebrate species recorded from the Isle of May has been given by Eggeling (1960).

Previous records of aquatic species from the Isle of May are rather scattered and usually in the form of a note on one or a few species only (e.g. Scott 1906, Grimshaw 1908, Evans 1911, 1915b, Eggeling 1957, etc.). Little reference is found in these to the inland waters themselves or their fauna as a whole. There are available, however, two excellent sources of information regarding the inland waters as they were earlier this century: the account by West (1910) of some aspects of the flora, and the unpublished general survey by Callan (1936) of both flora and fauna. One of the earliest notes of interest is by Sadler (1872) who recorded *Callitriche stagnalis* and *Apium inundatum* from the island.

West (1910) visited the Isle of May at about the beginning of this century (1905). He noted that the loch possessed a very marked algal bloom and no macroflora, undoubtedly being influenced by the discharge from the power house near by. Quite a few freshwater pools were present and those on the

Table 1.—Aquatic fauna collected on the Isle of May in June, 1958
SPECIES

	STATIONS														
	a	b	h	j	k	l	m	n	o	r	s	t	u	w	x
PLATYHELMINTHES															
<i>Dalyellia</i> sp.					x										
<i>Procerodes ulvae</i> (Oersted)	x														
ANNELIDA—OLIGOCHAETA															
<i>Nais elinguis</i> Müller	x	x													
<i>Tubifex costatus</i> Claparede	x														
<i>Lumbriculus variegatus</i> (Müller)		x	x	x						x		x	x		
NEMATOMORPHA															
<i>Gordius</i> sp.										x					
MOLLUSCA															
<i>Lymnaea truncatula</i> (Müller)													x		
<i>Placidium casertanum</i> (Poli)															
ARACHNIDA															
<i>Hydracarina</i>							x								
CRUSTACEA															
<i>Daphnia obtusa</i> Kurz					x	x	x	x							
<i>Macrothrix hirsuticornis</i> Norman & Brady		x						x	x						
<i>Chydorus sphaericus</i> (Müller)					x	x	x	x	x	x		x			
<i>Cyprinotus incongruens</i> Ramd.		x			x				x						
<i>Cyclops strenuus</i> (Fischer)		x	x		x	x	x	x	x	x	x	x	x		x
<i>Gammarus duebeni</i> Lilljeborg	x									x				x	x
INSECTA—HEMIPTERA															
<i>Notonecta glauca</i> L.			x				x								
<i>Corixa nigrolineata</i> (Fieber)			x	x			x		x	x					
<i>Corixa lateralis</i> (Leach)				x		x	x								
<i>Corixa praeusta</i> (Fieber)			x	x	x	x		x							
<i>Corixa falleni</i> (Fieber)			x												
<i>Corixa germari</i> (Fieber)			x												
INSECTA—TRICHOPTERA															
<i>Phryganeidae</i>							x								
INSECTA—DIPTERA															
<i>Procladius</i> sp.					x		x								
<i>Anatopynia</i> sp.			x				x							x	
<i>Cricotopus</i> sp.									x						
<i>Psectrocladius</i> sp.			x	x						x	x	x			
<i>Tanytarsus</i> sp.								x							
<i>Chironomus</i> sp.		x		x	x	x	x	x		x		x			
<i>Polypedilum</i> sp.												x			
INSECTA—COLEOPTERA															
<i>Agabus bipustulatus</i> (L.)	x	x	x	x	x	x	x		x	x	x	x	x		
<i>Agabus nebulosus</i> (Forster)					x										
<i>Hydroporus pubescens</i> (Gyllenhal)	x	x	x	x	x	x			x	x	x	x	x		
<i>Colymbetes fuscus</i> (L.)					x		x								
<i>Hydrobius fuscipes</i> (L.)										x					
<i>Anacaena limbata</i> (Fabricius)									x	x					
<i>Laccobius alutaceus</i> Thompson										x					
<i>Helophorus flavipes</i> Fabricius					x						x				

east shore and the higher parts of the island are mentioned. Several species of aquatic macrophyte are noted as occurring in these pools, e.g. *Littorella uniflora*, *Callitriche stagnalis* and *Apium inundatum*. One of the most interesting features of this account is a photograph of "one of the pools on the exposed part of the island." This is clearly identifiable as South Plateau Pool II (High Tarn), an almost identical photograph of which was taken in 1958 during the present study (Plate 1). It is clear that the outline and general floral character of this pool have changed very little over a period of almost 50 years.

The study by Callan (1936) was carried out in July of that year. Apart from the pool on Rona mentioned above, two dewponds on the North Plateau, two on the South Plateau and several ponds on the east side of the island are mentioned. The loch contained no flowering plants but unicellular algæ were abundant; *Gammarus* were common and Trout were also noted to be present. The pool on Rona contained *Callitriche* and was "the only pool with a true aquatic flowering plant on the island." The fauna of some of the pools was investigated and several invertebrate species recorded. Special mention is made of the fact that no aquatic Hemiptera were found—a surprising feature in view of the variety and abundance of species recorded in 1958 (Table 1).

DISCUSSION

The aquatic fauna of the Isle of May is of considerable interest in that it is made up of an assemblage of animals of different types which are able to adapt themselves to the variable and rather rigorous conditions found there. In general it may be said that the inland waters are typically small, shallow bodies of water which are temporary in nature. The only exceptions to this are the loch (a), the springs (t and u) and the wells (v to z); almost without exception these are greatly influenced by man and therefore of less interest on that account.

The loch, though the largest body of water on the island, has a very restricted fauna—none of the species found there being necessarily characteristic of freshwater. In view of this, and also the fact that no macrophytes are present, it appears likely that the salt content of the water is high, due both to spray from the sea and to the discharge from the engine house. This has undoubtedly been the situation for many years.

The permanency of Spring I is indicated by the presence there of *Pisidium casertanum* (Poli), one of the few hololimnic species found on the island which is unable to withstand habitat desiccation. Spring I was also the habitat of the only other species of Mollusca found during the present survey, *Lymnaea truncatula*; this is typically an amphibious snail which can survive in damp places without water and it cannot be regarded as truly aquatic (Boycott 1936). Apparently much of the depression which holds the water of Spring I is unnatural, having been excavated originally by man (Eggeling 1960). Spring II is also probably more or less permanent. The deposition of ferrous salts here

would indicate that some at least of its water has its origin well under ground (Ruttner 1953).

The wells, though they are permanent, are all man-made and obviously designed to keep organic matter to the minimum. They have accordingly a very limited fauna.

The characteristic natural aquatic habitats of the Isle of May are, therefore, the three series of pools found on the North Plateau, the South Plateau and the east shore. As noted above, many of these were completely dried up at the time of the present survey, while the temporary nature of the others is clearly reflected in their fauna and flora, almost all species of which are capable of withstanding desiccation of their habitat by some means.

The commonest macrophyte in these pools is undoubtedly *Callitriche stagnalis*, a species which is quite capable of growing in the absence of free water, providing the soil remains damp. This is true also of the other common species of plant recorded (e.g. *Glyceria declinata*, *Apium inundatum*, etc.).

Insecta are probably the dominant component in the animal communities occurring in these pools, especially Hemiptera, Diptera and Coleoptera. The adults of most species in these groups are independent of the water and many are good flyers. Thus most of the species of Coleoptera recorded from the Isle of May are extremely able flyers; the same species are characteristic of many other Scottish islands (Jackson 1956a). Many adult Hemiptera and Coleoptera live for several weeks and are capable of existing for such a period without free water, colonising the pools when they fill up again. Though most Diptera, especially Chironomidae, are short-lived as adults, several of the species recorded from the Isle of May live as larvæ in tunnels constructed in mud—here they can tolerate almost complete drying up of their habitat.

Certain adult Coleoptera which occur in pools, e.g. *Agabus bipustulatus*, are known to withstand drought conditions by going into a form of aestivation (Jackson 1956b). A number of animals are well known for their powers of withstanding desiccation by forming cysts, this is true of certain Turbellaria and Oligochæta (Stephenson 1930) as well as Crustacea such as Cladocera, Ostracoda and Copepoda (Sars 1889). One of the commonest species found on the Isle of May is *Cyclops strenuus strenuus* (Fischer) which is very characteristic of temporary ponds (Elgmork 1959), its whole life cycle being adapted to life in such habitats. Thus the main breeding season of this species is in winter when there is normally plenty of water available; during summer it normally goes into diapause as copepodid stage IV in the mud left at the bottom of the pool.

The only animals recorded from the pools which could not withstand desiccation by flight or encystment are *Gammarus duebeni*, recorded in East Pool IV (the closest of these pools to the sea, from which the species may have gained entrance by wave-wash) and Hydracarina found in South Plateau Pool V (a single specimen was recorded).

Many of the invertebrate species recorded from the various bodies of water

on the Isle of May are in fact typical of brackish rather than fresh water. This is true of *Procerodes ulvæ* (Pyefinch 1937), *Nais elinguis* Müller (Brinkhurst 1963), *Gammarus duebeni* (Segestråle 1949), *Corixa lateralis* (Leach) (Macan 1956) and *Hydroporus pubescens* (Gyllenhal) (Balfour-Browne 1953). Another important component of the fauna is formed of species which are characteristic of shallow pools, especially those which are very rich in organic matter—undoubtedly the large gull population of the island has an important influence here, as has been mentioned above. Among these species are found *Daphnia obtusa* Kurz (Scourfield & Harding 1958), *Corixa nigrolineata* (Fieber), *C. præusta* (Fieber), *C. falleni* (Fieber) (Macan 1954), *Agabus nebulosus* (Forster) and *Colymbetes fuscus* (L.) (Balfour-Browne 1953).

Certain other species of invertebrates recorded from the Isle of May have a rather doubtful aquatic status. Oligochaeta such as *Henlea hibernica* Southern, *Enchytraeus albidus* Henle and *Fridericia bulbosa* (Rosa) recorded by Evans (1911) are not truly aquatic but live mainly in rich soil in damp places—often under dead seaweed (Nielsen & Christensen 1959). The amphibious habit of *Lymnæa truncatula* has already been mentioned, and like it, several Coleoptera are found both in water and among damp vegetation close to it (e.g. *Laccobius alutaceus* Thompson). It is probable that the larvæ of *Schizothela leucopæza* (Meigen), adults of which were recorded by Pelham-Clinton (1958), can be included in this category also.

Most of the aquatic species previously recorded from the Isle of May are insects which were collected there as occasional adults and it is probable that many of these do not breed on the island. Such specimens have probably flown over from the Scottish coast or even the mainland of Europe; this is the case with many Trichoptera, such as those recorded by Evans (1915a), especially those whose larvæ are confined to running water (e.g. *Stenophylax stellatus* Curtis) which is more or less absent from the Isle of May. The records of adult dragonflies—*Sympetrum fonscolombii* (Selys) by Evans (1912) and *Aeshna juncea* (L.) by Eggeling (1957)—are almost certainly of migrant specimens from the mainland of Europe and the Scottish coast respectively.

Though the Isle of May is one of the few islands off the east coast of Great Britain, there are, of course, very many off the west coast, especially of Scotland. Unfortunately, very few of these have ever had comprehensive surveys of their aquatic fauna; exceptions to this are Clare Island (Præger 1912), Bardsley Island (Pyefinch 1937), Canna (Bertram 1939), St Kilda (Hamilton 1963) and a few others. Though all these islands have much more permanent water than the Isle of May, all the accounts indicate that temporary waters are of importance. Hamilton (1963) comments on the low numbers of aquatic species found on St Kilda and suggests that this is partly due to isolation. The number of aquatic species recorded from the Isle of May is even less, but here the probable cause is the temporary nature of the waters rather than isolation.

The character of the hololimnic forms, which spend all their time in fresh

water, justifies the point noted by Hubendick (1962): "the fact that special adaptations in the hololimnic fauna are largely restricted to features which favour hibernation, aestivation, passive dispersal and successful colonisation means that a wide ecological tolerance is common or normal in this fauna component."

It is clear then that the typical aquatic habitats of the Isle of May, though they may be temporary on a seasonal basis are reasonably permanent as casual habitats for certain aquatic species from year to year. Thus the characteristic aquatic fauna of the island consists of invertebrate species able to withstand desiccation of their habitats by some means—usually migration or encystment. However, the populations of such animals must clearly undergo massive and variable fluctuations from time to time, depending largely on the weather and the chance distribution of certain other species (e.g. predators or competitors). The nature of the pools themselves, especially their small sizes, means that they may be profoundly affected by the activities of the larger animals present on the island, notably gulls and sheep, whose defecatory and eating habits may well alter conditions far more rapidly and drastically than the influence of silting and erosion brought about by the weather.

SUMMARY

A survey of the aquatic habitats and their fauna was carried out on the Isle of May in June 1958. All types of water were examined except those influenced by high tide or grossly polluted by birds. Several of the habitats are man-made (e.g. wells); the most characteristic were shallow muddy pools, often with *Callitriche stagnalis* and other flora. These pools often dry up, and the typical fauna—made up mainly of Oligochæta, Crustacea and Insecta—includes mostly species which are able to tolerate this desiccation, usually by migration or encystment. The nature and ecological relationships of this fauna are discussed.

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Plate 1—(Top) North Plateau Pool VII looking east.
(Bottom) South Plateau Pool II looking north (See article on
Aquatic Fauna of the Isle of May).

ECHO SOUNDING OBSERVATIONS ON THE LOCHMABEN VENDACE, *Coregonus vandesius* RICHARDSON

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The Lochmaben area in Dumfriesshire, Scotland, is well known as being the only locality in which the unusual Lochmaben Vendace, *Coregonus vandesius* Richardson, occurs. The present-day general composition of the fish fauna of the two waters in which this species of fish was previously reported to be abundant—the Castle Loch and the Mill Loch—has been described elsewhere (Maitland, 1966b); it is suggested there that the Lochmaben Vendace is possibly extinct now in the Castle Loch, though it is certainly still present in the Mill Loch. The present account describes further work on this extremely interesting and possibly unique population of fish.

The study of fish populations in large bodies of fresh water is often difficult due to the large numbers of fish involved and to the size of the waters concerned. The use of echo sounding apparatus in such cases is clearly highly desirable and accordingly a recording echo sounder was obtained for work at present being carried out on the largest loch on the mainland of Great Britain—Loch Lomond. Initial echo sounding there has given an immediate picture of fish distribution and numbers within this loch, and, in conjunction with gill-netting and other methods of fish identification, the pattern of distribution and the abundance of various fish species throughout Loch Lomond is at present being studied.

The relatively small nature of the Mill Loch at Lochmaben (13 hectares), especially when compared to the only other lochs in Scotland known to contain *Coregonus*—Loch Lomond (8000 hectares) and Loch Eck (440 hectares), in both of which the species concerned is *Coregonus clupeoides* Lacépède—presents entirely different problems. Because of its size the population of fish there must be a comparatively small one. This imposes restrictions when carrying out research, for large scale sampling is not advisable for various obvious reasons. Though some netting is unavoidable in such work, especially in any final analysis of the various species concerned, methods other than those which involve handling the fish themselves are highly desirable, if they are at all possible.

Of the principal methods used to observe animals under water: direct observation by divers, photography, television, and echo sounding, the latter is undoubtedly the most versatile and generally useful. This is mainly because it can be used irrespective of depth, it involves no disturbance to the fish, for no part of the equipment is placed near them, nor is there any restriction caused by light or the lack of it.

One of the earliest accounts of work on echo sounding in relation to fish was that of Kimura (1929); this was followed by a great deal of research in

this field in various countries, notably Japan (Tauti, 1953; Takakura, 1954; etc.), Europe (Sund, 1935; Balls, 1948; etc.) and America (Tester, 1943; Hourston, 1953; etc.). The majority of the investigations carried out to date have been concerned with marine fisheries and a review of these was given by Hodgson & Fridriksson (1955). Only relatively recently have studies involving the use of echo sounders in fresh waters been carried out. Again, these have been mainly from Japan (Kawada & Yoshimuta, 1952; etc.), Europe (Scharfe, 1952; Ohle, 1960; etc.) and America (Stroud & Grice, 1952; Hergenrader & Hasler, 1966; etc.). Whilst the first echo sounders were rather crude and clumsy in use, recent models give very high definition pictures of individual fish in the water, and moreover several portable machines are now available.

Recording echo sounders can be used both for stationary observations and for moving ones, as, for instance, in a transect across a loch; in this way it is possible to build up a picture of the distribution and numbers of fish in an area. The main difficulty about the use of echo sounders, in an area where several fish species could be present, is that of giving specific identity to the fish traces obtained; other techniques must be resorted to for this purpose, some of which have already been mentioned.

In the present study a high-definition portable recording echo sounder was used for most of the work. In conjunction with it, gill nets were set for identification purposes. The equipment and methods used are described in detail below.

A short account of the physical characteristics of the Mill Loch has been given previously (Maitland, 1966b) and a detailed contour map is shown in Figure 1. The Mill Loch drains a total catchment area of some 130 hectares and has itself a surface area of 13 hectares. It contains about 1,000,000 cubic metres of water, while its surface is some 52.4 metres above sea level. The maximum depth of the loch is 16.8 metres and it has a mean depth of 6.3 metres. The basin of the Mill Loch is a simple one, the deeper water lying in the southern portion of the loch, the north-west end being comparatively shallow. On the north and south sides of the main basin the slope to the shore is relatively steep. The deepest part of the loch has a fairly level bottom and is extensive in area; the area of the loch floor covered by more than 15 metres of water is equal to more than 16 per cent. of the total area (Murray & Puller, 1910). The main inflow to the Mill Loch is a small stream which enters at the north-west end and leaves at the east end, eventually running into the Castle Loch.

METHODS

The machine used for the present study is a portable, straight line recording echo sounder which gives a continuous record on dry recording paper. It has two scale ranges, one of 0-110 metres phasing continuous to 340 metres and the other of 0-220 metres phasing continuous to 680 metres. The transmission rate at these ranges is 120 and 60 soundings per minute respectively. Because of

the relatively shallow nature of the Mill Loch (maximum depth, 16.8 metres) only the former range was used there. The transmission system is based on a pulsed c.w. transistor transmitter with an operating frequency of 48 kc./s. The model used is capable of producing both a normal sounding, and a white line effect as desired. The latter is a form of recording that portrays the bottom as a thin dark line with a white area immediately below it. White line recording makes it much easier to discern substrate echoes from echoes of fish close to the bottom (Plate III.).

The equipment consists of two major units, a recorder unit and a hull unit that includes the transducer. The recorder carries a roll of dry recording paper that is slowly drawn across a screen. A constant speed electric motor drives a toothed belt that carries a stylus across the paper; electrical impulses applied to the stylus cause it to mark the paper. Each time the stylus passes the zero of the range scale an electrical impulse, produced by the c.w. transistor transmission unit, energises a transducer acting as a transmitter to produce high intensity sound vibrations. These short bursts of sound energy are directed downwards and travel through the water at a constant velocity. The vibrations are reflected from the bottom of the loch, and from intervening objects such as fish, intercepted by the transducer now acting as a receiver, reconverted into electrical energy and after amplification are passed to the stylus. The transmitted and received signals each cause the stylus to mark the paper, and since the stylus velocity is accurately controlled, the time elapsing between transmission and reception may be measured. To enable a direct indication of depth to be read against a scale, the time taken between transmission and the return of the echo is translated into terms of distance by comparison with the velocity of sound in water; the scale is calibrated in terms of depth accordingly.

Sensitivity is controlled by a ten-position switch which operates the amplifier gain and hence the intensity of the echo markings on the paper. The use of a switch here means that an accurate repetition of the gain control settings can be achieved; the optimum setting of this control varies from loch to loch and should be checked at each place. Variations in the traces obtained from the Mill Loch at different sensitivities are shown in Plate IV.

Most of the field work for the present study was carried out from 27th to 29th August, 1966. On arrival at the Mill Loch, transect AB, across the deepest part of the loch (Figure 1) was established, and, after checking the traces obtained using different sensitivities of the echo sounder, regular soundings were taken at various times. They were obtained by rowing the boat containing the echo sounding equipment at constant speed from A to B and then from B to A using sensitivities 5 and 7 respectively. A mooring had previously been placed in deep water at E, and stationary soundings were then taken at it for two consecutive periods of 20 minutes each, again at sensitivities 5 and 7. These soundings (two transects and two stationary) were started at 1400 hrs. B.S.T. on 27th August and repeated every 3 hours for 24 hours. At 1300 hrs. on 28th August five consecutive transects were taken on another line (CD) across

the deep basin (Figure 1), each at a different sensitivity, to check the value of the two sensitivities (5 and 7) which had been previously selected.

During the period of echo sounding, gill nets of varied mesh size were fished in different parts of the loch, mainly in the area of the 15 metre basin, but some also towards the shallow western end. These nets were set at various depths—some on the bottom, some in mid-water and some at the surface; they were fished for a total of about 40 hours and were examined at intervals of a few hours during this time (i.e. between echo soundings), occasionally being shifted in position. This frequent examination meant that the distribution and movements of fish, both in time and space, could be checked accurately; also that fish caught in the nets were held for as short a period as possible so that they would be in good condition when released.

The weather throughout the period of study was fairly consistent with no rain. A mild easterly wind blew steadily during the 27th August, dropped at night, but rose again the next day and continued until work stopped at 1000 hrs. on the 29th August. The sky was mostly overcast during this time, though occasionally the sun shone for short periods; faint moonlight occurred on both nights for short periods. Official sunset on the 27th August was at 2010 hrs. and sunrise the next day at 620 hrs.

It is relevant here to mention some previous gill netting which had been carried out in the Mill Loch (Maitland, 1966b). In April, 1964, nets of very limited mesh sizes were set in the area of the 15 metre basin, both on the bottom and at the surface. On neither occasion were nets set in mid-water. As has been reported previously (Maitland, 1966a; b) no Vendace were caught in

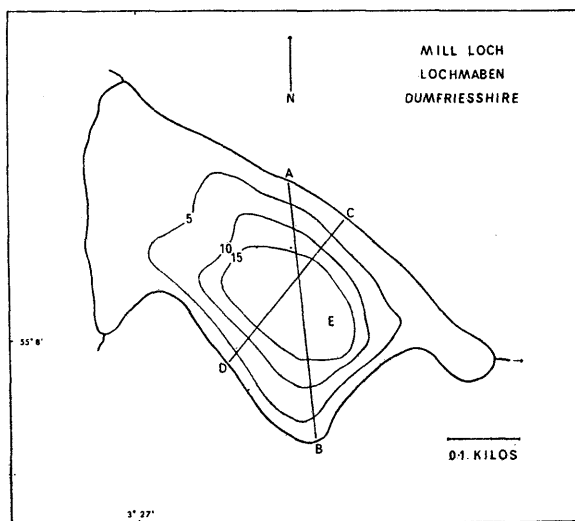


Figure 1.—Contour map of the Mill Loch, Lochmaben, showing the depth in metres, transects AB, CD, and the position of the mooring E used for stationary soundings.

1964, probably because of the absence of appropriate mesh sizes, but several were taken in 1965—all in nets fishing at the surface. The significance of these results in relation to the present echo soundings and nettings will be discussed later.

MILL LOCH ECHO TRACES

The following notes are included to clarify certain points evident in the five main sets of echo traces obtained from sounding in the Mill Loch and shown in Plates IV., V., and VI. Before discussing these traces, certain points must be made with reference to the particular echo sounder used in this study and the interpretation of the echo traces obtained from it. One of the main difficulties with these traces is, of course, the identification of the individual fish species concerned and this is discussed elsewhere. For various technical reasons it is necessary that echoes obtained from very near the surface undergo suppression, so that only the strongest of them are recorded. Also, because the beam of pulses from the transducer is not cylindrical but passes down into the water in the form of a cone, this means that proportionately more fish are recorded from deep water, compared with near the surface. Thus, in the depth range of water under consideration, given numbers of fish will appear fewer and fainter near the surface as compared to those in deep water.

As noted above, the five transects shown in Plate IV. were obtained by rowing a boat at constant speed from C to D and back again, etc. Thus each really represents a mirror image of the transect before it and the one after it. The sensitivity was increased by two places at the start of each transect; thus whilst there are few traces of fish shown in 1 and 3, many appear in 5 and 7. A dense "scattering layer" (discussed more fully below) appears in 7 and the effect of this is so great that in 9 it not only obscures the fish traces, but also merges in with and obscures the echo from the bottom of the loch. It can be seen clearly from these traces that the most useful sensitivities for study are 5 and 7, and these were the two settings used consistently both in the moving and the stationary soundings.

Plate V. shows the echo traces obtained from the series of moving transects carried out at sensitivity 5; it is mostly fish traces which appear on these, though they are occasionally obscured by the "scattering layer" discussed below and thought to be due to plankton. These few plankton traces exhibit the vertical migration also discussed below. The majority of the fish traces shown appear to be those of individual fish, though one or two shoals or aggregations appear at 1400 hrs., and to a lesser extent at 1700 and 1100 hrs. the next day. The dense individual traces shown at 1400 and 1700, 800 and 1100 hrs. are largely absent between these times. It is probable that these fish have moved up near the surface during this period into the region from which echoes undergo suppression. This hypothesis is supported by the fact that whilst, for the most part, the fish traces are low in the water, at 2000 and 800 hrs. several

traces appear much nearer the surface. These may represent fish which are moving up and down in the water respectively.

Several workers in the past have attempted to analyse the types of traces of fish obtained in various situations. Hodgson (1950) was one of the first to show that different species of fish gave different types of echo traces and he claimed to be able to distinguish several species. Four main types of trace were recognised: small spots (said to be characteristic of *Coregonus*), comets, compact deep marks and aggregated layers. Not all the published data are in agreement with this, however (Marchena, 1951; Scharfe, 1951; 1952) and further research is required. Cushing & Richardson (1954) have noted that there are several factors concerned with the appearance of different traces; notable among these are the nature of the swim bladder of the fish concerned, the size of the individual fish or their shoals, and the density of these shoals.

In the series of transects shown in Plate VI. (taken at sensitivity 7), the dense traces from plankton obscure many of those due to fish. The interesting vertical migration exhibited by this plankton is discussed below. Those traces of fish which are clear of the plankton are essentially similar to those shown in Plate V. Small shoals are evident at 1410 and 1100 hrs., whilst the strongest traces from individual fish appear at 1410, 1710, 810 and 1110 hrs. These fish are mostly low in the water, except at 2010 hrs. when several are evident near the surface.

FISH DISTRIBUTION

In any study of a fish population it is clearly of importance to know the distribution of the fish concerned, both in space and in time. The seine netting practised in the Mill Loch in 1964 from the shore, and the gill netting carried out there in 1964, 1965 and 1966 in various parts of the loch and at different depths has given a good idea of the general distribution during the summer months of the four major species of fish present in the loch—Pike, *Esox lucius* L.; Perch, *Perca fluviatilis* L.; Roach, *Rutilus rutilus* (L.); and Vendace, *Coregonus vandesius* Richardson. General information from echo sounding has been in agreement with these netting results.

For the most part, Pike are found in shallow water round the edge of the loch, particularly in the vicinity of weed beds. This species is especially common in the north-west corner of the loch among the beds of water lilies (*Nymphaea*) and reeds (*Phragmites*) there. Most of the large Pike caught in the Mill Loch were taken in this area. Small fish are not uncommon all round the edge of the loch and several were also found in the stream running into the loch at the north-west corner; along with Eels, *Anguilla anguilla* (L.), they were the only fish occurring in this stream.

Perch and Roach, too, are found during summer mostly in the shallower waters of the loch all round the edge. The greatest numbers of both species occurred in the shallow area at the west end (Figure 1) and, as with Pike, the largest individual specimens were taken in this area. Small shoals of young fish

are common round the edges of the Mill Loch during the summer months and on several occasions these were found to be made up of both Perch and Roach.

The distribution of Vendace during the summer appears to be quite distinct from that of the above three species for they are largely restricted to the deeper waters, notably the area represented by the 15 metre basin. Almost all the specimens, both large and small, which have been collected by the present author were taken in this area. Thus the ecological niche available to this species in the Mill Loch is considerably smaller than might be suggested from the superficial area of the loch itself.

This distribution of fish species is, in many ways, similar to that found in Loch Lomond, where, apart from Salmon, *Salmo salar*, L., and Trout, *Salmo trutta* L., Pike, Perch, Roach and Powan (*Coregonus clupeoides* Lacépède) are the dominant fish species.

Little is known yet about the seasonal variation in the distribution of fish in the Mill Loch. It is probable that the situation described above is true except during the winter months; during this period most fish tend to move into deeper water and this is certainly the case with Perch and Roach. Pike, Perch and Roach all spawn in shallow water among weed beds in early summer each species spawning slightly later than the other in that order. On the other hand, though the exact spawning period of the Vendace has still to be established, it is certainly during the winter months—probably some time in December or January, as is the case with other *Coregonus* in the British Isles (Maitland, 1967). The eggs are likely to be laid then in shallow water at the edge of the Mill Loch—the substrate, especially on the north and south shores, being similar to that over which *Coregonus* spawn in Loch Lomond. Thus during this winter period the adult members of the Vendace population will move inshore from the deeper areas. As with the Powan in Loch Lomond, this may only be at night, but it is during this period that they are most susceptible to their main predators—Pike; Copland (1956) has shown that Powan are eaten more by Pike during their spawning period than at any other time.

There is undoubtedly a definite diurnal pattern of movement and distribution of Vendace in the Mill Loch during the summer months and this has now been studied in some detail by means of the echo sounding and netting described in this paper. During the daylight hours the species stays mainly in mid-water at depths greater than 5 metres, but clear at the bottom (Plate V.). Thus only gill nets set in mid-water at the appropriate depth catch fish at this time. The fish move up to the surface at dusk and appear mostly to remain in the surface waters until dawn when they go deeper again.

These results agree with the observation of Service (1906) who noted of the Vendace that "in summer they remain in the lowest depths, during the warmer weather, but on dull or cold days, or rather in the evenings of such days they will rise higher in the water."

During a stationary echo sounding taken at E (Figure 1) just at dusk—2040 hrs.—many Vendace were seen at the surface of the Mill Loch and an

opportunity was taken to assess their numbers and observe their feeding behaviour. An exact count of their numbers was clearly impossible, due not only to the low light intensity at the time, but also to the fact that not all of the fish may have been at the surface together. Nevertheless, some idea of the order of the numbers there was possible. Some fish could be seen directly, just below the surface of the water near the boat (moored at E), but the best assessment was made by observing the "dimpling" caused by fish breaking the water surface; as noted below each fish appeared to be doing this almost continuously at that time. There was no evidence of shoaling behaviour, for fish were seen breaking the water surface all round the boat as far as visibility permitted. Counts were made as quickly and as accurately as possible under the conditions and several estimates of the density of the fish were obtained for areas round the boat. These gave an average of about one fish for every three square metres.

Due to the poor visibility at the time of these observations it was not possible to be certain of the exact identity of the fish. Nevertheless, gill nets of various meshes which were fishing at the surface in the same area caught only Vendace and it is unlikely that any other fish were included in the counts. These nets were inspected just before and very soon after the period of observation, when several Vendace were taken from them. Further specimens were taken (in surface nets only) during that night and the next, thus confirming the netting results of the previous year (Maitland, 1966b) when it was found that Vendace occur in the surface waters only at night.

The feeding behaviour of the Vendace at dusk was observed as closely as possible and for as long as visibility permitted. No fish was seen to move over long distances, but all made short darting movements almost continuously, very close to the water surface which was broken frequently. None, however, was seen to jump out of the water, even partially. The stomach contents of the specimens preserved at this time have not yet been examined: it is intended to do this after a study of their external characters has been completed, and it is hoped that their food may form the subject of a later paper. Nevertheless, from the few specimens which have been examined in the past (Knox, 1834; Yarrell, 1859; Service, 1906; Regan, 1911; etc.) it is known that the diet of the Lochmaben Vendace is similar to that of other *Coregonus* in Great Britain, e.g. the Powan (Slack, Gervers & Hamilton, 1957) and consists very largely of plankton. Samples of plankton taken from the Mill Loch during the period of netting showed it to consist mainly of Cladocera, Copepoda and larvae of *Chaoborus*. The latter were very common in some samples and huge swarms of the adults of this insect were abundant along the edge of the Mill Loch in August, 1965. The stomach of an Eel caught in the Mill Loch during this period was found to be full of these larvæ. As discussed below, it is probable that many of the echo traces obtained by the sounder and exhibiting vertical migration are largely due to these larvæ (Plate VI.). The constant darting movements of the Vendace at the surface were presumably due to their pursuing and capturing this and other species of arthropod common in the plankton.

As noted above, in addition to this population of the Vendace (*Coregonus vandesius*) in the Mill Loch there are in Scotland two populations of a closely related species—the Powan (*Coregonus clupeoides*)—found in Loch Lomond and in Loch Eck. Using the same echo sounder, these populations have also been studied recently. Both lochs are very much larger than the Mill Loch, but moving soundings along selected transects and stationary soundings (Plate III.) both show that the behaviour and distribution of *Coregonus* there was in many respects similar to that found in the Mill Loch and described above.

By making certain assumptions about some factors which have still to be proved conclusively for the echo sounder in use here, it is possible to arrive at a tentative estimate of the number of Vendace present in the Mill Loch. Taking the average number of fish traces shown during the daylight transects, and considering the 15 metre basin only (where the bulk of the Vendace population occurs), since the width of the echo beam at various depths is known, the total can be calculated. The present data give a figure of 1302 fish. For several reasons this estimate is a conservative one and the minimum population present at the time of the present survey (August, 1966) was therefore likely to be of the order of 1500 Vendace; the actual total is probably much higher.

PLANKTON MIGRATION

In those soundings taken at the higher gain setting (7), in both moving and stationary traces many of the fish traces are obscured by rather more diffuse ones due, almost certainly, to plankton. These traces were found to be quite extensive within the Mill Loch and equivalent to the "scatter layer" mentioned by many previous workers (e.g. Burt & Lee, 1951; Tucker, 1951; Saito & Mishuma, 1953) mostly concerned with the sea. This "scatter layer" has been shown to be due to a variety of organisms in the water, mainly pelagic invertebrates and small fish of different species, in various places. As mentioned above, vertical hauls of plankton, taken from the bottom to the surface of the Mill Loch showed that one of the commonest, and certainly the largest, species present in the plankton was *Chaoborus flavicans* (L.). These aquatic larvæ have well-developed hydrostatic organs which will reflect sound well; for this and for other reasons it is almost certain that this species was responsible for much of the "scatter layer" shown in Plate VI.

This "scatter layer" exhibited a definite diurnal pattern of vertical migration which is shown clearly in Plate VI. At 1410 and 1710 hrs. the layer was deep in the water, not far from the bottom. By 2010 hrs., however, it had started to move higher in the water, and by 2310 it was well clear of the bottom, where it remained at 210 and 510 hrs. the next day. At 810 hrs. it had moved deeper in the water and by 1110 hrs. the layer was deep again, in the same position as it had been the previous day. Basically the same situation was found in the stationary soundings taken just after each of these transects.

Thus the essential features of the animals in this layer are an upward

migration at dusk towards the surface, near which they remain overnight; at dawn there is a reverse migration towards the bottom near which the population stays during the day. Many species of planktonic animals are known to undergo migrations similar to this, and the whole phenomenon of vertical migration has been subject to considerable conjecture and debate (Hardy, 1956; Wynne-Edwards, 1962; etc.). Studies using quantitative sampling alone (Stahl, 1966) and quantitative sampling in conjunction with echo sounding (Teraguchi & Northcote, 1966) have verified that *Chaoborus* larvæ undergo a well-defined vertical migration of the type described above.

PREDATORS AND ECTOPARASITES OF SCOTTISH COREGONUS

In a previous paper (Maitland, 1966b) a preliminary comment was made on the present status of the Lochmaben Vendace and on its conservation. In view of the present results and those of some experimental work noted below it is relevant, and indeed important, to discuss conservation further in this study. However, before doing so a short account of the major ectoparasites and predators of all the Scottish *Coregonus* will be given, this being one of the main features pertinent to any discussion of their conservation.

With the examination of many specimens of Vendace in 1966, it is now possible to compare the species of ectoparasites and the degree of infestation of the three known Scottish populations of *Coregonus*—in the Mill Loch, Loch Lomond and Loch Eck. Studies of the internal parasites of these and the other *Coregonus* in the British Isles are also being carried out (e.g. Maitland & Price, 1968), but have not yet been completed and thus are not discussed here.

Only three species of ectoparasite—from widely differing groups—have been found commonly on the many specimens of *Coregonus* examined from each of the three waters concerned during the last three years. These are: an, as yet, unidentified species of the fungus *Saprolegnia*; the Fish Louse, *Argulus foliaceus* (L.), a member of the crustacean group Branchiura; and the adult of the common River Lamprey, *Lampetra fluviatilis* L.

Saprolegnia has been studied mostly on the Powan, *Coregonus clupeoides*, of Loch Lomond, but undoubtedly it occurs on the other Scottish *Coregonus* also. Adults are found from time to time with large patches of *Saprolegnia* covering sores on the body or fins. It is likely that the growth of the parasite here is a secondary one, resulting from the infection by spores of a wound of some kind (e.g. the wounds left by the attack of the River Lamprey, discussed below). *Saprolegnia* is a very common parasite of the early stages of *Coregonus*, both in the field and the laboratory, where it is apparently responsible for the death of many eggs and early embryos (Maitland, 1967); it is not yet certain here whether the fungus is the primary cause of death or not. *Saprolegnia* is also known to be of importance to other species of fish in the three lochs concerned.

Argulus foliaceus is parasitic on various species of freshwater fish and appears to be generally distributed throughout the British Isles (Scott & Scott,

1913). Of the three lochs under consideration, however, it has been observed only in the Mill Loch where it is very common, and several specimens are often found on a single fish. It has been found on Pike, Perch, Roach and Vendace there. The positions of the parasites on the bodies of a sample of Vendace were noted carefully and are recorded in Figure 2. It can be seen that in general they occurred all over the body of the fish, apparently in an unrestricted fashion. Both large and small specimens of Vendace were found to be infected and in all, over 50 per cent. of the specimens netted were found to be carrying one or more of these parasites.

Lampetra fluviatilis has not been observed in either the Mill Loch or Loch Eck, but it is abundant in Loch Lomond where some 50 to 70 per cent. of the population of *Coregonus* show signs of having been parasitised at some time by it. The adult parasites are themselves rarely seen in Loch Lomond, except occasionally when fish (usually Trout or Powan) can be observed jumping out of the water with one or more lampreys attached to them. They have never yet

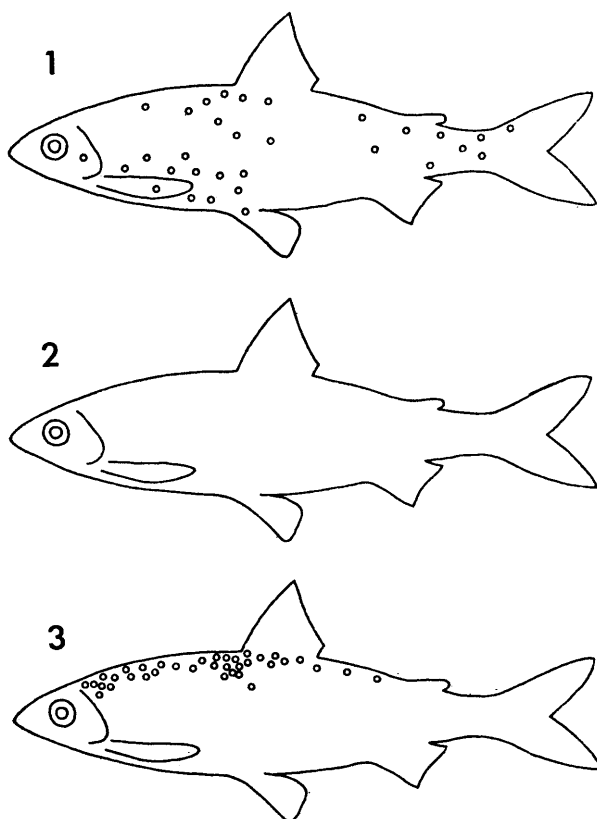


Figure 2.—Outline diagrams of *Coregonus* from (1) The Mill Loch, showing the distribution of *Argulus foliaceus*. (2) Loch Eck. (3) Loch Lomond showing the distribution of scars caused by *Lampetra fluviatilis*.

been seen on the many thousands of Powan caught in nets, very many of which, however, bear the characteristic oval scars of past parasitisation. Attacked fish may bear anything from one to ten or more of these scars and a detailed account of their nature and their effect on the growth rate of the hosts is at present being prepared. It is well known that, in North America, Lampreys have caused great damage to the stocks of trout and whitefish (*Coregonus*) in the Great Lakes (Hile, Eschmeyer & Lunger, 1951; Hile & Buettner, 1955; etc.). These attacks by lampreys appear to be seasonal for it is mainly during the summer months that the fresh wounds are found. Like *Argulus* in the Mill Loch, *Lampetra* attacks most other species of fish present, but in Loch Lomond, *Coregonus* is undoubtedly its main host. In contrast to *Argulus*, the site of attack by *Lampetra* appears to be restricted, and an analysis of the position of many hundreds of scars (some of which are shown in Figure 2) has shown them to be limited almost entirely to the dorsal part of the body, especially the region between the eyes and the dorsal fin.

Coregonus in Loch Eck, therefore, unlike those in the Mill Loch many of which are attacked by *Argulus* and those in Loch Lomond most of which are attacked by *Lampetra*, are remarkably free of ectoparasites—no species having yet been found commonly on them (Figure 2). All three populations are, however, known to harbour several species of internal parasite.

As with the Powan in Loch Lomond, the main predators of adult Vendace in the Mill Loch appear to be Pike, and several authors have referred to the fact that Pike prey on Vendace here (e.g. Service, 1906; Maitland, 1966b; etc.). Greatest mortality from this cause probably occurs, as in Loch Lomond (Copland, 1956), during the spawning season (December and January) when *Coregonus* come into shallow water to spawn (see above). Of the relatively few (25) Pike from the Mill Loch, caught in late summer, whose stomachs have been examined over the last few years, only two contained Vendace. One of these Pike had eaten four adult fish, the other a single juvenile specimen.

Other possible predators on the Vendace in the Mill Loch are Perch; Great Crested Grebes, *Podiceps cristatus* (L.); and Herons, *Ardea cinerea* L. On Loch Eck and Loch Lomond, Red-breasted Mergansers, *Mergus serrator* L. and Cormorants, *Phalacrocorax carbo* L., both of which feed almost entirely on fish (Mills, 1962; 1965) are also possible predators.

In Loch Lomond, certain invertebrates have been shown to be important predators of *Coregonus* eggs in some areas (Slack, 1955).

CONSERVATION

The Lochmaben Vendace was originally abundant in two waters at Lochmaben, the Castle Loch and the Mill Loch, and as noted elsewhere (Maitland, 1966b) was caught in them in some numbers until the beginning of this century. Since then it has become scarce and at various times it was suggested to have become extinct. During the last 50 years very few specimens have been caught (only five published records are known to the author) and until 1965 there were

only about 24 specimens in preservation, most of these having been caught during the last century. It appears probable that the Vendace may now be extinct in the Castle Loch, but it is certainly not so in the Mill Loch. Though the present study has shown that the numbers there are higher than originally expected, the small size of the Mill Loch means that they cannot rise above a certain maximum, and also the possibility of the entire population being wiped out suddenly is an ever present one. The unique nature of the Lochmaben Vendace makes it essential that as much as possible be done to guard against this eventuality.

Clearly the Mill Loch itself must be safeguarded. Fortunately, the fishing there is owned by the local council and many anglers are allowed to fish in it. These anglers catch mainly Pike and Perch, which, as noted above, are among the natural predators of Vendace, thus this fishing probably helps to maintain the stock of the latter species. Fortunately, since they are pelagic and plankton eaters, Vendace themselves very rarely take bait and are thus never affected directly by anglers. As noted in a previous paper (Maitland, 1966b) dangers from other aspects (e.g. poisoning and pollution) are also present, but as much as possible has now been done to ensure that there is little chance of these occurring. The recent proposal to start regular water-skiing on the Mill Loch in 1967 adds a further, rather unknown, hazard to the Vendace population, for this is unlikely to be other than detrimental to the stock of fish there.

Without doubt, the greatest chance of survival for the Lochmaben Vendace lies in increasing the number of populations of dispersing the species and introducing it into suitable waters. Unfortunately, for various reasons, none of the several other lochs in the Lochmaben area is suitable for this. However, it is desirable, both aesthetically and scientifically, to restrict any introduction to the south-west of Scotland; within this area there are undoubtedly many lochs in which the species would survive and breed. Though a good deal of research has still to be carried out on the ecology of the Lochmaben Vendace, enough information is available to be able to suggest the type of water which is required for successful introduction. Ideally, it should be a large loch, longer than one kilometre; it must also be reasonably deep, preferably over 15 metres in one area. For obvious reasons, the water running into this loch must be free from sewage and reasonably pure, whilst the loch itself should contain as few other fish as possible (especially Pike). Finally, and possibly most important, no matter how ideal any water may be, it would clearly be essential to have the goodwill and help of the riparian owner before any introduction scheme were attempted.

Introduction of the Vendace to any such loch could conveniently be done by obtaining fertilised eggs from the fish in the Mill Loch by stripping them and returning the adults (thus conserving the stock there as much as possible). These eggs could then be hatched out to fry which could then be liberated in selected places. Alternatively, the eggs themselves could be placed in various lochs over suitable substrates. That introduction of *Coregonus* in these ways

is feasible has been proved several times in Scandinavia (Alm, 1950; Svårdson, 1950) and by experiments recently carried out by the author using the Loch Lomond Powan (*Coregonus clupeoides*). Fry of this species hatched in the laboratory from eggs obtained by artificial fertilisation were released in a small loch near Glasgow, where they have since thrived and grown to spawning size in a remarkably short time. Further experiments of this nature are at present being carried out using both eggs and fry and stocking them into various types of water in the Glasgow area.

DISCUSSION

Though several problems remain to be resolved, the results obtained from the high frequency echo sounder used in the present study have given much useful information about the population of Lochmaben Vendace in the Mill Loch. Its value in this situation has been twofold: firstly, it has been possible to assess in a relatively short time the main distribution, during summer, in space and time, of this rather elusive fish; secondly, this has been done with relatively little interference to the population. The last point was an important one in planning this work, for very little information was available as to the possible range of size of the population of fish in this relatively small loch.

One of the main difficulties in the assessment and analysis of the results of echo sounding of fish in lochs is the accurate identification of the actual species concerned. Thus it was necessary to carry out a certain amount of netting in order to determine the specific distribution in space and time of the fish in the Mill Loch. This netting was kept to the minimum necessary for the requirements of the echo sounding programme. It is fortunate for the interests of the present study that, while the areas occupied by Pike, Perch and Roach in the Mill Loch overlapped, they were for the most part separate from that occupied by Vendace; thus in the deeper parts of the loch, where most of the echo sounding was carried out, over 95 per cent. of the fish netted were Vendace.

In his account of the Vendace, Service (1906) discusses its abundance and notes that "the difficulty of arriving at an estimation, not to say a census, of an under-water population, is rather baffling." It is now possible to give an estimate of the order of size of the population of Vendace in the Mill Loch. The two methods used (direct observation of fish feeding at the surface at dusk, and counts of mid-water traces in the 15 metre basin) have been described above; though both methods are open to criticism on different counts, they do at least give some idea of the order of the numbers of Vendace present—information which will be valuable for future work on the population dynamics and conservation of this fish.

The main objections to the estimates obtained by counting fish feeding are that such counts are subjective and that not all the population may be feeding at one time. The quantitative nature of the fish traces obtained by the echo sounder used in this study has yet to be proved (experimental work is at present

being carried out in the Loch Lomond area for this purpose), but results obtained by such analyses are likely to be accurate, judging from the results of other workers, most of whom used less sensitive machines. Thus Runnström (1941) and Sund (1943) have shown that it is possible to estimate the fish density along a transect; similar estimates have been made by Tester (1943) whilst Tungate (1958) used echo sounding to assess the general density, distribution and movement of shoals of Herring, *Clupea harengus* L., in the North Sea.

The general results of the estimates of the size of the Vendace population have been given above; these figures must be regarded as being very tentative indeed, but of interest nevertheless. For the 15 metre basin only, they give an average of about 3000 fish altogether. For various reasons both methods of estimation are likely to be conservative and it is probable that the actual size of the Vendace population in the Mill Loch is in excess of this figure. With a population of this size, therefore, it should be safe to carry out plans for the preservation of the species along the lines suggested above. It is hoped that it may be possible to implement these within the next few years, thus attempting to establish the future of the Lochmaben Vendace on a firm basis.

The diurnal rhythm in the behaviour of the Vendace in the Mill Loch is of some interest, especially when considered in relation to that of the organisms in the plankton which form a major part of the food of these fish. Both show the traditional pattern of daily vertical migration which has been demonstrated several times in various types of plankton (Hardy, 1956; Stahl, 1966; etc.) and in several species of fish (Balls, 1951; Craig, 1955; etc.): i.e. the maintenance of a relatively constant position deep in the water during the day, then a movement upwards to the surface water at dusk and a corresponding downwards movement at dawn the next day to the previous daylight position. Many differing reasons have been suggested for such patterns of vertical migration in aquatic organisms (Hardy, 1956; Wynne-Edwards, 1962; etc.) and the subject will not be discussed here.

Further work on this unique and interesting population of *Coregonus* is intended. Apart from the conservation measures already dealt with, information is still lacking as to detailed figures relating to the age, growth, fecundity, mortality, food and internal parasites of the species. The relationships with other British and European members of the genus are also still in doubt, and it is hoped that the specimens obtained recently along with further study of the living population will help to answer these problems.

SUMMARY

The Mill Loch near Lochmaben in Dumfriesshire is of great interest in containing what is probably the only living population of the Lochmaben Vendace, *Coregonus vandesius*; other fish common in the loch are Pike, *Esox lucius*; Perch, *Perca fluviatilis*; and Roach, *Rutilus rutilus*. A recent study of this fish population using a high frequency echo sounder in conjunction with a

series of gill nets has shown that, during summer, Pike, Perch and Roach are common in the shallow waters round the edge of the Mill Loch, while the Vendace occurs mostly in the deep basin further out. The Vendace appear to stay in deep water during the day rising at dusk to the surface to feed; a reverse migration takes place at dawn. Much of the plankton present in the Mill Loch shows a similar behaviour, one of the dominant species being *Chaoborus flavicans*. *Argulus foliaceus* is an important ectoparasite on the Vendace in the Mill Loch; it does not occur in either of the other two Scottish lochs in which *Coregonus* occurs, Loch Eck and Loch Lomond, but in the latter loch the River Lamprey, *Lampetra fluviatilis* is of major importance as an ectoparasite. Pike are probably the main predators of Vendace. Because of the unique nature of the population of Vendace in the Mill Loch, and its relatively small size, conservation of the species by introduction elsewhere is of immediate importance and methods for carrying this out are suggested.

ACKNOWLEDGMENTS

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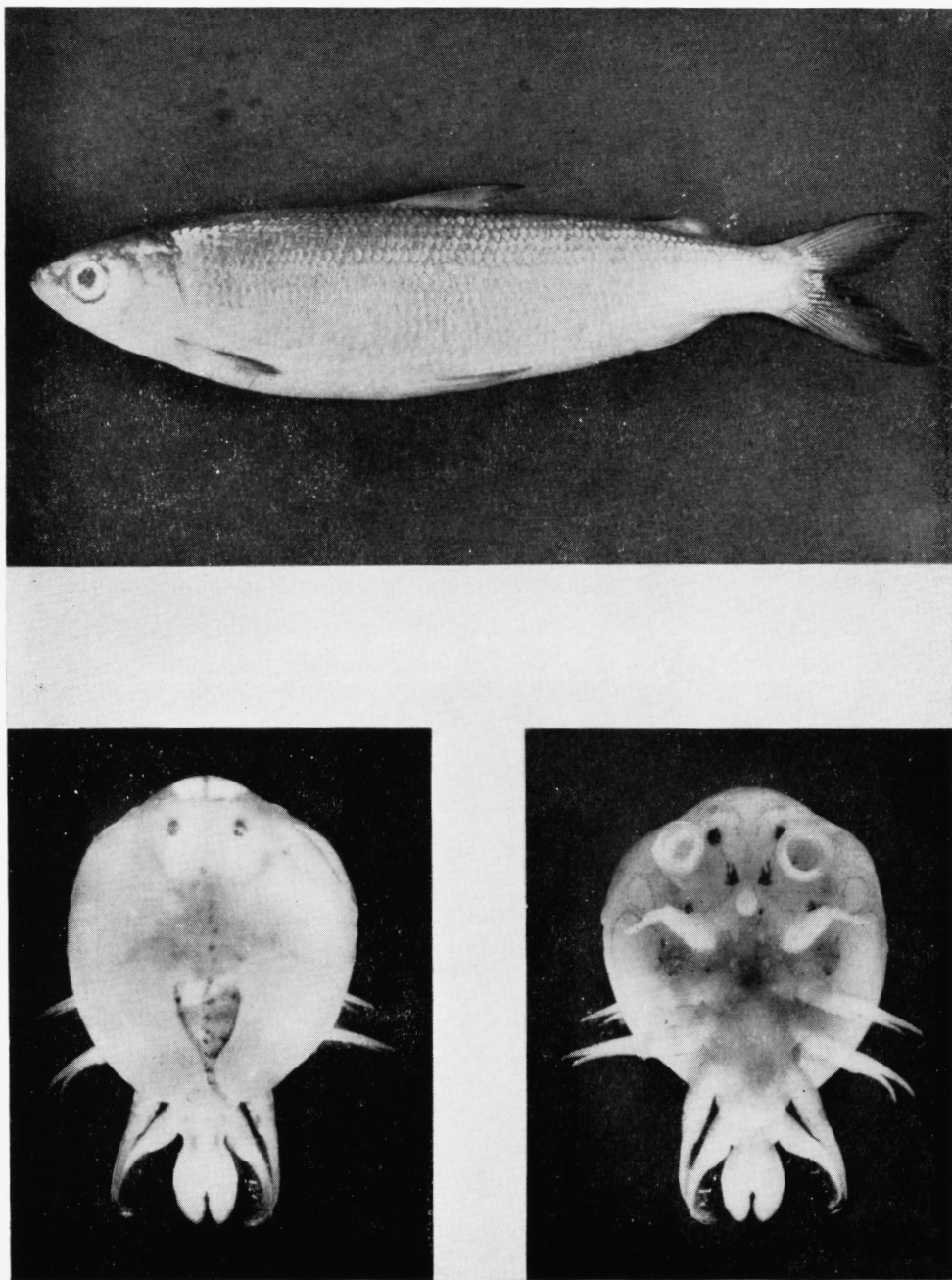


Plate II.—Top: A fresh adult specimen of the Lochmaben Vendace, *Coregonus vandesius* (actual length: 18 centimetres). Bottom: An adult specimen of the Fish Louse, *Argulus foliaceus*, showing the dorsal surface (left) and the ventral surface (right). Note anteriorly on the ventral surface the well-developed pair of suckers used for attachment to the host (actual length: 5 millimetres).

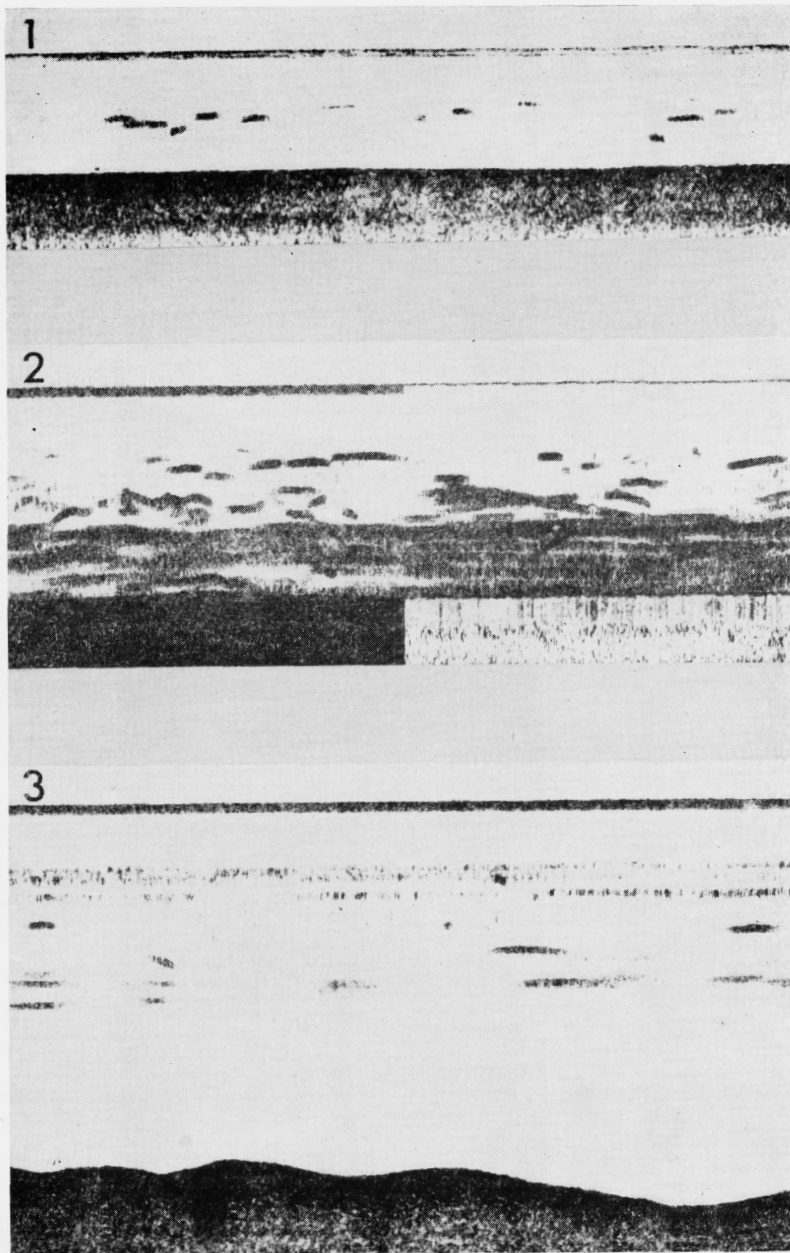


Plate III.—A comparison of stationary echo traces of *Coregonus* from the three known Scottish populations: (1) The Mill Loch (depth 16 metres). (2) Loch Eck (depth 28 metres). Only the lower traces here are *Coregonus*, the upper ones being mainly due to *Salmo*. The lower traces were so dense that the “white line” effect (see text) was used on the second half of the sounding (right) to distinguish the fish traces from the bottom. (3) Loch Lomond (depth 56 metres). The time taken for each of these traces was 10 minutes.

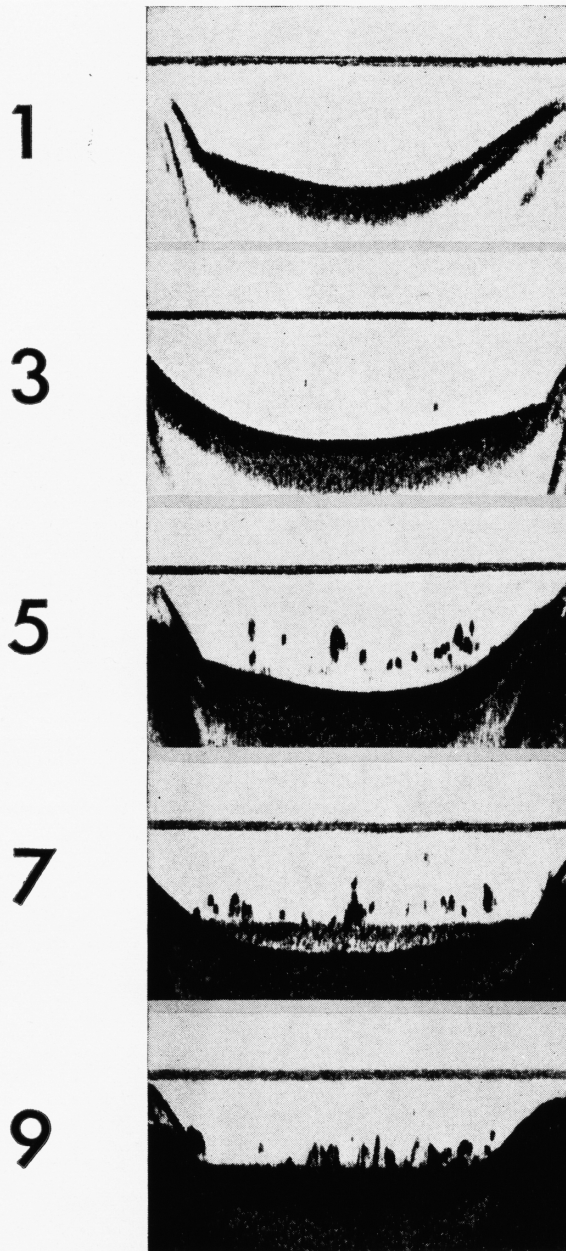


Plate IV.—Five consecutive echo sounding traces across the Mill Loch (transect CD), using sensitivity levels 1, 3, 5, 7, and 9 respectively and starting at 1300 hrs. on 28th August, 1966.



Plate V.—Eight echo sounding traces across the Mill Loch (transect AB) at sensitivity 5, taken every 3 hours from 1400 hrs. on 27th to 1100 hrs. on 28th August, 1966. Reading top to bottom, left then right.

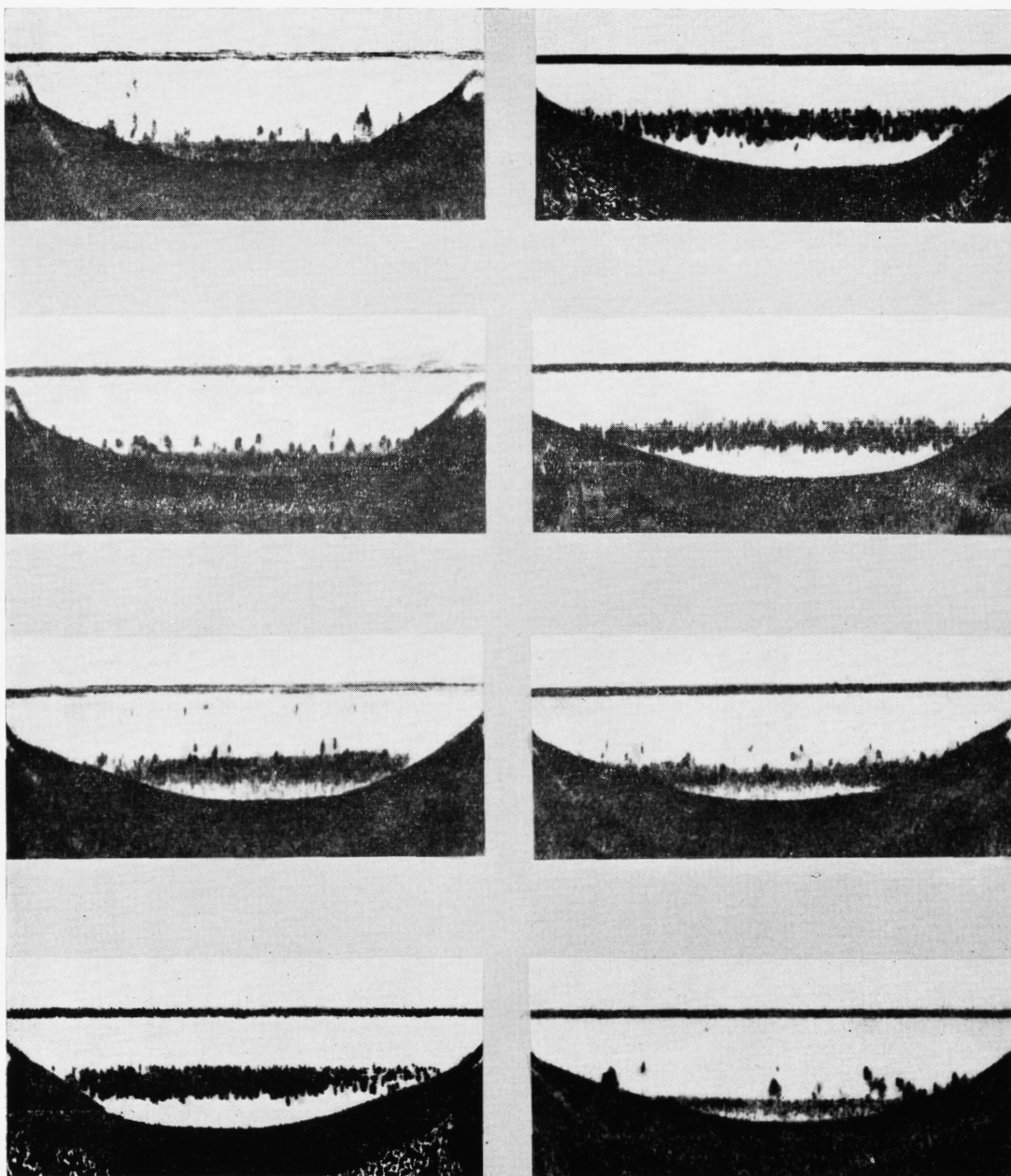


Plate VI.—Eight echo sounding traces across the Mill Loch (transect BA) at sensitivity 7, taken every 3 hours from 1410 hrs. on 27th to 1110 hrs on 28th August, 1966. Reading top to bottom, left then right.

SOME ASPECTS OF THE BIOLOGY OF *CARCINUS MAENAS* (L.)

By E. J. PERKINS

Introduction

Of all the animals which were examined in the investigation of the Solway Firth, described by Perkins, Williams and Gorman (1965), *Carcinus maenas* (L.) has had, for me personally, a considerable subsequent influence. This animal has recently become the focus of widespread attention, and is of such economic importance that its former neglect is incomprehensible; particularly since Orton (1926) concluded from field experiments that it is a great enemy of small cockles.

Carcinus maenas is commonly called the green shore crab, although shore crab without the prefix green is surely more appropriate. As all field workers know its colour ranges from green to reddish-brown, some may even be blue or purple in hue; the more juvenile members of a population may be distinguished by orange, brown, red, yellow and white geometrical patterns which may confuse the inexperienced. Seen against a natural background of gravel, stones or rock, these vari-coloured markings break up the outline of the crab and are an efficient camouflage. The work described below concerns an investigation performed in the Solway, and continuing studies arising out of that investigation.

The Food of Carcinus maenas

The known food of the shore crab is summarised in Table I. It is a voracious and active carnivore with pronounced cannibalistic tendencies, preying upon anything which is weaker than itself.

Carrion is often stated to form a part of its diet. However, this contention has not been established in the laboratory. Possibly a more precise definition of carrion is required. My own observations would suggest that the freshly dead flesh of any species is acceptable, but that material which has been dead for some time, viz. rotten flesh, is not. Preserved materials such as bacon rind, so often used by children as bait, is apparently as attractive to the crab as living or freshly killed materials.

It was noted by Perkins, Williams and Gorman (1965) that *Carcinus* apparently did not feed readily when removed from sea-water. This is not so for crabs taken from the Gareloch. Here crabs of various sizes (35-60 mm. carapace width) were presented with the flesh of *Nucella* and *Buccinum* while exposed without access to sea-water. In a series of experiments, the flesh of both species was taken readily, except for some of the tougher columellar and foot muscles. Clearly, to evoke a positive response, it was necessary only to present the crab with suitable food material. Consequently, it is possible that presentation of carrion from the "wrong source" or in the "wrong way" has led to the negative result noted in the laboratory.

Knowledge of this ability to feed when not submerged has revealed an apparent anomaly in the behaviour of *Carcinus*. All who turn stones on the shore know the gregarious habit of *Carcinus*, such that large numbers of mixed sizes may occur together, and without any apparent shelter from each other. In a more docile animal, such gregarious behaviour would not appear strange, but *Carcinus* is a pronounced cannibal, even when exposed without water, as collections from the Gareloch and Loch Long have shown. Observations on the Gareloch suggest that under high density conditions such apparent gregariousness may occur because of a need to find suitable shelter; while under low density conditions such pressures do not exist and gregariousness is not so apparent; confirmation is however necessary.

The selection of food by any predator is apposite to a consideration of the mortality and survival of prey species. Considering the trophic ecology of fishes, Ivlev (1961) showed that selection of food could be defined by the electivity index, E , viz.:

$$E = (r_i - p_i) / (r_i + p_i)$$

where r_i is the relative content of any ingredient in the ration and p_i the relative value of the same ingredient in the food complex of the environment.

This concept was applied to the feeding of *Carcinus* upon *Mytilus* (see Table II.), from the Solway. In any group of mussels offered, *Carcinus* tended to open and feed upon a greater proportion of smaller ones, even though the larger ones were opened without difficulty, hence producing a disproportionate

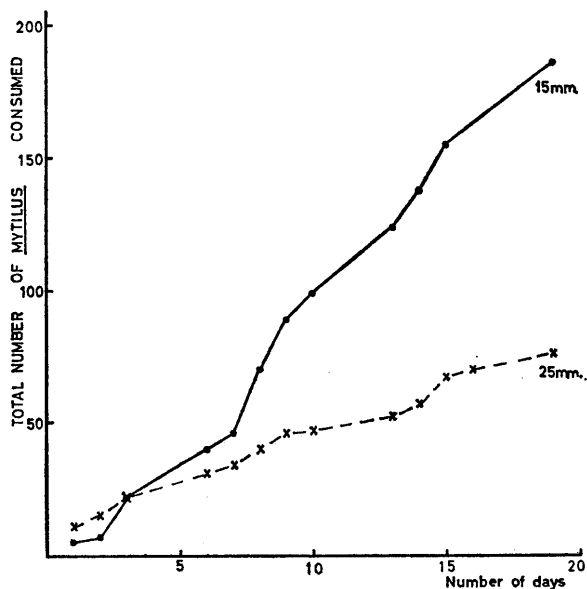


Fig. 1.—Feeding of *Carcinus* (carapace width 58 mm.) upon two sizes of *Mytilus* (standard ration 25 each of mean sizes 15 and 25 mm.). Both species taken from the Solway Firth in 1964.

mortality among the smaller sizes. The possibility that a learning process may also be involved is suggested by fig. 1; such a process would enable a crab to obtain its food with a minimum of effort in opening mussel shells, although a disproportionate number of the smaller ones are required to produce the same ration as the larger mussels would.

The selection of smaller mussels in preference to larger ones by the crab, and the avid feeding of flounder upon very small mussels noted in the Solway suggests that the shore zonation of at least some species is due to biological as well as physical factors. It may be deduced that the occurrence of a prey species in a particular zone is the consequence of a difference in the ability of the predator and prey species not only to survive, but grow and reproduce in the environmental conditions of the particular zone. Above this level, conditions are too rigorous for the successful survival of the prey, while below, its predators can give full rein to their appetite. The mussel, *Mytilus*, is apparently an example; normally it lives in a zone between the middle and lower shore, and may often occur only in a narrow band in the middle shore. It has been found that transplantation of more adult, and therefore less vulnerable, mussels to more favourable situations below the low water mark leads to an enhanced rate of growth and an improved condition. This knowledge is used commercially in N.W. Europe. Perhaps, freedom from the attacks of natural enemies may explain the success of mussels in colonising and fouling the cooling water systems of large power stations and other marine installations.

Control of Carcinus maenas

Consideration of Table I. and the adverse effect of *Carcinus* in experimental fish farms, reported in the "Fishing News" and elsewhere, suggests a need for measures to control *Carcinus*. American biologists claim that *Carcinus* may be controlled by the use of pesticides, particularly "Sevin"; however, the effect upon other species remains uncertain. For this reason and because of a rising body of public and scientific opinion, antagonistic to the use of these substances, a more detailed investigation of certain aspects of the biology of *Carcinus* has been undertaken. It should be noted also that a method of biological control ought to be cheaper, an important consideration when marginal costs may have a significant effect upon the economics of a project.

It is expected that marine fish farming will be conducted in ponds of 5 acres or more. Therefore, a number of more obvious approaches suggest themselves as worthy of investigation. These are:

- (1) what is the ability of a crab to survive exposure to the air without water, and the conditions which enhance its chances of survival,
- (2) what is the ability of a crab to survive exposure to water which is fresh or has a salinity of up to 5 parts per thousand, and
- (3) can advantageous use be made of the crab's natural predators.

I shall consider these possibilities in reverse order.

Williams, Perkins and Hinde (1965) found that 39 *Cottus scorpius*, taken

from the Solway, had fed upon crustacea and fish exclusively; indeed as a food of *Cottus*, *Carcinus* was second in importance only to the shrimp *Crangon*, and both species were markedly predominant with respect to other species occurring in the gut of *Cottus*. *Cottus scorpius* (L.) normally dwells close inshore and is sometimes classed as a shore fish. For this reason, and because of its preference for *Carcinus* as an item of diet, it is apparently suitable for use in an ecological method of control. A preliminary evaluation of this proposal is being conducted in the Gareloch. Large plastic cages which permit the ready access of prey species, including *Carcinus*, but prevent the escape of the *Cottus*, are in use. A large number of *Mytilus* are placed in each cage to provide shelter and an inducement for *Carcinus* to enter. The cages are either permanently submerged in approximately 20 ft. (6m) of water or are placed at low water mark such that the bottom is always immersed in a small depth of water.

Regarding the effects of fresh water, preliminary experiments indicate fresh water will kill crabs of 10 mm. and 48 mm. carapace width in approximately 24 and 50 hours respectively.

Of the three approaches defined above, the first has progressed the furthest so far. Initial work on the effects of the exposure of *Carcinus* to the atmosphere was described by Perkins, Williams and Gorman (1965). I resumed this investigation in October, 1965, since when it has been shown that survival of *Carcinus*

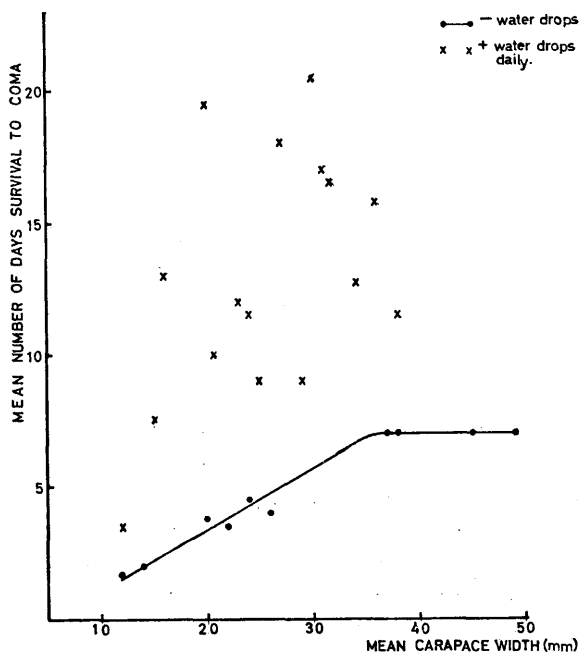


Fig. 2.—Exposure of *Carcinus*, from Harrington, Solway Firth, to the atmosphere in shaded conditions from 13th June, 1966.

on exposure to air in shade, but without other shelter depends on size, and the temperature and humidity of the air in contact with the crabs (see figs. 2 and 3). The survival of the crab may also be affected by other factors (see fig. 2). The addition of a few water drops daily significantly prolonged the survival of the crab to the coma stage (see below), it also markedly improved the chances of recovery from coma when returned to water. A recovery rate of 4% and 12% of 1247 and 477 crabs subjected to exposure in the absence and addition of water drops respectively has been recorded; there appear to be other features in this survival which depend upon the time of year, but this has yet to be confirmed.

The ability of a crab to survive the effects of exposure can also be much improved by the provision of algal shelter. Taking survival under the most favourable conditions, crabs of ca. 20 mm. carapace width have taken 7, 28 and 60 days to reach coma when exposed to air without water drops, with water drops and with algal shelter respectively. When exposed to the air completely without shelter and in full sunlight coma may ensue within a few minutes: if the sky is cloudy, however, crabs can survive such exposure for as long as they may require to return to the sea, more than 12 hours say. Indeed, crabs which were tagged and liberated, on land, some 80 feet or more from the high water mark, were able to find their way back to the sea in a few hours: these tagged specimens were later recovered from the sea. In dull conditions, they appear to head directly for the sea, but with a brighter light they react to shadow in seeking shelter, from which they make their way to the sea during the night.

More recently, work has been initiated in which *Carcinus* have been kept in conditions of 100% relative humidity and in bottles containing gravel, the interstices of which were filled with sea water. Preliminary results indicate that those crabs kept under 100% R.H. have a poorer survival to and recovery from coma than those exposed to the air in the presence of water drops or beneath algae, those maintained in the bottles appear to survive much longer to coma than those exposed beneath algae (greater than 100 days), even though, at first sight, this appears to be a rather unfavourable and unpromising type of experiment.

The results of a comparison of the survival of crabs taken from Harrington on the south shore of the Solway and those from the Gareloch, suggest that the crabs from Harrington are much better equipped to survive exposure than those from the Gareloch. This could perhaps be due to the very different tidal range in the two areas, but further work is required on this aspect.

The progress of all crabs exposed has conformed to the following pattern. All were active at the beginning of the experiment (some even escaped from the experimental vessels), but this activity decreased as each experiment progressed. The crabs then enter a relatively short coma stage in which either all overt activity has ceased, or some slight unco-ordinated activity is evinced. This stage of uncertain duration is followed by death. All crabs returned to seawater before the onset of the coma stage immediately resume normal activity;

those in the coma stage when returned to sea-water also display this resumption of normal activity upon recovery from coma. Because of the difficulty in defining precisely the point at which death occurs, all survival is discussed in terms of the time at which the onset of coma is recorded. Except in the case of the exposures beneath algae where observations are made at seven-day intervals only, the crabs exposed are examined at least three times daily, viz. at 0800, 1500 and 2200. During the winter months and particularly at temperatures less than 35°F, the reduction of activity and the ability to sham death makes even the decision regarding the onset of coma difficult. Clearly, a more objective result could be obtained by returning batches of crabs to sea-water at fixed intervals, but, especially in winter months, it is impossible to obtain samples large enough to mount such an experiment, and overall one would lose more than one gained by adoption of this technique. All the crabs darken, or tend to darken, when exposed, particularly those which have received drops of fresh water. The onset of coma is not apparently affected by the absence of limbs, or the incidence of black necrosis (see below). Males and females showed an equal ability to survive coma, where any disparity occurred this reflected accurately the proportions of the sexes in the original samples.

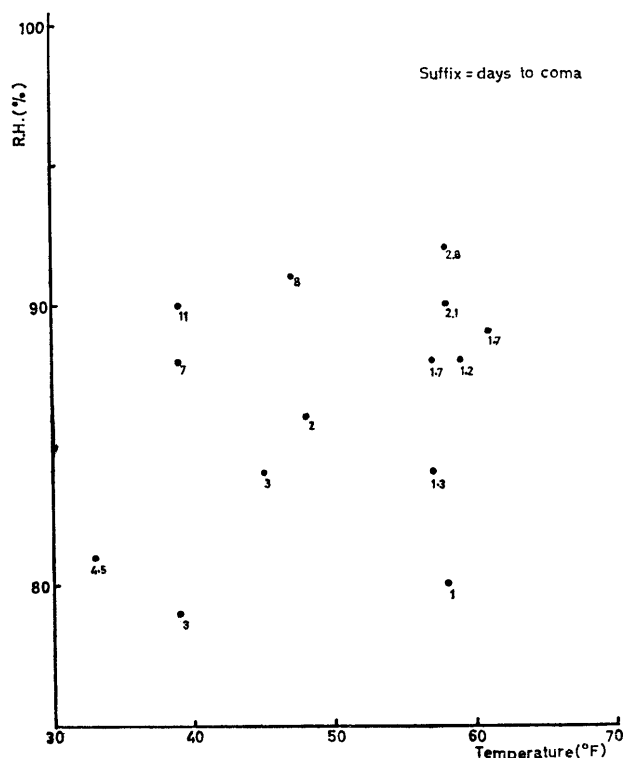


Fig. 3.—The effect of Temperature and Humidity upon the survival to coma of *Carcinus* (carapace width 15 mm.).

Crabs which had been exposed for up to 53 days showed an ability to resume feeding very soon after return to sea-water and on recovery from coma. All moulted normally, showing a good growth increment and a normal hardening of the exoskeleton. Some have been maintained for many months in a tank room, and the detailed history of their moults traced. However, the exposure, coma and subsequent recovery in no way affected the habit of cannibalism which is still pronounced. Because of food source difficulties many *Carcinus* were returned to the sea in live-boxes. Here they maintained themselves in food and showed excellent growth, for example 4 of 25 mm. carapace width in the first week of June, 1966, had grown to 47 mm., 47 mm., 45 mm., and 34 mm. by 19.12.66; a considerable increment by any standards; one further crab of 25 mm. had shown no growth, but this is not unusual. Unfortunately, many of the 1966 crabs were lost as a result of a gale. To sum up, the evidence so far obtained would suggest that even when a crab is treated to such severe conditions that coma ensues, its vital functions, on recovery, are in no way impaired; however, I have yet to show that crabs which have been taken to coma can still reproduce.

Some experiments comparing the survival of crabs with other shore dwelling animals have shown that under comparable conditions of exposure to the air without the addition of water drops the exposure required for a 50% mortality (LE_{50}) is 22-40, 22-50, 25, 8-30, 8—ca 25 days for *Littorina littorea*, *Littorina saxatilis*, *Littorina littoralis*, *Nucella lapillus* and *Mytilus edulis* respectively. A pronounced improvement in the survival of *Littorina littorea* and *Littorina littoralis* resulted when they were maintained beneath algae, viz. LE_{50} = 40 and ca. 35 days respectively.

Since the ability of the shore dwelling algae to survive exposure must also be known if the results of the work on crabs is to be meaningful, comparable exposures of algae have been carried out. These have shown that while the alga will retain its form long after death has ensued 55 days of exposure is lethal to *Pelvetia canaliculata* and *Fucus spiralis*; *Gigartina stellata*, as one might expect is less resistant to exposure than these species and apparently is dead within 12 days when exposed outside, survival is improved in the shaded, sheltered conditions of a shed.

The ability of *Carcinus* to survive exposure is not purely a matter of academic or industrial interest for it has been found that crabs will wander on the exposed shores of the Gareloch at night, and as already noted, they have the ability to feed out of water unlike those from the Solway. Perhaps, this is an expression of the difference in environmental conditions of the two areas, for *Carcinus* in the Solway readily takes, opens and ingests *Mytilus*, while those of the Gareloch show a complete lack of interest in mussels as a food; indeed I have never seen a mussel opened by a *Carcinus* from the Gareloch, nor have I found a mussel shell opened and showing the typical signs of attack by *Carcinus*, as I have so often seen in the Solway, and at Firemore Bay, Loch Ewe.

Black Necrosis

I. McIntosh, Ministry of Technology, Humber Laboratory, unpublished information, reviewed the information available upon the occurrence of a black necrosis in decapod crustacea of commercial importance. Fishermen of the Isle of Man know as "Grannies," crabs (*Cancer*) which are typified by dirty, discoloured shells and broken claws and a characteristic pitting of the carapace; when eaten they have a bitter taste and a powerful purgative effect. McIntosh showed that two species of chitinoclastic bacteria could be isolated from such crabs, but was not successful in his attempts at re-inoculation. A black necrosis also occurs in *Carcinus* upon which it appears to have a number of unpleasant effects resulting in the loss of legs and mouth parts; in addition, lesions of the carapace, sometimes extensive, may be found. In the Solway Firth, black necrosis noticed very occasionally, in the survey of 1961-64, was in no way obtrusive in its occurrence, unlike the Gareloch where it immediately attracts attention. Comparison of the incidence in the Solway Firth with that of the Gareloch in 1966, is made in Table III. It would appear that the evidence so far available confirms the subjective opinion of the differing incidence in the two areas.

Acknowledgements

I am deeply indebted to my wife for her assistance in making the detailed records essential to the work on the effects of exposure. I am also indebted to Mr K. Neilson for his assistance, and to the Cumberland Sea-Fisheries Committee for their support of a survey of the Cumberland coast of the Solway.

TABLE I.

The recorded diet of *Carcinus maenas* (L.)

Authority	Site	Food
Blegvad, 1914	<i>Zostera</i> bed. Denmark	Molluscs: <i>Hydrobia</i> , <i>Rissoa</i> , <i>Mytilus</i> , <i>Modiolaria</i> ; Crustacea: <i>Gammarus</i> , <i>Crangon</i> , Mysids; Fish: <i>Gobius</i> , <i>Gasterosteus</i> , <i>Sygnathus</i> ; Vegetable matter: Green, Brown algae rarely.
	Outside <i>Zostera</i> bed, Denmark	Polychaetes: <i>Pectinaria koreni</i> , <i>Harmothoe imbricata</i> , <i>Styela</i> ; Molluscs: <i>Macoma</i> , <i>Abra</i> , <i>Nucula nitida</i> , <i>Cardium edule</i> , <i>Mytilus</i> .
Orton, 1926	Essex coast	Significant predator of <i>Cardium</i> juv.
Smidt, 1951	Dutch Waddensea	Molluscs: <i>Hydrobia</i> , Crustacea: especially <i>Crangon</i> , <i>Carcinus</i> , Mysids; Vegetable matter: small pieces of algae.
Stickney, 1959	} Coast of Maine, U.S.A.	Serious predator of soft shelled clams— <i>Mya arenaria</i> .
Hanks, 1961		
Ebling et al, 1964	Lough Ine, Eire	Molluscs: <i>Nucella lapillus</i> , <i>Mytilus edulis</i>
Perkins et al, 1964-65	Solway Firth—Gut contents (occurrence as index)	Polychaete remains 1; Molluscs: <i>Mytilus</i> 6; Crustacea: <i>Idotea</i> 1, <i>Crangon</i> 13, <i>Carcinus</i> 25; Fish remains 5, <i>Clupea</i> 2, <i>Ammodytes</i> 1, <i>Gobius</i> 1; <i>Enteromorpha</i> 1, Land detritus. 91 examined, 25 empty.
	Solway Firth—Laboratory	Polychaetes: <i>Nephthys</i> ; Molluscs: <i>Mytilus</i> , <i>Cardium Macoma</i> , <i>Mya</i> juv.; Crustacea: <i>Carcinus</i> . Fish: <i>Platichthys flesus</i> .
Loosanoff, 1965	U.S.A., Atlantic coast	State that almost all crabs with claws large and strong enough are oyster (<i>Crassostrea virginica</i>) killers. <i>Carcinus</i> included in list of killers.
Perkins, 1966	Gareloch, Loch Long—Laboratory	Polychaetes: <i>Nephthys</i> , <i>Nereis</i> , N.B. <i>Cirratulus</i> was rejected. Molluscs: <i>Acmaea</i> , <i>Patella</i> , <i>Littorina</i> , <i>Nucella</i> , <i>Buccinum</i> , <i>Mytilus</i> . Crustacea: <i>Balanus</i> , <i>Gammarus</i> , <i>Orchestia</i> , <i>Ligia</i> , <i>Carcinus</i> , <i>Eupagurus</i> ; Echinoderms: <i>Asterias</i> .

TABLE II.

Feeding by *Carcinus maenas* (L.) upon *Mytilus edulis* L.
Numbers of Mussels consumed and Index of Electivity E.

Carapace Width (mm)/ Sex	Duration Days	Number of Mussels Consumed							
		10 mm	15 mm	20 mm	25 mm	30 mm	35 mm	40 mm	45 mm
63 M	27	63 (30)	—	142 (30)	—	73 (10)	—	2 (5)	—
	34	—	16 (25)	—	19 (25)	—	3 (25)	—	0 (25)
57 M	27	33 (30)	—	56 (30)	—	0 (10)	—	—	—
	34	—	46 (25)	—	7 (25)	—	0 (10)	—	—
26 F	27	—	62 (10)	—	0 (10)	—	—	—	—
	34	64 (10)	—	0 (10)	—	0 (10)	—	—	—

Carapace Width (mm)/ Sex	Duration Days	Index of Electivity — E							
		10 mm	15 mm	20 mm	25 mm	30 mm	35 mm	40 mm	45 mm
63 M	27	—0.2	—	0.11	—	0.39	—	—0.69	—
	34	—	0.62	—	0.76	—	0.06	—	—1.00
57 M	27	0	—	0.31	—	—1.00	—	—	—
	34	—	0.70	—	—0.05	—	—	—	—
26 F	27	—	0.72	—	—1.00	—	—	—	—
	34	0.96	—	—1.00	—	—1.00	—	—	—

N.B.—Bracketed values indicate the standard ration which was maintained by additions daily.

TABLE III.

Incidence of Black Necrosis in the Solway Firth and Clyde areas, 1966
Percentage incidence

Clyde	10—30 mm	Over 30 mm.
Gareloch, June ...	3.3—13.7	28.6
Gareloch, Aug. ...	9.3—18.2	44.4—66.7
Loch Long, June	5.8—10	—
Loch Long, Aug.	12.6	—
Solway Firth		
Harrington, June	5.7	7.1
Siddick, Aug ...	2.7	2.5

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THE BATTLE-AXES, MACE-HEADS AND AXE-HAMMERS FROM SOUTH-WEST SCOTLAND

By FIONA E. S. ROE, M.A.

The stone implements from this part of Scotland have received little attention since the end of the last century, when in 1887 a concerted effort was made to list material of all kinds in Scottish museums.¹ This was followed a year later by a list of implements from Wigtownshire,² which included a number of the types now under review. John Smith, in 1895, listed a certain amount of material in his account of Ayrshire,³ and these works, together with Sir John Evans' invaluable *Ancient Stone Implements*,⁴ form the main sources of reference to the implements listed in the Appendix. Although few of these have not received at least a mention in print, no comprehensive study of them has yet been made for the area in question. This paper is intended to add to the corpuses so far compiled for South-West Scotland, and published recently in these Transactions, on Food Vessels,⁵ and Bronze Age Metalwork.⁶

Inevitably there are some instances in the Appendix of implements recorded in the last century that can no longer be traced, while the absence of illustrations for some of these makes only a general attribution to types possible. No doubt many of the implements so recorded, and indeed others not listed, are kept in private collections to this day, so that this corpus of battle-axes, mace-heads and axe-hammers cannot pretend to be a complete one.

Of the three classes of implement under discussion, the distinction followed between battle-axes and axe-hammers is that made recently by the writer,⁷ in which the term **axe-hammer** is retained for the larger and more clumsily shaped axes with shaftholes, while **battle-axe** is used to describe the smaller and often more elegantly shaped axes. The term **mace-head**, as understood here, does not include simple pebbles with hour-glass shaped holes, which may perhaps be more effectively described as "**pebble hammers**." A true mace-head is distinguished by having been shaped intentionally to one of a fairly limited range of forms, and has a straight, rather than an hour-glass hole.

BATTLE-AXES

The various different types of battle-axes are well represented in South-West Scotland. The earlier varieties, shown on Fig 1, are characterised by their simplicity of form, and by either the absence of a splayed cutting edge (Stage I: Nos. 28, 112, 127, 133, 152, 156, 177 and 181), or by a blade that is

¹ J. Anderson & G. F. Black. P.S.A.S., xxii, 1887-8, 331-422.

² Sir Herbert Eustace Maxwell. P.S.A.S., xxiii, 1888-9, 200-232.

³ J. Smith, 1895. "Prehistoric Man in Ayrshire."

⁴ Sir John Evans, 1897. "Ancient Stone Implements," second edition.

⁵ D. D. A. Simpson. "Food Vessels in South-West Scotland," in T.D.G.A.S. xlii, 3 ser., 1965, 25-50.

⁶ J. M. Coles. "Bronze Age Metalwork in Dumfries and Galloway," in T.D.G.A.S. xlii, 3 ser., 1965, 61-98.

⁷ F. E. S. Roe. "The Battle-axe Series in Britain," in P.P.S. xxxii, 1966, 199-203.

very slightly expanded (Stage II: Nos. 18, 31, 78, 132, 140, 161).⁸ Those in Stage I belong to the **Woodhenge** group, named from an axe of this type associated with a Long Necked Beaker⁹; the Stage II axes are the earliest of those of **Intermediate** type,¹⁰ i.e. those that lack evolved features.

Battle-axes from Stages I and II comparable to those shown in Fig. 1, are known elsewhere in association with Beakers of the Long Necked (or Southern British) variety and other objects that typically occur with them, or with Food Vessels,¹¹ but none from the area under review is recorded from a specific context save that from Tynron (No. 78), which is known to have come from a cist under a cairn. Another cairn in this parish is also reputed to have yielded a "stone hammer" from a cist (No. 79), and there is an allusion to an implement from a barrow at Twynholm (No. 120), which may perhaps have been a battle-axe or mace-head.

Three of the more finely made early battle-axes, including that from Tynron (and nos. 28 and 177), are slightly hollowed or dished on the top and bottom. This feature is not found on later battle-axes, from Stages III-V, but occurs not infrequently on the earlier varieties,¹² a chronological factor that is useful in making comparisons with axe-hammers, as discussed below. Two of these battle-axes are dished over most of the top and bottom areas (78, 177), but that from Castledykes is hollowed more in the nature of a broad groove, a feature that is rare on battle-axes, but that is again found on axe-hammers.

Also rare is the fluted decoration on the battle-axe from Douglas Support (No. 127). Ornamentation that can be closely compared is known only on two other very similar early Scottish battle-axes, from Clova, Angus, and Rossie Law, Perth.¹³ (One Irish battle-axe with fluted sides is known to the writer.) As with the dished surfaces, parallels are to be found among axe-hammers, and in particular in the area under review.

Turning to the later battle-axes, from Stages III-V (Fig. 2), each successive Stage represents increased expansion of the blade. Further division into types is made possible by the fact that the more squat varieties, with the expanded butt and blade close together, have a distribution almost entirely restricted to Scotland, and have accordingly been termed **Northern Variants**, while longer and thinner axes, with the expanded ends far apart, are found mainly in England, and have been named **Southern Variants**. There are also **Intermediate** forms, that do not have extreme features, and are common to both areas.¹⁴ Further distinctions depend on differences in butt form, of which five types have been distinguished, A-E.¹⁵

It can be seen on Fig. 2 that shaped angular butts of form "D" are common (Nos. 1, 2, 20, 24, 82, 118, 187, 191), and indeed they account for

⁸ F. E. S. Roe. *op. cit.*, pp. 203-5.

⁹ M. E. Cunnington, 1929, "Woodhenge," 148 & Pl. 40.

¹⁰ F. E. S. Roe. *op. cit.*, 204.

¹¹ F. E. S. Roe. *op. cit.*, 219-224.

¹² F. E. S. Roe. *op. cit.*, 213.

¹³ F. E. S. Roe. *op. cit.*, 213 & Fig. 6b, No. 423.

¹⁴ F. E. S. Roe. *op. cit.*, 203-4.

¹⁵ F. E. S. Roe. *op. cit.*, 204 & Fig. 4.

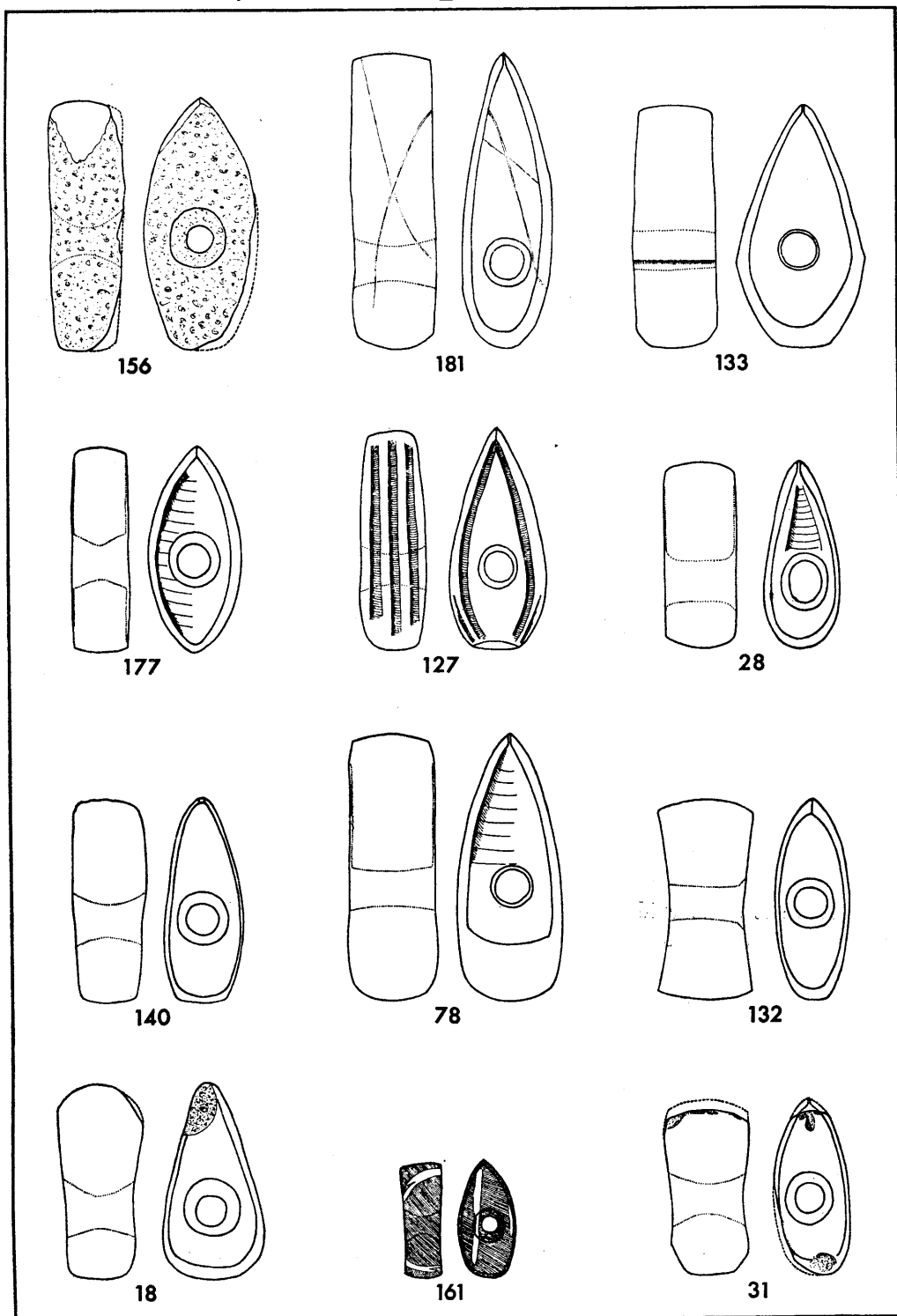


Fig. 1. Early battle-axes (No. 181 after P.S.A.S.). Scale (x4).

50 per cent of the battle-axes of Stages II-V from South-West Scotland, though in Britain as a whole they form only a small proportion, some 26.2 per cent of the battle-axes in these Stages. Incised decoration, in the form of single, double or triple incised lines along the sides, is also relatively common on the later battle-axes from the area under review.

The inter-relationship of shapes among the battle-axes from stages III-V is worthy of comment. The crescentic butt shape, form "A," is rare (Fig. 2, No. 5). The unusual rounded shape of the butt of the Kilmacolm battle-axe (No. 136) among the Intermediate forms seems to foreshadow the rounded butts of some of the Northern Variants—those from Whiteinch, Glasgow, and Kirkoswald (Nos. 16, 129). Butts that are almost spherical like this belong to the Crichtie group, but can be considered as a sub-division of it. Only one other example of this particular butt shape is known, from Culbin, Moray.¹⁶ The Northern Variants with shaped, angular butts, belonging to the Scotsburn group, compare closely with those of the Crichtie group in all but the shape of the butt (Nos. 1, 20, 82, 162). The battle-axe from Kirkinner (No. 162) in the Scotsburn group is unusually large, but it may be compared with one from Sandwick, Orkney.¹⁷ Both groups of Northern Variants resemble the Irish battle-axes of Bann type. These axes must belong to the same phase of contacts between South-West Scotland and Ireland in the Early and Middle Bronze Age that has already been demonstrated by Dr J. M. Coles in his discussion of metalwork from the area.¹⁸

Only two complete battle-axes of Southern Variant type are known from Scotland, both of the Loose Howe group, from Longniddry, East Lothian,¹⁹ and Stranraer (No. 187), but the broken axe from Whithorn (No. 191) most probably also belongs to this group.

Associations are not lacking for these later battle-axes. Among the Intermediate forms, that from Colmonell (No. 5), of the Calais Wold group, was, according to Anderson 'supposed to have been washed out of a cairn of stones in which an unburnt burial was subsequently found,' and an association with an inhumation would not be out of place for this type of battle-axe.

There is some evidence that the axe from Kilmacolm (No. 136) also came from a cairn, though it is only certainly known that it was deposited with a cremation.

In four cases battle-axes have been found in direct, or near direct, association with urns.²⁰ The grave group from Sandmill Farm, Stranraer (No. 187), was contained in a Tripartite Collared Urn of I. H. Longworth's Secondary Series. With the battle-axe and a cremated burial were found a bronze blade that appears to be a razor of Class IB, a tubular bone head with incised ornament, and three pieces of sandstone that were perhaps used as whetstones.

A second Collared Urn of the Secondary Series, and associated with a

¹⁶ F. E. S. Roe, *op. cit.*, pp. 212 & 242, No. 402.

¹⁷ P.S.A.S. xxxii, 1897-8, 319 & Fig. 2.

¹⁸ J. M. Coles, *op. cit.*, 88.

¹⁹ P.S.A.S. xxviii, 1893-4, 241 & Fig. 5.

²⁰ I am grateful to Dr I. H. Longworth for advising me on the classification of the urns.

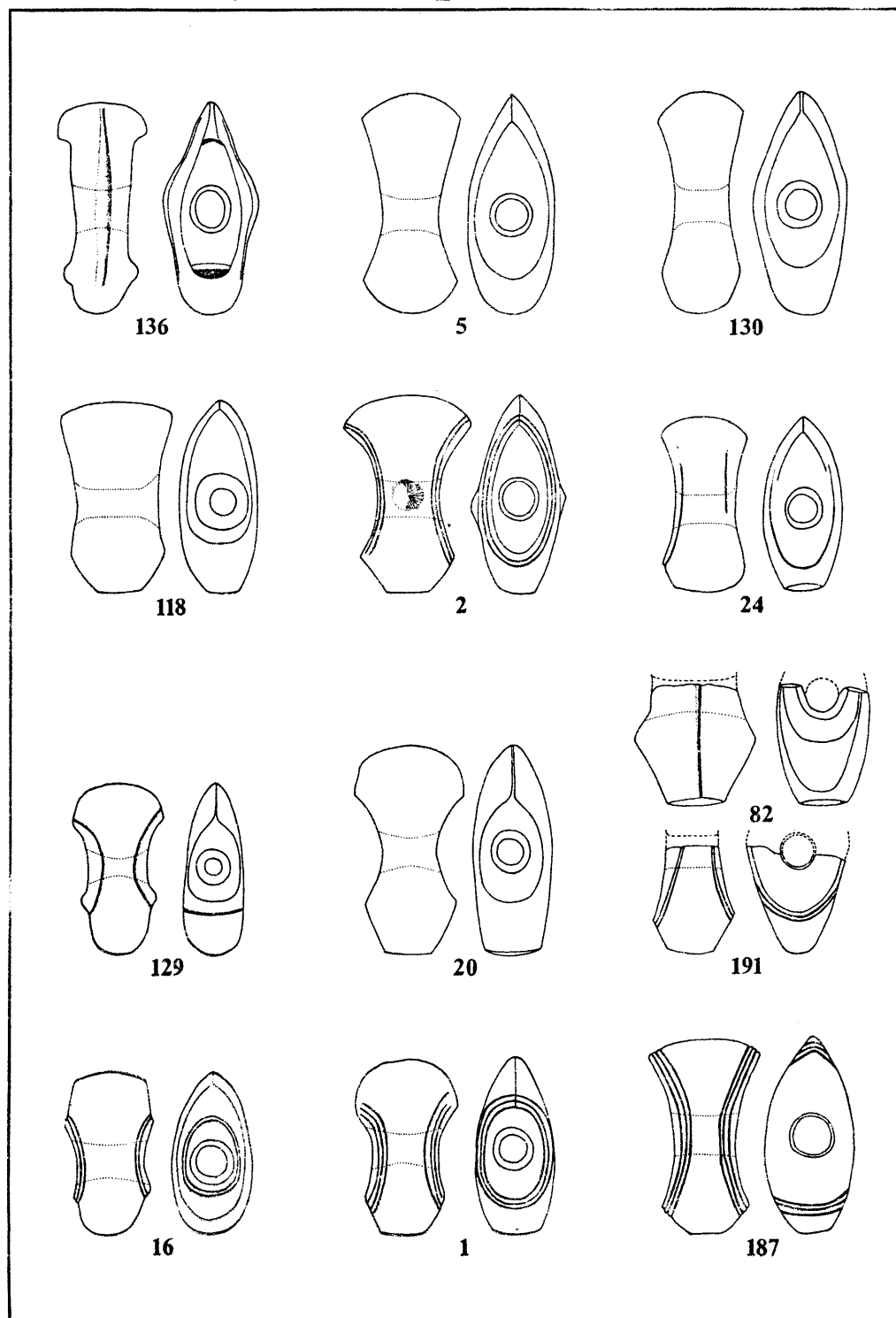


Fig. 2. Later battle-axes (No. 5 after Anderson). Scale (x1).

cremation, came from Nith Lodge (No. 20), where a stone circle had been used as the site of a cremation cemetery. Two incense cups were also found. The battle-axe was not directly associated with any of the other finds, but is perhaps broadly contemporary with them.

At Chapleton Farm, Ardrossan (No. 1), the fine axe of Scotsburn type was found with a cremation and a Cordoned Urn. The battle-axe of the Crichton group from Whiteinch, Glasgow (No. 129), came from another cemetery site. This has never been published, but Mr J. G. Scott kindly informs me that the axe accompanied a cremation in a Collared Urn. The other vessels found were a Short Necked Beaker (D. L. Clarke's Late Northern N3 type²¹) and two biconical Food Vessels.

Battle-axes appear to be comparatively uncommon in South-West Scotland (Fig. 3) when their distribution as a whole is considered,²² though the nature of the terrain, a large part of which consists of Highland areas, must be at least in part the reason for this.

Pottery of the types generally associated with earlier battle-axes is not abundant in this region of Scotland. Beakers of D. L. Clarke's Developed and Late Northern British (Short Necked) types, which should be contemporary, are rare, and apart from the finds at Glenluce they are mainly recorded from Lanarkshire.²³ D. D. A. Simpson has shown that the Food Vessels associated with battle-axes belong mainly to the Yorkshire Vase category,²⁴ but only two such vessels are known from South-West Scotland, and the main body of Food Vessels in the area comes from the Clyde Valley,²⁵ a region almost empty of battle-axe finds. Subsidiary Food Vessel concentrations centred on Ardrossan and Stranraer do however correspond with the battle-axe distribution. Cinerary Urns, too, are most abundant in the Clyde valley,²⁶ but otherwise have a fair correspondence in distribution with that of the later battle-axes. On the whole, the distribution of Early Bronze Age metalwork from Dumfries and Galloway²⁷ compares best with that of the battle-axes, showing the same concentrations around Dumfries, and in the Whithorn and Stranraer areas.

MACE-HEADS

There is only one true Pestle mace-head among those under review, from New Abbey (Fig. 4, No. 111 and Plate VII). A Pestle mace-head may be distinguished by its angular outline, as seen in plan, and though this example is not an extreme form, its waisted shape can be compared with the Pestle mace-

²¹ D. L. Clarke. Ph.D. thesis, Cambridge, 1964, "The Origin and Development of British Beaker Pottery," and forthcoming book of the same title, C.U.P., 1968, Corpus No. 1703.

²² F. E. S. Roe. *op. cit.*, Maps 1 & 2.

²³ D. L. Clarke. *op. cit.*, Corpus; S. Piggott, ed., 1962, "The Prehistoric Peoples of Scotland," Fig. 11.

²⁴ D. D. A. Simpson. Lecture to the Prehistoric Society, 28th Jan., 1967, "The Food Vessel Cultures of the British Isles."

²⁵ D. D. A. Simpson. *op. cit.*, 1965, Fig. 1.

²⁶ S. Piggott. *op. cit.*, Fig. 13.

²⁷ J. M. Coles. *op. cit.*, Fig. 2.

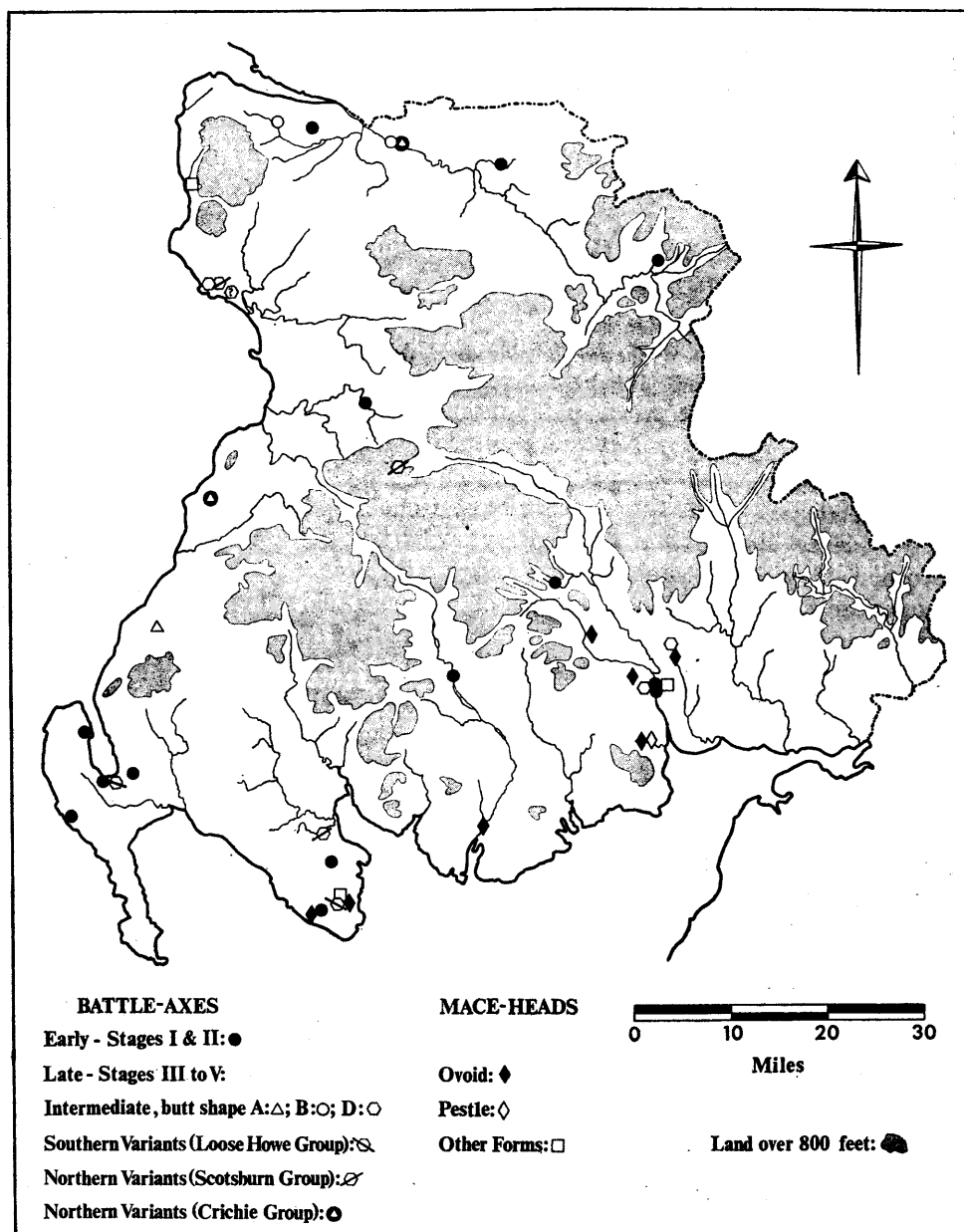


Fig. 3. Battle-axes and mace-heads from South-West Scotland.

heads from the Scottish chambered tombs of Taversoe Tuick²⁸ and Isbister²⁹ in Orkney.

The majority of the mace-heads from South-West Scotland have an entirely rounded or **Ovoid** outline, as seen in plan (Nos. 46, 76, 98, 109, 115, 146, 192, 198). Some of the Ovoid types compare well with the "egg-shaped" mace-heads defined by Eliot Curwen in 1941³⁰ (e.g. Nos. 146, 192, 198), while others are more elongated in form (e.g. No. 46), and more closely resemble examples such as that from the chambered tomb on Tormore Farm, Arran.³¹

The mace-head from Tinwald (No. 76) differs from the others in having a near square section, and in form it is very like the four faceted mace-heads from Maesmore (Merioneth), Quarnford (Staffs), Airdens (Sutherland), and Urquhart (Moray),³² while it also resembles other non-ornamented specimens. It is made of whitish quartzite³³ with two red patches, and the material was no doubt chosen for its unusual colouring.

Mace-heads of the types so far discussed have been shown by Piggott to belong to his Secondary Neolithic cultures,³⁴ and in particular they seem to be connected with that aspect of the later Neolithic represented by Rinyo-Clacton pottery. The Ovoid mace-head from Tormore is associated with a Rinyo-Clacton sherd,³⁵ and fragmentary Ovoid and Pestle mace-heads have been recorded respectively from Rinyo and Skara Brae.³⁶ Such mace-heads are known only from the Southern part of the area under consideration (Fig. 3), and though later Neolithic finds are not abundant, Rinyo-Clacton pottery has been recorded from Glenluce,³⁷ and from Kirkburn and Beckton, near Lockerbie.³⁸ Mace-heads such as these need not antedate the earliest types of battle-axes, and indeed it seems likely that the technique of boring shaftholes through stone was learnt from the makers of battle-axes.

The only associated mace-head from the present corpus is that from Largs (No. 17), which comes from a cemetery site where it was found with the fragments of a Tripartite Collared Urn of the Secondary Series. Other urns from this site, either Collared, or of a simple flowerpot shape, contained cremations.

This mace-head is very different in shape from those discussed above, being flat at either end, and with the hole in a central position. The incised decoration, in the form of two rings round the hole, seems to be taken from similar ornament on some of the later battle-axes, particularly those of the Crichton and Scotsburn groups (e.g. Nos. 1, 16, 129). Such battle-axes, as has just been shown, are also sometimes found with urns of the Secondary Series, and these two factors would seem to suggest that the Largs mace-head is later than the others so far described.

28 A. S. Henshall, 1963. "The Chambered Tombs of Scotland," vol. I, 234 & illustrated, p. 251, No. 38.

29 A. S. Henshall. *op. cit.*, 205 & illustrated, p. 247, No. 4.

30 Eliot Curwen. *Ant. J.* xxi, 1941, 337.

31 P.S.A.S., xxxvi, 1901-2, 100 & Fig. 23.

32 J. Anderson. P.S.A.S. xliii, 1908-9, 377-384.

33 Identified by the Geological Survey, Edinburgh.

34 S. Piggott, 1954. "Neolithic Cultures of the British Isles," chapter XI.

35 S. Piggott. *op. cit.*, 1954, 175.

36 S. Piggott. *op. cit.*, 1954, 331.

37 J. G. Callander. P.S.A.S., lxiii, 1928-9, 29-98.

38 W. F. McCormack. P.S.A.S., xcvi, 1962-3 (1965), 122; T.D.G.A.S., xli, 1964, 111.

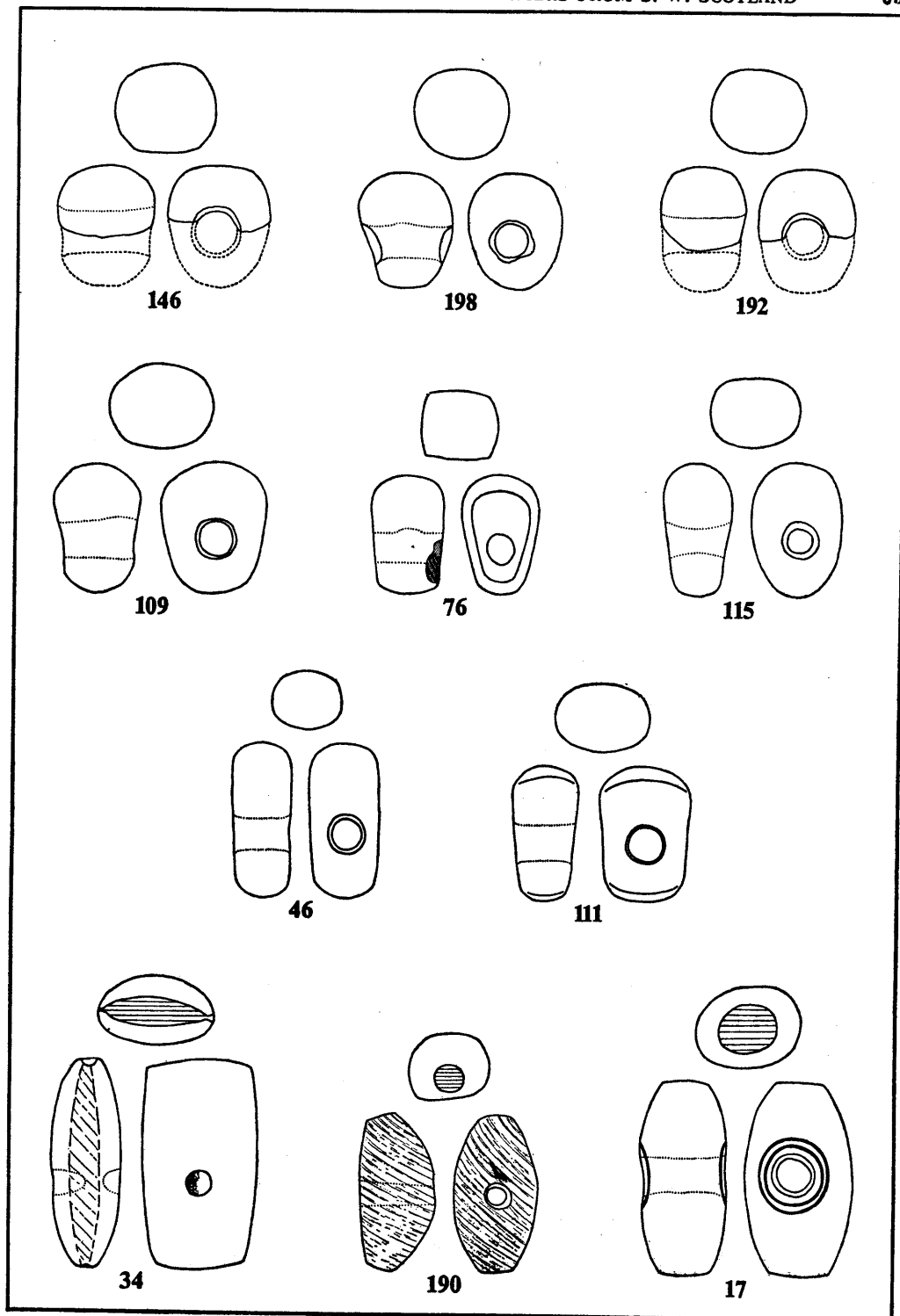


Fig. 4. Mace-heads. Scale ($\times 4$).

Mace-heads with flattened ends and centrally placed holes are not common, but one can include in this category an example from Towthorpe barrow C 39, E. R. Yorks,³⁹ which was found with an inhumation burial in association with a Bush Barrow dagger and a plano-convex flint knife. (Mortimer does not state that one end of the mace-head, as illustrated by him, consists of mere plaster reconstruction.) Another comparable mace-head is known from Cambusbarron, Stirling, where it was associated with a Cordoned Urn.⁴⁰

One of the mace-heads from Whithorn (No. 190) is without precise parallel, being unusually assymetrical in profile, but it appears to belong to the same general category as that from Largs. It is made of an attractive green and yellow veined stone with a well polished surface.

A final mace-head to be considered is the curious adze-like specimen from Dumfries (No. 34). This has blunted ends, and lacks the centrally placed hole characteristic of adzes, while its polished surface and elongated shape suggest affinities with the cushion type of mace-head. It is, however, too broad and thick in relation to length to conform to the elegant proportions of true cushion mace-heads, but it is possibly a prototype form.

AXE-HAMMERS

Axe-hammers are numerically the most important part of this corpus, with some 160 examples recorded to date (Fig. 5). Only 62 axe-hammers are known to the writer from the rest of Scotland, though they are again very common in North-West England. Most of the axe-hammers from South-West Scotland come from Dumfries and Galloway, and there is a nucleus of 14 finds in and around Dumfries.

Many are very large, with an average length of 9.3 ins., while one specimen from Mearns (No. 137) is 13.5 ins. long. There are not a great many features that can be noted about these axe-hammers, which for the most part are large, somewhat crudely shaped, and often weathered. A specimen from Applegarth (No. 27, Plate VIII) still retains traces of a smooth surface, but it seems unlikely that any were polished to the extent that battle-axes and mace-heads were (Plate VII).

No petrological analysis has yet been carried out for axe-hammers in South-West Scotland, but it was stated in 1889 of finds from Wigtown that they 'are made of the prevailing stone in the district, viz., Lower Silurian sandstone' (i.e. Ordovician).⁴¹ One would expect a petrological examination to confirm that the axe-hammers were, in fact, made of locally available materials, though ones made of imported stone as well would not be out of the question. The use of Group VI Langdale stone in the area for polished stone axes has already been documented.⁴² The nearest sources of stone known to have been used for making axe-hammers are that of Group XV, a micaceous sub-greywacke which

39 J. R. Mortimer, 1905. "Forty Years Researches . . .", 6 & Fig. 9.

40 J. Anderson. P.S.A.S., xvii, 1882-3, 453.

41 Sir Herbert Eustace Maxwell. P.S.A.S. xxiii, 1888-9, 204.

42 R. G. Livens. P.S.A.S. xcii, 1958-9, 57-64 & Fig. 1.

may have originated in the Coniston grit of the Lake District, and Group XVIII quartz dolerite, which comes probably from the Whin Sill area in Teesdale.⁴³

Among the characteristics of axe-hammers that are also to be found on battle-axes, most striking is that of fluted ornamentation in the form of broad shallow grooves along the sides (Fig. 6). This is known only on a few early battle-axes, and is rare on axe-hammers. The four axe-hammers shown on Fig. 6 are the only ones decorated in this manner from Scotland, while there are a further three from England. One of these, from Wotherton, Chirbury, Shropshire (Sh. 61/ah) is made of Group XIII Prescelly stone. This distinctive spotted dolerite was also used for making battle-axes, but again it was restricted to the early types.⁴⁴

Three of the Scottish fluted axe-hammers are from Dumfriesshire, and in addition to the fluted ornament they are grooved on the top and bottom. This feature is more common without the fluted sides, and there are some nine further examples from South-West Scotland (Fig. 7), all of them from the Southern part of the area. Grooved ornament in this particular form is not known on battle-axes, save on the fluted one from Clova, Angus, and an unlocated Scottish find (N.M.A.S. No. L 1933 2105), and it is rare on axe-hammers outside South-West Scotland. No other comparable Scottish example is known, and there are only a few others, all from the North of England, save one from Ireland that has come to the writer's notice. This feature then seems to be largely a local manifestation.

A number of axe-hammers are dished, that is they have the top and bottom slightly hollowed out at the blade end of the implement (Fig. 8). As already pointed out, this feature occurs on battle-axes, but on the earlier varieties only. The dished area may take the form of a broad groove (Nos. 124, 193 and 27) (Plate VIII), or a wider area may be slightly hollowed out (Nos. 29, 71, 89, 149, 164, 172).

An axe-hammer from Carruchan (No. 88) has a raised rib along the centre of the top and bottom at the blade end. Another unusual variation is found on the axe-hammer from Forth (No. 128, Fig. 8), which has a well shaped blade and butt, so that in form (but not in size) it resembles some of the later battle-axes. Axe-hammers shaped in this manner are not common, but an example can be quoted from Deane, Lancashire,⁴⁵ while another from Egton, N. R. Yorks, compares quite closely with that from Forth.⁴⁶ The grooved axe-hammer from New Abbey (Fig. 7, No. 108) has what appears to be the beginning of a secondary hole, in the form of two cup marks. Similar small hollows are sometimes found on the broken blade ends of battle-axes.

Two large "hammer-heads" from Wigtown (Nos. 154, 157) lack a blade end or cutting edge, and are circular in section, while neither has a completed hole. Parallels are not known.

⁴³ P.P.S., xxviii, 1962, 220 & 224.

⁴⁴ F. E. S. Roe. *op. cit.*, 218.

⁴⁵ V. C. H. Lancashire, I, 1906, 224 & Pl. II. 4.

⁴⁶ The Yorkshire Museum, Reg. No. 1055/1948.

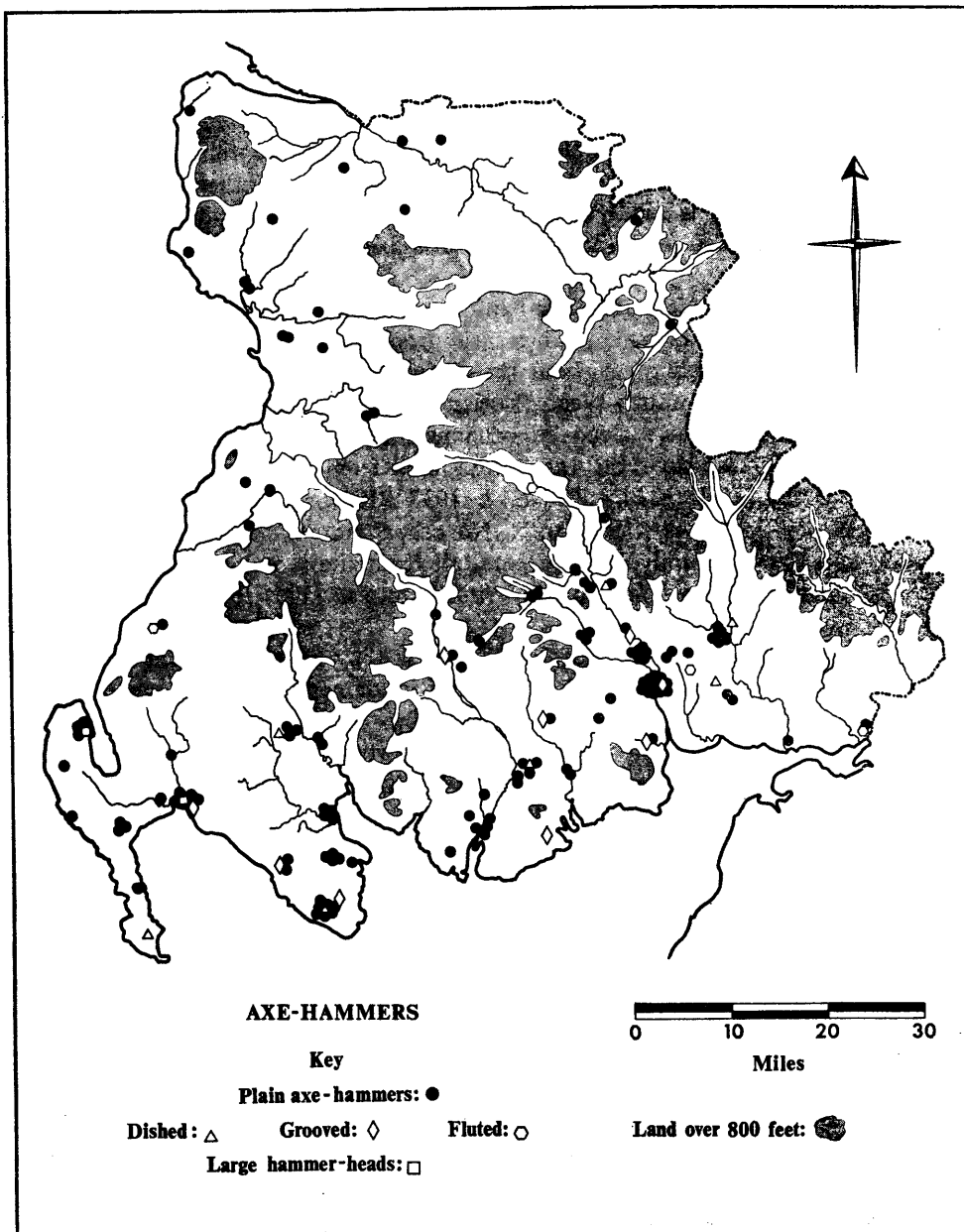


Fig. 5. Axe-hammers from South-West Scotland.

One of the factors which must hitherto have discouraged work on axe-hammers is the fact that none has been found as part of a grave group, and other associations virtually do not exist. Three of the axe-hammers listed in the corpus (Nos. 15, 60, 70) are recorded as coming from cairns, but in no case are they said to have been found with a burial, and there is no evidence that they were anything more than part of the cairn material.

So, for dating purposes, one must resort to the comparisons made with battle-axes. As shown above, all the parallels that can be drawn are with the earlier types of battle-axes, which themselves are dated by the Long Necked (or Southern British) Beakers and the Food Vessels (mainly of the Yorkshire Vase type) with which they are sometimes found. Another link between battle-axes and axe-hammers is through petrology. The use of Group XIII Prescelly stone for both types has already been mentioned. Other grouped rocks used for battle-axes and also for axe-hammers in England include Groups XII, XIV, XV and XVIII; of these Group XV was used as far as is known only for the earlier varieties of battle-axes, and Group XIV mainly for later types, while Groups XII and XVIII were used for battle-axes from all Stages.⁴⁷ However, battle-axes do not seem to have outlasted the Early Bronze Age of Wessex, while axe-hammers are so much more numerous that it seems a possibility that they may have continued in use for a little longer.

The distribution of axe-hammers lies almost entirely in Dumfries and Galloway, and it is here, too, that the different varieties of ornamented or dished axe-hammers have been found (Fig. 5). Pottery finds in the area are too limited for significant comparison, but the emphasis on find-spots in river valleys, especially those of the Nith and the Dee, is reminiscent of the distribution patterns of Early and Middle Bronze Age metalwork.⁴⁸ It seems not impossible to postulate a link between some of the axe-hammers and the quantities of Middle Bronze Age metalwork noted by Dr Coles.⁴⁹

The suggestion that there may be a connection between the distribution of axe-hammers in Britain and the working of copper ores is not a new one.⁵⁰ While no large copper deposits are known to exist in South-West Scotland, there were some ores available,⁵¹ though there is no concrete evidence that they were utilised during the Bronze Age. Copper was once mined at Wauk Mill, near Kirkcowan,⁵² and there was another source of material in the Tonderghie area.⁵³ However, this point must await future work, since it can be further clarified only when a complete map of axe-hammers from Britain is available for correlation with the known sources of copper ores. Much research remains to be done on axe-hammers, and these notes must suffice as a start.

47 F. E. S. Roe. *op. cit.*, 215-18.

48 J. M. Coles. *op. cit.*, Fig. 1.

49 J. M. Coles. *op. cit.*, 64-5.

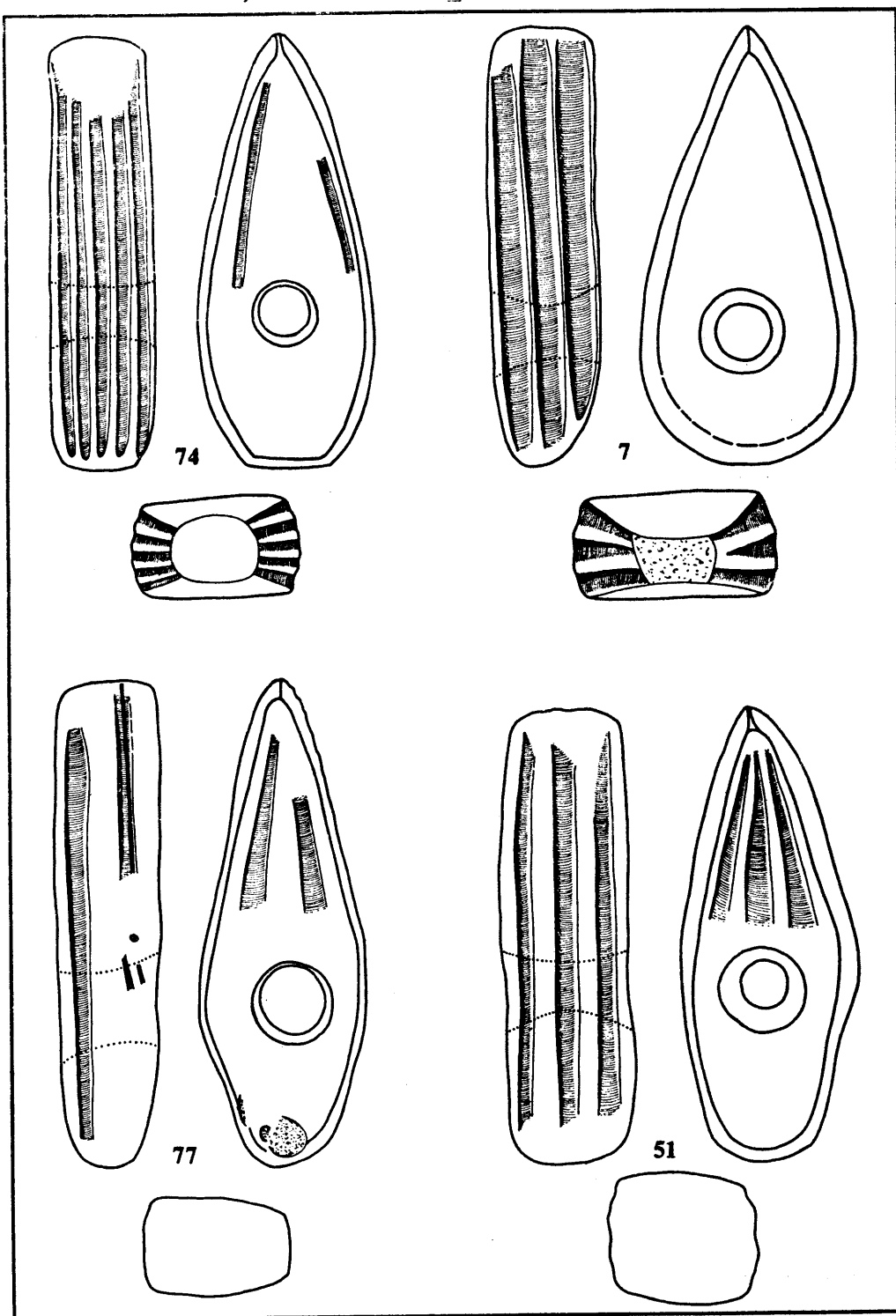
50 S. Piggott. *P.P.S.*, xxviii, 1962, 238.

51 Sir Lindsey Scott. *P.P.S.* xvii, 1951, map p. 70.

C. F. C. Hawkes, 1951. Map p. 174, in "Aspects of Archaeology in Britain and Beyond."

52 J. Pringle, 1948. "The South of Scotland, Geological Memoir," 86.

53 J. M. Coles. *op. cit.*, 66.

Fig. 6. Fluted axe-hammers. Scale ($\times 4$).

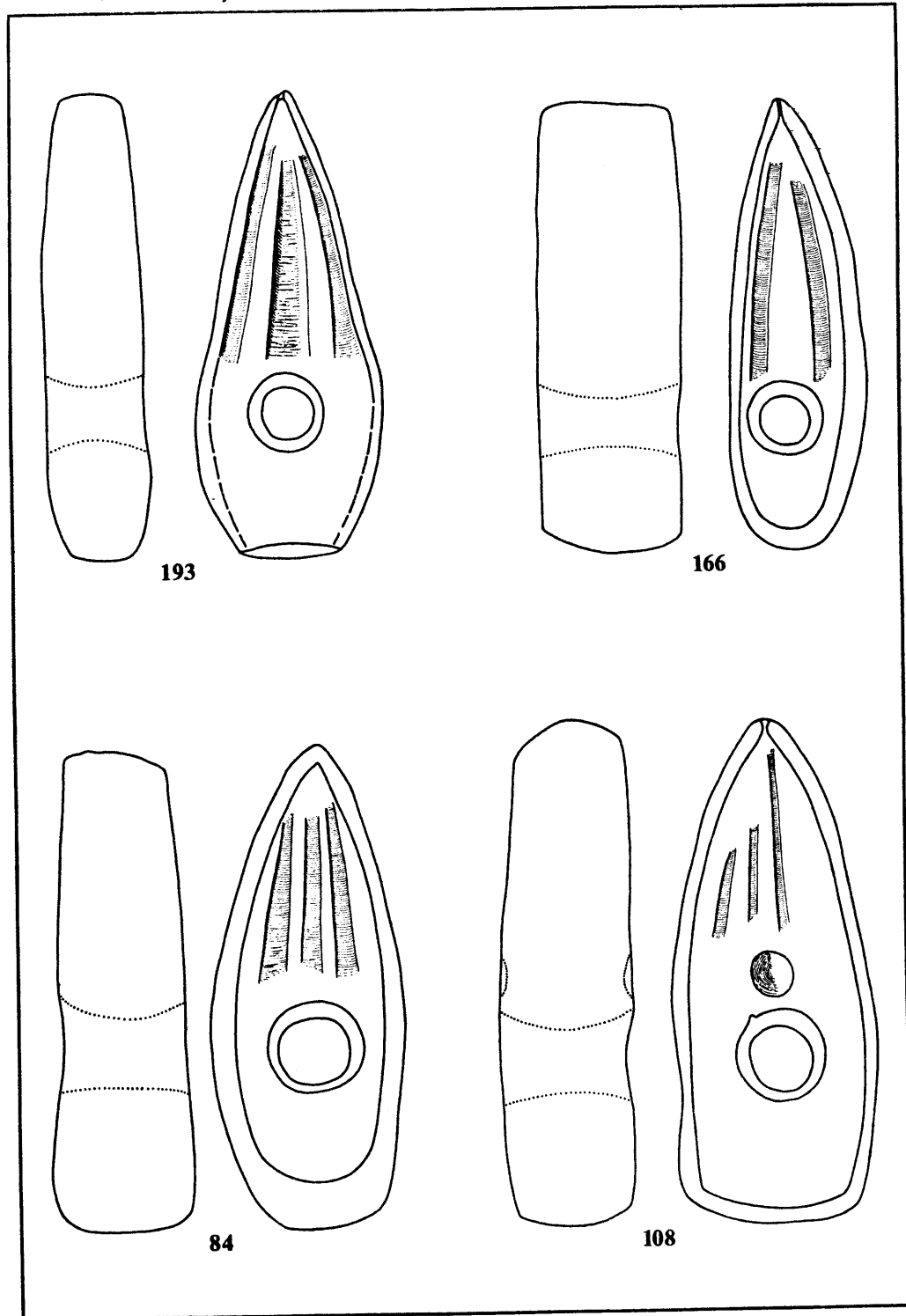


Fig. 7 Grooved axe-hammers. Scale (x1).

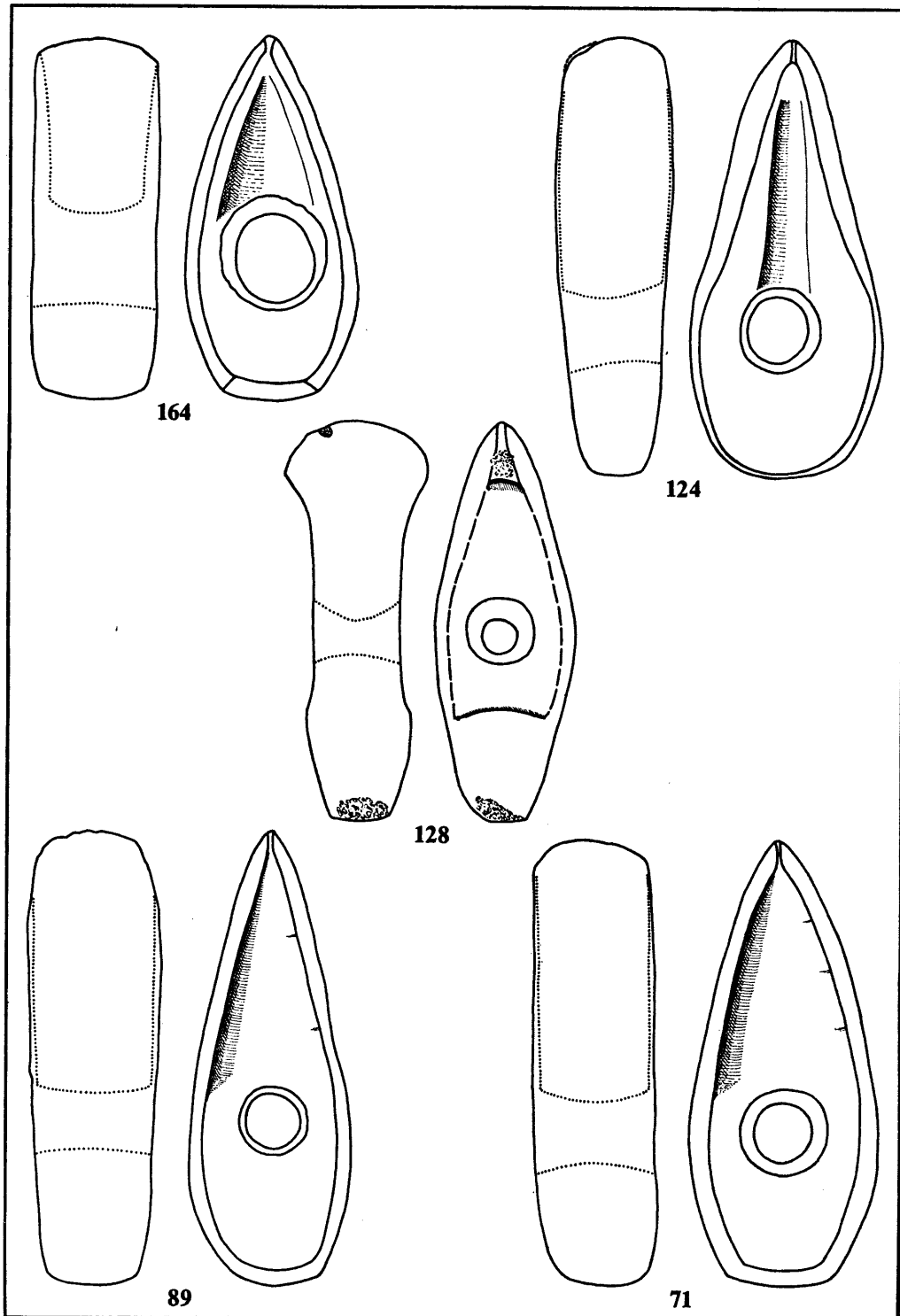


Fig. 8 Dished axe-hammers (except 128). Scale (x4).

ACKNOWLEDGMENTS

Of all those who have helped in the work for this paper, special mention must be made of Mr A. E. Truckell, for the valuable part he has played in making material available to me. I am also grateful to Miss A. S. Henshall, Miss A. Robertson, Mr J. G. Scott, Mr R. B. K. Stevenson, and Mr A. Wilson for their help in recording implements; to my husband and Dr J. M. Coles for practical help, and to Major-General and Mrs J. Scott-Elliot for their unfailing kindness and hospitality. Mr P. Narracot, of the Pitt Rivers Museum, Oxford, kindly took the photographs which appear as Plates VII and VIII.

APPENDIX

LIST OF IMPLEMENTS

Abbreviations

Anderson: Joseph Anderson, 1886. Scotland in Pagan Times.
 Arch: Archæologia.
 Cata NMAS: Catalogue of the National Museum of Antiquities of Scotland, 1892.
 Discov & Excav: Discovery and Excavation (Scotland).
 Evans: Sir John Evans, 1897. Ancient Stone Implements, second edition.
 J. Smith: John Smith, 1895. Prehistoric Man in Ayrshire.
 Munro: Robert Munro, 2882. Ancient Scottish Lake Dwellings.
 NMAS: National Museum of Antiquities of Scotland, Edinburgh.
 PSAS: Proceedings of the Society of Antiquaries of Scotland.
 TDGAS: Transactions of the Dumfriesshire and Galloway Natural History and Antiquarian Society.

* Indicates that the implement is illustrated in this paper.

AYRSHIRE

- | | | |
|---|--|--|
| 1. ARDROSSAN,
Chapelton Farm. | *Battle-axe,
Scotsburn Group. | NMAS EQ 65.
PSAS, ix, 1871-2, 383 & Pl. XXII,
Fig 1. |
| 2. ARDROSSAN,
Montfode Braes. | *Battle-axe,
Codford St Peter
Group. | Kelvingrove.
PSAS, ix, 1871-2, 383 & Pl. XXII,
Fig. 2. |
| 3. AUCHANS CASTLE,
near Troon. | Axe-hammer. | Kilmarnock AC 311. |
| 4. BEITH. | Axe-hammer. | NMAS AH 12.
Cata NMAS, 38. |
| 5. COLMONELL,
Fardenreoch. | *Battle-axe,
Calais Wold Group. | Whereabouts unknown.
Anderson, 314 & Fig 292. |
| 6. COLMONELL,
Farm of Laggansarroch. | Axe-hammer. | NMAS AH 147.
PSAS, liii, 1918-9, 11. |
| 7. COLMONELL,
Preston or Prieston. | *Axe-hammer,
fluted. | NMAS AH 14.
Anderson, 316, Fig 296. |
| 8. CRAIGIE. | Axe-hammer. | NMAS AH 176.
PSAS, lxiii, 1928-9, 17. |
| 9. DALGAIN,
Blindburn. | Axe-hammer,
unfinished hole. | NMAS AH 63.
PSAS, xx, 1885-6, 146. |
| 10. DUNDONALD district,
Drybrig. | Axe-hammer? | Kilmarnock.
J. Smith, 109. |
| 11. EGLINTON,
Eglinton Castle. | Axe-hammer. | Whereabouts unknown.
J. Smith, 60 & Fig 138. |
| 12. KILKERRAN. | Axe-hammer. | Kelvingrove. |
| 13. KILMARNOCK,
Templeton Farm. | Axe-hammer. | Kilmarnock TF 312.
J. Smith, 106. |
| 14. KILWINNING district,
Redwells. | Axe-hammer? | Whereabouts unknown.
J. Smith, 60. |
| 15. KIRKMICHAEL
district,
from a cairn. | Axe-hammer? | Whereabouts unknown.
J. Smith, 183. |

- | | | |
|---|--|--|
| 16. KIRKOSWALD,
Hallowsheen Farm. | *Battle-axe,
Crichie Group. | Kelvingrove.
PPS, xxxii, 1966, 241 & Fig 7b,
No 369. |
| 17. LARGS,
Nelson Street. | *Mace-head,
with flattened ends. | Kelvingrove 4. 09.
Arch, lxii, Pt I, 1910, 245 & Fig 4. |
| 18. LUGAR,
Lugar Water. | *Battle-axe,
Wilsford Group. | NMAS AH 238.
PPS, xxxii, 1966, 241. |
| 19. MAYBOLE,
Lochlands. | Axe-hammer? | Whereabouts unknown,
J. Smith, 180. |
| 20. NITH LODGE. | *Battle-axe,
Scotsburn Group. | NMAS EP 57.
PSAS, lxxii, 1937-8, 244 & Fig 8. |
| 21. OCHILTREE MOAT. | Axe-hammer. | Whereabouts unknown.
J. Smith, 142 & Fig 235. |
| 22. STEVENSTON,
Middleton. | Battle-axe?
Unfinished. | Whereabouts unknown.
PSAS, xxi, 1886-7, 264. |
| 23. WEST KILBRIDE
district. | Axe-hammer? | Whereabouts unknown.
J. Smith, 22. |
| DUMFRIESSHIRE | | |
| 24. AMISFIELD. | *Battle-axe,
Codford St Peter
Group. | Dumfries (ex Thornhill 17).
TDGAS, ix, 1894, 109. |
| 25. ANNAN,
Stapleton Road. | Axe-hammer? | Annan.
Discov & Excav, 1956, 13. |
| 26. ANNANDALE. | Battle-axe? | Whereabouts unknown.
Evans, 195. |
| 27. APPELGARTH,
Perch-hall. | *Axe-hammer,
dished. | Mr G. Wright, Kirkmichael.
— — — |
| 28. CASTLEDYKES,
Dumfries. | *Battle-axe,
Woodhenge Group,
dished. | Dumfries 33/PSA/468A.
PPS, xxxii, 1966, 242. |
| 29. CLOSEBURN,
Greenhead. | Axe-hammer,
dished, unfinished
hole. | Dumfries (ex Thornhill 25)
TDGAS, ix, 1894, 110. |
| 30. CLOSEBURN,
Park of Closeburn. | Axe-hammer,
broken half. | Dumfries (ex Thornhill 37)
PSAS, xxii, 1887-8, 374. |
| 31. CRINDAU,
Bank of River Nith. | *Battle-axe,
Codford St Peter
Group. | Dumfries 7/PSA/392.
PPS, xxxii, 1966, 242. |
| 32. DUMFRIES. | Axe-hammer. | Dumfries (No reg. No.).
— — — |
| 33. DUMFRIES. | Axe-hammer. | Carlisle AII 203 (R4).
— — — |
| 34. DUMFRIES. | *?Early form of
cushion mace-head.
Unfinished hole.
Axe-hammer. | Royal Scottish Museum, Edinburgh
1890. 546.
TDGAS, vi, 1890, 208.
Dumfries 3/PSA/30.
— — — |
| 35. DUMFRIES,
Crichton Royal Hospital. | Axe-hammer. | Dumfries 16/PSA/672.
— — — |
| 36. " " " " " " | Axe-hammer. | Dumfries 24/PSA/33.
— — — |
| 37. " " " " " " | Axe-hammer. | Dumfries (No. reg. No.).
— — — |
| 38. " " " " " " | Axe-hammer. | Dumfries 12/PSA/34.
PSAS, xxii, 1887-8, 412.
Dumfries 23/PSA/33.
— — — |
| 39. DUMFRIES district. | Axe-hammer,
unfinished hole. | Dumfries 32/PSA/13.
— — — |
| 40. " " " " " " | Axe-hammer. | Dumfries 11/PSA/9.
— — — |
| 41. " " " " " " | Axe-hammer (part),
grooved. | Dumfries 13/PSA/580.
— — — |
| 42. DUMFRIES,
Marchmount. | Axe-hammer. | Dumfries (ex Thornhill 23).
PSAS, xxii, 1887-8, 375. |
| 43. DUNSCORE. | Axe-hammer,
damaged. | |
| 44. DUNSCORE,
High Kilroy. | Axe-hammer. | |

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| 45. DUNSCORE,
Kirk of Dunscore. | Axe-hammer. | NMAS AH 13.
TDGAS, vi, 1890, 208. |
| 46. DUNSCORE,
Morrinton Quarry. | *Mace-head,
Ovoid. | Dumfries 1/PSA/38.
TDGAS, xiv, 3 ser, 1930, 54 &
Fig. 2. |
| 47. DURISDEER,
Old Gaitslack. | Axe-hammer. | Dumfries (ex Thornhill 30).
PSAS, xxii, 1887-8, 375. |
| 48. FRIARSCARSE,
Loch of Friarscarse. | Axe-hammer,
grooved. | NMAS AH 199.
Munro, 157 & Fig. 159. |
| 49. GLENCAIRN. | Axe-hammer,
broken half. | Dumfries 15/PSA/578A. |
| 50. " " " | Axe-hammer,
damaged. | Dumfries 27/PSA/577A. |
| 51. GRETNA,
Douglas Farm. | *Axe-hammer,
fluted and grooved. | NMAS AH 140. |
| 52. GRETNA,
Westhills Farm. | Axe-hammer. | NMAS AH 1
PSAS, xiii, 1878-9, 335. |
| 53. HOLYWOOD. | Axe-hammer. | Dumfries (ex Thornhill 32).
PSAS, xxii, 1887-8, 375. |
| 54. HOLYWOOD,
Balterson Farm. | Axe-hammer. | Dumfries (ex Thornhill 36).
PSAS, xxii, 1887-8, 375. |
| 55. HOLYWOOD,
Charlesfield,
Cormaddie Farm. | Axe-hammer. | Dumfries 36/PSA/9968.
Discov & Excav 1964, 27. |
| 56. HOLYWOOD,
Neilson's Park,
Blackpark. | Axe-hammer. | Dumfries (ex Thornhill 28).
PSAS, xxii, 1887-8, 375. |
| 57. HOLYWOOD,
Portrack. | Axe-hammer. | Dumfries 4/PSA/426. |
| 58. KEIR,
Auchenage. | Axe-hammer. | Dumfries (ex Thornhill 29).
PSAS, xxii, 1887-8, 375. |
| 59. KEIR,
Keir Mill. | Axe-hammer,
damaged. | Dumfries (ex Thornhill 34).
PSAS, xxii, 1887-8, 375. |
| 60. KIRKMAHOE,
Cairn, near Auldgirth
Station. | Axe-hammer. | Dumfries (ex Thornhill 33).
TDGAS, i, 1864, 48; ix, 1894, 110. |
| 61. KIRKMAHOE,
Whitehall Farm. | Axe-hammer,
unfinished hole. | Dumfries (ex Thornhill 24).
TDGAS, i, 1864, 48; ix, 1894, 110. |
| 62. KIRKMICHAEL. | Axe-hammer. | Dumfries 9/PSA/19.
PSAS, xxii, 1887-8, 417. |
| 63. KIRKPATRICK
IRONGRAY,
Barncleugh. | Axe-hammer,
part. | Dumfries 25/PSA/20.
PSAS, xxii, 1887-8, 417. |
| 64. LOCHARBRIGGS. | Axe-hammer. | Dumfries 5/PSA/494.
TDGAS, xxv, 3 ser, 1948, 173 &
Fig. 1. |
| 65. LOCHMABEN. | Axe-hammer. | NMAS AH 11.
Cata NMAS, 38. |
| 66. " " " | Axe-hammer. | NMAS AH 168. |
| 67. LOCHMABEN district. | Axe-hammer. | NMAS AH 128. |
| 68. " " " " " " | Axe-hammer,
damaged. | Dumfries 31/PSA/661B. |
| 69. NITHSDALE,
Troloss Farm,
Upper Nithsdale. | Axe-hammer. | Dumfries 14/PSA/493. |
| 70. PENPONT, cairn,
Chanlockfoot. | Axe-hammer. | Dumfries (ex Thornhill 31).
TDGAS, i, 1864, 48. |
| 71. ROCKHALL,
near Dumfries. | *Axe-hammer,
dished. | Dumfries 20/PSA/31.
PSAS, xxii, 1887-8, 412. |
| 72. RUTHWELL,
Cleuchbrae. | Axe-hammer,
broken half. | Dumfries 17/PSA/15. |
| 73. " " " | Axe-hammer. | Dumfries 29/PSA/17. |
| 74. SANQUHAR,
Ulzieside. | *Axe-hammer,
fluted and grooved. | Mr Wilson, Thornhill.
TDGAS, vi, 1890, 130. |

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| 75. TINWALD,
Cobshaw Farm. | Axe-hammer,
damaged. | Dumfries (ex Thornhill 35).
PSAS, xxii, 1887-8, 375. |
| 76. TINWALD,
Farm of Slacks. | *Mace-head,
Ovoid. | Dumfries (ex Thornhill 18).
TDGAS, ix, 1894, 110. |
| 77. TORTHORWALD,
Drummuir Farm. | *Axe-hammer,
fluted and grooved. | Dumfries 22/PSA/10.
— — — |
| 78. TYNRON, cairn,
Farm of Lands. | *Battle-axe,
Wilsford Group,
dished. | Dumfries (ex Thornhill 16).
TDGAS, i, 1864, 48; ix, 1894, 109. |
| 79. TYNRON,
from a cairn. | "Stone hammer." | Whereabouts unknown.
TDGAS, ix, 1894, 109. |
| 80. UNLOCATED,
'Found in an attic in
Dumfries.' | Axe-hammer. | Kirkcudbright 1374.
— — — |
| GALLOWAY | | |
| 81. GALLOWAY. | Axe-hammer. | NMAS AH 6.
Cata NMAS, 38. |
| 82. GALLOWAY. | *Battle-axe,
broken half,
probably Scotsburn
Group. | NMAS AH 115.
PPS, xxxii, 1966, 243. |
| 83. GALLOWAY. | Axe-hammer,
damaged. | Dumfries (No reg. No.).
— — — |
| KIRKCUDBRIGHTSHIRE | | |
| 84. AUCHENCAIRN,
Auchencairn Moss. | *Axe-hammer,
grooved. | NMAS AH 110.
PSAS, xxix, 1894-5, 275.
TDGAS, xiv, 3 ser, 1930, 288,
Pl. VIII. |
| 85. BALMACLELLAN,
New Galloway. | Axe-hammer,
part. | NMAS AH 10.
TDGAS, xv, 1900, 33. |
| 86. BORGUE,
Culraven Farm. | Axe-hammer. | Kirkcudbright, 2946.
— — — |
| 87. CARLINGWARK,
Carlingwark Loch. | Axe-hammer. | NMAS AH 10.
TDGAS, xv, 1900, 33; xiv, 3 ser,
1930, 288 Pl. VIII. |
| 88. CARRUCHAN,
near Dumfries. | Axe-hammer,
raised rib along top
and bottom blade
end. | Dumfries 10/PSA/36.
— — — |
| 89. CASTLE DOUGLAS. | *Axe-hammer,
dished. | Kelvingrove. 1. '43 (17).
— — — |
| 90. " " " " | Axe-hammer. | Originally in Greenwell Coll. B.M.
(LOST?).
Evans, 202. |
| 91. " " " " ,
near. | Axe-hammer. | Kirkcudbright 5060.
— — — |
| 92. DALRY. | Axe-hammer. | Private Hands?
TDGAS, xvii, 3 ser, 1930-1 (1932),
99 & Fig. 1, No. 1. |
| 93. DALRY, near White
Cairn, Corriedoo. | Axe-hammer,
grooved. | Private Hands?
TDGAS, xvii, 3 ser, 1930-1 (1932),
99 & Fig. 1, No. 2. |
| 94. GLENHOUL,
Glenhoull Farm. | Axe-hammer,
damaged. | Dumfries.
Discov & Excav, 1966, 33. |
| 95. KELTON. | Axe-hammer. | NMAS AH 27.
PSAS, vii, 1867-8, 478. |
| 96. KELTON,
Meikle Lochdougan
Farm. | Axe-hammer. | Kirkcudbright 1608.
— — — |
| 97. KIRKCUDBRIGHT,
near, bank of R. Dee | Axe-hammer. | NMAS AH 9.
TDGAS, xv, 1900, 33. |
| 98. KIRKCUDBRIGHT,
Galtway Hill. | Mace-head,
Ovoid. | Kirkcudbright 1776.
— — — |
| 99. KIRKCUDBRIGHT,
North Milton Farm. | Axe-hammer. | Kirkcudbright 2683.
— — — |

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| 100. KIRKCUDBRIGHT,
The Stall. | Axe-hammer. | Kirkcudbright 4089. |
| 101. KIRKPATRICK
DURHAM,
Lochpatrick Mill. | Axe-hammer,
grooved. | Dumfries (ex Thornhill 27).
PSAS, xxii, 1887-8, 374. |
| 102. KIRKPATRICK
DURHAM,
Garmartin. | Axe-hammer. | Kirkcudbright 3899. |
| 103. LOCHRUTTON. | Axe-hammer,
broken half. | Kirkcudbright. |
| 104. MAXWELLTOWN,
Howgate Street. | Axe-hammer. | Dumfries 1/PSA/32.
PSAS, xxii, 1887-8, 413. |
| 105. MINNIGAFF. | Axe-hammer. | NMAS AH 171.
PSAS, lxi, 1926-7, 15. |
| 106. " " " | Axe-hammer. | NMAS AH 172.
PSAS, lxi, 1926-7, 15. |
| 107. MONYBUIE,
Balmacellan. | Axe-hammer. | NMAS AH 64.
TDGAS, xv, 1900, 33; xiv, 3 ser,
1926-8 (1930), 288, Pl. VIII. |
| 108. NEW ABBEY. | *Axe-hammer,
grooved, and with
secondary cup
marks. | Hunterian B 1914 253. |
| 109. NEW ABBEY,
Barbeth. | *Mace-head,
Ovoid. | Dumfries 1/SMH/492. |
| 110. NEW ABBEY,
Grierson. | Axe-hammer. | Hunterian B 1951. 2120.
TDGAS, xxx, 3 ser, 1951-2 (1953),
174-5. |
| 111. NEW ABBEY,
Kirkconnel Estate. | *Mace-head,
Pestle. | Mrs J. McGinley, New Abbey. |
| 112. NEW GALLOWAY. | Battle-axe,
broken half,
Woodhenge Group. | Kirkcudbright 4050. |
| 113. RINGFORD,
Culquha Farm. | Axe-hammer. | Kirkcudbright.
Discov & Excav, 1966, 33. |
| 114. SHAMBELLIE,
near Dumfries. | Axe-hammer. | B.M. |
| 115. TERREGLES,
Starrieheugh Farm. | *Mace-head,
Ovoid. | Dumfries 3/SMH/7343.
Discov & Excav, 1962, 27. |
| 116. TONGLAND,
Langbarns Farm. | Axe-hammer,
broken half. | Kirkcudbright 144. |
| 117. TROQUEER. | Axe-hammer,
damaged. | Dumfries 30/PSA/126. |
| 118. TROQUEER,
Janefield Park. | *Battle-axe,
Codford St Peter
Group. | Dumfries 2/PSA/25.
PPS, xxxii, 1966, 242. |
| 119. TROQUEER,
Moat of Troqueer. | Axe-hammer. | Dumfries 28/PSA/35.
PSAS, xxii, 1887-8, 412. |
| 120. TWYNHOLM,
from a tumulus. | ?Battle-axe or
mace-head. | Whereabouts unknown.
TDGAS, xiv, 3 ser, 1926-8 (1930),
286. |
| 121. TWYNHOLM,
Irelandton Farm. | Axe-hammer. | Kirkcudbright 3283. |
| 122. URR. | Axe-hammer. | Huddersfield 54.1.61. |
| 123. URR,
Grange Farm. | Axe-hammer. | NMAS AH 224.
PSAS, lxxxvii, 1952-3, 201. |
| 124. UNLOCATED,
probably River Cree. | *Axe-hammer,
dished. | Kirkcudbright.
Discov & Excav, 1966, 33. |
| LANARKSHIRE | | |
| 125. CADDIE,
Hilton Farm. | Axe-hammer. | Hunterian A 123.
PSAS, xxii, 1887-8, 350. |
| 126. CULTER,
Aikbrae. | Axe-hammer. | Whereabouts unknown.
J. Brit. Arch. Assoc. xvii, 1861, 20
& Pl. 5, No. 2. |
| 127. DOUGLAS SUPPORT,
near Coatbridge. | *Battle-axe,
Woodhenge Group,
fluted. | Hunterian A 1917.1.
PPS, xxxii, 1966, 242. |

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| 128. FORTH. | *Axe-hammer. | NMAS AH 240. |
| 129. GLASGOW, Fossil
Grove in Victoria Park,
Whiteinch. | *Battle-axe,
Crichton Group. | Kelvingrove.
PSAS, lvii, 1922-3, 105 & Fig. 5. |
| 130. GLASGOW,
Princes Dock, Govan. | *Battle-axe,
Wilsford Group. | Kelvingrove.
PPS, xxxii, 1966, 242. |
| 131. GLASGOW,
Stobcross Docks. | Axe-hammer? | Kelvingrove (LOST?).
PSAS, xxii, 1887-8, 351. |
| 132. WEST SIDEWOOD,
near Carnwath. | *Battle-axe,
Calais Wold Group. | NMAS AH 136.
PSAS, xiv, 1910-1, 12 & Fig. 2. |
| RENFREWSHIRE | | |
| 133. BAROCHAN,
North Brae. | *Battle-axe,
Woodhenge Group. | NMAS AH 158.
PPS, xxxii, 1966, 243. |
| 134. INVERKIP. | Axe-hammer. | Greenock. |
| 135. JOHNSTONE,
Bridge of Johnstone. | Axe-hammer. | Kelvingrove '02.11498 (15). |
| 136. KILMACOLM,
Farm of Lawfield. | *Battle-axe,
Wilsford Group,
with rib along each
side. | Kelvingrove.
PSAS, lvii, 1922-3, 104 & Fig. 3. |
| 137. MEARNS. | Axe-hammer,
unfinished hole. | NMAS AH 73.
PSAS, xxii, 1887-8, 274. |
| WIGTOWNSHIRE | | |
| 138. AIRIEHASSAN. | Axe-hammer,
damaged. | NMAS AH 82.
PSAS, xxiii, 1888-9, 145. |
| 139. BALGOWN,
Duplin. | Axe-hammer,
damaged. | NMAS AH 54.
Cata NMAS, 41. |
| 140. CULHORN MAINS,
Barrack Hill Field. | *Battle-axe,
Herd Howe Group. | Stranraer 1964/4 (Stair Coll).
PPS, xxxii, 1966, 243. |
| 141. DUNRAGIT,
The Creamery. | Axe-hammer. | Kelvingrove (18). |
| 142. GARLIESTON,
near. | Axe-hammer? | Mrs Vance, Garlieston. |
| 143. GLASSERTON. | Axe-hammer. | Dumfries (ex Thornhill 26).
PSAS, xxii, 1887-8, 375. |
| 144. " " " | Axe-hammer. | NMAS AH 143.
PSAS, xlviii, 1913-4, 16. |
| 145. " " " | Axe-hammer?
(fragment). | NMAS.
PSAS, xxiii, 1888-9, 204. |
| 146. GLASSERTON,
BalCraig. | *Mace-head,
broken half, Ovoid. | Kelvingrove. |
| 147. " " " | Axe-hammer. | NMAS AH 80.
PSAS, xxiii, 1888-9, 210. |
| 148. GLASSERTON,
Carleton. | Axe-hammer,
part. | NMAS AH 84.
PSAS, xxiii, 1888-9, 145. |
| 149. GLASSERTON,
Drumfad. | Axe-hammer,
dished. | NMAS AH 117.
PSAS, xxxiv, 1889-90, 18. |
| 150. " " " | Axe-hammer. | NMAS AH 145.
PSAS, xlix, 1914-5, 10. |
| 151. GLASSERTON,
Kiddale. | Axe-hammer. | Whithorn. |
| 152. " " " | Battle-axe,
probably Wood-
henge Group. | Whithorn.
PPS, xxxii, 1966, 243. |
| 153. GLENLUCE. | Axe-hammer. | NMAS AH 97.
Cata NMAS, 46. |
| 154. GLENLUCE,
Mull of Sinniness. | Hammer-head,
unfinished hole. | Stranraer 1964/73 (Stair Coll). |
| 155. GLENLUCE,
North Milton. | Axe-hammer,
grooved. | NMAS AH 15.
Cata NMAS, 39. |
| 156. INCH, | *Battle-axe, Wood-
henge Group,
very weathered. | NMAS AH 113.
PSAS, xxx, 1895-6, 5. |

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| 157. KIRKCOLM,
Balgour. | Hammer-head,
unfinished hole. | NMAS AH 72.
PSAS, xxiii, 1888-9, 96. |
| 158. KIRKCOLM,
Balgowan. | Axe-hammer. | Stranraer 1951/5. |
| 159. KIRKCOLM,
Balgracie Farm. | Axe-hammer,
damaged. | Kelvingrove (16). |
| 160. KIRKCOLM,
Barnhills. | Axe-hammer,
fragment. | Hunterian B 1914.257. |
| 161. KIRKCOLM,
Low Glengyre Farm. | *Battle-axe,
Calais Wold Group. | Kelvingrove.
PSAS, lvii, 1922-3, 98-102 & Fig. 3. |
| 162. KIRKINNER,
Claycross. | Battle-axe,
Scotsburn Group. | NMAS AH 28.
Anderson, 311 & Fig. 290. |
| 163. LOCHNAW,
Lochnaw Estate. | Axe-hammer. | NMAS AH 166. |
| 164. MARYPORT,
near. | *Axe-hammer,
dished. | Hunterian B 1951.3239. |
| 165. MOCHRUM. | Axe-hammer. | NMAS AH 118.
PSAS, xxxiv, 1899-1900, 18. |
| 166. MOCHRUM,
Felyennan. | *Axe-hammer,
grooved. | Kelvingrove. |
| 167. MOCHRUM,
High Clone. | Axe-hammer,
damaged. | NMAS AH 22.
PSAS, xiv, 1879-80, 126. |
| 168. NEW LUCE,
Barluce. | Axe-hammer. | Whithorn. |
| 169. OLD LUCE. | Axe-hammer. | NMAS AH 99.
Cata NMAS, 46. |
| 170. OLD LUCE,
Barnsallie. | Axe-hammer. | Kelvingrove.
PSAS, xxiii, 1888-9, 204. |
| 171. OLD LUCE,
Drumwhill Hill. | Axe-hammer,
worn blade. | NMAS AH 21.
PSAS, xiv, 1879-80, 126 & Fig. 1. |
| 172. PENNINGHAME,
Barnkirk Farm. | Axe-hammer,
dished. | NMAS AH 76.
PSAS, xxiii, 1888-9, 205-6 & Fig. 6. |
| 173. PENNINGHAME,
Barr. | Axe-hammer. | NMAS AH 77.
PSAS, xxiii, 1888-9, 205 & Fig. 5. |
| 174. PENNINGHAME,
Bishop's Burn. | Axe-hammer. | NMAS AH 79.
PSAS, xxiii, 1888-9, 145. |
| 175. PENNINGHAME,
Bishop's Burn. | Axe-hammer. | Kelvingrove. |
| 176. PHYSIGIL,
Glasserton. | Axe-hammer?
Unfinished hole,
and very weathered. | NMAS AH 86.
PSAS, xxiii, 1888-9, 209 & Fig. 9. |
| 177. PORTPATRICK. | *Battle-axe,
Woodhenge Group,
dished. | NMAS AH 45.
Anderson, 309 & Fig. 287. |
| 178. PORTPATRICK,
near. | Axe-hammer. | NMAS AH 20.
Anderson, 319 & Fig. 299. |
| 179. SORBIE,
Cruggleton. | Axe-hammer. | Whereabouts unknown.
PSAS, xxiii, 1888-9, 204. |
| 180. SORBIE,
Dowalton. | Axe-hammer. | Dumfries 35/PSA.
TDGAS, xvii, 3 ser, 1932, 99 &
Fig. 1, No. 3. |
| 181. " " " | *Battle-axe,
Woodhenge Group. | Whereabouts unknown.
PSAS, xxiii, 1888-9, 208 & Fig. 8. |
| 182. SORBIE,
Orchardton. | Axe-hammer,
broken half. | NMAS AH 85. |
| 183. SORBIE,
Stewarton. | Axe-hammer,
broken half. | PSAS, xxiii, 1888-9, 204.
NMAS AH 18. |
| 184. STONEYKIRK,
Clayshant. | Axe-hammer. | Cata NMAS, 39.
Whithorn. |
| 185. STONEYKIRK,
Culmore. | Axe-hammer. | NMAS AH 17.
PSAS, xv, 1880-1, 266. |
| 186. STONEYKIRK,
Mye Loch. | Axe-hammer,
damaged. | NMAS AH 2.
PSAS, xiv, 1879-80, 126. |
| 187. STRANRAER,
Sandmill Farm. | *Battle-axe,
Loose Howe Group. | NMAS EQ 486.
PSAS, lxxvi, 1941-2, 79 & Pl. XXI. |
| 188. TORHOUSKIE. | Axe-hammer,
worn blade. | NMAS AH 125.
PSAS, xxvii, 1892-3, 57. |

189. TORHOUSKIE, Cunningham Farm.	Axe-hammer.	NMAS AH 26. Anderson, 318 & Fig. 297.
190. WHITHORN.	*Mace-head, assymetrical, with flattened ends.	Kelvingrove. L. Mann Coll. — — —
191. WHITHORN.	*Battle-axe, broken half, probably Loose Howe Group.	Kelvingrove. PPS, xxxii, 1966, 243.
192. WHITHORN.	*Mace-head, broken half, Ovoid.	Kelvingrove. — — —
193. WHITHORN.	*Axe-hammer, grooved and dished.	NMAS AH 226. — — —
194. WIGTOWN.	Axe-hammer.	NMAS AH 83. PSAS, xxiii, 1888-9, 145.
195. " " "	Axe-hammer, damaged.	NMAS AH 81. PSAS, xxiii, 1888-9, 145.
196. WIGTOWN, Barness.	Axe-hammer.	NMAS AH 78. PSAS, xxiii, 1888-9, 145.
197. WIGTOWN, Farm of West Mains of Baldoon.	Axe-hammer.	Whereabouts unknown. PSAS, xxiii, 1888-9, 208 & Fig. 7.
198. WIGTOWNSHIRE.	*Mace-head, Ovoid.	NMAS AH 87. Cata NMAS, 45.
199. " " "	Axe-hammer.	Whereabouts unknown. PSAS, iv, 1860-1, 55.
200. " " "	Axe-hammer.	Whereabouts unknown. PSAS, xxiii, 1888-9, 204.
201. UNLOCATED, but probably Wigtownshire.	Axe-hammer.	Stranraer 1945 I.A. — — —
202. " " " " " "	Axe-hammer.	Stranraer 1953/23. — — —
203. " " " " " "	Axe-hammer.	Stranraer 1964/2 (Stair Coll). — — —
204. " " " " " "	Axe-hammer.	Stranraer 1964/3 (Stair Coll). — — —
205. " " " " " "	Axe-hammer.	Stranraer 1964/5 (Stair Coll). — — —
206. " " " " " "	Axe-hammer.	Stranraer 1964/6 (Stair Coll) — — —

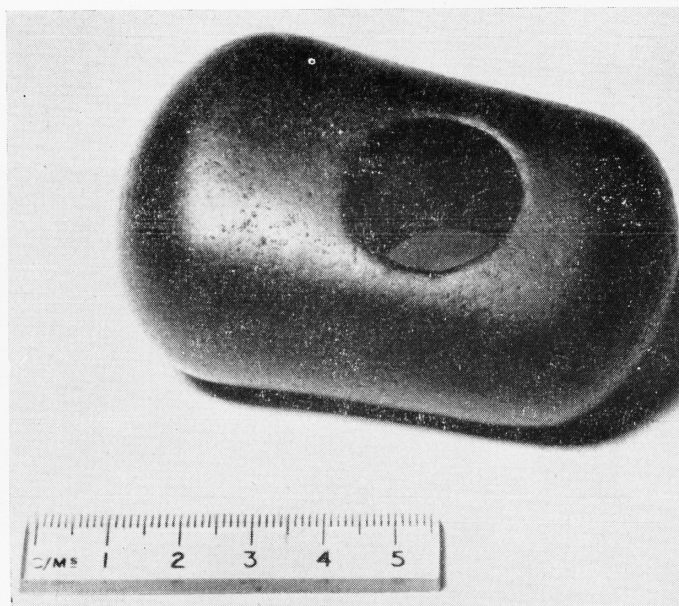


Plate VII. Pestle mace-head from New Abbey (No. 111). Length 3.25 ins.

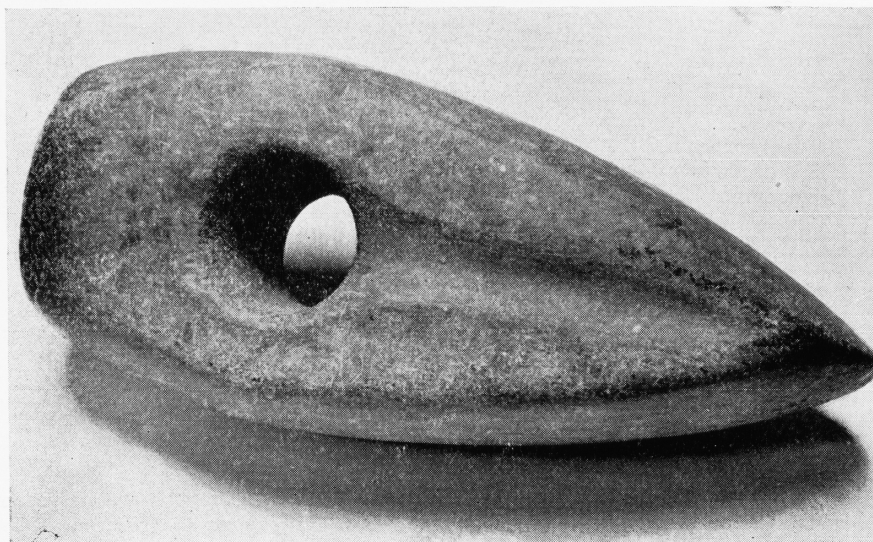


Plate VIII. Dished axe-hammer from Applegarth (No. 27). Length 9 ins.

BALNABRAID CAIRN, KINTYRE, ARGYLL

By J. N. GRAHAM RITCHIE

Royal Commission on the Ancient and Historical Monuments of Scotland

In the work preparatory to the Commission's forthcoming *Inventory of Kintyre* it became apparent that earlier accounts of this cairn had been in some respects unsatisfactory. In view of doubts which must remain in the interpretation of the earlier excavation reports, however, the present article can only be a personal assessment of the site and its finds. An up-to-date illustration and description of the small finds may be of wider interest.

Balnabraid Cairn¹ is situated on the left bank of the Balnabraid Water about 100 yds. from the shore of the Firth of Clyde and some 5 miles SE. of Campbeltown. The steep bank of a raised beach platform, some 25 to 30 ft. above sea level, on which the cairn stands, has been cut away by the stream, and the W. and SE. sides of the cairn have been destroyed. The discovery of a Cinerary Urn in the open section of the cairn material in 1910 led to the first notice of the monument. Small-scale excavations were carried out at that time,² and a complete examination of the site undertaken in 1913.³ The purpose of this note is to re-examine the status of the "supposed segmented passaged chamber" and to publish in detail the small finds from the cairn. Further excavations were carried out by the writer in April 1966 in an attempt to elucidate some of the features of the published plan.⁴

The trenches of the 1966 excavation have been plotted on to the published plan of 1913 (and the cist numbers of that plan retained), using Cist 12, and the rectangular hole from which Cist 9 had been removed as a base line (Fig. 2). The position of Cist 2 and the right-angled pit from which Cist 6 had been removed appear rather differently on the surveyed plan of 1966, and these are shown on the plan by the hachured rectangle (2a) and the corner of the pit marked 6a. Of the original features, only Cists 2 and 12, and a portion of the kerb remain intact. Cists 6 and 9 were represented merely by the holes in the gravel subsoil from which they had been removed. There was no trace of Cist 7, and the supposed segmented passaged chamber had been completely dismantled.

The cairn measures about 48 ft. by 25 ft., but the W. and SE. sides are now destroyed. From the surviving remains it can be assumed that the cairn was originally oval in shape, with its longer axis N. to S. The stone and boulders of the cairn material survived before excavation to a height of almost 10 ft. above the original surface. A kerb of upright slabs remains in position

¹ National Grid Reference NR 767154. It is also known as Corphin or Coraphin Cairn.

² PSAS, xlv (1910-11), 434 ff. The excavation was undertaken by Mr and Mrs T. Lindsay Galloway, D. McQueen and D. McKinlay.

³ Ibid., liv (1919-20), 172 ff. The 1913 excavation which lasted for two months, was conducted by L. McL. Mann, A. H. Bishop, A. Beckett and M. Buchanan, with local assistance.

⁴ The Commissioners are indebted to His Grace The Duke of Argyll for permission to carry out this work and to his Farm Manager in Kintyre, Mr Charles Melville, for assistance during it.

on the NW.; in 1966 a probable kerb-stone was recorded on the E. Further, it seems likely that the large block on the SE. and the two upright slabs to the S. of it form part of this line. Cist 9, it may be noted, is outside this kerb.

In the past the site has usually been referred to as a chambered cairn, the "supposed segmented passaged chamber" of the 1913 plan being regarded as the primary structure of the site. Childe⁵ considered Balnabraid to be a chambered long cairn with twelve secondary short cists, and he included it on

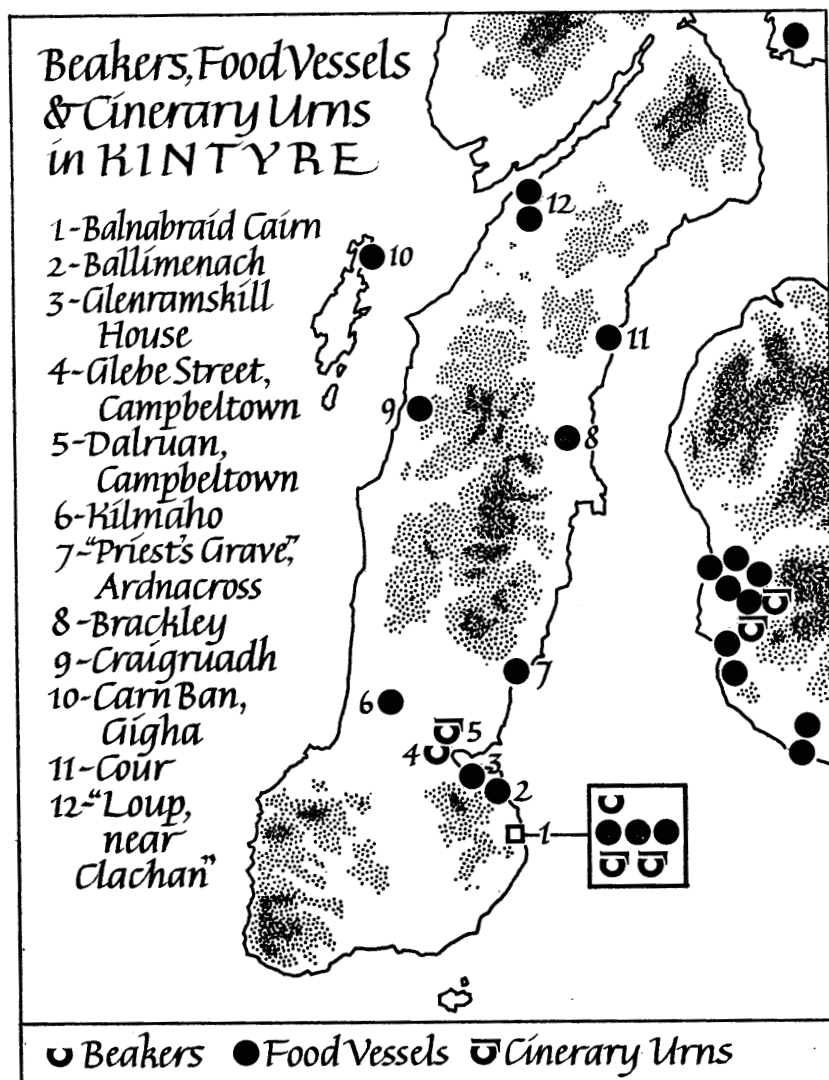


Fig. 1.

⁵ Childe, V. G., *The Prehistory of Scotland*, 1935, 31 and Map I.

his distribution map amongst the Clyde-Solway series. This attribution was accepted by subsequent writers,⁶ although Collins and Waterman⁷ tentatively considered the site as analogous to Millin Bay, Co. Down. They also thought it possible, however, that the Beaker and Food Vessel cists might be the primary features of the site. Scott⁸ suggested in 1959 that the plan was closer to a Passage Grave tradition than a Clyde-Carlingford one, and in 1966⁹ in his distribution map he postulated that it was a probable hybrid Passage Grave Clyde-Solway cairn. No trace could be found of the "passed chamber" in the re-examination of the site in 1966 and it is presumed that it was destroyed during the 1913 excavation. The published plan and report must remain our only source of information about it. The plan shows Cist 3 at one end of a narrow passage. Together their length was about 10 ft., and the passage, which was about 1 ft. wide, was constructed "mostly" of upright slabs rather less than 2 ft. high. To the E. of Cist 3 were two further upright slabs which were thought to be the ruins of a chamber. This latter seems most probably to have been a ruined cist: the passage seems too slight to be related to either Passage or Gallery Graves.¹⁰ The complete absence of characteristic Neolithic pottery, though not of course conclusive, may also be indicative of this. The cairn of Balnabraid is not alone, however, in possessing a stone setting that is not easily explicable. In the cairn at Drannadow, Minnigaff (Kirkcudbrightshire)¹¹ there is a straight double wall with, parallel to it, a row of upright boulders; between the boulders and the wall the spaces are filled with rubble. Double rows of stones continue, one 14 ft., the other 18 ft. in length, from each end of this feature and run parallel to the edge of the cairn. As the Minnigaff wall and the Balnabraid "passage" are straight and are not aligned to the cairn kerb, they are certainly different from the multiple kerb walls of e.g. Inverael¹² or Cairnpapple.¹³ But they may be linked in some way to the consolidation of the cairn material. It is not clear what the Balnabraid setting represents, but from the evidence available it is not necessary to infer a Passage or Gallery Grave phase in the cairn.

Twelve cists were discovered and emptied. Their size and the finds from them have been tabulated as follows, using the information of earlier reports and taking account of changes discussed later.

6 Davies, Margaret, *Antiq. Jour.* xxv (1945) 126, fig. 1, 135, fig. 6; *ibid.*, xxvi (1946), 45 fig. 3.

Scott, Sir L., PPS, xvii (1951), 67, 78.

Piggott, S., *Neolithic Cultures of the British Isles*, 1954, 153, fig. 23.

7 Collins, A. E. P., and Waterman, D. M., *Millin Bay*, 1955, 49 ff.

8 Scott, J. G., *PSAS*, lxxxix (1955-6), 52.

9 Scott, J. G., *South-West Scotland*, 1966, 19, fig. 7.

10 Size itself is not an absolute guide. The S. passage of the cairn by the Water of Deugh (Kirkcudbright), *PSAS*, lxiv (1929-30), 272 ff., seems on the plan to be only 1 ft. 6 in. in width.

11 *Ibid.*, lvii (1922-23), 65 ff.

12 *Ibid.*, xlviii (1913-4) 112 ff.

13 *Ibid.* lxxxii (1947-8), 115 f.

Cist	Internal length x breadth x height in inches	Rite	Pottery	Other finds
1	29 x 13½ x ?	Cremation		Quartz pebbles
2	34 x 20 x 30	Cremation		
3				
4	29 x 21 x 14	Cremation	Food Vessel	
5	See <i>infra</i> p. 92	Cremation	Cinerary Urn	Bone toggle, bronze fragments, flint flake
6	46 x 26 x 27	?Inhumation	Beaker	Two jet beads, flint flake
7	26 x ? x 10		See <i>infra</i> p. 91	
8	53 x 33 x 18			
9	34 x 20 x 22	{ above Inhumation below Cremation Cremation	Food Vessel	Two flint flakes
10	36 x 24 x 20			Flint flake
11	38 x 24 x 19		Cinerary Urn fragments "nearby"	Flint flake
12	18 x 10 x 16		Food Vessel	Red sandstone rubber

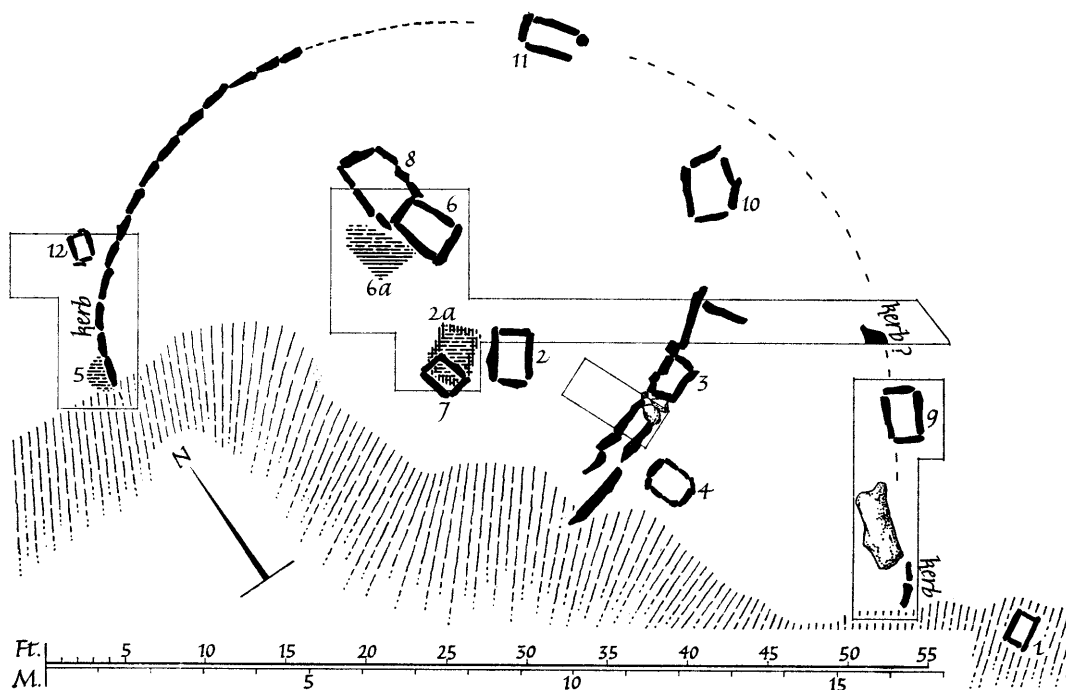


Fig. 2.—Balnabraid Cairn, Kintyre. Plan after PSAS, liv (1919-20), fig. 3, opp. p. 174, with 1966 excavation trenches added.

POTTERY AND OTHER SMALL FINDS¹⁴

POTTERY

Short-necked Beaker

Cist 6 (fig. 3, 1).

Diam. of rim: 4.6 in. Height: 5 in. Diam. of base: 2.8 in.

The beaker is of a fine compact red fabric with traces of a reddish slip on the outside. There is a slight inside ridge at the base of the neck: the rim is undecorated and bevels slightly inward. The four zones of ornament are evenly spaced—below the rim, at the base of the neck, at the widest part of the body and at the base. On the neck, zigzag and chevron bands have been impressed with a fine comb. A pair of fine cord impressions border the neck decoration. There are two bands on the lower part of the pot of fine comb criss-cross decoration. The bordering lines at the top and bottom of this zone also seem to be comb-impressed, but the central lines are less even.¹⁵

Hunterian Museum, Glasgow: Inv. No. A.129.

Food Vessels

Cist 4 (fig. 3, 2).

Diam. of rim: 6.9 in. Height: 7.2 in. Diam. of base: 3.5 in.

The pot is made of a buff-coloured clay of rather coarse fabric with medium grits. Between the rim and the upper rib the decoration consists of panels of zigzag impressions in a rocked technique. Between the ribs a plain central band is bordered on each side by a row of small curved impressions, to give a false-relief effect, and by two lines of discontinuous scores. Below the lower cordon this central feature is repeated, and below this there are further panels of rocked impressions. On the internal bevel of the rim, which is rather less than half an inch thick, a false-relief zigzag has been achieved by alternating triangular impressions.

Hunterian Museum, Glasgow: Inv. No. A.130.¹⁶

Cist 9 (fig. 3, 3).

Diam. of rim: 6.2 in. Height: 5.5 in. Diam. of base: 3.6 in.

This thick coarsely made pot is of a light buff clay with a rough texture. Two cordons at its greatest width are decorated with slanting impressions of whipped cord. Above and below this central feature are close horizontal lines achieved perhaps with a toothed comb. The outer side of the rim and its internal bevel, which is half an inch thick, are both decorated with slanting impressions of whipped cord.

Hunterian Museum, Glasgow: Inv. No. A.136.

¹⁴ References to the original reports are not included.

¹⁵ PSAS, lxxviii (1933-4), 146 f., 178.

¹⁶ *Ibid.*, lxxxv (1950-1), 49 ff.

BALNABRAID CAIRN, KINTYRE, ARGYLL

Cist 12 (fig. 3, 4).

Diam. of rim (as drawn): 5.75 in.

Height (surviving): 4.25 in.

The outer surface of this pot is buff-coloured; the interior is black and contains largish grits. The outer surface has been carefully smoothed, and two small cordons have been raised before overall incised decoration has been effected. This consists of almost vertical strokes below the rim, while the cordons have been made the centres of opposing chevrons. The lower part of the pot is covered with slanting incisions. The interior bevel of the rim, which is half an inch thick, is ornamented with an incised chevron pattern.

Two large adjoining fragments and three small pieces are from the earlier excavations, and one small rim fragment was found *in situ* in 1966. Glasgow Art Gallery and Museum.

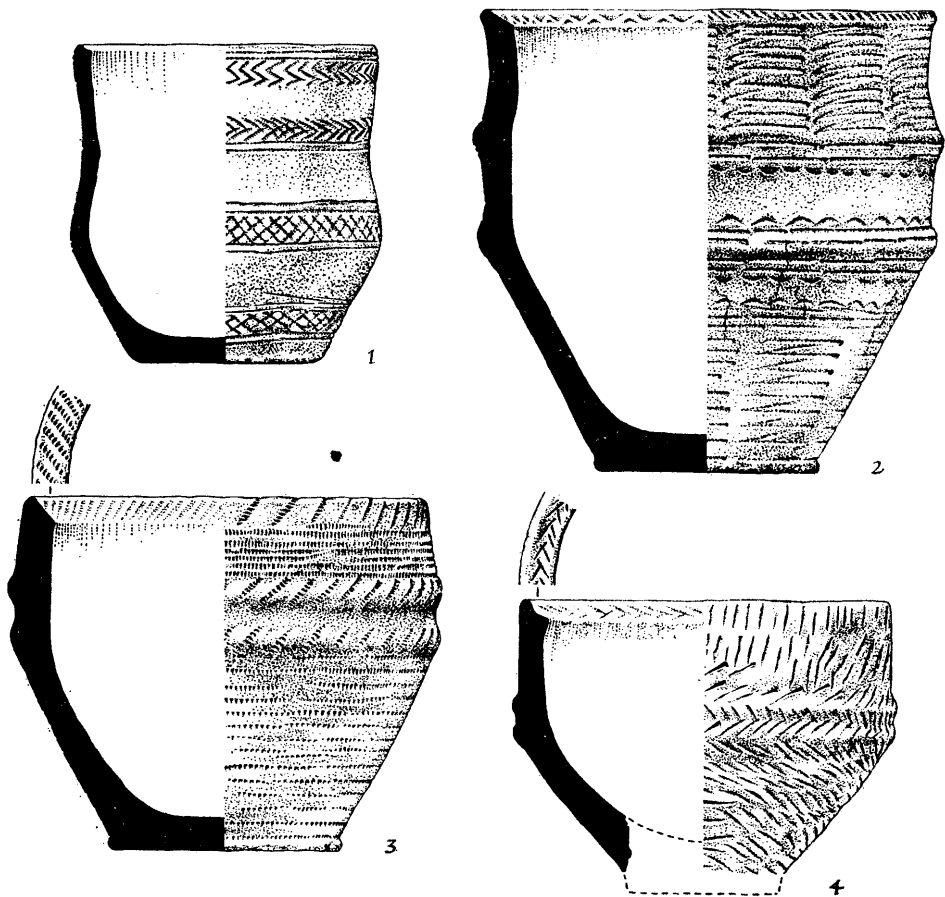


Fig. 3.—Balnabraid Cairn. 1, Beaker, Cist 6; 2, Food Vessel, Cist 4; 3, Food Vessel, Cist 9; 4, Food Vessel, Cist 12; (all one third nat. size).

Cordoned Urn

Cist 5 (fig. 4, 1).

Diam. of rim: 10.75 in. Height: 15.75 in. Diam. of base (as restored): 4.75 in.

This thin walled vessel is made of a sandy red ware and is decorated below the rim with up to five slight raised cordons which are bounded by lines of twisted cord impressions. A band of twisted cord lattice pattern forms the principal decorative feature. Below this are two bands, each of five low cordons with a central plain zone. There is a slight interior cordon some 2 in. below the rim.

Campbeltown Museum.

Cinerary Urn

"X; 18 ins. West of string:" possibly either Cist 10 or 11 (fig. 4, 2).

Three rim sherds remain of this vessel which has had a buff outer surface with a rather redder inner one. The ware is gritty and very coarse. The flattish rim slopes slightly inwards and is about 0.4 in. in thickness. A faint broad line has been smoothed out just below the rim. The estimated rim diameter is 8.3 in. A base fragment, not labelled, probably belongs to the same pot and this provides an estimated base diameter of 2.9 in.

Glasgow Art Gallery and Museum.

Indefinite Sherds, Glasgow Art Gallery and Museum.

- (a) "9 ft. direct East of levelling pin (No. 2) and 1 foot below it." This is a red gritty sherd some 1.2 x 1.6 in.
- (b) "Immediately above displaced slab, supposed to form S. side of segmented chamber": "Urn Fragments" on published plan. These are four small sherds of red gritty ware and an outer wall sherd with two slight grooves.
- (c) A small rim sherd (fig. 4, 3) was found in disturbed cairn material in 1966; it is of a buff gritty ware. The rim bevels slightly inwards, and there is a smoothing on the inside beneath the rim. The sherd is 0.4 in. in thickness.

BONE, BRONZE AND FLINT

Calcinated Bone Toggle (fig. 5, 7).

Cist 5.

This rather irregular rectangular bone toggle measures 0.7 x 0.25 in. and is 0.05 in. thick. There are two hour-glass perforations some 0.1 in. in diameter but they are not completely regular, and the bone has been slightly warped (possibly in the cremation).

Glasgow Art Gallery and Museum.

Sheet Bronze Fragments

Cist 5.

149 bronze fragments were originally recorded; rather fewer now survive and many are diminutive. They fall into three groups.

- (i) Two fragments of fused bronze, seemingly undecorated, offer no hint from their shape of what they have been.
- (ii) A number of fragments belong to what seems to have been a strip (fig. 5, 8 showing fragments and reconstructed decoration) about 0.8 in. wide and about 1 mm. thick. Three ribs run along each edge of this strip, and there is small vertical ribbing between them.
- (iii) There are several fragments with repoussé decoration in what seem to be chevrons (fig. 5, 9), but their purpose is unknown.

Glasgow Art Gallery and Museum.

Bronze Razor (fig. 5, 10).

Unassociated.

The razor, which belongs to Mrs Piggott's Class I,¹⁷ was found in an area of sand in a disturbed portion of the cairn in 1966. It is 2.75 in. long and the blade is 0.75 in. in width. The sides are almost parallel and taper to the tip.

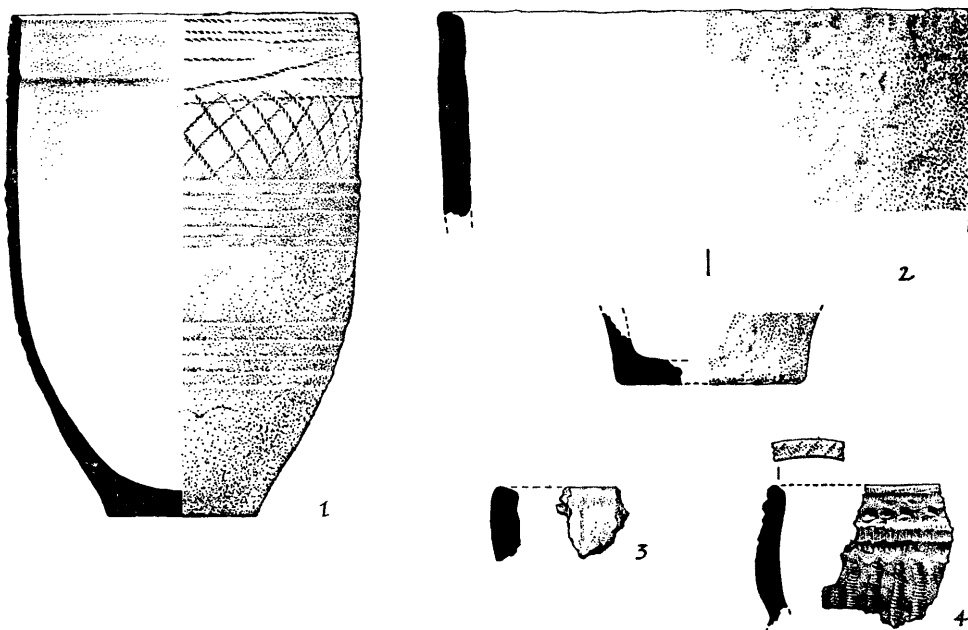


Fig. 4.—Balnabraid Cairn. 1, Cinerary Urn, Cist 5; 2, Urn "X"; 3, Indefinite sherd (c); 4, Food Vessel sherd, Priest's Grave, Ardnacross, Campbeltown Museum (Scale: 1, one sixth; 2-4, one-third).

The tang, a portion of which is missing, is 0.75 in. long and 0.3 in. wide; it joins the blade by gently curving shoulders.

Glasgow Art Gallery and Museum.

Jet Disc Beads

Cist 5 (fig. 5, 6).

The two jet disc beads are 0.4 and 0.3 in. in diameter and are 0.075 in. thick. The perforation is about 0.1 in. in both cases. The larger bead has on one side what may be the zigzag marks of the cutting instrument with which it was originally shaped.

Glasgow Art Gallery and Museum.

Flint

Only provenanced pieces from the cairn have been included. In the Hunterian Museum, Glasgow, Inv. Nos. B.1951, 285 and 287 are some thirty-nine pieces of light yellowy flint flakes and a core which are marked from "the excavations" of Balnabraid. It is possible that these come from the "Hut-site with Flint Chippings" that was excavated in 1913 and from which "some 45 flint chippings (none secondarily worked)" were recovered.¹⁸

The provenanced flint is in the Glasgow Art Gallery and Museum.

Cist 5 (fig. 5, 1).

Small triangular flake of smoke grey flint 1.2 in. long with secondary working on all edges.

Cist 6 (fig. 5, 2).

A flake knife in pale grey flint (2.4 x 1.1 in.) with tiny retouching along its edges and a pressure flaked rounded point.

Cist 9 (upper deposit) (fig. 5, 3 and 4).

(i) A pale grey flake knife some 2.75 in. in length with pressure flaking along its longer edges.

(ii) A darker grey knife of smoked flint with almost translucent pressure flaked edges, 2.5 in. long.

Cist 9 (lower deposit) (fig. 5, 5).

A small fire-whitened and cracked flint flake, 1.8 in. long. This shows no traces of secondary working.

Cist 10.

A flint flake of dark colour, found in this cist, is now lost.

Red Sandstone Rubber

This is the only provenanced stone object in the Hunterian Museum's collection of stones from the site, Inv. No. B.1951, 286. It is marked "N. cist," and reasons will be put forward for suggesting that this is Cist 12. The rounded stone measures 6.75 x 2.6 in. and is 1 in. thick. Its flatter surface has a central area that has been artificially smoothed.

¹⁸ *FSAS*, liv (1919-20), 175.

DISCUSSION

The published reports, the finds and observations made during the 1966 season make it possible to hazard the following sequence.

Phase I: Cist 6 was built in a pit dug into the natural gravel. A burial (possibly an inhumation), a Short-necked Beaker, two jet beads and a flint flake were deposited in it. The cover slab was placed over it, and a crack in the slab was filled up with clay; a further layer of flat stones formed a double cover along this crack, and the spaces between the cover slab and the cist side stones were filled up with clay. In the same phase Cist 8 was added to the N. end of Cist 6, but no further information can be added about this unusual feature.

The pit in which Cist 6 had been built is not shown on the published section

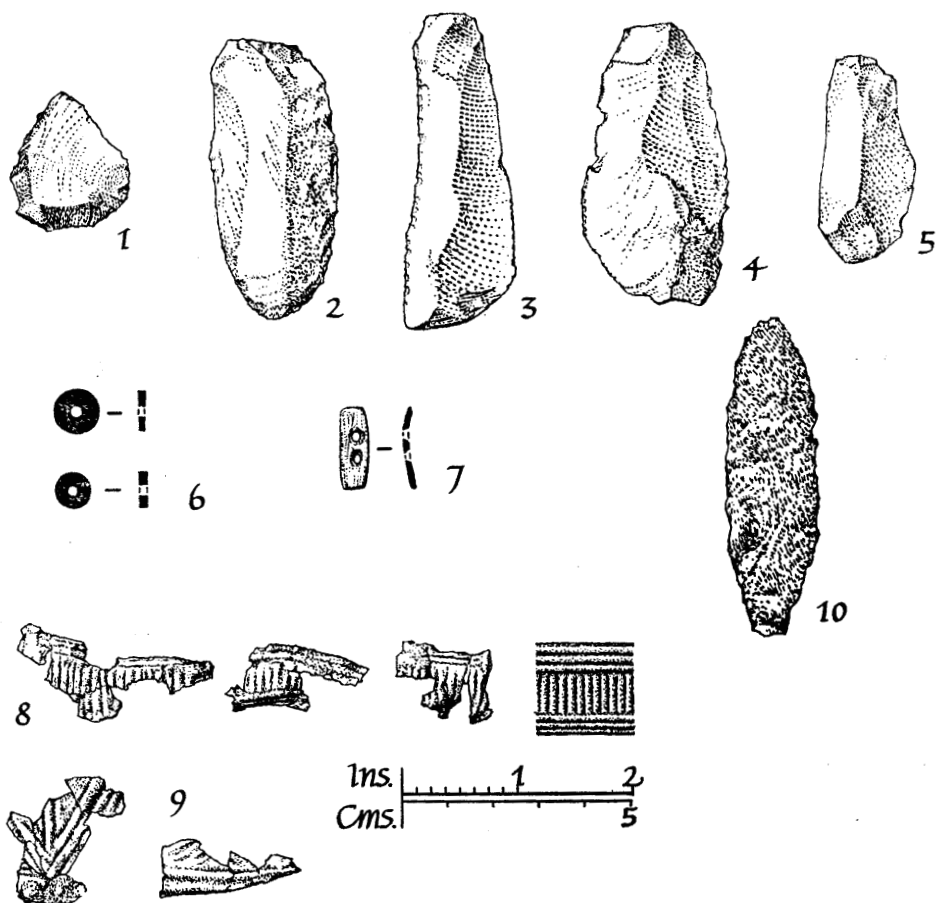


Fig. 5.—Balnabraid Cairn, 1-5, Flint; 6, Jet Disc Beads; 7, Bone Toggle; 8 and 9, Bronze Fragments; 10, Bronze Razor, (all to scale shown).

but it was clearly seen during the 1966 excavation. Two sides of the pit, which had a depth of over 2 ft., with the stony packing that had been behind the side slabs were quite distinct. The rest had been destroyed with the removal of the cist in 1913.

Phase II: Cist 4 was also built in a pit dug into the natural. This is clearly shown on the 1913 section drawing. It seems likely that this belongs to the second phase of activity on the site. A cremation burial and a Food Vessel were deposited in it. Although it is possible that it could have been dug through the cairn material and constructed at the bottom of a shaft, it seems to the present writer unlikely that the builders would go to this amount of trouble to construct a "loosely" built cist of "small slabs." Phases I and II could pre-date the construction of the present cairn, although their cover stones may have had some form of cairn over them. Phase II is the least certain of the sequence.

Phase III includes the cists under the cairn built on ground level; these required the protection of the present cairn, and it may be worth noting that Cist 2 is the most central to the cairn. Cist 3 and 7 also belong to this phase of construction. Cist 2 contained a cremation burial but nothing is known about Cists 3 and 7 (see *infra* under Cist 12).

Phase IV: It seems likely that the Food Vessel burials of Cists 9 and 12 should be grouped together in this phase. It has been suggested above that Cist 9 lies outside the kerb of the cairn, and the fact that the cist was used on two separate occasions might be seen as confirmation of this. The lower burial is a cremation and was accompanied by a flint flake. Above this, with a layer of sand intervening, a crouched inhumation was deposited along with a Food Vessel and two further flint flakes. The great weight of its massive cover slab must have been considered to provide adequate protection for the cist. The slab measures 54 in by 36 in. and was at least 1 ft. thick.

Re-examination of Cist 12 brought to light a small abraded rim sherd in the clay and rubble packing behind the S. end-slab. The fabric, decoration and rim section of this sherd are identical to a number of Food Vessel sherds from the earlier excavations deposited in the Glasgow Art Gallery and Museum. Although these sherds are not given a cist number, the marking "N. cist" on them indicates Cist 12 in the language of the 1910 report. It seems probable that these sherds from Cist 12 were mentioned in the 1920 report under Cist 7 and that the confusion has arisen in Mrs Lindsay Galloway's use of the records of the 1910 excavations when both Cists 7 and 12 were first examined. The 1966 sherd and the labelling of the Glasgow fragments seem better evidence of the provenance of this Food Vessel.

Phase V: The two Cinerary Urn deposits are considered to post-date the Food Vessels of Phase IV, although the disturbed condition of Cists 10 and 11 makes any dogmatic statement impossible. Cist 5 was the first part of the cairn to be examined in 1910.

As the descriptions in the published reports do not tally with the cist still

visible on the edge of the cairn, it is suggested here that this cist is a reconstruction dating from 1913. It may be noted that its present dimensions would make it impossible to place in it the Cinerary Urn found there. In 1910 it is described as "a kind of circular chamber, about 27 inches in diameter and 30 inches deep, and covered by a slab of sandstone." An Interim Report on the 1913 excavation, published by L. McL. Mann,¹⁹ says that when the Urn was first seen "it was intact, surrounded by a little structure of built up water-rolled stones." Further amplification is given in the 1919 report.²⁰ "The north-east wall was one of the undisturbed slabs of the marginal setting." The SW. end-slab was missing. "The cist was built of boulders. The upper stones were set so that they overhung the lower; the cist had a vault-like roof capped by two flat water-rolled stones." The slab-sided cist at present visible would seem to be a construction of no great age. The Cinerary Urn has been placed against the kerb of the cairn, and a construction of boulders built round to protect its other flanks. The Urn was inverted over cremated bone and it is possible that the small bone toggle was burnt along with the body. The fused and twisted state of the bronze fragments may also indicate that they were burnt with the body.

Cists 10 and 11 were in a disturbed condition even in 1913. Cremated bone and a flint were found in 10, and fragments of pottery and burnt bone were found near 11. There is a number of coarse rim sherds of what is probably a Cinerary Urn in the Glasgow Art Gallery and Museum which are marked "X." As it does not seem improbable that this "X" may indicate Cist 10, it is suggested that this Urn belongs to this area of the cairn and to one or other of these cists.

Phase VI: The uncisted inhumations in the upper levels of the cairn material are possibly Iron Age in date but they have not been reconsidered in this account; the fragmentary remains of at least four adults and three children are represented.

It is not possible to assign Cist 1 to any particular phase.

The range of ceramic finds from Balnabraid makes it the richest single Bronze Age site in Kintyre, and discussion of the pottery from the cairn forms a suitable basis for noting some of the other vessels from this region. It has recently been stressed more than once that the Beaker, Food Vessel, Cinerary Urn division of pottery types does not form an exclusive chronological scheme. Although such a sequence does seem to be the most probable for the burial deposits on the site, this cannot be proved by stratigraphy and cannot be stated with certainty. Even accepted as a hypothesis, however, there need not be a considerable time lapse between the phases and contemporaneity between Beaker and Food Vessel, and Food Vessel and Cinerary Urn is a distinct possibility.

The suggestion has been put forward here that Cist 6 is the earliest on the

¹⁹ Mann, L. McL., *Interim Report on the Cairn at Coraphin, near Campbeltown*, 5th May 1913. Kintyre Antiquarian Society MS. No. 312.

²⁰ *PSAS*, liv. (1919-20), 179.

site. It contained a possible inhumation, a Short-necked Beaker, a flint knife and two jet disc beads. The criss-cross decoration finds parallel from Luce Sands (Wigtownshire)²¹ and on one of the Beakers from Ardiffery (Aberdeenshire)²² where two pots were found with twelve jet beads, a four-holed bracer, a polished flint axe, a barbed and tanged arrowhead and four amber beads. At Dalmore, Alness (Ross-shire),²³ fifty jet beads were found with a contracted skeleton, a flint plano-convex knife and part of a four-holed bracer. A necklace of some 187 disc beads comes from Stoneykirk (Wigtownshire);²⁴ they were found with a tall vessel some 9 in. in height with a thick rim. The incised chevron and latticed lozenge decoration may ally this pot to the Beaker-Food Vessel group recently discussed by D. D. A. Simpson.²⁵ Disc beads are also found with Food Vessels but in such contexts they may also be associated with fusiform beads and crescentic jet necklaces.²⁶ The flint knife from Cist 6, however, can be compared with a flint found with a Food Vessel at Ballimenach, Kintyre,²⁷ in a cist with a quantity of cremated bone, and with the knife from Inchmarnock, Bute,²⁸ which accompanied the crouched inhumation of a woman which was associated with a jet necklace of fusiform and spacer beads.

Only one other Beaker is known from Kintyre, a Long-necked Beaker from Glebe Street, Campbeltown (Pl. IX, top left), found in 1886 in a gravel pit.²⁹ It measures 7.75 in. in height and is ornamented overall with cord and comb impressions. Just below the rim there is a pair of cordons the lower of which is decorated with slanting comb impressions; two lines of stamped or rouletted zigzags are drawn round the waist and there is a further band at the base.

The Food Vessels from Kintyre, mapped on Fig. 1, have a mainly eastern distribution. The three Balnabraid vessels fall into the Irish Bowl category as it is described by D. D. A. Simpson.³⁰ The Cist 4 vessel was included by Alison Young in her Tripartite Bowl Group;³¹ the Cist 9 and 12 pots fall into the Ribbed Bowl group. Simpson has drawn these two groups together. The slight chronological distinction, hazarded for the construction of the cairn, may also be worthy of note in connection with these pots. The former occurs under the cairn, while the other two are certainly secondary to it.

In shape and in the use of the "false-relief" technique of decoration, the Cist 4 pot is close to that from Mauchrie Moor, Arran,³² among many others, and the false-relief decoration is seen on the Food Vessel sherd from the large

21 *Ibid.*, xcvi (1963-4), 78, no. 176; fig. 10, no. 176.

22 *Ibid.*, xxxviii (1903-4), 345, and pl. 164 bis.

Piggott, S., in ed. Foster and Alcock, *Culture and Environment*, 1963, 73.

23 *PSAS*, xlii (1878-9), 253 ff.

24 *Ibid.*, xxxvi (1901-2), 584; *ibid.*, 1 (1915-16), 209.

25 *Ibid.*, xxxvi (1901-2), 584; *ibid.*, 1 (1915-16), 209.

26 *Ibid.*, xxxvi (1901-2), 584; *ibid.*, 1 (1915-16), 209.

27 *Ibid.*, xxxvi (1901-2), 584; *ibid.*, 1 (1915-16), 209.

28 *Ibid.*, xxxvi (1901-2), 584; *ibid.*, 1 (1915-16), 209.

29 *Ibid.*, xxxvi (1901-2), 584; *ibid.*, 1 (1915-16), 209.

30 *Ibid.*, xxxvi (1901-2), 584; *ibid.*, 1 (1915-16), 209.

31 *Ibid.*, xxxvi (1901-2), 584; *ibid.*, 1 (1915-16), 209.

32 *Ibid.*, xxxvi (1901-2), 584; *ibid.*, 1 (1915-16), 209.

33 *Ibid.*, xxxvi (1901-2), 584; *ibid.*, 1 (1915-16), 209.

cist known as the Priest's Grave, near Ardnacross, Kintyre (fig. 4, 4).³³ The cover slab of this cist, which measures some 6 ft. by 5 ft. 6 in. and is 9 in. in thickness, is out of proportion to the cist itself which is about 3 ft. by 2 ft. internally. Here a sandy yellow vessel has been ornamented with vertical whipped cord impressions and zigzags of false-relief. Whipped cord impressions in chevrons have recently been discussed with reference to the Ballimenach sherd.³⁴ Tripartite vessels have been found at Cour,³⁵ Brackley,³⁶ Glenramskill,³⁷ from Kilmaho³⁸ a Food Vessel, not of Tripartite group, was found in a cist with an inhumation burial, two flint knives, a bronze dagger and awl. The massive cist cover at Kilmaho can be compared with that from Ardnacross and the slab covering Cist 9, where an inhumed burial has a less spectacular accompaniment.

From Carn Ban³⁹ on the N. tip of the island of Gigha from one of the stone cists under a cairn with a diameter of 50 ft., there is a pot, now lost, which is described as some 5.25 in. in height, 5.25 in. in rim diameter and 2 in. in base diameter. This sounds very like another Food Vessel. The cairn, which was said to be full of coffins, some large, some small, seems to be the closest surviving local parallel to the cairn structure of Balnabraid. Two Food Vessels from N.W. Kintyre are illustrated here for the first time (pl. IX, top right and bottom left). These, said to be from Loup, near Clachan, West Loch, Tarbert, were purchased by the National Museum of Antiquities of Scotland in 1948-9.⁴⁰

⁴⁰ PSAS, lxxxiii (1948-9), 247.

The larger pot, 4.6 in. in height, is biconical, made of a buff ware and decorated with incisions forming a chevron pattern and lines of cord ornament on the body of the pot and the inner slope of the rim. It falls into the Ribbed Bowl group and has some similarities with the Food Vessel from Cist 9, although the decoration of the latter is much less formal. The smaller Loup vessel is of a coarse gritty fabric; it is ornamented all over with horizontal bands of herringbone pattern made of narrow incisions. On the flattish top of the rim runs a band of finely incised chevron pattern. It measures 3.6 in. in height. A pot from Craighuadh, Killeen, is illustrated here also for the first time (pl. IX, bottom right); it was found in 1901 and its context is not known. It has an everted rim and a slight carination and measures some 5.75 in. in height. The pot is of a gritty buff fabric and is undecorated. This vessel does not fall conveniently into either Beaker or Food Vessel group; although examples of undecorated Beakers are known, the texture and profile of the pot seem to ally it more to the Food Vessel class.

The two Cinerary Urn deposits from Balnabraid are perhaps the least satis-

³³ Moffat, A., Report on the Examination of the Site Known Locally as The Priest's Grave, Ardnacross. Kintyre Antiquarian Society Ms. No. 250/18.

³⁴ PSAS, xcv (1961-2), 131 ff.

³⁵ DES 1961, 13.

³⁶ PSAS, lxxxix (1955-6), 39 f., fig. 9.

³⁷ Ibid., lxxxv (1950-1), 38 ff., fig. 1 (1).

³⁸ DES 1959, 3.

³⁹ Stat. Acct., viii, 1793, 56 and Plan facing p. 53. A new plan of this cairn and cists will be published in the forthcoming Inventory of Kintyre.

factorily documented. The architecture of Cist 5 has already been discussed. The urn was taken from it in 1910 and the other small finds excavated in 1913. This vessel and the Cinerary Urn from Dalruan, Campbeltown (pl. X) found with cremated bones in it in 1894,⁴¹ belong to the Cordoned Urn class. As restored the height of the Dalruan urn is 15.25 in. On both, lines of cord impression are used; on the Balnabraid urn the main band of decoration consists of lattice impressions. The pattern on the Dalruan urn is most complex; the band is divided into rectangles, which are diagonally sub-divided, and alternately the lower triangle is infilled with slanting cord impressions or the upper triangle with horizontal impressions. Cordoned Urns with criss-cross cord impressed panels have recently been listed by Miss I. McInnes.⁴² The pattern on the Dalruan urn is almost identical to one "probably north of Ireland" in the National Museum of Antiquities of Scotland.⁴³ Latticed infill to triangles is used on the Cordoned Urn from Oban⁴⁴ near which was found a perforated axe hammer. Cinerary Urns are rare on the west coast, and the Cordoned Urn, with an inner rim cordon as well, from Ardochy on the north shore of Loch Etive completes the present Argyll distribution.⁴⁵ A close parallel for this pot comes from the Isle of Man found associated with a Class I bronze razor.⁴⁶ The razor from Balnabraid found unassociated in 1966 most closely resembles the size and shape of the razor from Sandmill Farm, Stranraer, Wigtownshire, which was found with a Cinerary Urn, battle axe, bone bead or tube and three whetstones.⁴⁷

Miss McInnes has also listed some of the Bucket Urns to which the rim and base fragments from the region of Cists 10 and 11 might be compared⁴⁸ although its tapered base links it in shape to many Cordoned Urns. The Firth of Clyde and SW. Scotland seems to be one of the main areas of Bucket Urn distribution, stretching from Glenluce to Largs⁴⁹ as well as Balnabraid. There is also a recently published example of an undecorated Cordoned Urn from Girvan,⁵⁰ which is perhaps relevant in this context. At Largs a rough cist, found in 1909, contained some seven urns with cremations in them. Superficially, too, this cist as photographed is similar to the Balnabraid Cist 10 as planned.

The cleaning undertaken on the small bronze fragments has shown that there are two distinct groups of recognisable pieces: those making up a strip with ribbed decoration and those with chevron ornament in repoussé. No suggestion can be offered as to the purpose of this second group. The former, however, might tentatively be linked to the strip from the Migdale hoard (Sutherland)⁵¹ and to the small group of strip armlets, although none is in any way a close parallel.⁵² The twisted state of all the fragments makes any definite reconstruc

41 *Ibid.*, xxviii (1893-4), 263 ff.

42 *Ibid.*, xcvi (1963-4), 57.

43 *Ibid.*, xli (1906-7), 269, fig. 178.

44 *Ibid.*, xxxii (1897-8), 58 f.

49 *Archæol.*, lxii (1910), 239 ff.

51 *Inventaria Archaeologica GB. 5th Ser.* 1958, GB. 26.

50 *Avr. Arch. & Nat. Hist. Coll.*, vii (1961-66), 9 ff., and pl. 3.

52 *PFS*, xxix (1963), 279 ff.; *ibid.*, xxx (1964), 426 ff.; *PSAS*, xcvi (1962-3), 149 ff.

45 *Ibid.*, lxxix (1944-5), 176, pl. xix (1).

46 *PFS*, i (1935), 85, pl. iv 3A and B.

47 *PSAS*, lxxvi (1941-2), 79 ff.

48 *Ibid.*, xcvi (1963-4), 56 f.

tion of the pieces impossible. The small bone toggle also found with the Cist 5 Cinerary Urn is of a type most frequently associated with Urns or Enlarged Food Vessels with cremations.⁵³ An Irish example, with four perforations, was found with a polished bone pin of probable Wessex II derivation in a cremation.⁵⁴ A comparable pin from Balneil (Wigtownshire) with a Cordoned Urn has been given an Early or Early-Middle Bronze Age date.⁵⁵

The Cinerary Urn deposit of Cist 5 is the latest burial on the site that can be dated with any accuracy and it may belong to the 15th century B.C. or rather later. The sherds marked "X" and the inhumations within the cairn material cannot be given any chronological context at present but the Class I razor shows that even the Bronze Age activity on the site could go on as late as about 1000 B.C.⁵⁶

The Beaker burial of Cist 6, on the present evidence probably the earliest burial, is perhaps 17th century B.C. in date. The chronological span of the main period of burial activity on the site, which includes not only the well-documented cists but also Cists 2, 7 and 8, is thus probably quite short. It would seem, therefore, that from this cairn there is the record of the burial practices of some of the members of a single community over a period of some three centuries at least.

ACKNOWLEDGMENTS

The finds from this cairn are in the charge of three museums, and the writer is indebted to Mr J. G. Scott of the Glasgow Art Gallery and Museum, Dr A. S. Robertson and Mr E. W. Mackie of the Hunterian Museum, and Mr E. McKiernan of Campbeltown Public Library for assistance during this work. The Court of the University of Glasgow has given permission for the finds in the charge of the Hunterian Museum to be published. Mr R. B. K. Stevenson and Miss A. S. Henshall of the National Museum of Antiquities, Edinburgh, have given assistance not only in permitting publication of the Loup vessels but also in allowing Mr J. A. Brown of the technical staff of the Museum to undertake cleaning operations on the sheet bronze fragments. The writer is indebted to Professor Piggott for reading the text, to Dr K. A. Steer for considerable editorial assistance, and to Mr A. MacLaren and Mr G. S. Maxwell for helpful encouragement. They are not, however, responsible in any way for the views expressed. Mr T. F. Spence has kindly examined the extant cremated bone material and has contributed the report. The most important contributions come from Mr I. G. Scott, who has done all the drawings, and Mr G. Nichol, who has provided the photographic illustration.

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⁵³ *Ibid.*, ix (1870-2), 268 f.

Ibid., xli (1906-7), 9 f.

⁵⁴ *Riocht na Midhe* iii (1963-6), 225 ff., fig. 2. Reference from Miss Henshall.

⁵⁵ *PSAS*, I (1915-16), 302 ff., fig. 2.

TDGNHAS, xlii (1965), 80.

⁵⁶ *PSAS*, xcvi (1963-4), 120.

APPENDIX

CREMATED BONE FROM BALNABRAID CAIRN, CISTS 5 AND 9, AND FROM
DALRUAN, CAMPBELTOWN

By T. F. SPENCE, B.Sc., F.R.A.I., F.I.S.T.

Department of Anatomy, University of Birmingham

Cist 5 (Bone deposited with the Cinerary Urn in Campbeltown Museum. Found 1910.)

Colour: White to grey.

Character: Hard and brittle.

Total weight: 28 g.

Skull:

Several vault fragments.

Two pieces of the Mandible, one of which shows partial tooth roots. A fragment of the right petrous Temporal bone.

Thorax: Several fragments which are probably rib shafts.

Others: Several fragments of unidentifiable bone.

Pathology: Nil noted.

Number cremated: These fragments can only be a very small part of the cremation, so information of this type is pointless.

Sex: Unknown.

Age: Unknown.

Cist 9 (Bone recovered in 1966 from the pit from which the cist had been removed.)

Colour: Off white/grey.

Character: Hard and brittle.

Total weights:

Unidentifiable fragments 60 g.

Unidentifiable long bone fragments ... 65 g.

Identifiable fragments 60 g.

Skull: Many vault fragments with serrated sutural edges. Some fragments consisting only of outer table and others only of inner table. A fragment of the right petrous temporal bone. ? A piece of the right nasal bone.

Vertebral column: A fragment of a ? thoracic vertebra which may show the facet for the rib articulation.

Ribs: Three pieces of rib shafts.

Upper limb: Two pieces of the shaft of the Humerus. Three pieces of the shaft of a Radius. Two fragments of metacarpal bones.

Lower limb: Three pieces of the shaft of the femur.

Others: Numerous fragments of unidentifiable long bones.

Pathology: Nil noted.

Number cremated: On this evidence alone, probably one.

Sex: Unknown.

Age: Probably adult.

Dalruan, Campbeltown (Bone deposited with the Urn in Campbeltown Museum. Found 1894.)

Colour: White to grey.

Character: Hard. Many fragments twisted.

Total weight:

Unidentifiable fragments 183 g.

Unidentifiable long bones 400 g.

Identifiable fragments 183 g.

Skull:

Many vault fragments with serrated sutural edges.

A piece of the Maxilla. It shows an empty tooth socket which just enters the antrum of Hymore. A fragment of Mandible with three empty tooth sockets.

A piece of the left petrous Temporal bone. A small fragment of skull which may be part of the left mastoid process.

Thorax: Several fragments of rib shafts.

Upper limb: Two fragments of the left Scapula, each consisting of part of the glenoid fossa. Possibly three fragments of the thin blade of the Scapula. Several fragments of the shaft of the Humerus. Two pieces of phalanges.

Lower limb: A piece of the right innominate bone consisting of part of the greater sciatic notch.

Others: Many fragments of unidentifiable long bones.

Pathology: Nil noted.

Number cremated: Unknown. Probably one.

Sex: Unknown.

Age: Unknown. Probably adult.



Plate IX.—Top left: Beaker—Glebe Street, Campbeltown (Campbeltown Museum); top right and bottom left: Food vessels, said to be from Loup, near Clachan, West Loch Tarbert (National Museum of Antiquities of Scotland); bottom right: Vessel from Craighuadh, Killean (Campbeltown Museum) (all $\frac{1}{2}$ nat. size). See article on Balnabraid Cairn, Kintyre.

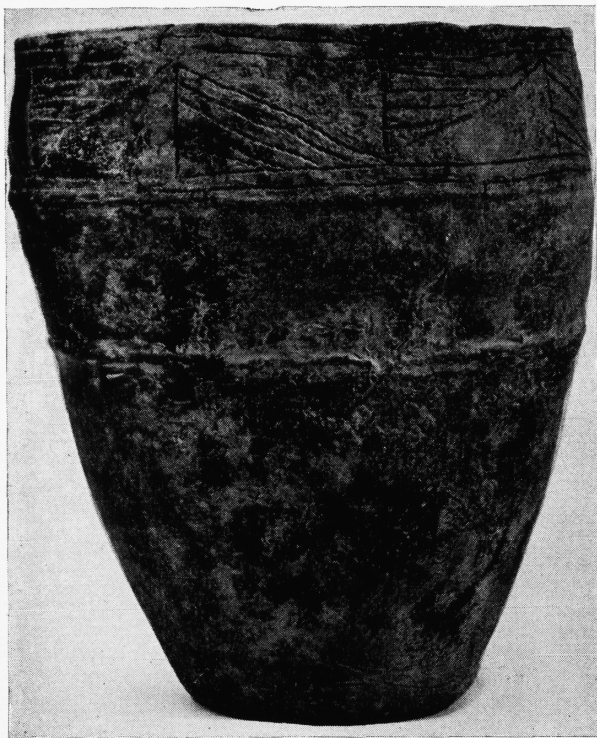


Plate X.—Cinerary Urn—Dalruan, Campbeltown (Campbeltown Museum) (approx. $\frac{1}{4}$ natural size). See article on Balnabraid Cairn, Kintyre.

THE SMALL CAIRN FIELDS OF DUMFRIESSHIRE

By General J. SCOTT-ELLIOT, assisted by Dr IAIN RAE

The fields of Small Cairns that lie on the lower hill ground of Dumfriesshire and in other parts of Scotland, Northern England and Wales, have for long provided a source of discussion as to their origin and true nature.

A survey of these fields in Dumfriesshire, coupled with some excavation, has been carried out by the writer, assisted by Dr Iain Rae under the auspices of the Dumfries and Galloway Natural History and Antiquarian Society. Similar surveys are being carried out in Kirkcudbrightshire and in Wigtownshire by other field workers. With this done, a picture should emerge covering the Southern Uplands, from east Dumfriesshire to Stranraer and north to the watershed between these three counties and Lanarkshire and Ayrshire.

The survey of Dumfriesshire coupled with limited excavation has produced some interesting results. These are discussed in the following pages.

The location of the cairn fields is shown in figs. 1a and 1b and a detailed list with notes is appended.

General Location of the Cairn Fields

It will be seen from the location map fig. 1b that the majority of the fields lie in a belt about ten miles wide running south-west to north-east across the county. The heaviest concentration is round the area of Bogrie Hill (NX7885). The two other main concentrations lie in the vicinity of the upper Ae and its tributaries (NX 9889) and in the area to the west of Beattock, up on the plateau round the headwaters of the Kinnel Water (NT 0400). Only one field has been found east of the River Annan.

The impression given is of communities closely grouped in certain main areas with a few outlying and isolated. The other impression given is not one of settlement following the rivers up from the sea, but of spread across country from south-west to north-east.

Topographical Situation

The height at which the fields are found varies between 600 ft. and 900 ft. and the majority lie about the 800 ft. level. For this county this means that they lie at about, or above the point of change from the lower gentler slopes to the higher or steeper ground. Often they lie at the point which from the lower ground forms the skyline. At this height the quality of the ground from the point of view of cultivation becomes poorer.

In nearly all cases fields lie in the area of the head waters of rivers or streams and close to them. Often the fields lie just above the source of a small stream. The majority of fields have a southerly aspect, though there are a few, notably the Jarbruck sub group, which lie on the northern slopes. At

first it was thought that the southerly aspect was of considerable significance, but now it is thought that the lie of the country and the run of the streams is the greater influence, though there may well be some preference for a southerly aspect for social or ceremonial reasons. In almost every case the ground on which cairns lie is firm and dry. They are not normally found on wet, spongy, or peaty parts of the terrain, though that type of ground may be plentiful near at hand.

From these facts it might be deduced that the people who built the cairns lived and worked in the vicinity of these streams on the better, lower and perhaps more sheltered ground and placed the cairns higher up on the poorer ground which formed the crest line from where they lived.

Types of Cairns in the Fields (Plate XI.)

There are four types of cairn which have been found:

- (1) The small Cairns which are found in every field except two in the list at Appendix Q.
- (2) Ring Cairns which occur in many fields.
- (3) Oblong Cairns.
- (4) Site 80 Cairns¹ (so called after the excavated example which is site 80 in the Whitestanes Moor Cairn field).

Small Cairns

While cairn fields vary enormously in size and composition the morphology of the individual small cairns exhibits an almost standard type throughout the county, and for that matter in other counties as well. They do vary in diameter, but in shape they are quite unmistakeable. They are built of stones of any size, but usually of about 8 ins. diameter, casually piled upon each other to produce a near circular cairn, the height of which seems to vary with the diameter. In diameter they are found from 6 ft. to 24 ft. but the greater number is between 9 ft. and 15 ft. Today, the smaller they are in diameter the flatter is the cairn and only the larger ones are up to 2 ft. in height. The average is probably around 12 in. for the 12 ft. to 15 ft. cairns. The 6 ft. cairns are usually flat, the 9 ft. ones have a slight rise but are often nearly flat. All over the county and in other counties as well, the similarity of this "standard cairn" type is most noticeable. In a few fields larger cairns are found, usually only singly or in very small numbers. For the purposes of this study they have been listed but are not dealt with, except to note that the construction of such larger types appears outwardly to be, in general, similar to that of the smaller cairns.

Ring Cairns

These are circular banks of stones, loosely thrown together up to a height in some cases of 2 ft. or so. with a width at the bottom of the bank of up to

about 7 ft. The bank of stones encloses a flat area of ground, sometimes this ground is slightly hollowed.

In this county they vary in overall diameter from 12 ft. to 48 ft. and are always found close to, or within fields of small cairns, never on their own. Not all cairn fields have ring cairns in them.

From limited excavation it is now known that some of these are funerary sites.

Oblong Cairns

In a few fields, a type of oblong cairn is found which varies in size but may measure about 18 ft. by 8 ft. These do not appear to be just ill made circular cairns, but are more likely to be a small type of Long Cairn. None have been excavated here in recent years.

Site 80 Cairns

These have been found in only two fields. They consist of an oblong bank, mainly of earth but containing some stone, measuring about 14 ft. long by about 7 ft. at widest and 1 ft. at the highest. Alongside this mound and centrally placed, is a depression. In the only one excavated on Whitestanes Moor the depression was found to be a stone filled pit some 2 ft. deep. This type of monument has been found at Whitestanes (Serial 24 Appendix Q) where there are what appears to be three of this type and at Lochside (Serial 50) where there are some 25.

Density Within Fields

The density of small cairns within fields varies a great deal. Generally speaking in the larger fields the cairns are closer together. When close together the interval between cairns may be as little as 18 ft. The more normal distance is about 40 ft. In some cases the interval between cairns is great and occasionally they are found singly.

Excavations

The following Excavations in connection with this study have been carried out at Whitestanes Moor (see Serial 24).

Two Small Cairns. Apart from one piece of Chert found at the old ground level in one cairn, nothing was found that would give an indication as to the age or purpose of construction.

Three Large Ring Cairns. One of these contained eight cremation burials, one of which was dated by C 14 Test to B.C. 1360, plus or minus 90 years². One contained what is believed to be a crouched burial pit, centrally placed³. No dateable material was found. The remaining ring cairn yielded nothing structural or dateable³.

One Small Twelve Foot Ring Cairn. This yielded nothing structural or dateable.

The Purpose of the Fields

In deciding the purpose of these cairn fields the choice of rôle seems to lie between funerary, ceremonial, or field clearance. It is difficult to think of any other purpose.

It is impossible to walk over all these cairn fields and others in other counties and not be struck by the similarity in type of the cairns wherever built. It is as if there was a standard height, size relationship and a convention of near circular construction. It would seem most unlikely that this similarity in pattern would result from stone clearance, where the object must be to get as much surface clear as possible and where, therefore, the result would tend to be fewer and higher heaps of all shapes and sizes.

Fields large and small always seem to be on the harder dry ground, not on the softer wetter, more peaty ground though often this softer ground lies close alongside the cairn field. If the object was stone clearance one would have expected the stones to be thrown into the wetter ground. In addition there is more often than not equally dry and useful looking ground no distance away with no cairns on it. It is difficult to explain this in the context of a need for stone clearance for scratch cultivation.

Sometimes cairns are found singly a long way from others. Even these conform to the standard size and shape. If these cairns were the result of clearance it is not likely that they would be of the standard size or shape.

If the field clearance theory is not accepted there remains the Ceremonial or funerary theories.

As far as ceremonial is concerned we shall not get much further in the present state of knowledge.

There remains the funerary theory and here some of the facts begin to make sense. We know that certain of the monuments in the cairn fields are funerary, e.g. The long Cairn in the Broadshow Rig Group (Serial 13), the three large cairns in the Gawin Moor field (Serial 20) and some probably most, of the larger Ring Cairns. This at once suggests a funerary purpose for many of the fields. It is argued that because nothing is found under the small cairns they cannot be funerary. In this county if a body were folded into the usual crouched burial position, laid on the surface and covered with a pile of stones and left, nothing would remain after a period. The soil is acid and decomposition and weather would comparatively quickly remove all human remains. If this form of burial is accepted as a possibility it is interesting to note that the decomposition of the body would result in a drop in the height of the cairn and that this drop would be inversely proportional to the size of the cairn. That is to say that if the cairn were small it would tend to flatten when the body disappeared. A larger cairn would not be so much affected and would tend to retain more of its height. This parallels what has been found to be a feature of the shape of cairns in the fields today—the smaller the flatter and the larger the more rounded. Perhaps careful soil analysis may help to solve this problem.

It will be asked, why should they adopt this method of burial? Part of the answer may be that the rock is very close to the surface in the areas under consideration, and cutting into the rock was difficult. We know that crouched inhumation burials occur in pits which were then stone-filled on top of the body to the lip of the pit or just above. The small cairns are therefore just a variant of the known method. It would be natural to place the burial cairns up hill away from the living sites where decomposition would not affect the living.

One other factor which must be taken into consideration is that of tradition. These cairn fields have been looked upon traditionally by local folk, as burials of some sort and their survival in many places is probably largely due to this tradition. The strength of the burial tradition seems quite a good argument for the theory that the cairns had a funerary purpose.

Having studied these cairn fields and having seen so many of them I cannot accept that they are clearance cairns, although in a few cases individual cairns may be for this purpose. On the present evidence I believe that the fields have a funerary purpose. If this is accepted it is logical to seek for the living sites on the ground not far away. Where the cairn fields are on the higher ground then it seems likely that the living areas may be on the ground down hill and down stream. Recent work by Jobey in Northumberland tends to confirm that the bulk of these cairns are for funerary purposes⁴.

Numbers of Cairns

One of the puzzling things is why there should be so few cairns. If they are clearance heaps it would mean that very small and very few areas were cleared for cultivation and often in very odd places.

If they are funerary as one believes, then presumably only certain people qualified for the honour of this type of burial. This would be in keeping with the present view in regard to the large cairns.

Settled Communities or Nomadic

It is thought by some that the folk who built the cairn fields were nomadic. The impression gained by a study of the fields is not favourable to the nomadic community theory.

The comparative inaccessibility of many of the fields, the grouping of many of them into large communities, the isolated little communities up small valleys, and finally the location of fields above or by burns, taken together seems to point to a settled people occupying valley or plateau and living by streams.

Were the people nomadic one would expect to find burial sites very scattered and small. A cairn field containing as many as 100 surely must indicate a fairly settled community.

Acknowledgements

We are very grateful to Landowners and Farmers who have allowed us to walk over their land and to the Royal Commission on the Ancient and Historical Monuments of Scotland for their help. We are also most grateful to the ladies who have helped with the typing of this paper.

APPENDIX

List of the cairn fields, grouped by general locations from East to West.

Group A, Kinnel:

1. Emblem Brae.
2. Coats Hill.
3. Stanshiel Rig.
4. East Earshaig.
5. West Earshaig.
6. Kinnelhead I.
7. Kinnelhead II.
8. Lochanhead.
9. Lonnachie Rig.
10. Rough Burn.
11. Kinnel Burn Junction.
12. Meikle Hill.
13. Broadshaw Rig.
14. Knockilsine.

Group B, Knockbrack:

15. Fellend.
16. Knockbrack.

Group C, Ae:

17. Knockespeen.
18. Craigshiels.
19. Nether Dodd.
20. Gawin Moor.
21. Auchencairn.
22. Shaws Moor.
23. Watchman Moor.
24. Whitestanes Moor.
25. Glenmaid Moor.
26. Gledenholm.
27. Moor Park.

Group D, Keir Hills:

28. Barjarg Moor.
29. Crossford.

Group E, Moniaive:

30. Old Auchencairn.
31. Holmhead.
32. Twentyshilling.

Group F, Bogrie:

- Glenesslin Burn Sub-Group.
33. Bogrie I.
34. Bogrie II.
35. Bogrie III.
36. Bogrie IV.
37. Sundaywell.
- Jarbruck Sub-Group.
38. Girharrow I.
39. Girharrow II.
40. Girharrow III.
41. Girharrow IV.
42. Girharrow V.
43. Girharrow VI.
- Craes Hill Sub-Group.
44. Craes Hill I.
45. Craes Hill II.
46. Craes Hill III.
47. Craes Hill IV.
48. Craigdasher I.
49. Craigdasher II.

Group G, Miscellaneous:

50. Lochside.
51. Raeburnfoot.

NOTES

1. Where the site is mentioned in the Royal Commission on the Ancient Monuments of Scotland, Inventory of Dumfriesshire it is quoted under the abbreviation, RCAM.
2. Abbreviation sign for Small Cairn is SC. Abbreviation sign for Ring Cairn is RC.
3. The list of sites is not exhaustive, though all sites known at present (March, 1967) are included. The number of cairns in each site has been counted as accurately as possible short of cartographical survey. There may be an error in some cases, but

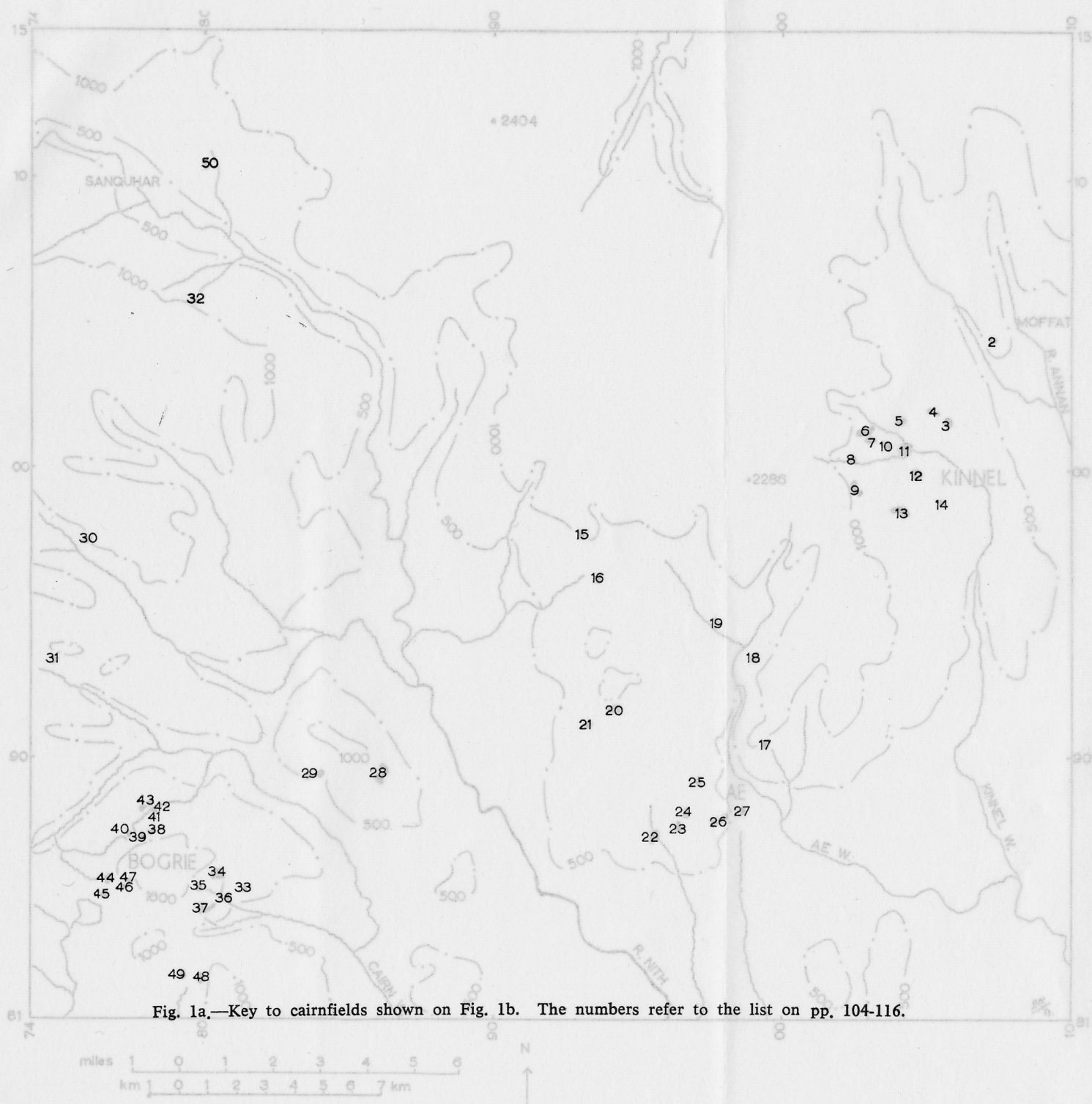


Fig. 1a.—Key to cairnfields shown on Fig. 1b. The numbers refer to the list on pp. 104-116.

Fig. 1b.—Plan of the small cairnfields showing the three principal groups. Off the plan to the east are Serials 1 and 51, Emblem Brae and Raeburnfoot. All heights are in feet. The marginal numbers are the 10 k.m. squares of the National Grid.

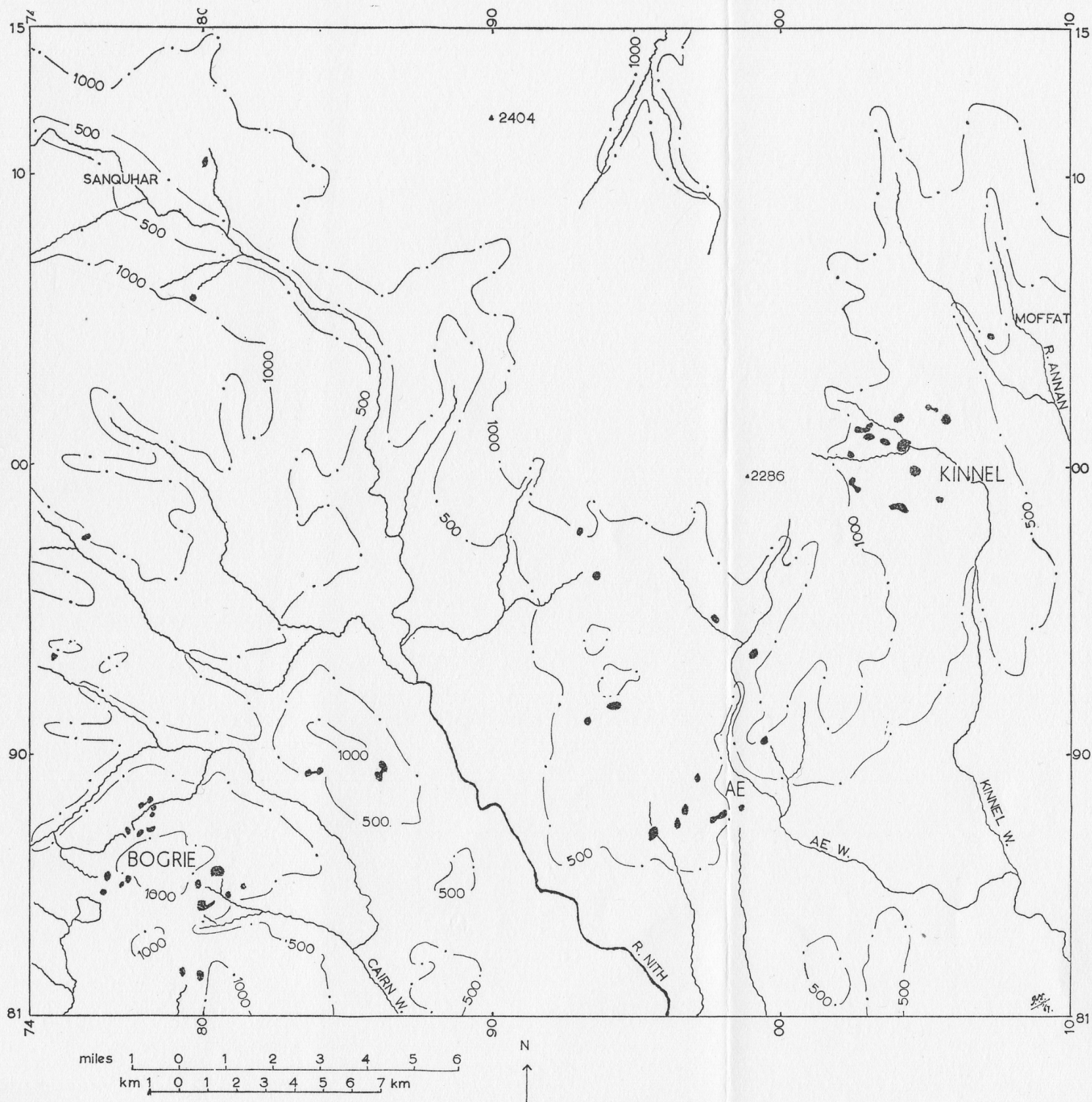


Fig. 1b.—Plan of the small cairnfields showing the three principal groups. Off the plan to the east are Serials 1 and 51, Emblem Brae and Raeburnfoot. All heights are in feet. The marginal numbers are the 10 k.m. squares of the National Grid.

such error as there is will be an understatement rather than an overstatement of numbers.

4. A number of other monuments have been found in the course of searching these fields. Those which have been thought to be in any way relative to the study have been included, the others have been omitted.

GROUP A: KINNEL**Parish of Kirkpatrick-Juxta**

This is the most easterly group of cairn fields in Dumfriesshire. Serial 1. Emblem Brae and Serial 2. Coats Hill have been added to this group for convenience.

The group lies up on the saucer shaped plateau of the headwaters of the River Kinnel. The individual fields lie on the higher ground and mostly round the lip of the plateau. The group gives the impression of belonging to a compact and isolated community of some size.

From the lie of the fields it would seem likely that the communities lived in the central, eastern and southern parts of the plateau.

There is today a good track which enters the plateau from the Ae valley and the South-West by the Bloody Gill (NY 026977). Close to this track lie the Broadshaw Rig and the Meikle Hill fields. This is an easier approach to the plateau from the south and west than the present one and could well have been the route used by the builders of the cairns as they penetrated inland and later for normal communications.

Serial No.	Map. Ref.	Name	Type of Cairn	No. of Cairns, Overall measurement in feet	Height above sea level in feet. Aspect
1.	NT 181140	Emblem Brae	SC.	3-6 ft. 17-12/15 ft.	750 S.E.

The field lies between the road and the very steep mountain side on an area of ground raised some thirty to forty feet above the valley floor. At present much of it is used as a sheep tending area. It is a piece of ground which being a safe height above the river could always have been used by man.

Some of the cairns are irregular in shape and they vary in size considerably. For these reasons it could be argued that these were clearance cairns. On the other hand it would not be practicable to use these very steep slopes as burial sites nor as routes to such sites, so funerary practices would have to take place on the valley floor. In addition it is doubtful if any form of scratch cultivation would have been productive on this ground, so the balance of probability is that this is a cairn field similar to others in the County.

It may be that this route was one of the south-west north-east routes through the hills used by these peoples, as one cairn field at least is known in Peeblesshire near Blake Muir (3032). This is not far from the northern end of the Glen in which this field lies.

2.	NT 073045 RCAM 418	Coats Hill	SC.	10-9/15 ft.	600 South
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The field lies on the Moffat golf course at what is now the junction between the eighth and seventh fairways. A considerable quantity of stone, through the years, has been removed from this area and now lies piled in the rough, so the field may well

have been larger. The remaining cairns are grass covered and appear as humps in the mown fairway.

3.	NT 057018	Stanshiel Rig	SC.	115-12/15 ft.	800
	RCAM 420			46-18/21 ft.	South
			RC.	1-45 ft.	
				1-20 ft.	

The largest cairn field in Dumfriesshire. Grass covered. Dry ground used, wet land nearby avoided. Moderately wide spacing of cairns in places, in others very close together.

Stanshiel Rig "Fort" lies in this field. It is shaped like a very large and sophisticated Ring Cairn. It is unlikely to be a fort having no ditch and being on ground that is closely overlooked. The remains of the wall round the enclosure is seven to nine feet wide at foot: there is no indication of its original height.

4.	NT 051021	East Earshaig	SC.	7-12 ft.	700
	NT 054019			6-18 ft.	South

Grass covered. The first group lies close to the stream in a small valley bottom. The second lies on the slope just west of the Earth work at 055019 (RCAM 402).

5.	NT 039015	West Earshaig	SC.	27-9 ft.	750
				9-12 ft.	South
				4-15 ft.	
			RC.	2-18 ft.	
	NT 045019		SC.	6-9 ft.	

The main field lies close to the road to Kinnelhead Farm and Mainly on the south side. A small group lie immediately north of the road.

There are three scoops with stone backing which may have been structures. They measure 2—15 x 9 ft., 1—18 x 9 ft. (See Serial 23. Watchman Moor).

The other small field lies just west of the West Earshaig enclosures and on the South side of the road.

6.	NT 030013	Kinnelhead I.	SC.	6-6 ft.	850
	RCAM 419			20-9 ft.	S.E.
				5-12 ft.	
				2-18 ft.	
			RC.	1-46 ft.	
	NT 030022		S.C.	2-9 ft.	
				1-18 ft.	

The field runs from just below the cottage at 031015 where there is the ring cairn, to the hill side at 026013. A number of cairns lie beside the road, the bulk of them lie in the field NW of the road to Lochanhead.

7.	NT 030011	Kinnelhead II.	SC.	10-9 ft.	800
	NT 032011			2-12 ft.	South
				8-15 ft.	
				Large oblong	
				50 ft. by 80 ft.	
	NT 029009		RC.	1-48 ft.	
				Large 40 ft. cairn	
				and 2-22 ft.	

The first part of the field lies on the top of the bluff 100 yards SE of the road to Lochanhead. The second lies a further 150 yards East on the other side of a boggy valley. This contains the large oval shaped stone banked enclosure. The banks are 12 ft. thick at base and 1 ft. 6 in. high. The western interior is levelled up. Entrance is at S by W (See Serial 37 Sundaywell and Serial 32 Twentyshilling).

The third group containing the ring cairn lies to the south-west. The ring cairn lies beside the 40 ft. cairn.

All cairns are grass covered and lie on the dry ground.

8.	NT 024004	Lochanhead	SC.	2-6 ft.	900 S.E.
----	-----------	------------	-----	---------	-------------

This small field lies north of the burn and down stream from the wood. Cairns lie on flattish ground from which shallow peat has been dug in recent years. The cairns are small and flat.

9.	NT 024995	Lonnachie Rig	SC.	1-6 ft. 9-9 ft. 21-12 ft. 2-15 ft.	1000 N.E.
			RC.	1-15 ft.	

The field lies on the hillside between two ancient tracks. The site is dry and stony, one of the few places where stone outcrop appears on this hillside. There is much tussocky grass round outside the area of this field.

There is one monument in the field built of loose stone, measuring 36 ft. long by 12 ft. wide by 2 ft. 6 ins. at highest. Another lies about 150 yds. above the field, this measures 27 ft. by 9 ft. Neither of these is oblong, the sides appear to be straight. They look like miniature Long Cairns.

NT 027995	SC.	1-6 ft. 3-9 ft. 4-12 ft.
-----------	-----	--------------------------------

These few cairns lie right on the top of the Rig.

10.	NT 035009 NT 037008	Rough Burn	SC.	9-9 ft. 6-12 ft. 1-15 ft. 1-18 ft.	750 South
-----	------------------------	------------	-----	---	--------------

These lie some 400 yards from the previous field and are in two groups on neighbouring dry ridges.

11.	NT 043007	Kinnelburn Junction	S.C.	3-6 ft. 13-9 ft. 31-12 ft. 10-15 ft.	700 Level
			RC.	8-12 ft. 1-33 ft.	

The field is in three parts and covers a considerable area, mostly on the West side of the Kinnel with a small part on the Eastern side. The part on the Eastern side consists mainly of larger cairns of the 15 ft. variety lying between the Kinnel and 150 yards to the east, around 045009. On the west bank there are two groups. The most northern

stretches down stream from 042009 and westward for about 300 yards. The southern stretches from 043007 South to the Burn Junction and westward across to Rough Burn. Four of the small ring cairns lie in a row close together just south of the Track at 043007.

12.	NT 048000	Meikle Hill	SC.	14-6 ft.	700
	NY 045999			4-27 ft.	to
				32-12/15 ft.	750
					East

Just East of where the track crosses the burn are the 6 ft. cairns, they are very small and flat, close together and grass-covered. West of the burn a cairn field runs uphill westward and broadens out to the north and south. Only dry areas of short grass are used, wet ground and peat is avoided. The occasional single cairn is found outside this field always on a dry piece of ground.

13.	NY 041987	Broadshaw Rig	S.C.	45-15 ft.	900
	RCAM 416		RC.	1-36 ft.	N.W. and
					South

This field is in two groups. The one to the south-west of the Long Cairn, astride the track, includes the large ring cairn and four small cairns. The other lies up hill from these, south and south-east from the Long Cairn and runs over the top of the ridge and on to the southern side. Much of this group appears to lie in line with the continuation of the axis of the Long Cairn.

14.	NY 055989	Knockilsine	SC.	5-9 ft.	850
					East

A small isolated field on an exposed, steep hillside.

GROUP B, KNOCKBRACK:

Parish of Closeburn

These cairns appear to belong to a very isolated community.

15.	NX 930978	Fellend	SC.	2-15 ft.	1000
	RCAM 69			1-30 ft.	South

Grass covered. In cultivated fields. The 30 ft. cairn is 2 ft. high.

16.	NX 936962	Knockbrack	SC.	39-9/12 ft.	900
	RCAM 70			1-24 ft.	West

Grass covered. There is an interesting looking monument at the northern end of this field, which could be a long cairn.

GROUP C, AE:

Parish of Kirkmichael and Closeburn

A large group of cairn fields bordering the upper reaches and tributaries of the River Ae. Here, as in most other groups, they lie on the locally higher ground.

17.	NX 995905	Knockespeen	SC.	RCAM states: "...	900
	RCAM 362			a considerable num-	S.E.
				ber of small cairns	
				varying from 12-	
				20 ft. ..."	

Now covered by the forest of Ae. Lies at the headwater of the Tuppark burn.

- | | | | | | |
|-----|-----------|-------------|-----|----------------------|------|
| 18. | NX 989933 | Craigshiels | SC. | RCAM states: "... | 850 |
| | NX 991934 | | | a number of small | West |
| | RCAM 361 | | | cairns of low eleva- | |
| | | | | tion, which measure | |
| | | | | in diameter 12- | |
| | | | | 15 ft..." | |

Now covered by the forest of Ae.

- | | | | | | |
|-----|-----------|-------------|-----|-------------|------|
| 19. | NX 977947 | Nether Dodd | SC. | 9-12/15 ft. | 850 |
| | RCAM 68 | | | | S.W. |

The field lies on a grassy slope well above the burn. Cairns are well scattered and irregularly placed. There is quite a large level area below the cairn field and comfortably above the burn, which could have been used as a living area.

About the top of the ridge are two large cairns of 32 ft. and 48 ft. diameter. These are referred to in RCAM 73.

- | | | | | | |
|-----|-----------|------------|-----|----------|-------|
| 20. | NX 943917 | Gawin Moor | SC. | 20-9 ft. | 900 |
| | RCAM 75 | | | 1-12 ft. | South |

The field lies up on the plateau. The cairns are small and low in profile.

To the south of the cairn field lie three very large cairns. They are about 50 ft. in diameter and 8 ft. high.

- | | | | | | |
|-----|-----------|-------------|-----|----------|------|
| 21. | NX 933912 | Auchencairn | SC. | 4-9 ft. | 850 |
| | RCAM 346 | | | 2-18 ft. | West |

This small field lies at the headwater of a burn which joins the Clauchrie. A very small field with the two larger cairns robbed. It is said that flints were found here at the beginning of the century.

- | | | | | | |
|-----|-----------|------------|-----|-----------|-------|
| 22. | NX 956874 | Shaws Moor | SC. | 54-9 ft. | 650 |
| | RCAM 365 | | | 12-18 ft. | Level |
| | | | | 3-15 ft. | |
| | | | RC. | 1-15 ft. | |
| | | | | 1-24 ft. | |
| | | | | 1-45 ft. | |
| | | | | 1-48 ft. | |
| | NX 955870 | | SC. | 15-9 ft. | |
| | | | RC. | 1-21 ft. | |
| | | | | 1-36 ft. | |

The main cairn field lies along a dry ridge in the valley close to and above the Duncow Burn. The cairns are flattish and many have been severely damaged. The largest ring cairn lies close to the burn. It is a very fine specimen, well built of medium stones and has an entrance to the south. The next largest lies on the top of a knoll on the ridge not far from the dyke that borders the southern end of the field. Among this part of the field are some low grass-covered stone banks: whether these are of the same period is not known.

The other part of the field lies three hundred yards to the west on a neighbouring dry grassy ridge,

THE SMALL CAIRN FIELDS OF DUMFRIESSHIRE

23.	NX 965876	Watchman Moor	SC.	16-9 ft. 4-12 ft. 6-15/18 ft.	800 East
			RC.	1-16 ft. 1-18 ft.	

This field lies on the Watchman Hill shoulder, to the north of the wood and along the eastern and southern slopes. Cairns are heather covered. Among the cairns are four sites which may be scooped dwellings (See Serial 5 West Earshaig).

24.	NX 966882	Whitestanes Moor	SC.	4-6 ft. 26-9 ft. 19-12 ft. 11-15/18 ft.	800 East
	RCAM 344		RC.	8-12 ft. 7-15 ft. 7-18 ft. 1-48 ft.	

This is a large and varied field where a limited amount of excavation has taken place in recent years.

The field lies around the head of a burn and near the top of the ridge. From the lower ground it appears to be the crest of the hill. The cairns vary a great deal in size and there are a large number of Ring cairns of different sizes. There are in addition three site 80 cairns. Cairns are mainly heather covered, some are grass covered, and some are raw stone.

There is no doubt that this field will repay further study. Four Ring cairns and two small cairns have been excavated.

- (a) Site 1—A large Ring cairn of 48 ft. overall, was excavated in 1962-63 and contained eight cremation burials. One that contained a small Pygmy cup was dated by C. 14 test to B.C. 1360 plus or minus 90⁵.
- (b) Sites 7 and 8—Excavated in 1964 were two Ring cairns of 19 ft. and 24 ft. overall, respectively. In Site 8, no artifacts or structural work was found. In Site 7, no artifacts were found but the centre of the site contained a stone filled pit, 2 ft. deep which was thought to be an inhumation burial.
- (c) Site 201—Small Ring Cairns 12 ft. overall, was excavated in 1964. No artifacts or structural work was found.
- (d) Two small cairns have been examined. In one a piece of chert was found at the old ground level, otherwise neither cairn yielded artifacts or recognisable structural work.
- (e) One "Site 80" type cairn was excavated in 1963¹. The results were inconclusive.

¹ T.D.G.N.H.A.S., XLII., 1965, pp. 58.

25.	NX 971892	Glenmaid Moor	SC.	3-9 ft.	800
	RCAM 343		RC.	11-15 ft.	South

This is an unusual field in that it is mostly composed of ring cairns. They are grass covered and are nicely situated to be exclusive, with a deep cut to the south and a very steep hill-face running away to the west, east and north. The field lies above the head waters of a burn.

26.	NX 977879	Gledenholm	SC.	17-9 ft.	600
	RCAM 347			1-12 ft.	South
	348		RC.	2-12 ft.	

A small field widely scattered in groups. There is the possibility of a large ring cairn of sixty feet near the top of the hill but it is ill-defined.

27.	NX 988882	Moor Park	SC.	4-9 ft.	450 Level
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A very small field of small cairns. There are ancient stone banks possibly forming agricultural enclosures in the vicinity. There is also an ancient road of six-seven feet width.

GROUP D, KEIR HILLS:**Parish of Keir and Glencairn**

Two isolated communities, living on the Keir hills.

28.	NX 862898	Barjarg Moor	SC.	20-9/15 ft.	850
	NX 861894				South
	RCAM 328			1-12 ft.	and East

The field lies on either side of the upper reaches of the Auchenage Burn. There are fifteen on the northern side of the burn and six on the southern. All are heather covered and stand up well. On the southern side also are what appear to be the remains of two large cairns, mostly destroyed.

29.	NX 840895	Crossford	SC.	(a) 28-9/21 ft.	550
	NX 841895			(b) 5-9/15 ft.	South
	RCAM 248				

All cairns are grass covered, some are in cultivated fields. Cairns vary very much in size.

A further group mentioned in the Inventory as being at 836894 lies in replanted woodland.

What may be a chambered cairn lies in site (b) at 841895. It is about thirty-six feet diameter, stone built, with a six foot hollowed space in the centre. It stands some two feet above surrounding ground. There is a possible entrance to the east. The whole is grassed over.

GROUP E, MONIAIVE:**Parishes of Tynron, Glencairn and Sanquhar**

In this group have been put old Auchenbrack and Holmhead Hill which are typical cairn fields, each in its own valley with its own burn, apparently isolated communities. Twenty shilling has been included, being on the same massif and very isolated.

30.	NX 758974	Old Auchen- brack	SC.	10-12 ft. 7-15 ft. 1-21 ft.	800 S.W.
	RCAM 613			This may be a ring cairn.	

The field lies above the junction of the burns where the valley bottom widens out. It is in two parts, the lower consisting of twelve cairns and the twenty-one foot one. The other part is a further one hundred feet up the slope and consists of five cairns. This upper group lies in a small hollow, the lower lies on the steep hillside.

31.	NX 745936	Holmhead Hill	SC.	2-9 ft.	800
	RCAM 244			6-18 ft.	S.W.

Grass covered cairns situated well up the hill above the Dalwhat Water. The field lies beside the headwaters of a small burn which runs down to join the Water.

32.	NS 797057	Twenty-	SC.	6-9 ft.	900
	RCAM 559	shilling		2-12 ft.	N.E.
				4-24 ft.	
				1-24 ft.	
				with outside plat-	
				form,	

Two hundred yards south of the Deil's Dyke and in the area between the Twenty-shilling burn and the one that runs down the slope 300 yards further west of it, lies this small scattered field.

The 24 ft. cairn and its built up, stone marked, outside platform is interesting. The platform is oblong, 51 ft. long by 45 ft. wide. It is levelled up from the surrounding ground and its edge is marked with large stones. It is similar in many respects to the large oblongs mentioned under Serial 37, Sundaywell, and Serial 7, Kinnelhead II.

GROUP F, BOGRIE:

Parishes of Glencairn and Dunscore

This group is much the largest concentration of cairn fields in the county.

It has been divided into three sub-groups:—

(a) Glenesslin burn sub-group. Consisting of the Sundaywell and Bogrie fields.

(b) Jarbrook burn sub-group covering the Girharrow fields.

(c) Craes Hill and Craigdasher sub-group.

The Glenesslin and Jarbruck sub-groups are two of the best examples of the use of the upper waters of streams and burns.

The fields lie not far apart round the Bogrie hill feature. It is more than likely that other fields lay on that part of the north side of the feature which is now forest.

The group lies on the natural West/East routes in this part of the county.

(a) Glenesslin Burn Sub-Group

This sub-group lies round the valley above Bogrie farm. The Sundaywell field lies just outside the valley on the high slopes above Sundaywell farm.

33.	NX 814854	Bogrie I.	SC.	6-6 ft.	750
	RCAM 140			24-12 ft./15 ft.	South
			RC.	1 possible large ring cairn 75 ft.	

Grass-covered cairns, concentrated in a small area of sloping hillside in cultivated fields.

34.	NX 805860	Bogrie II	SC.	5-6 ft.	850
	RCAM 147			30-12/15 ft.	South
				1-18 ft.	
			RC.	1-36 ft.	

A concentrated field on a very rough and very stony hillside. The ring cairn stands on a level platform on the hillside. It is well shaped in plan, of rough construction, typical of this size of ring cairn.

35.	NX 798855	Bogrie III.	SC.	28-12 ft. 12-15 ft. 2-Oval shaped 28 by 12 ft.	800 East
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An untidy group on a very rough, stony and rugged hillside.

36.	NX 807852	Bogrie IV.	SC.	6-9 ft. 1-114 ft. This is Bogrie Fort.	500 East
-----	-----------	------------	-----	--	-------------

The six tidy little cairns lie in the vicinity of what is known as Bogrie Fort (RCAM—140). It looks just like a large ring cairn. A near circular stone bank, two feet to three feet high, encloses a level area of ground with a small cairn near the centre. The entrance is to the east and there is a small cairn just outside. There is no sign of any defensive ditch.

37.	NX 800848 RCAM 146	Sundaywell	SC.	86 mainly 12-15 ft. a few 9 ft. 1 over 21 ft.	800 South
			RC.	1-12 ft. 3-18 ft. 1-24 ft. 1 large oblong -75 ft.	

A large field covering a large area, but cairns are well concentrated in groups. The main cairn field is above the drystone dyke. There is a small field at about 803849, and some ancient banking.

The ring cairns lie on the more level ground between the two fields and below the dyke, though one ring cairn lies above the dyke. The large oblong monument (801848) is levelled up and the edges marked with large stones. It is similar to one in Serial 7, Kinnelhead II., and Serial 32, Twentyshill.

(b) Jarbruck Sub-Group

This lies round the Girharrow Burn, which is the upper waters of the Jarbruck Burn. There are a large number of cairns grouped in fields of varying sizes. Most lie on the southern side of the valley with a northerly aspect, but there are fields on the valley bottom and on the northern side as well. The north-east slopes of the main Bogrie Hill feature are now covered by forest, but it is certain that there were further fields in this area as occasional cairns can still be found in the rides. There is a group of three at 789874.

38.	NX 782875 RCAM 246 247 for this and other Gir- h a r r o w sites.	Girharrow I.	SC.	13-9 ft. 7-18 ft. 4 oblong viz:— 1-22 by 9 ft. 1-30 by 12 ft. 2-18 by 12 ft.	900 North
-----	---	--------------	-----	---	--------------

These lie about six hundred yards S.S.W. from Girharrow Farm, in the heather, on the north slope overlooking the valley.

THE SMALL CAIRN FIELDS OF DUMFRIESSHIRE

39.	NX 779873	Girharrow II.	SC.	2-6 ft. 14-9 ft. 9-12 ft. 6-15 ft. 8-18 ft. 2 oblong 1-27 by 15 ft. 1-21 by 9 ft.	900 N.W.
-----	-----------	---------------	-----	--	-------------

The field lies about one thousand yards S.S.W. of Girharrow Farm in heather. Cairns are spaced very close together and are mainly in the hollows.

40.	NX 774873 NX 773874	Girharrow III.	SC.	2-6 ft. 20-9 ft. 6-12 ft. 1-15 ft.	800 North
			RC.	1-36 ft. 1-21 ft. 1 oblong 21 by 26 ft.	

Part of this field is concentrated on the shoulder of the hill. One of the two ring cairns seems to be oval but otherwise they are typical in general appearance. The other part is situated at the top of the pass.

41.	NX 782880	Girharrow IV.	SC.	4-9 ft.	750 North
-----	-----------	---------------	-----	---------	--------------

This field is two hundred yards west of Girharrow Farm. One cairn is on top of a knoll with a very large stone standing up in it. The knoll has the remains of an ancient stone bank running round on the north, west and south side.

42.	NX 783882	Girharrow V.	SC.	2-6 ft. 6-12 ft.	700 Level
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On a dry hump surrounded by boggy ground two hundred and fifty yards north of Girharrow Farm.

43.	NX 783885 NX 779883	Girharrow VI.	SC.	6-6 ft. 8-6/9 ft.	750 700 East
-----	------------------------	---------------	-----	----------------------	--------------------

These two small cairn fields lie on the southern slopes of Green Craig and Hill Point 1050. The cairns are grass covered.

(c) Craes Hill Sub-Group

This sub-group contains the more western of the Bogrie group. The Craes Hill III. and IV. fields and also the Craigdasher fields lie, typically, above the source of a burn.

44.	NX 766857 RCAM 243	Craes Hill I.	SC.	17-6/9 ft. 8-18 ft. 2 oblong: 1-21 by 12 ft. 1-27 by 12 ft.	950 South
-----	-----------------------	---------------	-----	---	--------------

The small cairns are to all intents and purposes flat. All cairns are grass covered. A small covered stone bank seems partially to enclose the larger cairns and the oblong cairns.

- | | | | | | |
|-----|-----------|----------------|-----|----------|--------------|
| 45. | NX 765852 | Craes Hill II. | SC. | 6-15 ft. | 750
South |
|-----|-----------|----------------|-----|----------|--------------|

The cairns lie four hundred yards north-east of Craes Farm and one hundred feet higher, on a steep slope. All are grass covered.

- | | | | | | |
|-----|-----------|---------------------------------|-----|----------------------------------|-------------|
| 46. | NX 772855 | Craes Hill III.
West of Burn | SC. | 3-6 ft.
17-12 ft.
6-15 ft. | 850
S.E. |
| | | East of Burn | SC. | 14-6/9 ft.
1-18 ft. | |

The cairn field is grouped east and west of the small burn. Cairns are low, grass-covered and difficult to see in summer.

- | | | | | | |
|-----|-----------|----------------|-----|-------------|--------------|
| 47. | NX 774857 | Craes Hill IV. | SC. | 17-9/12 ft. | 950
South |
|-----|-----------|----------------|-----|-------------|--------------|

The cairns of this field are rough and somewhat crudely built.

- | | | | | | |
|-----|-----------------------|----------------|-----|--------------------------------|-------------|
| 48. | NX 799823
RCAM 361 | Craigdasher I. | SC. | 9-6 ft.
7-9 ft.
8-12 ft. | 850
S.W. |
|-----|-----------------------|----------------|-----|--------------------------------|-------------|

- | | | | | | |
|-----|-----------|-----------------|-----|--------------------------------------|--|
| 49. | NX 793825 | Craigdasher II. | SC. | 7-9 ft.
16-12 ft. | |
| | | | RC. | 1-15 ft.
1 oblong:
18 by 8 ft. | |

These two fields are comparatively isolated. They lie at the head of the valley of the Barr Burn, which flows south-west to the R. Urr.

GROUP G: MISCELLANEOUS

The two fields recorded below are not fields of small cairns. They are recorded here because of similarities to monuments found in the small cairn fields.

- | | | | | | |
|-----|-----------------------|----------|---|-------------------------------|-------------|
| 50. | NS 801105
RCAM 558 | Lochside | Oval cairns
mainly
earth with
hollow on
one side. | 25-14 by 7 ft.
1 ft. high. | 750
East |
|-----|-----------------------|----------|---|-------------------------------|-------------|

Lochside contains what appears to be a number of what we have called Site 80 monuments. At present it is not known what these are, but one was excavated in 1963 and is described in T.D.G.N.H.A.S xlii, 1965—pp. 58. Three of these exist in Serial 24, Whitestanes Moor; they have not been recognised elsewhere in the county.

THE SMALL CAIRN FIELDS OF DUMFRIESSHIRE

51.	NY 253992	Raeburnfoot	5-26 ft.	600
	to		5-27 ft.	to
	NY 260004		3-33 ft.	700
	RCAM 197			S.E.

This is a field of earth-banked circles. The earth banks enclose a flat area and are 1 ft. to 1 ft. 6 ins. in height. They look very like the ordinary ring cairn, but built of earth and not stone.

The field lies along the easterly slope of the 898 feature and above the road. None have been excavated in recent years. There are no stone-built cairns or ring cairns in the field or in the vicinity. This is the only example of a field of this type known in the county, but isolated structures of this type are known.

² T.D.G.N.H.A.S., XLII, 1965, pp. 51.

³ T.D.G.N.H.A.S., XLIV., 1967, pp. (this issue).

⁴ Cairn Field at Alnham. Arch. Ael., Vol. XLIV.

⁵ T.D.G.N.H.A.S., XLII., 1965, pp. 51.

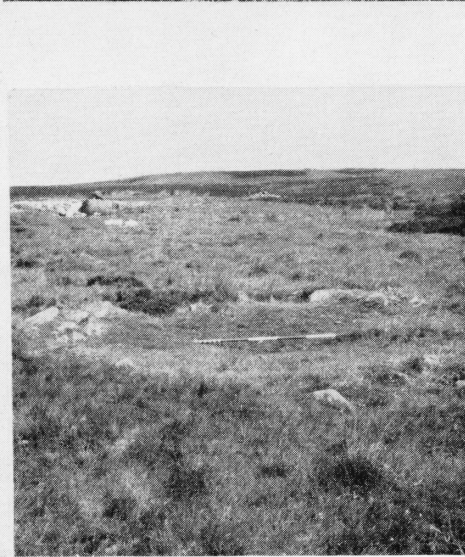
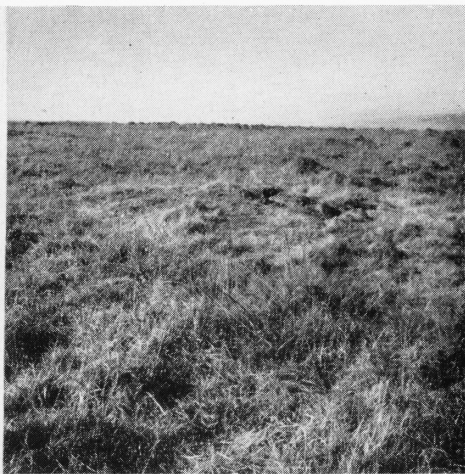


Plate XI.—Some typical cairns in Dumfriesshire. Top left, small cairn, Bogrie I; top right, small cairn, 6 ft., Craes I.; bottom left, ring cairn, 36 ft., Bogrie II.; bottom right, ring cairn, Whitestanes Moor Site 7.

WHITESTANES MOOR

(Ring Cairn Sites 7 and 8)

By Major General J. SCOTT-ELLIOT

F.S.A.Scot.

Following the excavation of the large Ring Cairn, Site 1, on Whitestanes Moor in 1962/63, (TDGNHAS, xlii, 1965, pp. 51) two smaller Ring Cairns were excavated in 1965. These lie within 100 ft. of Site 1, and are similar in shape to it but less sophisticated in construction.

In one, Site 7, what is thought to be an inhumation pit centrally placed, was found. In the other, Site 8, no signs of inhumation pit, or cremations was found.

We thus have in close proximity to each other, Site 1, a known enclosed cremation cemetery dated to about BC 1360, Site 7 with a central inhumation pit, and Site 8, with no recognisable purpose. There are a number of other ring cairns of similar size to Sites 7 and 8, excavation of some of these is now necessary in an effort to establish their purpose and date.

Site 8. Map Reference NX 967883. (Fig. 1).

This Ring Cairn was excavated in late May, 1965. It stands at about 800 ft. on Whitestanes Moor in heather and grass country. It is 90 ft. East of Site 1, and 20 ft North of the similar sized Ring Cairn, Site 7.

It consists of a circular stone bank round a fairly level but stony enclosure. During excavation much of the stone bank was uncovered and it was sectioned in two places. The whole of the interior was excavated down to two feet. No burials or cremations were found and no structural remains identified.

The Stone Bank.

In structure, the stone bank is very similar to that of Site 7, but better built and more massive. It is also broadly similar to that of Site 1, though not nearly so well made and very much smaller. It consists of a collection of stones of all sizes from 4 ins. to 12 ins. and more, thrown up to form a bank, 7 ft. wide at base and 1 ft. 6 ins. in height. At the eastern and downhill side the bank is wider at base than at the western and uphill side.

The bank forms a near circle, but is somewhat egg-shaped. It is 24 ft. overall in diameter, the interior width is 9 ft. 9 ins.

Sections were cut in two places but nothing remarkable was found in the structure, nor on the ground underneath.

There appeared to be no entrance.

The Interior.

After the turf and the heather had been removed it was found that the surface of the interior was covered by a layer of small stones, 8 ins. or smaller, lying loosely on the surface. Projecting through these were a large number of larger stones bedded in the soil, some very big and deeply set.

The surface was so rough that it is unlikely the interior could have been used as a floor for habitation. In this way it is similar to Site 7. Site 1 differed in this respect, there the surface was mainly smooth and only a few stones projected markedly and there was no clutter of small loose stones.

In a number of places scatters of carbonised wood were found at a depth of 5 ins. to 8 ins. below the surface. Some pieces were of small diameter but some were larger than heather stems. In three places small areas of ash at 8 ins. to 12



Fig. 1—Plan of Site 8, with section above

ins. depth were found. It was thought at first that this was signs of ceremonial burial, but it is more likely to result from burnt surface vegetation and worm action on it. Worms were however remarkable by their absence on this site!

In the eastern half of the interior the subsoil consisted of hard packed small stones and earth. Peat staining had penetrated much of this area and it was thought that some part of this area could have been disturbed, but there was no identifiable pit.

The Western half was sandy and stone free and gave eventually onto clean undisturbed white sand at 2 ft. In this area there were the remains of a number of roots about 1 ins. thick.

There was no sign of staining other than peat staining in either half, nor was there any sign of an occupational level.

The only possible structural remains in the interior was a line of stones lying well together across the centre on the East/West axis. Some were quite large stones, many of which were showing when the turf was first lifted, the bottom of some of these lay as deep as 12 ins.

Discussion.

The interior of the site was carefully examined for cremations, burials and structural remains. Nothing identifiable was found.

It is certain that there was no cremation burial of the type found in Site 1. The site could have been used for some ceremonial purpose, but there is no evidence of this. There are no post holes and this coupled with the extreme roughness of the surface is thought to preclude any form of building used for living and storage purposes.

Two alternatives remain. Either some form of extended surface burial was used, with a very thin covering of stones, or an inhumation pit was missed in the excavation.

In view of the results of the later excavation of Site 7, which is so similar and so close, it would be reasonable to expect an inhumation burial here too. It might be that the more usual form of pit, filled only with stones, was not used. The body may have been placed in the soft sandy end of the site in a pit which was refilled with sand, or it could have been in the peat stained area. In neither case would any signs of the body now remain in the very acid soil.

The solution to the problem lies in the excavation of other sites of this nature.

As regards date, little can be said. The site resembles and is close to Site 7, the probability is that it is of similar date.

Site 7. Map Reference NX 967883. (Fig.2).

This Ring Cairn is similar in type and size to Site 8, and lies 20 ft. South of it. Site 1 lies 90 ft. to the West of it.

Before excavation it appeared to be about 18 ft. overall, consisting of a stone bank enclosing a hollowed centre area. At the eastern end, close up to but within the encircling stone bank, was a small mound on which the grass differed in texture from the rest of the covering.

The excavation revealed a surrounding stone bank, 19 ft. in diameter overall, slightly egg-shaped in plan and a very stony interior with a stone-filled pit in the centre 2 ft. deep.

No artifacts or identifiable remains were found in the pit or on the site.

Stone Bank.

The type of stone bank surrounding the site is typical of these monuments in this county. A collection of stones, large and small were thrown up into a rough bank 3 ft. 6 ins. at base and about 1 ft. in height, the overall diameter being

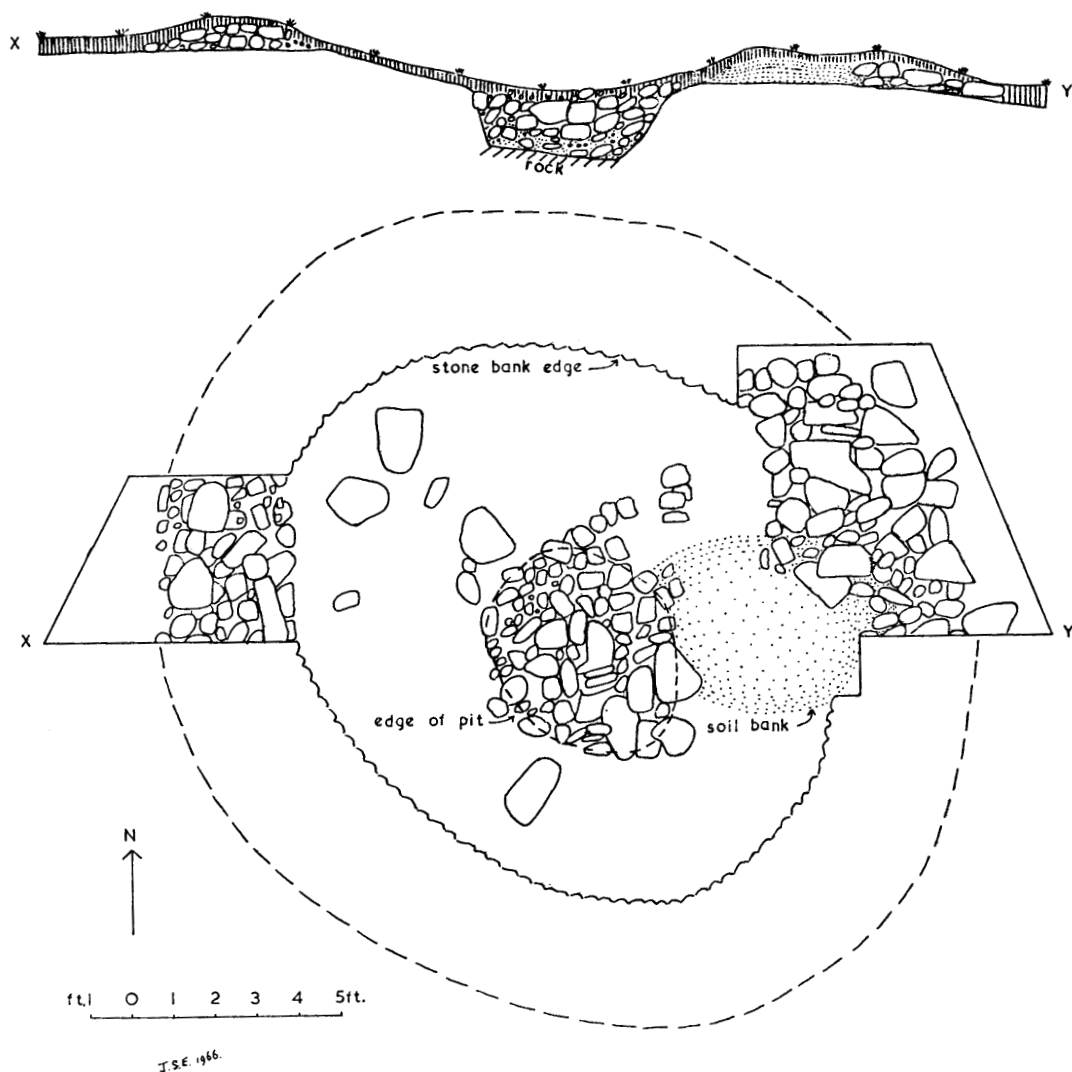


Fig. 2—Plan of Site 7, with section above.

19 ft. and the interior 12 ft. The plan is slightly egg-shaped, the centre line running about North by West to South by East.

The bank on this site is more roughly put together than that on Site 8.

The Interior.

After the turf had been removed, the interior was found to be very stony and covered with a layer of small stones and chips, quite unlike the outside surface under the peat. In the centre was found a stone-filled pit, the spoil from which had been thrown up to form a soil mound to the east, between the edge of the pit and the interior of the stone bank. Some of this soil lay under the stone bank, apparently preceding it.

Though the rest of the interior was searched carefully, no artifacts or other constructional work was found.

The declination of the site is 1/20 ft.

The Pit.

The pit is egg-shaped in plan, 5 ft. by 4 ft. 6 ins., the centre line running similarly to that of the site. It is 2 ft. deep. The bottom is on the smooth natural rock. On the bottom lay 8 ins of small stones and earth, above this level it was entirely stone-filled. Stones varied in size from small to large, some being over 12 ins. diameter. The top of the stone filling was markedly hollowed in the centre. No sign of staining was found at the bottom nor at any level. There were no artifacts. The sides of the pit were rough cut, not cleanly cut, as has been found in other places, but it is unlikely that pit sides in soil of this type, which is loose yellow earth and stony, would stand for long with a clean cut appearance.

Discussion.

Because of the relationship of the soil heap with the surrounding stone bank it seems likely that the sequence of events in the construction of the site was.

Digging of the pit.

Filling of the pit.

Construction of the surrounding stone bank.

then later, due to the rotting of the contents of the pit the centre of the stone filling sags. The problem is, what was the contents. Had this been vegetable, it is more than likely that some coloured matter would have remained. As there is none, it would seem fairly safe, in this case, to assume that this is an inhumation burial. The size of the pit is suitable; one of the excavators, a man of about 5 ft. 8 ins., fitted in nicely, lying on his side with the knees up to the chin, there was then about 6 ins. between the higher portion of the body and the level of the top of the pit. With the amount of stone which was in the pit piled on the body, the result might have been a slight mound. With decomposition this mound would disappear and instead a sag could form.

There is no means of dating the site accurately, but if it is accepted that its purpose is for inhumation burial, then because of this and the comparative crudeness of construction, it is possible that it might be of different period from its near neighbour, Site 1, dated by C.14 test to around B.C. 1360.

A HIBERNO-NORSE PENNY OF DUBLIN FOUND IN WIGTOWNSHIRE

By R. H. M. DOLLEY, M.R.I.A., and W. F. CORMACK, F.S.A. Scot.

Finds of Hiberno-Norse coins from Great Britain are notably rare. One penny is believed to have been found at the mouth of the Cheshire Dee, but this singular paucity of finds from England can plausibly be explained as the fruits of reiterated legislation by the tenth and eleventh century English kings on the subject of foreign coins.¹ Their currency was prohibited, and an analysis of coin-hoards shows that the ban was almost completely effective. From Man, of course, some hoards are known, but the exiguous position as regards coin-hoards, and to a lesser extent single-finds, in Scotland is set out definitively in the magisterial introduction to Mr R. B. K. Stevenson's recent *Sylloge* fascicle embracing the Anglo-Saxon pennies preserved in the National Museum of Antiquities of Scotland at Edinburgh.² One solitary Scottish hoard, that from Inch Kenneth which we may suppose to have been concealed just about the year A.D. 1000, is on record as having contained Hiberno-Norse coins, and then only four or five or so pieces of just the first two coinages, and these apart there are only a half-dozen or so Hiberno-Norse coins known to the writers which could conceivably have been found in Scotland.

The explanation of the absence of Hiberno-Norse coins from Scotland is doubtless the observed fact that after c. 1000 the Vikings of the Isles very rapidly relapsed into coinlessness.³ All three eleventh-century hoards are from eastern Scotland and appear to be connected with Cnut's operations against the Scots or Norway, and it has recently been remarked that there are no coin-hoards from Western Scotland and the Isles which can be associated with the great slaughter of the Northmen at Clontarf, the simple explanation being that they had no coins to conceal on their crofts before going off to fight the wily Sihtric Silkbeard's battles.⁴ In the tenth century the Vikings of the Isles had been users of coin, but the mint of Dublin did not open until c. 995, and so was too late on the scene to meet a demand which until 980 seems in fact to have been filled more than adequately by the English mint at Chester.⁵

The West Coast of Scotland, however, forms the natural highway between Ireland and Norway, and it is known from Scandinavian coin-hoards that a small proportion of Hiberno-Norse coins did find their way to the Baltic, though after c. 1010 there was a marked diminution in a flow which at the best of times had been little more than a trickle. Accordingly any evidence that

1 Cf. most recently R. H. M. Dolley, "Sven Estridsen-Mont Fundet i London 1872," *Nordisk Numismatisk Unions Medlemsblad*, 1962, pp. 133-135.

2 R. B. K. Stevenson, *Sylloge of the Coins of the British Isles*, National Museum of Antiquities of Scotland, Edinburgh: Part I—Anglo-Saxon Coins, London, 1966, pp. xvi, xix, etc.

3 R. H. M. Dolley, *Sylloge of Coins of the British Isles: The Hiberno-Norse Coins in the British Museum*, London 1966, p. 37.

4 *Ibid.*, p. 38.

5 R. H. M. Dolley, "The 'Lost' Hoard of Tenth-Century Anglo-Saxon Silver Coins from Dalkey," *Journal of the Royal Society of Antiquaries of Ireland*, XCI, 4(1961), pp. 1-18.

Hiberno-Norse coins passed across the North Channel is welcome in the extreme, and we are indeed grateful to Mr J. G. Scott, the Curator of the Department of Archæology, Ethnography and History at the Glasgow Art Gallery and Museum, for permission to publish here a Dublin penny with an attested Scottish provenance. The coin in question came to the Museum with the Ludovic M. Mann collection (registration no. '55-96 lw), and p. 865 of the more than fifty-year-old *Catalogue of the Scottish Exhibition of National History, Art and Industry* (Glasgow 1911) tells us that it was found at Whithorn in Galloway, the ancient Candida Casa. Unfortunately we are given no details concerning the precise date or circumstances of the discovery, but one may wonder whether the Bute excavations of St. Ninian's Church c. 1900 could not provide the answer.

Again through the kindness of Mr J. G. Scott, the coin is illustrated here by enlarged direct photographs (Plate XII). It is an imitation of one of the *Crux* pennies of Æthelræd II, the prototype being dated to the first half of the last decade of the tenth century, and probably to the sexennium Michaelmas 991 to Michaelmas 997. The apparently meaningless obverse legend runs:—

+ F I L V D N + R T - O X

whereas on the original it should be:—

+ ÆÐELRÆD REX ANGLOR X.

In the same way the only less obscure reverse legend reads:—

+ F O L D F O R L O -

but here it is not possible to suggest the wording of the original as Anglo-Saxon pennies had a wide variety of reverse legends which included the name of the moneyer, the man responsible for its quality, and also the name of the mint. Since there were at this time something like seventy mints, and since the largest mints might have a score or more of moneyers at any one time, it will be understood that the variants of reverse legend in any one type run into hundreds and in some cases thousands. The weight of the coin from Whithorn is 1.505 grammes or 23.1 Troy grains, and the metal gives the impression of being a tolerably fine silver. The diameter is 20 mm.

As an imitation of an English penny the coin from Whithorn is by no means unsuccessful. There is little about the draped, bareheaded, profile bust on the obverse to suggest that the coin is not in fact from official English dies, though on the reverse the eye accustomed to such niceties at once is arrested by the circumstance that the letters in the angles of the voided short cross of the reverse type read C-R-+-V instead of C-R-V-+. Nor, too, are the letters of the main legends all that badly formed. A useful analogue is afforded by a coin in the British Museum from the 1834 Inch Kenneth hoard (no. 15 on Plate I of the recent *Sylloge*) which has the literate if obscure reverse legend

+ MORDVNTNOFY. Unfortunately it has not been possible to find an actual die-link with any coin in the British Museum, nor with any coin in the collections of the Royal Irish Academy at the National Museum in Dublin. The last is particularly disappointing since in the early 1840s the Academy was able to acquire from the estate of Dean H. R. Dawson of St. Patrick's Cathedral a very substantial parcel of relevant coins from the Clondalkin hoard from just outside Dublin discovered in the early 1830s. For all this, there are affinities between the new coin from Whithorn and pieces of certain Dublin provenance which leave no room for doubt that the former is Hiberno-Norse.

There remain the problems of the date of the coin and of its loss. A *terminus post quem*, for both, of course, is afforded by the introduction of the *Crux* type in England, and there can be few who would date that event more than a year or two on either side of the generally preferred date of 991. How much later we should date the earliest of the Dublin imitations is not perhaps quite so easy to determine. Since, however, there is a certain amount of evidence that the immediately succeeding *Long Cross* type from England was being copied in Dublin before the millennium, and that *Crux* imitations by then had been abruptly discontinued, it may seem unlikely that the Sylloge estimate of c. 995 for the introduction of coinage at Dublin is wide of the mark by more than a year or two. If anything it is perhaps late rather than early, and an estimate of c. 995 for the imitative coin from Whithorn is probably acceptable in all the circumstances.

What is needed now is a detailed study of all the *Crux* coins of Dublin, some of them with legible and also intelligible legends which include the name of Sihtric and that of the mint, and others, such as the Whithorn coin, where the inscriptions are entirely blundered and apparently senseless. The total number of such coins probably does not amount to one hundred, and may well be considerably less. Many can be shown to derive from the Clondalkin hoard, and most of the remainder can be assumed to have the same provenance. Thirty-six are in the National Museum at Dublin, fifteen in the Ulster Museum, and a score in the British Museum, and we know of no other collection which contains more than the odd specimen. Only two or three are from Scandinavian hoards, and of these one has the significantly early Igelösa provenance.⁶ The other recorded findspots are Knockmaon near Dungarvan in Co. Waterford (two coins in a hoard).⁷ Inchkenneth in the Hebrides (likewise two coins in a hoard),⁸ and now Whithorn in Galloway, a single-find. Such a distribution is, of course, entirely consistent with the mint being Dublin, an important consideration in view of the fact that quite a number of the Clondalkin coins appear to imitate pieces of York, at least where the mint-signature is con-

⁶ R. H. M. Dolley and F. Elmore Jones, "An Intermediate 'Small Cross' Issue of Æthelræd II and some Late Varieties of the 'Crux' type," *British Numismatic Journal*, XXVIII, 4(1955), p. 77.

⁷ Dolley, *Sylloge* (supra, p. 122), n. 3), p. 57.

⁸ *Idem*, *ibid.*, p. 58.

cerned.⁹ Since, however, York coins of *Crux* type are relatively common, and since it is well-known that Hiberno-Norsemen were a continuing element in the population of York in the tenth and eleventh centuries, too much importance should not be attached to such imitations. Much more interesting, in point of fact, is the phenomenon that a Dublin coin of this class should present us with a tolerably faithful rendering of the reverse legend of a penny of the Watchet moneyer Sigeric.¹⁰ Watchet was a very minor port on the Bristol Channel, and it is only a mint not too far removed and situate on the opposite coast of the Irish Sea that plausibly could be expected to imitate so rare a coin.

The coin from Whithorn, then, has proved to be a useful addition to our knowledge of the first coinage in Ireland. It may also be thought significantly to augment our understanding of what was going on in the Irish Sea at a period when more conventional historical sources are largely silent.¹¹ How little attention, for example, has been attached by English historians to the statement that the naval force which ravaged Wirral in 980 was "*fram North*"!¹² Is it only a coincidence that the latest coins found with the skeleton of a Viking in a bog deep in the Irish Midlands near Mullingar are analogous in date with the latest in a hoard from Iona which it is almost impossible not to associate with a 986 sack of the monastery recorded in the *Annals of Ulster*?¹³ What we forget at our peril is that in the tenth century the Irish Sea was constantly traversed by the ships of the Ostmen—and conceivably by those of the Irish as well. Not all these comings and goings were warlike, and there is numismatic evidence that there was commercial intercourse between this area and Normandy both in the tenth and the eleventh centuries. It is only, though, when every last piece of evidence has been ferreted out and fitted into the pattern that it will be possible for us to form an accurate impression of the picture as a whole. Just how exiguous is the available material can be gathered from the totality of Viking Age coin-finds from the whole of Galloway. For the three centuries c.800-c.1100 there is just the odd copper styca from the middle of the ninth century found on Glenluce Sands,¹⁴ the curious conglomeration of stycas and ninth-century silver pence aggregated to a hack-silver hoard from Talnotrie on the road from New Galloway to Newton-Stewart,¹⁵ and now, a whole century later in date, the Hiberno-Norse penny from Whithorn.

9 J. Lindsay, *A View of the Coinage of Ireland etc.*, Cork, 1839, Table 4, nos. 58-60 and 66-70 (coins by moneyers Fastolf and Asctel, names peculiarly associated with the York mint), and nos. 74-76 (coins apparently reproducing the York mint-signature).

10 *Ibid.*, no. 77, cf. W. O'Sullivan, *The Earliest Irish Coinage*, Dublin, 1961, Appendix, no. 2.

11 Evidence for Norse or Gail Gael settlement in Galloway has been fully discussed mainly from the aspect of ecclesiastical sculpture by W. G. Collingwood in these Transactions VII, 1919-20, p. 205 and X, 1922-3, p. 205, and more recently by C. A. Ralegh Radford also in these Transactions XXVII, 1948-49, p. 97.

12 C. Plummer and J. Earle, *Two of the Saxon Chronicles Parallel*, Oxford, 1952, vol. I, p. 124: cf. D. Whitelock, *The Anglo-Saxon Chronicle*, London, 1961, p. 80.

13 R. H. M. Dolley, "New Light on the Mullingar Find of Hand Pence of Aethelraed II," *British Numismatic Journal*, XXXVI (1967) in the press.

14 Stevenson, *op. cit.*, p. xix.

15 *Ibid.*, p. xxii.



Plate XII.—Hiberno-Norse Penny found at Whithorn (Enlarged about four times)
(Photo R. Roddam).

A MEDIÆVAL IRON SMELTING SITE AT MILLHILL, NEW ABBEY

By JAMES WILLIAMS, F.S.A.Scot.

Bloomery sites have been known in the Mabie/Kirkconnell area near New Abbey for many years. The site at Millhill was probably first mentioned in a paper read to the Dumfries and Galloway Natural History and Antiquarian Society by Patrick Dudgeon of Cargen¹.

Upon visiting Millhill farm a small oval heap beside a stream was pointed out by Mr Riddick, the farmer, as a place from which heavy slag-like material had been obtained during ploughing. The soil surrounding this heap was filled with many small fragments of tap-slag. The site promised to be of interest since none of the S.W. Scottish bloomery sites has ever been excavated and no accurate estimate of their age been made.²

THE SITE

The site on Millhill Farm (Grid. Ref. NX96306710) consists of a roughly oval, partially ploughed-out heap approximately ninety feet long by thirty five feet wide, and probably between two and three feet deep. The base of the heap is on a slight slope on the South bank of a small stream and about two and a half

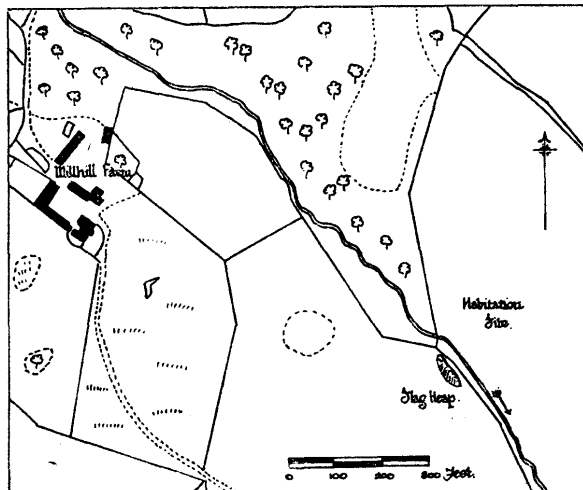


Fig. 1—Millhill Smelting Site location plans. Based with permission on the Ordnance Survey 6 in. sheet.

¹ This paper was never published in the Society's Transactions, but Dudgeon himself had it printed privately in 1871—"Ancient Smelting Places in Troqueer"—unfortunately no copies of this paper appear to be known. Mention of many of Dudgeon's bloomery sites is made in "Lands and Their Owners" by P. H. M'Kerlie.

² There is no record of finds, apart from slag, from the Dumfries and Galloway bloomery sites except a passing mention in a paper by Patrick Dudgeon. In this paper he makes reference to "Roman" pottery from Martingirth, New Abbey; however, due to the confused dating techniques of the mid-Victorian period, this material was probably mediæval. See "Linarite in Slag," Min. Mag., No. 22, 1982.

feet above normal water level. About 100 feet to the north a freshly ploughed field yielded a scatter of mediæval pottery—the bulk of this material was from the top of the slope representing the 100 foot contour (Grid. Ref. NX96346705) and probably represents a habitation site associated with the slag-heap.

THE EXCAVATION

The excavation of this site merely took the form of an exploratory trench some four feet six inches wide by fifteen feet long, at right-angles to the main axis of the heap. Excavation revealed the original edge some nine feet to the South of the present visible edge. Within this nine feet the slag cover increased from nil to about sixteen inches. The slag covered an originally flat surface and its removal yielded a simple hearth some two feet in diameter and about nine to eleven inches deep surrounded by a structure of set stones—the stones of this structure were laid on a mixture of charcoal and slag and were therefore assumed to be secondary to the hearth which was built directly into the old soil level.

FINDS

Slag and Cinder.—Abundant quantities of tap-slag were recovered—many pieces showing impressions of twigs, leaves, etc. Many of the samples, especially those of a larger size, were found to have a rounded base which was generally covered with burnt clay—these possibly indicate clay basins constructed to catch molten tap-slag. Several samples of spongy cinder showing impressions of wood fragments were also found.

Fused Clay.—As the hearth was being excavated many of the spaces between the stones were found to be filled with a fused clay which showed a beautiful yellow-green glaze not unlike the lead glaze found on mediæval pottery. The presence of this fused and glazed clay indicates that reasonably high temperatures were achievable in the hearth although it was of a simple type.

Granite Smoother.—Immediately below the grass roots and above the slag layer proper, a small rounded pebble of buff-stained granite was found. This pebble was 1.1 inches in diameter, 0.4 inches in thickness, with a slightly concave base. The exact use of this object is unknown but it may have been utilised as a smoother or a playing man.

Sandstone (?) Smoother.—A small fragment of red sandstone—seven inches by three and a half inches—was found among the set stone around the hearth. The use of this fragment is unknown but it may have been used as a smoother.

Charcoal.—Charcoal was found throughout the heap mixed intimately with the slag—occasional pockets of pure charcoal were also found. (See appendix).

Pottery.—The ridge top representing the 100 foot contour in the field to the North of the slag heap yielded a scatter of mediæval pottery. This pottery was in general a very coarse ware possessing only minor amounts of pale yellow to green lead glaze—all the fragments were in an advanced state of corrosion and this is probably due to regular ploughing of the soil over many years. One small

fragment of wall is of a much finer ware and may represent a casual loss at some later date than the bulk of the material. By comparison with other material this pottery could be dated to 1250-1300.

All the finds mentioned above are now in the Dumfries Burgh Museum.

LITERARY EVIDENCE

South-West Scotland is unfortunately virtually devoid of any literary references to industrial activities in the earlier mediæval period when much of the land around New Abbey was under Church control. However the charters of Holm Cultram Abbey in Cumberland give several references to the New Abbey area. Almost all of these references are to grants made by the de Kyrkconnuels in the 1200's and the following is included:

"Andrew f Robert f Symon de Kyrkconnuel confirms to Holm Abbey the land between Pollechos and Grenesyke, and half the moss between the same bounds, as in the charter of William f Michael de Kyrkconnuel. He wishes the monks to have a suitable and sufficient place to put their "mina" on his land above the shore; the place to be enclosed with a hedge or by building a house, as they may think fit. Also rights of way to Mayby by roads and paths from landing-places on the Nid."³

(Dated by comparison with other information: c. 1276.)

This reference is of interest because although the charters and grants to Holm Cultram Abbey normally specified iron-working when such sites are mentioned this "mina" (? quarry) may in fact represent the source of the iron ore used at Millhill. The chances that the "mina" signified a source of building stone or gritstone—for millstones and querns—are probably not very great as no suitable outcrops of these materials occur in the immediate neighbourhood of Kirkconnell.

CONCLUSIONS

This smelting site at Millhill, New Abbey, is of small size with small, simple

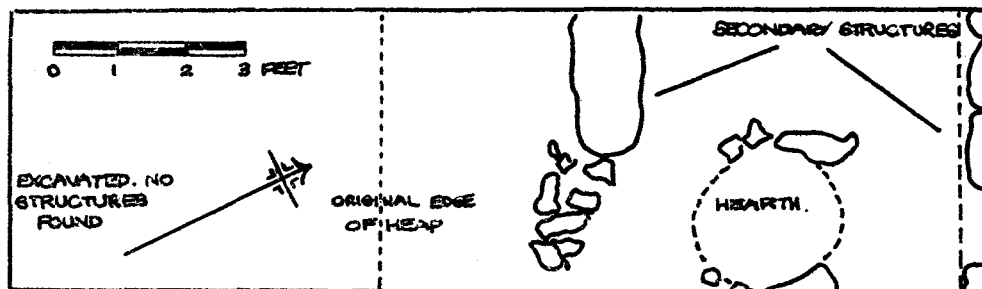


Fig. 2—Millhill Smelting Site, plan of excavated area.

³ Register and Records of Holm Cultram, Cumb. and West Ant. Soc., 1929, p. 57, No. 150.

hearth within the heap of slag. With respect to the position of the hearths and the location beside the small stream the site is a close parallel to one excavated at Springs Bloomery, near Coniston Hall, Lancashire, by H. S. Cowper in 1897.⁴ Although no datable finds were recovered from the heap itself it is felt that the habitation site on the North side of the stream was closely connected with it. The site could be dated, by the pottery found, to around 1250-1300—this would compare well with the Coniston site and the somewhat meagre literary evidence. The raw materials were very probably local in origin and indeed suitable supplies of low grade ore—high quality ore would probably not be used as it requires much higher temperatures and is correspondingly more difficult to smelt—are available at Craigend and Mabie. The site therefore appears to have been a small rural (?) family unit which was probably only worked occasionally as the need arose. A tentative dating of 1200-1300 is probably applicable to this site and to others of a similar nature in the area.

ACKNOWLEDGMENTS

The writer wishes to thank Messrs Riddick, of Millhill Farm for their permission to excavate; Mr A. E. Truckell of Dumfries for help in the field and discussion of the finds; and also Professor R. F. Tylecote of Newcastle University for his interest in the site.

APPENDIX A

Smelting sites of Mediaeval Date in Dumfriesshire and Galloway

DUMFRIESSHIRE

Blacketlees, Annan. Nat. Grid. Ref. NY189687. Near the S.W. corner of this 5th-6th century site there is an extensive area of iron slag—of unknown date but very possibly of a later date than the main site.

Wauchope Bridge, Langholm. Nat. Grid. Ref. NY356845. During the excavation of the late mediæval pack-horse bridge, bloomery waste was found to be incorporated within the causeway—associated with a single fragment of 14th-15th century pottery. *Discovery and Excavation*, 1965, P. 19.⁵

Tynron Doon, Penpont. Nat. Grid. Ref. NX819939. Excavation in the 6th-7th century rubbish spread and examination of the scree below the Dark Age site has yielded samples of iron, bloom, cinder, and some (?) vitrification. *D. & E.*, 1965, p. 18.

Capel Rig, Closeburn. Little appears to be known of this site but the ridge of Capel Rig bears many cultivation banks and traces of buildings. The finds so far, an axe and a horse-shoe, would fit the 11th-12th century. One bloom only has been found. *D. & E.*, 1962, p. 28.

Bankhead, Kirkconnel. Nat Grid. Ref. NS747118. During excavation of this rectangular site—identified from aerial photographs and thought to be Roman—the only datable finds were fragments of glass and 15th century pottery associated with iron slag. *D. & E.*, 1963, p. 27.

Old Irvine, Langholm. Small slag heaps (the largest 9 feet long by about 3 feet deep) were found in 1911 on Burian Hill, which lies about $\frac{1}{4}$ a mile from the farmhouse of Old Irvine. The samples seen appear to be mainly tap slag. See "Langholm as it Was" by J. & R. Hyslop, p. 87 (1912). Also *D. & E.*, 1961, p. 30.

⁴ See *Trans Cumb. and West Ant. Soc.*, Vol. XV, Part 1, p. 211.

⁵ All future references to *Discovery & Excavation* are abbreviated to "D. & E."

Solwaybank. Slag was obtained from a distinct heap which was disturbed during cultivation. D. & E., 1961, p. 30.

Kirkpatrick-Fleming. Nat. Grid. Ref. NY276700. A field on the farm of Kirkpatrick, ploughed for the first time for many years in 1962, yielded approximately 50 lbs. weight of bloomery waste—a single fragment of painted mediaeval pottery was also found. D. & E., 1962, p. 27.

Hopsrigg, Westerkirk. During ditching operations in 1881 an ingot of iron was found—no associated finds. Presented to the Royal Scottish Museum through Patrick Dudgeon.

Dinwoodiegreen, Applegarth. Two bun-shaped ingots were recovered from the ditch of the mediaeval enclosure during roadworks in 1959.

KIRKCUDBRIGHTSHIRE.

Butterhole, Troqueer. Nat. Grid. Ref. NX952705. This site was described by Patrick Dudgeon as "an extensive smelting place for iron"—the exact location is at present unknown. "Lands and Their Owners" by P. H. M'Kerlie. Vol. 5, p. 228.

Martingirth, Troqueer. Described as a lead smelting site—location at present unknown. Min. Mag. 1882, No. 22, "Linarite in Slag" by Patrick Dudgeon.

Woodside, Troqueer. Lead smelting site—no details of site or location known. M'Kerlie, Vol. 5, p. 222.

Dunrod Moated Manor. Nat. Grid. Ref. NX699459. Two seasons excavation yielded samples of pottery with slag, animal bone, and iron—no concentrations of slag were encountered. D. & E., 1965, p. 25.

Livingstone House, Balmaghie. Nat. Grid. Ref. NX714677. Bloomery waste has been recovered from a point just north of Livingstone House where the river has uncovered a deposit in the bank. D. & E., 1961, p. 36.

East Preston, Kirkbean. Nat. Grid. Ref. NX958558. Specimens of slag have been obtained from fields adjacent to the farmhouse—associated with a little late mediaeval pottery.

Polmaddie, Dalry. A sample of cinder showing tong-marks has been recovered from the mediaeval village site.

Mote of Mark, Rockcliffe. Nat. Grid. Ref. NX845540. During the excavation under Alexander O. Curle in 1913-14 samples of haematite, slag, limestone and crucible fragments were found in association with a hearth. Stone moulds and indications of glass and bronze smelting were also found. Dark Age date. P.S.A.S. 1913-14, pp. 125-168.

Sweetheart Abbey. A small bun-shaped bloom, approximately 3 inches in diameter, was recovered during gravedigging in December 1966. This is probably of Dark Age date and related to the marvered glass beads (2) found during last century.

Carlingwark, Castle-Douglas.

1. During the draining of the loch in 1765 iron "horse-shoes" and evidence of smelting and the working of iron were found. O.S.A. Vol. 8, p. 305.

2. Nat. Grid. Ref. NX760613. During the construction of the Military Road masses of ash, cinder and bloomery waste were found near the S.-W. corner of the loch. N.S.A. Vol. 4, p. 159.

WIGTOWNSHIRE.

Luce Sands.

1. **Flint Howe.** Hearths approximately 36 by 32 inches were excavated in 1948. A sample of slag was also found with fragments of a Bronze Age urn suggesting the possible utilisation of urn fragments as crucible material. P.S.A.S. 1951-52, Vol. 86, p. 55.

2. **Luce Sands area.** Reports indicate a general scatter of iron slag, with a little

bronze slag, throughout the sand dunes. Iron blooms, associated with baked clay, are reported in D. & E., 1962, p. 49.

S.-W. Scotland. The following references to iron smelting are made in Palace of History—Scottish Exhibition of National History, Art and Industry, Glasgow (1911)—Vol. II., p. 865.

1. "Collection of Twyers or thick pottery discs, with large central perforation, used in Galloway between 850 and 900 A.D. in a bloomery or iron furnace as a non-inflammable extension to the bellows' nozzle as it entered the furnace. Lent by Ludovic M.L. Mann."

2. "Iron furnace debris, slag, wood charcoal, spinning whorls, heads of bronze pins, and belt-tab, with interlaced decoration, found together in S.-W. Scotland (possibly Luce Sands). Late 9th century. Lent by Ludovic M.L. Mann."

APPENDIX B

CHARCOAL SAMPLES FROM MILLHILL

By M. E. RANSOM

Sub-department of Quaternary Research, Botany School, Cambridge University.

Samples of charcoal were submitted through A. E. Truckell, Dumfries Burgh Museum, for identification. The pieces of charcoal were studied by making a "clean break" surface which could then be examined under a low power microscope. On a preliminary examination the samples were divided into four groups, labelled A-D. The size of the charcoal ranged from pieces about 1 in. square to extremely small pieces which could not be identified because the arrangement of vessels and rays could not be seen. The identifications were based mainly on the pattern and size of the vessels as seen on the transverse surface of the charcoal.

Sample A

Two pieces of charcoal extremely twisted and compressed making identification impossible.

Sample B

Most of the charcoal came in this group. Transverse and longitudinal breaks were made where possible and the following features could be seen in most of the pieces.

T.S. Strongly ring porous, large vessels in early summer wood, 200-300u in diameter. Late wood vessels smaller, in "flame" arrangement with wedge shaped bands of tracheids and parenchyma in between. Large rays up to 400u across with very fine rays, probably uniseriate in between. Many of the larger rays were split along some of their length.

T.L.S. Confirmed presence of large rays.

R.L.S. Rays of both heterogenous and homogenous type.

These features taken together are characteristic of *Quercus* sp. (oak).

Sample C

One piece of charcoal about 1 in. square. Transverse and longitudinal breaks were made and the following features seen:

T.S. Diffuse porous but with more vessels in early summer wood although the vessels were not larger than those of the later wood, all being less than 100u diameter, the average size about 50u. The vessels of the later wood arranged in distinct radial chains. A few large rays were seen c. 200u across, most of the rays extremely fine and probably uniseriate.

R.L.S. Rays heterogenous. Some scalariform perforations of the vessels, very faint but seemed to consist generally of only a few bars.

These features fit *Corylus avellana* L. (hazel).

Sample D

One piece of charcoal c. 1 in. x $\frac{1}{2}$ in. Transverse surface showed large vessels, 200-300u diameter, regularly arranged with no sign of growth rings. Appeared therefore to be diffuse porous but vessels too large. One large ray was seen; when compared to *Quercus* wood that had grown slowly a very similar arrangement of vessels was seen, i.e. only early summer wood apparent with large vessels and no distinct growth rings thus giving the appearance of diffuse porous wood. Thus this piece of charcoal may also be referred to *Quercus* sp. (oak).

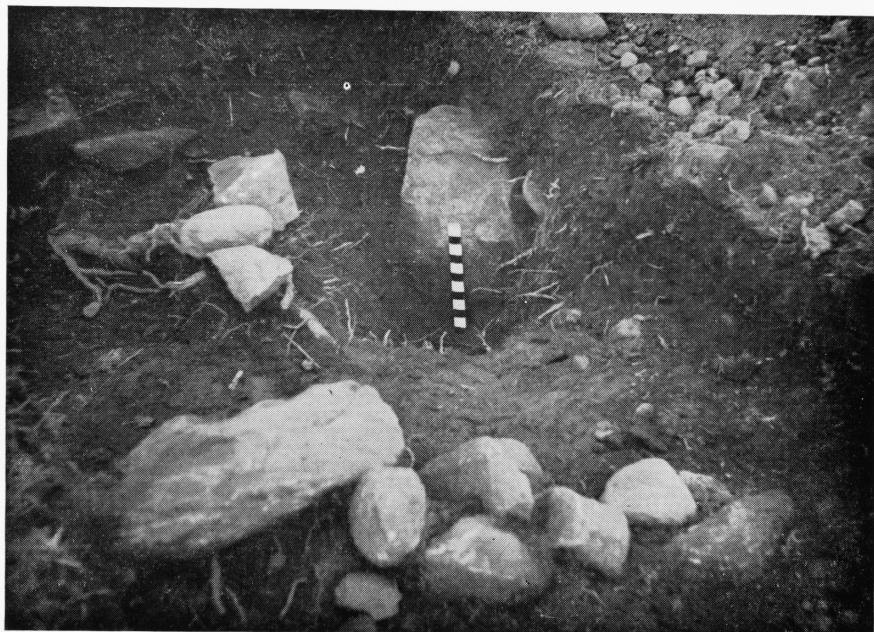


Plate XIII.—Millhill Smelting Site. Top, slag heap viewed from East. Bottom, hearth viewed from South-West.

MEDIAEVAL POTTERY IN DUMFRIESSHIRE AND GALLOWAY

A Survey By A. E. TRUCKELL, M.A., F.M.A., F.S.A., Scot., and
J. WILLIAMS, F.S.A., Scot.

This paper assembles for the first time mediæval pottery from some 70 or so sites in Dumfriesshire, the Stewartry of Kirkcudbright, and Wigtownshire. While the large collections — Lochrutton Crannog, Kirkcudbright Castledykes, and Holywood—were made in the first 22 years of this century, the vast majority of the sites are represented by collections, ranging from single surface finds to large groups, made in the past four or five years. It must be emphasised that many of our major early-mediæval stone castles and ecclesiastical sites still lie untouched as rubble-covered ruins in the quiet countryside and so have yielded no pottery at all, or only stray surface finds. In the first category lie Wigtown Castle (c. 1260 to c. 1315), Cruggleton Castle (12th cent. Motte followed by a castle c. 1260, this strengthened in the 1280's, thereafter occupied until at least the late 16th cent.): Morton Castle, a hall-castle built about 1260-70 and occupied until 1715: Sanquhar Castle (c. 1350 to early 18th century): Closeburn Castle (c. 1390: still occupied): Threave Castle (c. 1370: occupied up to 17th century): Tongland Abbey (12th century to the Reformation), Saulseat Abbey (12th century to Reformation), Whithorn Priory (1125 onwards, on older site): the Bishop's Palace at Palace Yard near Gatehouse, built within an earlier moated manor—no pottery from either: the Bishop of Galloway's residences at Clarie and Inch: the Bishop's "Castle of Balnespik at the church of Candida Casa": Lincluden Convent, later College, 12th cent. to the Reformation, and the Priors of St. Mary's Isle and Canonbie, have yielded nothing apart from one scrap and part of a jug from Lincluden. Lochmaben Castle (1298 to 18th century) has yielded a few surface scraps and Torthorwald Castle, 12th cent. to 18th, the same.

Of the area's more than 65 Mottes only two have had any excavation at all, and only five have yielded stray finds: the same applies to the 13 or more Moated Manors, with the exception of Dinwoodie Green and Dunrod. None of the 250-odd 15th-16th century tower-houses in the area have been excavated, and only a few stray shards have been found from one or two of them: and it must be remembered that production of green-glaze ware locally went on well into the 17th century. Unthank Manor, deserted in 1307 or shortly after, lies unexcavated and has yielded nothing: the same goes for the mediæval villages such as the large site at Kirkconnel (Springkell): Buittle Castle, a courtyard-castle of about the 1230's, built on a large 12th-century motte, and ceasing occupation early in the 14th century, was excavated to some small extent last century, but no pottery is known from that excavation: the same thing happened at Tibbers Castle (mid-13th century, strengthened in the 1290's and

destroyed soon after: no pottery known) and the "old" castle, probably of the 1230's, near the better-known triangular castle at Caerlaverock: there the pottery found was reburied. The "new" Caerlaverock, built about 1290 and occupied until 1640 has however yielded a large amount of pottery including intact vessels to the recent excavations by the Ministry of Works and a report on this is forthcoming. When trial trenching was done at Auchencas, a fine courtyard-castle of the mid-13th century and first years of the 14th century, in 1928 a great deal of pottery was found but so slight was interest in mediæval pottery at that time that it was all simply thrown back into the spoil.

The same lack of investigation and finds goes for almost all of the host of minor mediæval sites and the halls which it is becoming apparent were the seats of many of the minor lairds in the 13th century and in some cases later. As for the towns, if one excepts castles within towns, only Dumfries has yielded any pottery, although seventeen Burghs are recorded for the area in the Middle Ages, ten of these of the earlier part of the period. Kilns are indicated in several places by place-names (two farms called Potterland, for instance), or glazed pebbles in association with pottery, but the first recognisable kiln is still to be found.

The devastation of the Edwardian Wars means that many of the early-mediæval sites had a short life, and that another wave of castles began in the late 14th and early 15th century. This means that 13th-century pottery, and sites with a later start, can be fairly easily recognised, and so the deliberately rash step has been taken of giving approximate dates to much of the pottery, basing on types, fabrics and glazes from more or less dated sites in the area. Some features vary with time, strap-handles being commoner in the later periods, rod-handles in the earlier, though both occur at all periods.

Field collection (the discovery of the mediæval village at Kirkconnel (New-abbey) in 1966 by this means is a case in point) judiciously combined with excavation where possible obviously must be the chief line of attack: the greater part of the sites in the following list are in the list because of systematic collection by one man over the last year or two.

I. HOLYWOOD ABBEY.

Nat. Grid. Ref. NX955796.

Holywood Abbey: a Premonstratensian house, traditionally founded in the 1160's (a bronze figure of St. Norbert of pronouncedly Romanesque type found a mile or so away from the Abbey is in Dumfries Museum): but historians now feel that it is likelier to have been founded in or about 1228 (Dr. Cowan, forthcoming paper on mediæval parishes in Dumfriesshire, in these Transactions). It was in full occupation at the Reformation in 1560 and suffered the usual gradual run-down over the next generation.

Eighty-four pieces, twenty of which have been reassembled. The pottery was obtained during a brief trial excavation by Major Keswick of Cowhill in 1922.

The following may be noted:

Handles.

1. 37/5/26/25/MPH. Piece of wall, rim, flange-handle, and base in a fine hard grey-

pink ware. Fine glaze ranging from yellowish-green to pale reddish-brown: pitted in places: glaze on rim, flange and interior, but not on exterior. Incised ornament on flange: two shallow incisions on inner face of rim, covered by glaze. 13th-14th cent. Depth 5.5 cms.

2. 10/50/MPH. Piece of rim, handle junction and wall of jug or jar in a very hard medium-thick pale-grey ware. Ridge below rim, strap handle has had a shallow central groove giving a concave profile. Unusually rich lustrous green glaze, brown where thinnest. Rim diameter. 15th-16th cent.

3. Piece of rim and upper part of strap-handle in a soft red ware: handle shows grey ware beneath glaze. Central groove of handle very deep at junction. Glaze very patchy ranging from olive-green to a lustrous red where thinnest. 13th cent.

4. 42/11/MPH. Piece of rim, wall and larger part of a circular-sectioned handle in a rather thin ware, grey on inner face and pink on outer. Very patchy pale yellowish-green glaze. Two thumb impressions at junction of handle and wall. Handle considerably thinner than usual in this district. 13th-14th cent.

5. 20/MPH. Small fragment of wall and upper end of strap-handle with deep central groove. Dull grey ware, pale-buff externally, with no apparent glaze. 13th-14th cent.

6. 12/MPH. Upper end of very broad heavy strap-handle with four broad combed grooves on the upper surface. Hard grey ware, red internally. Bright yellow-green glaze. 14th-15th cent.

7. 8/MPH. Piece of wall and upper part of strap-handle with central groove and two very large thumb impressions. Coarse thin hard gritty ware with metallic ring. Very rough dull-green glaze. Suggestion of raised ridge to right of handle-junction. 15th-16th cent.

8. 6/MPH. Complete strap-handle but shows no trace of wall. Deep central groove. Grey ware tending to pink where unglazed. Metallic ring. Rather dull greenish glaze. Somewhat patchy, red where thinnest. 15th-16th cent.

9. 9/MPH. Piece of strap-handle with junction: three thumb-depressions at junction. Top of handle has five combed grooves (cf. No. 6). Reddish-grey ware with darker core. Thick lustrous yellow-brown glaze. 15th-16th cent.

10. 13/MPH. Piece of rim and upper part of narrow handle intermediate in form between circular-section and strap. Has borne three sharp-edged grooves on upper surface. Pinkish-buff ware with remains of a fine yellow-brown glaze. 13th cent.

11. 16/MPH. Part of strap-handle with edge of junction. Deep narrow central groove. Hard grey ware, paler on outer surface. Remains of yellow-brown pitted glaze. 13th-14th cent.

12. 18/MPH. Underside of strap-handle in a grey ware. Buff externally. Thumb impression. Traces of central groove remain but most of upper surface is split away, 13th-14th cent.

13. 7/MPH. Complete long rather narrow strap-handle with central groove. Hard grey ware but buff-red where unglazed. Olive-green glaze somewhat patchy and very pitted. 15th-16th cent.

14. 14/MPH. Parts of a broad strap-handle with three grooves. Extremely gritty grey ware, tending to red where unglazed. Dark greenish-yellow glaze. 15th-16th cent.

15. 15/MPH. Piece of rim and upper part of strap-handle with deep central groove. Rather soft pink ware with remains of a thin dull yellowish glaze showing red where thinnest. 13th-14th cent.

16. 44/MPH. Fragment of rim and top of handle from a small jug. Hard pinkish-grey ware with a good yellowish-orange glaze. Handle deep oval in section at junction. 8 cm. diameter rim. Traces of stacking ring.

17. 21/MPH. Piece of strap-handle with central groove. Pale grey core with reddish-grey exterior where unglazed. Thick yellowish-green glaze with touches of red where thinnest. 15th-16th cent.

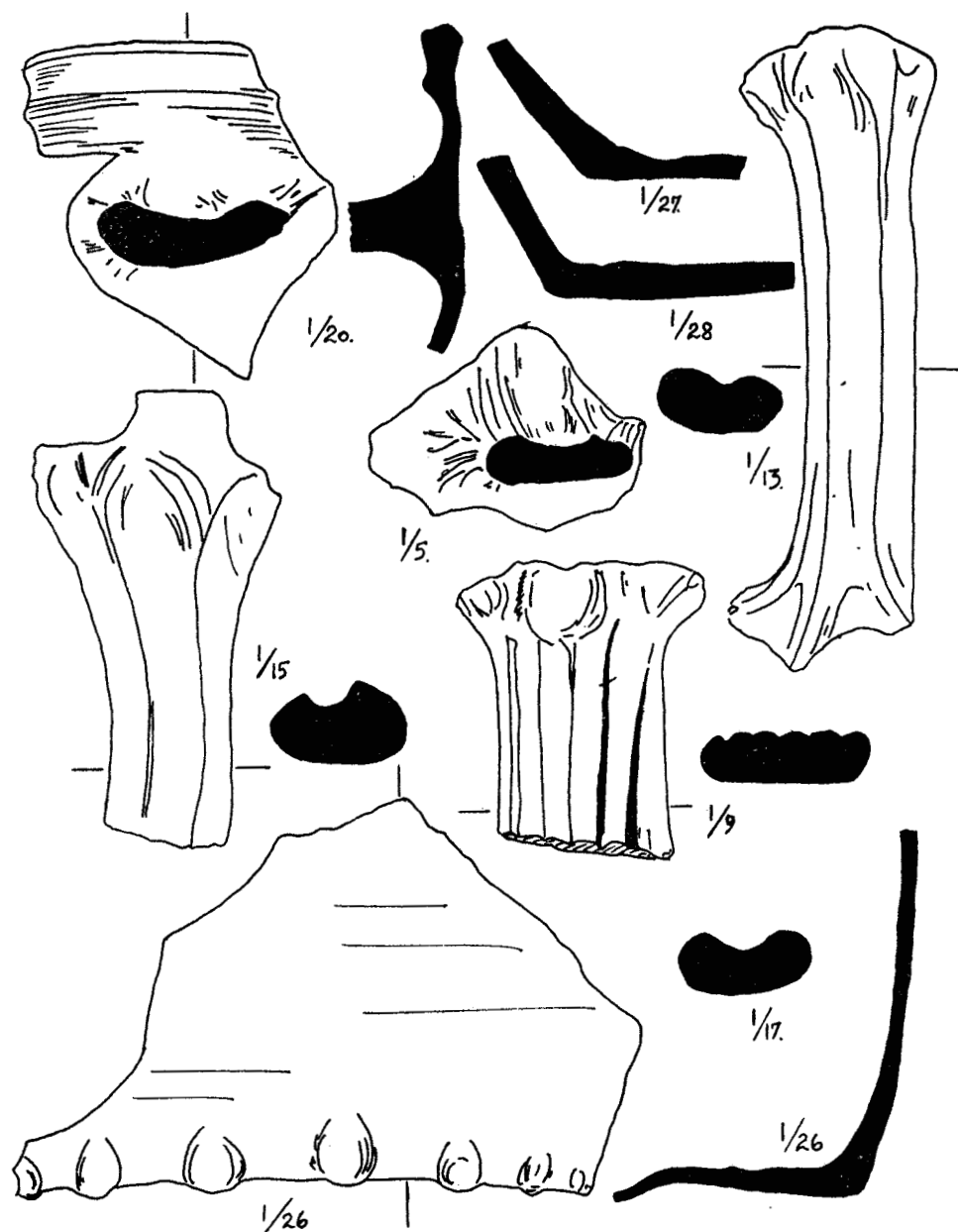


Fig. 1.—Holywood Abbey (1) [$\times\frac{1}{2}$].

18. 22/MPH. Rim, wall, and part of handle of skillet in a very thin grey ware with a metallic ring. Strong indentation under handle. Inner surface bears a fine thin olive glaze, showing brown where thinnest. Glaze on outer face much more mottled, ranging from pale olive to almost black. 14th-15th cent. Termination of handle recurved. 16 cms. in diameter.

19. 17/MPH. Wall and bottom junction of handle—exact profile not determinable. Thin pink ware. Very hard with metallic ring. Thin yellowish-green glaze showing red over most of surface. 15th-16th century.

20. 49/MPH. Rim and part of wall of jug or jar in hard grey ware, red externally. Traces of thin olive glaze, largely worn off. Ridge under rim. Rim diameter 7 cm. 14th-15th cent.

21. 51/MPH. Rim and piece of wall and edge of base of a deep (7.5 cm.) platter in a fine hard ware with metallic ring. Grey under glaze and red on outer face. Appears to have been part of an almost rectangular platter or dish. Very poor orange-yellow glaze. 13th-14th cent.

22. Part of spout, rim and wall of a smallish jug. Fine thin hard pink ware. Patchy but exceptionally brilliant orange-green glaze. 13th-14th cent.

23. 55/MPH. Piece of wall of a tall jug or jar in a hard grey ware: pink under glaze. Decorative wheel ridges on outer surface. Remains of rather dirty olive-brown glaze. 15th cent.

24. 25/MPH. Piece of shoulder in medium thick grey ware. Thin olive glaze ranging to pale yellowish brown. 14th-15th cent.

25. 91/MPH. Small piece of shoulder, hard grey ware: dull pink on inner face. Lustrous yellowish glaze. Strong rather decorative wheel marks. 14th-15th cent.

26. 109/MPH. Half of base and lower part of wall of a large jug or jar: neat finger-pinchings round lower edge of wall. Curve of base asymmetrical being slightly bulged upwards near one side. Rather thin hard grey ware: no grits: pink in places under glaze. Dark green to transparent glaze, somewhat patchy. 15th-16th century. 15 cm. diameter.

27. 33/MPH. Piece of base and lower part of a strongly outward-curved wall. Rather thin hard ware, grey internally, pink on outer face. Traces of yellow-brown glaze on both interior and exterior faces: much stronger on interior. 14 cm. diameter. 14th-15th cent.

28. 34/MPH. Part of base and lower part of wall in a rather soft grey ware. Pink on outer face. 20 cm. diameter. Lightly glazed on the bottom: pale yellow-green. 15th-16th cent.

29. 53/MPH. Part of base in very hard gritty grey ware. Base shows thick dark-green glaze, 15 cms. diameter: 15th-16th cent.

30. 23/46/54/77/MPH. Three conjoined pieces and one isolated piece of base and lower edge of wall of a large (?) jar. Rather thick hard pale grey ware, pink under glaze. Very pronounced "kick" in centre of base. Patchy pale yellow-green glaze showing reddish-brown where thinnest. 15th-16th cent. 21 cm. diam.

31. 1/MPH. Large piece of base and lower edge of wall of a large jar (20 cms. diameter). Heavy thick blue-grey ware, very hard. Pink on both faces with very patchy vivid green glaze with traces of brown. Stacking ring (10 cms. diam.) very clear on underside of base giving slight upward bulge at that point. 15th-16th cent.

32. 36/MPH. Part of base and extreme lower edge of wall, rather thin hard grey ware. Pink on both faces but underside of base largely flaked away. No glaze remaining. 15 cm. diameter. 15th-16th cent.

33. 69/MPH. Small piece of base and edge of wall in a grey fabric with internal white(?) slip. Pink externally. No surviving glaze. 16 cm. diameter. (?)14th-15th cent.

34. 9/MPH. Piece of base and lower edge of wall with strong finger-pinching around lower edge of wall producing wavy edge to base. Hard thick grey ware: pink on wall under glaze. Rather thick lustrous dark-green glaze, orange where thinnest. Part of stacking-ring (9 cms. diameter) very clear on underside of base. 19 cm. diameter. 16th cent.

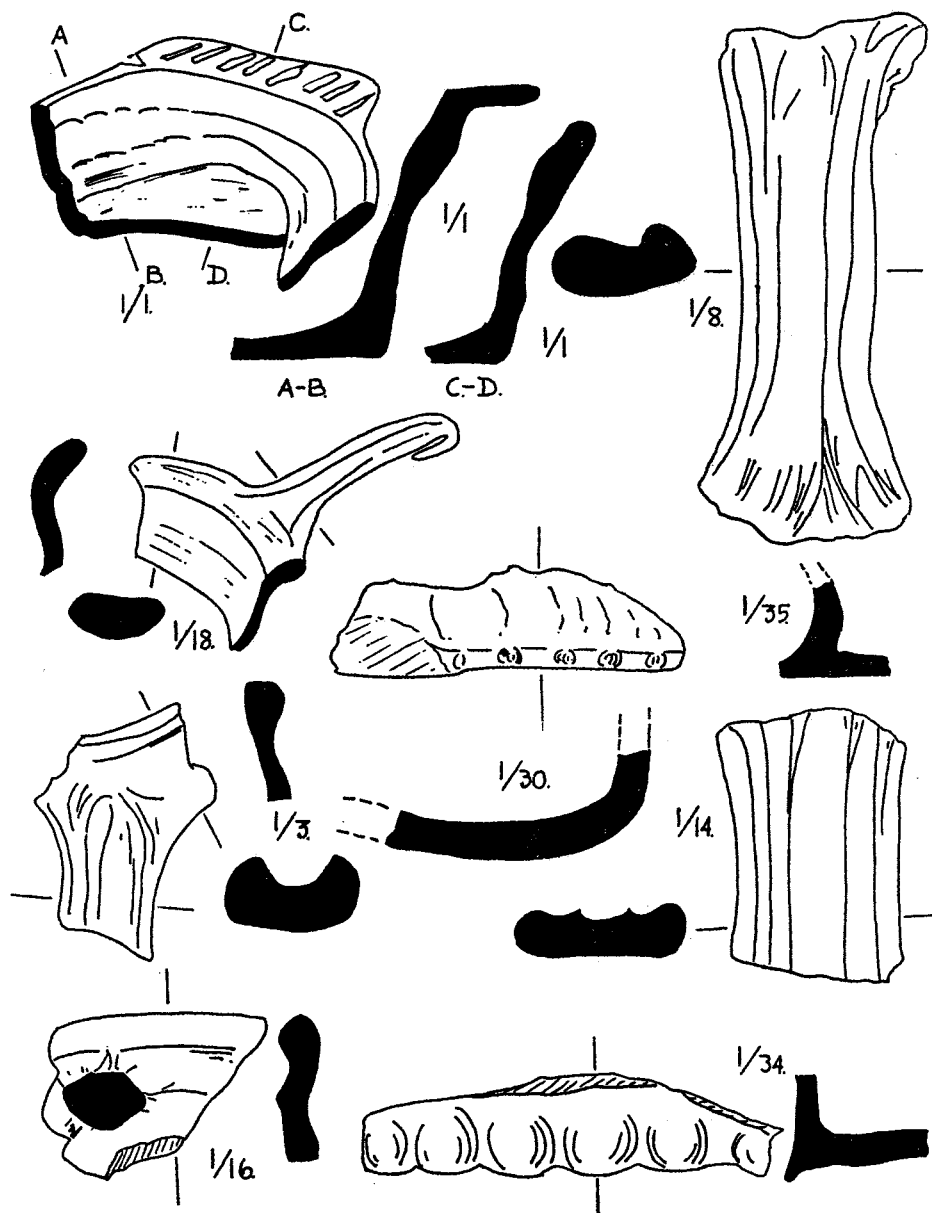


Fig. 2.—Holywood Abbey (1) [$\times\frac{1}{2}$].



Fig. 3.—Redkirk Point (4), Holywood Abbey (1) [$\times\frac{1}{2}$].

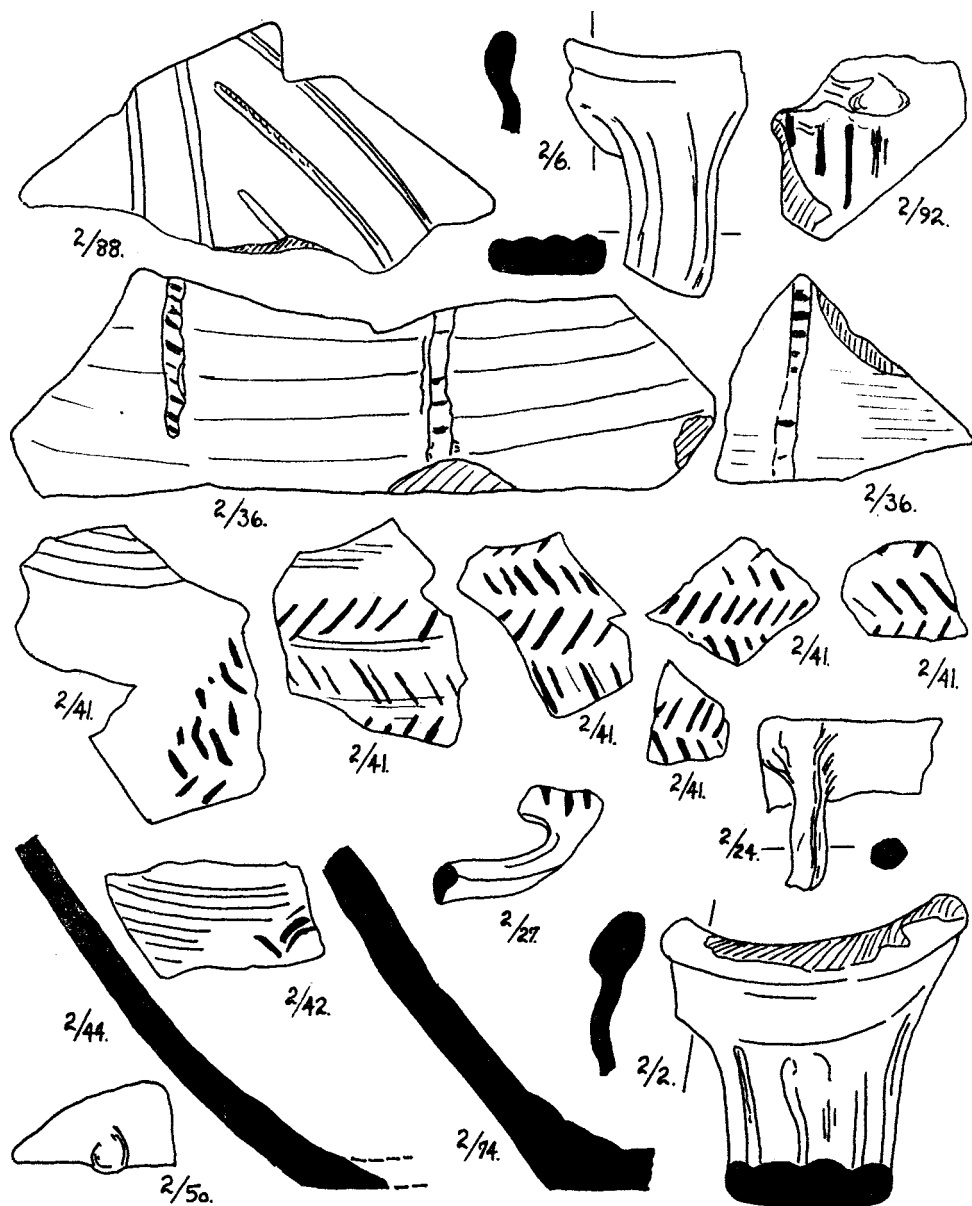


Fig. 4.—Lochrutton (2) [$x\frac{1}{2}$].

35. 730/MPH. Part of base and lower edge of wall of jug: thick ware with grey core, pale internally, pink externally under very pale yellowish-green glaze flecked with bright-green patches (due to copper?). 12 cm. diam. 14th cent. Edge of base "dimpled" with circular indentations.

36. 32/MPH. Piece of base and lower edge of wall in a pale-grey ware, pink at surface. Much worn yellow glaze on both upper and lower surfaces. 19 cms. diameter. (?)15th cent.

37. 28/MPH. Piece of base and lower edge of wall in a rather hard grey ware, pink on both faces. Wall and underside of base bear glaze, mainly yellow-green-olive on base and orange on wall. Very distinct criss-cross scratches visible under glaze on under side of base. 20 cms. diameter. 14th-15th cent.

38. 3/MPH. Edge of base and lower part of wall in rather thick soft gritty ware, bright red on both faces with remains of dirty blackish-green glaze on wall and underside of base. 15 cms. diameter. 13th-14th cent.

39. 35/MPH. Much-flaked piece of very thick (1.3 cm.) heavy base. Very thick almost black ware, pronounced pale buff under lower surface, which is impregnated with caked soot. Undateable.

40. 31/MPH. Piece of base and lower edge of wall in a grey ware pale on upper and lower surfaces. Faint traces of glaze remain—colour not determinable. 16 cm. diameter. Probably 15th-16th cent.

41. 84/MPH. Piece of base and lower edge of wall in a rather heavy medium-hard ware. Paler under glaze. Wall and underside of base bears pale-yellow glaze with pronounced pitting on base. Reddish where thinnest. 14 cm. 15th-16th cent.

42. Piece of rim and wall with ornamental moulding below rim: upper part of face mask. Thin hard pale-grey ware with metallic ring. Lustrous yellow-green iridescent glaze. 14th cent.

II. LOCHRUTTON

Nat. Grid. Ref. NX900731

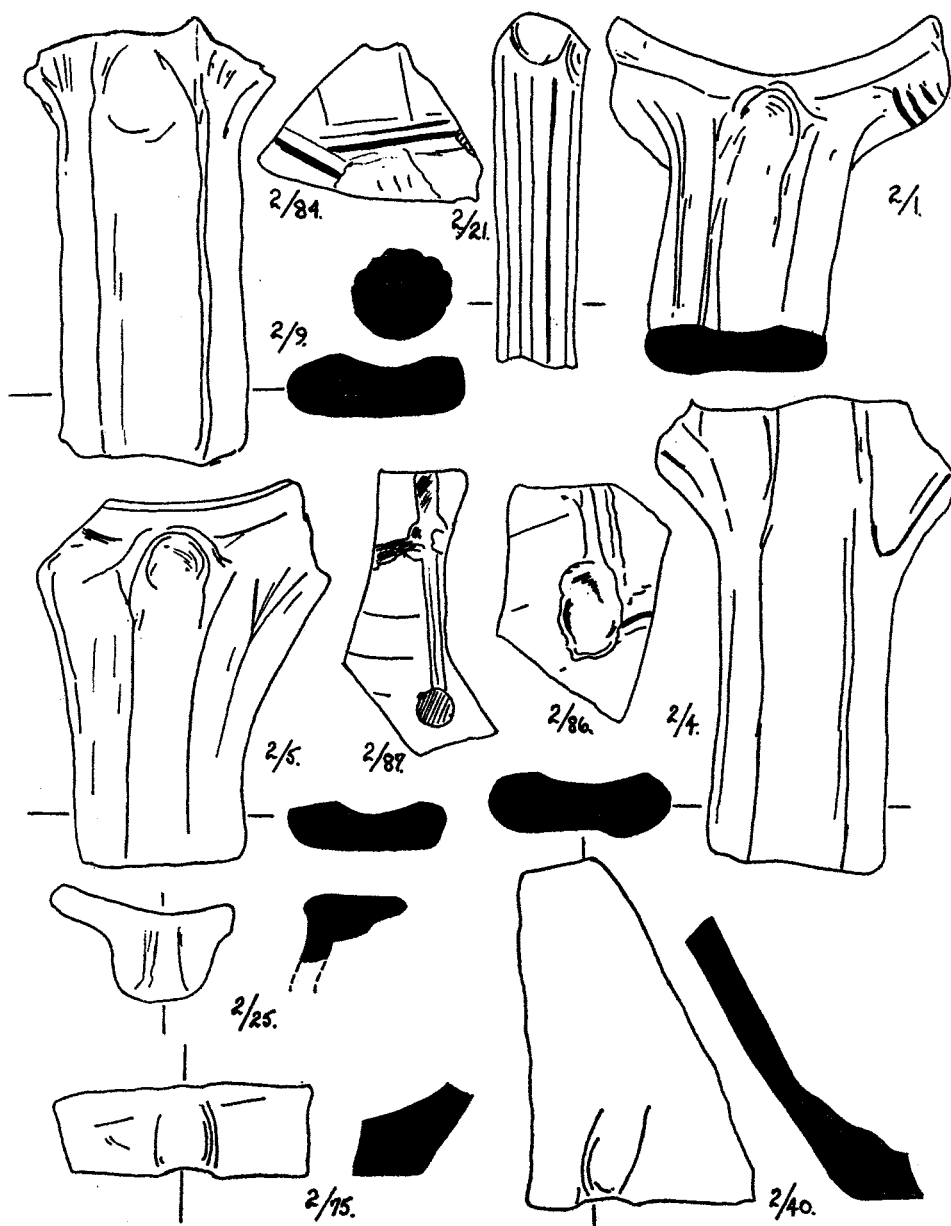
Lochrutton: A timber crannog of unknown date near the centre of the loch was found during the investigation by James Barbour for the Dumfries and Galloway Society in 1901-02 to have had a mediaeval occupation—apparently a hall. All finds were of mediaeval type and included a jet cross with IHS monogram, the script and style fitting a date in the mid-13th century. Nothing from the crannog, other than stray objects left by fishermen, need date from much after 1300. T.D.G.N.H.A.S 1900-02, pp. 128-136. T.D.G.N.H.A.S. 1902-03, pp. 246-254.

Three hundred and forty-six fragments, including several rebuilt portions. The following should be noted:

1. 2/169/MPL. Piece of rim and upper part of strap-handle with a shallow central groove in handle, and with deep thumb-impressions at top of handle pushing clay up below rim. Several "reeded" grooves at top of wall at one side of handle (probably against the spout). Thin, finely gritted medium-hard ware, grey core; pink where unglazed. Very thin yellow-green-grey glaze (colour caused by extreme thinness of glaze). Rim diameter 9 cm.

2. No number. Piece of rim and upper part of strap-handle which shows three shallow decorative grooves. Top of rim partly obscured by remnants of a stacking-ring in the same hard gritted grey ware. Medium-thick ware, red where unglazed on outer face. Very heavy lustrous green-brown flecked glaze. Rim diameter 10 cms.

3. 1/MPL. Piece of rim and upper portion of strap-handle which shows three shallow grooves. Small thumb impression at top of groove. Gritted ware, mainly a bright pink but showing some grey below glaze on handle. Glaze yellow-brown and thick, showing red-brown on rim and wall at edge of handle. Rim diameter not determinable.

Fig. 5.—Lochrutton (2) [$\times \frac{1}{2}$]

4. 18/26/MPL. Broad strap-handle showing junction with wall. Broad, shallow, central groove. Finely gritted grey ware, pink externally, medium-hard. Lustrous yellow-green glaze, brown where thinnest.

5. 15/MPL. Rim, 10 cm. diameter. Piece of rim and upper part of broad, heavy strap-handle. Very shallow, central groove with very deep thumb impression at top pressing material up against rim. Ware hard grey, finely gritted, and pink externally. Very thin yellow-green glaze.

6. 14/MPL. Rim and upper part of handle with badly-worn surface. Handle small and delicate with four grooves on upper face. Pale grey ware, pinkish-buff externally, finely gritted. No glaze surviving. Rim diameter 9 cms.

7. 27/MPL. Rim and edge of strap-handle junction in a very thick coarse, hard, finely gritted ware with grey core. No glaze surviving. Ring diameter not determinable.

8. 90/MPL. Small piece of neat, small handle with shallow central groove: grey ware, pink underside of handle: medium hard. No glaze surviving.

9. 9/266/MPL. Junction and upper end of broad, simple strap-handle with shallow central groove. Thumb impression at top end of handle squeezing material into a pronounced ridge. A hard, grey-buff, finely gritted ware. Traces of a dirty brown glaze survive.

10. 308/MPL. Junction and upper end of broad strap-handle with shallow central groove and thumb impression at junction, giving a pronounced ridge (cf. No. 9). Brick red-buff ware with grey core. Finely gritted. Traces of an iridescent yellow-brown glaze.

11. 69/MPL. Junction and upper end of a very thick strap-handle narrowing rapidly from the junction. Very deep central groove at upper end. Hard grey ware, finely gritted, pinkish buff externally. Very thick red-brown glaze with green flecks—overfired?

12. 343/MPL. Piece of simple strap-handle with shallow central groove in a soft pink ware—no grits. Traces of a bright pale-green "brushed" glaze, best preserved in the groove.

13. 475/MPL. Piece of wall and stub of a simple strap-handle, rather narrow. Rather thin, finely-gritted pink ware; grey core to handle. Traces of iridescent brown glaze remain.

14. 403/MPL. Piece of wall at base of strap-handle showing deep groove between thumb impressions. Finely-gritted pinkish-grey ware. Iridescent yellow-brown glaze.

15. 82/MPL. Junction of strap-handle with a strong central groove in a grey ware: pink under glaze. "Brushed" yellow-green glaze.

16. 162/MPL. Junction and upper end of a rather narrow strap-handle with a shallow central groove: grey ware, red on underside of handle. No glaze surviving on grey upper surface.

17. 162/MPL. Piece of small neat strap-handle: has had 3 rather narrow incised grooves on upper surface. Ware grey and finely gritted: pink externally. No visible traces of glaze remain.

18. 12/MPL. Piece of wall and junction of handle in a rather thin greyish-pink ware, with pale grey handle core. Medium soft finely-gritted. Patchy green-brown glaze.

19. Piece of rim, wall and upper part of a fine rod-handle, brought up to rim; handle decorated at junction with deep incised grooves terminating at a stop-ridge below which the handle has borne spiral rope-like ornament. Bright-red, finely-gritted ware with grey handle core. Patchy yellow-green to brown glaze. Diameter of handle 3.0 cms. Rim diameter 9.0 cms.

20. 127/MPH. Piece of large rod handle, diameter 3.1 cms., in a reddish-buff. Finely-gritted ware with a grey core. Bears 4 deep combed grooves on upper face. Remains of brushed yellowish-brown-green glaze.

21. Piece of rod-handle, 3.4 cms. diameter, in a fine hard grey ware, pink where unglazed. Lustrous dark-green-orange glaze over combed decoration. Trace of thumb-marks at one end.

22. 95/MPL. Piece of a very small rod-handle, diameter 1.4 cm., in a soft pinkish-

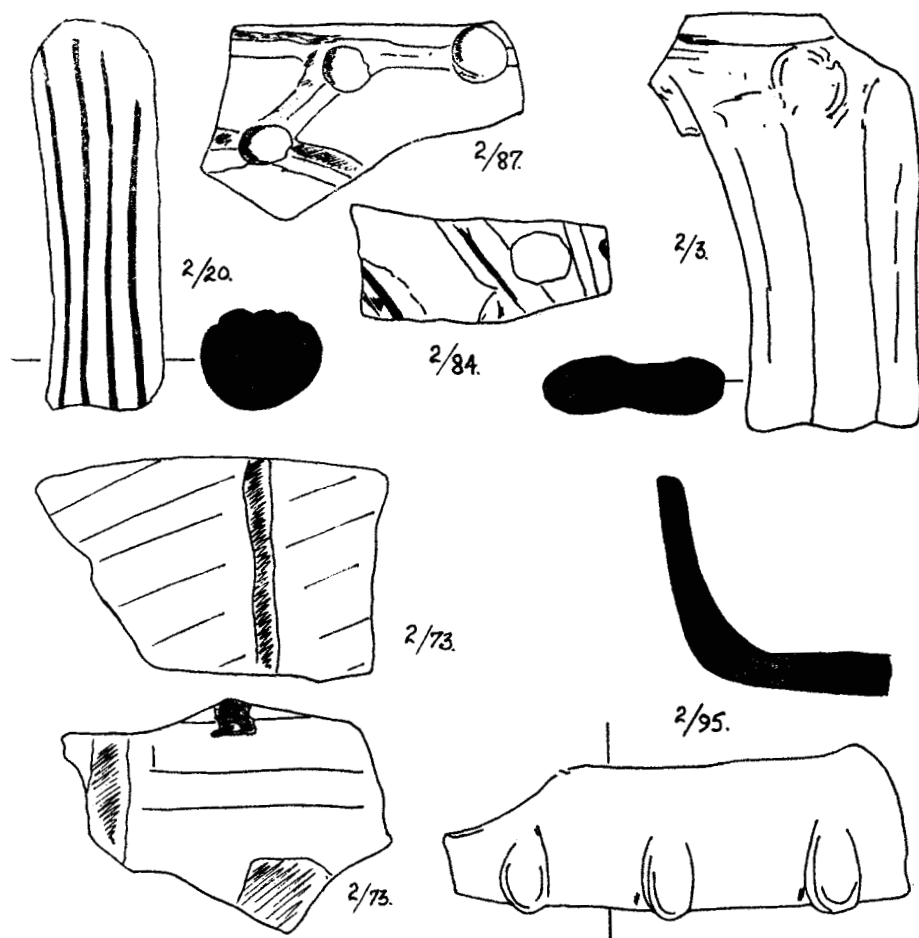


Fig. 6.—Lochrutton 2) [x $\frac{1}{2}$].

buff ware. Bears shallow combing on upper surface. Very lustrous bright apple-green glaze—somewhat patchy. Remains of thin translucent brushed glaze on underside. (?)Imported.

23. 37/MPL. Piece of rim and wall showing part of tubular spout. Hard, finely-gritted, orange-pink ware, grey under a pale yellow-brown lustrous glaze. 9.0 cms. diameter.

24. Piece of wall with small (?)ornamental lug-handle, probably from a jug. Thin hard grey ware, pink externally. Very lustrous orange-green glaze shading to orange where thinnest. Very patchy.

25. 54/MPL. Piece of rim with shallow broad spout and upper part of wall. Glaze surviving on upper surface of spout and partially on exterior face. Green-orange glaze. Medium-hard pinkish ware.

26. 114/MPL. Piece of rim and wall with a small pinched spout. Thin rather soft finely-gritted pinkish-brown ware. Strong wheel-marks internally. No glaze surviving.

27. 242/243/MPL. Piece of handle and junction. Rather soft finely-gritted red ware. Handle very steeply curving with ornamental ribbing where it has broadened to join vessel. Thin yellow-brown glaze.

28. 114/MPL. Rim and upper part of wall in a hard rather spongy coarsely-gritted pink ware. Badly burnt; no glaze surviving. Rim diameter 11 cm.

29. 256/MPL. Piece of wall and rim in a soft very thin ware; pink core: run green-brown glaze. Ornamental line of circular indentations along outer edge of rim. Rim diameter 8 cm.

30. 226/405/MPL. Two pieces of wall with slightly flared rim (diameter 7.0 cm.). Medium thick pink hard ware; no glaze surviving. Ornamental wheel-mark on outer face.

31. 38/MPL. Piece of rim and wall with edge of pinched spout. Soft very thin pink gritted ware. Some yellow-brown glaze survives.

32. 190/MPL. Piece of wall and rim in a thick hard grey ware, pink where unglazed. Traces of brownish-green glaze survive. Top of rim bears traces of stacking-ring.

33. Piece of rim and wall in a medium-hard buff burnt ware. Traces of greenish glaze survive.

34. 249/MPL. Piece of rim and wall of badly-worn soft greyish-pink ware. No glaze surviving.

35. 441/MPL. Piece of (?) lug handle in a pink badly burnt ware with a little yellowish glaze surviving. Appears to bear incised ornament.

36. 250/321/98/150/364/MPL. Three pieces of a large vessel in a hard dark-grey ware—lighter beneath a dirty olive-green glaze. Bears ornament of raised notched vertical ridges.

37. 396/MPL. Piece of wall in a hard grey-buff finely-gritted ware: sharp internal wheel ridges. Bears black-brown pitted run glaze. (?)Overfired.

38. 370/MPL. Piece of neck of vessel in a hard gritty grey ware with a coarse olive-brown glaze. Bears ornamental wheel-ridge externally.

40. 109/MPL. Piece of neck of vessel in a thin soft bright-pink ware with fine lustrous orange-brown glaze.

41. 110/64/223/191/MPL. Seven pieces of wall from a (?) jug in a finely-gritted thin pink ware. Thin yellow-brown glaze. Surface of vessel is decorated with horizontal bands of inclined slashes, forming a pattern of chevron type.

42. 425/MPL. Piece of neck in a medium-hard greyish-buff finely-gritted ware. Bears thin yellowish-green glaze over ornamental wheel-ridge and groove. Bears two short slashed incisions at right angles forming arrow-head-type decoration—part of a vertical chevron-type decoration?

43. 48/128/178/MPL. Piece of wall and edge of base in a thin hard pink ware with thin patchy brown-green glaze. 8 cms. diameter.

44. 10/65/66/418/MPL. Piece of wall and edge of base of a large (?)cooking-pot in a hard grey to pink finely-gritted ware. Very patchy thin lustrous brown to green glaze. Sagging base. Diameter 17 cm.

45. 324/MPL. Piece of wall and edge of base of a large vessel in a thick medium-hard grey ware. Pink on outer face where unglazed. Thin pale yellow-green glaze. Surface bears irregular scratches under glaze. Pinched thumb and forefinger impressions at edge of base.

46. 6/MPL. Lower part of wall and edge of base in a thick medium-hard pink ware. Thin grey core: pronounced internal wheel-marks. Trace of brownish-yellow glaze.

47. 448/MPL. Lower part of wall and edge of base in a thick medium-hard pink ware, grey on inner face. No glaze remaining.

48. 218/MPL. Lower part of wall and edge of base in a thin rather soft finely-gritted pink ware. Badly worn yellow-brown glaze. 13.0 cm. diameter.

49. 407/MPL. Lower part of wall and edge of base form a (?) rectangular vessel. Medium pink-grey finely-gritted ware: reddish-brown-black glaze.

50. 40/MPL. Lower part of wall and edge of base of a small vessel in brown-pink fine thin ware. Thin brown lustrous glaze. Prominent finger pinching on wall. 10 cm. diameter.

51. 449/MPL. Part of wall and rim showing edge of pinched spout. Ornamental ridge below rim. Lustrous red-brown glaze over fine pink ware.

52. 341/MPL. Rim and part of wall of jar or jug in a thick hard greyish-pink finely-gritted ware. Traces of yellow-green glaze remain.

53. 470/MPL. Rim and part of wall showing (?) rusticated decoration. Three pronounced wheel grooves below rim on inner face. Medium hard buff finely-gritted ware. No glaze surviving. 9 cms. diameter.

54. 136/MPL. Piece of rim and wall showing scar of handle-junction. Thick grey-pink ware with grey core. Black-green thick glaze. 9.0 cms. diameter.

55. 429/MPL. Piece of rim and edge of wall in a thin very hard pink-grey ware. No glaze surviving.

56. 421/MPL. Piece of rather bulbous rim and wall in a burnt medium-hard pink ware. A little burnt yellow glaze survives.

57. 182/MPL. Piece of rim and wall of small vessel in a medium-soft thin pink ware: no glaze survives. 8 cm. diameter.

58. 115/MPL. Much worn piece of rim and wall of a rather hard pink ware. No glaze surviving.

59. 252/MPL. Piece of grooved rim in thin hard pink ware, with brownish glaze.

60. 456/MPL. Piece of rim and upper edge of wall in a rather soft pinkish-buff very finely-gritted ware. No glaze surviving. 9 cm. diameter.

61. /MPL. Piece of rim and wall in a much burnt rather hard pink ware: glaze colour not determinable due to burning. Remains of thumb impressions are shown below rim on outer face. 9 cm. diameter.

62. 222/MPL. Piece of rim and wall, thin soft pink ware. No glaze surviving.

63. 181/MPL. Piece of rim and wall, showing remains of handle junction scar. Soft thick pink ware. Yellowish burnt glaze survives in groove below rim.

64. 409/MPL. Piece of medium-thick wall in soft pink ware: shows a fine patchy lustrous brown pitted glaze.

65. 332/MPL. Piece of neck of vessel in a hard grey to pink ware. Run dark green to brown glaze.

66. 404/MPL. Piece of wall in a medium-soft thin whitish cream ware, showing prominent ornamental wheel grooves externally. No glaze surviving. (?)Import.

67. 398/MPL. Piece of wall in hard pinkish buff ware, with dark grey core. Thin yellow-green glaze with dark apple-green speckling.

68. 314/312/319/354/371/121/345/MPL. Six pieces of wall from a large vessel in a very dark dense hard ware. Ornamental wheel ridges externally. Glaze where surviving ranges from iridescent yellow-brown to a lustrous opaque green. Wall, where not decorated by wheel marks, bears an ornament of parallel incised grooves with diagonals.

69. 140/320/20/216/426/MPL. Three pieces of the wall of a large vessel in a thick

hard dark-grey ware, pale beneath glaze. Exterior pink where unglazed. Pale yellow-green glaze. Prominent internal wheel-marks.

70. 327/196/MPL. Two pieces of wall in a hard medium-thin grey ware, pale under the glaze. Ornamental wheel-marks on outer surface under the remains of a very thin yellow-green glaze. Glaze very corroded.

71. 296/291/MPL. Two large pieces of wall and edge of a sagging base in a thick buff ware, pink on exterior. Very strong wheel-marks internally. Bears curious cut facet adjacent to base, the edge of which has been crudely chopped through. 18 cms. diameter at base.

72. 293/300/299/MPL. Wall and edge of base and two pieces of wall from a large vessel in a medium thick hard grey ware. Thick yellow-brown glaze. One fragment of wall bears ornamental wheel-marks.

73. 100/83/73/MPL. Three pieces of wall from a large vessel in a thin hard pale grey ware, paler under glaze and red where unglazed. Bears ornament of parallel horizontal incisions and vertical raised ribs. Much worn. A little yellow-green glaze remains.

74. 318/MPL. Piece of wall and edge of base of a large vessel in a hard thick pale-grey ware: dull red on outer surface where not covered by a dull yellow-green glaze. Very strong wheel-marks internally. Base 20 cms. diameter.

75. 4/MPL. Foot of wall and edge of base in a thick medium-hard grey gritted ware: pink externally except where covered by lustrous yellow green glaze. Bears large thumb and forefinger pinch at edge of base. Diameter approx. 20 cms.

76. 147/MPL. Piece of wall and edge of base in very hard gritty thin grey ware. Strong wheel-marks internally. No glaze surviving. Base 7 cm. diameter.

77. 369/MPL. Piece of base and foot of wall in very thick dirty white coarsely-gritted cement-like ware. Strong wheel-marks on inner face. Bears possible string marks on base. No glaze.

78. 398/MPL. Piece of wall and edge of base in thick hard pale grey ware pink under glaze and on inner face. Patchy brown to yellow-green glaze on wall and underside of base.

79. 78/MPL. Piece of base and edge of wall in medium-thick hard pale-buff ware. Interior bears remains of a yellowish-olive thick glaze.

80. 502/MPL. Piece of base and edge of wall in a medium thick rather soft pink-buff ware. Has borne rather thick olive-brown glaze internally.

81. 164/MPL. Angle of base and wall in soft grey ware with traces of yellow-brown glaze. Edge of base has been pushed up from below.

82. 269/MPL. Fragment of wall and edge of base of small vessel in a rather thick grey ware paler grey beneath glaze and pink internally. Glaze yellow-green with dark green mottling.

83. 5/MPL. Piece of wall and edge of base in rather thick hard greyish buff ware pink on outer face where exposed. Lustrous brown-green glaze on and at edge of base. Pronounced groove at junction of wall and base. 14 cm. diameter.

84. 101/106/87/MPL. Three pieces of wall showing very little curvature. Rather thin hard grey ware pink internally, with a good yellow-brown glaze over bold applied ornament of ridges and bosses.

85. 36/MPL. Piece of wall in a grey finely-gritted ware with patchy yellowish-brown glaze. Bears bold applied ornament of buckle form.

86. 107/MPL. Piece of wall in a grey finely-gritted ware, pink internally with pale yellow glaze over applied decoration of ridges and bosses.

87. 35/MPL. Piece of wall in a thin grey ware with brownish glaze externally. Bears decoration of applied ridges and bosses forming crosses.

88. 105/25/MPL. Pieces of wall from a large vessel in rather thin medium-hard pale-grey finely-gritted ware. Glaze (?) burnt and ranging in colour from brown to yellow-green. Ornament of two bold converging near-vertical grooves with parallel ones roughly diagonal to central pair.

89. 163/MPL. Piece of wall in a pinkish-buff rather thick soft ware: no glaze surviving: bears slashed groove in form of hyperbola, and the end of another groove.

90. 112/MPL. Piece of wall in a greyish buff ware, pink under yellowish-brown thin glaze. Bears two parallel vertical grooves which appear to have been made by dried grass or straw.

91. 21/MPL. Piece of wall in a hard grey fabric, paler below a thick apple-green glaze which shows ornamental brushed strokes within a (?) rectangle enclosed by two thin shallow grooves.

92. 46/MPL. Piece of wall in a rather thin soft pink ware with iridescent remains of yellowish-brown glaze. Bears bold combed ornament (?handle junction) with boss.

93. 170/MPL. Piece of wall in a thin hard rather gritty, pale grey ware with thick brownish-green glaze. Bears remains of prominent curved ridge which may be part of a "buckle" ornament or merely part of a thumb impression.

94. 302/MPL. Piece of wall in thin medium-hard buff ware: no glaze surviving. Bears curved ridge ? thumb impression.

95. Twenty pieces (register numbers not quoted) of a thick, soft, grey to pink gritted ware rebuilt to give a base 22 cms. in diameter. Prominent thumb and forefinger pinching around edge of base and wall. Glaze very thin yellowish-green.

III. LOCHRUTTON PROMONTORY

Nat. Grid. Ref. NX900732

Some excavation took place by James Barbour in 1901-02, immediately prior to the Lochrutton Crannog excavation, in the fortified promontory on the mainland opposite the Crannog: the promontory clearly acted as "bailey" to the crannog's "motte." The Crannog excavation report does not mention any pottery being found on the promontory site: but in 1957 Mr John Inglis found the single piece described here.

1/LPP. Piece of wall in a medium hard pink-grey ware with lustrous yellow glaze over ornamental wheel ridge. Bears two parallel slightly curving slashed grooves.

IV. REDKIRK POINT

Nat. Grid. Ref. NY302652

The Redkirk Point pottery is being washed out of the soil into the beach as the tides cut into a low cliff of carse clay: the Red Kirk itself, probably built in the late 12th century, fell into the sea in 1675. The site is at the end of an important mediæval ford across the upper Solway and is some ten miles by land from Carlisle. Among associated finds is a simple cross, in lead, perhaps a pilgrim cap-badge.

363 fragments—the following should be noted:

1. 28 pieces of a large vessel, probably a jug, in a bright red ware, ranging to pale grey in places. Very coarsely gritted. Base diameter 20 cms. Seven pieces of wall and handle bear bold ornament of applied strips. Handle is a simple strap with an applied strip occupying the central groove. Very little glaze survives but has been pale yellow-green with many small brown pits. Date end of 13th to early 14th century. The ware bears a close resemblance to some of the material from Castle Street, Carlisle, less than ten miles away. (Trans. Cumb. West. Antiq. Arch. Soc. LV. (1956).)

2. Piece of exceptionally broad strap handle (5.5 cms. across). Very fine hard bright-red ware with pale-grey core. Upper face of handle flaked away. Bears traces of a run yellow-green glaze—brown where thinnest, and pitted occasionally. End of 13th-early 14th cent.

3. Junction and upper part of a narrow handle intermediate in form between rod and strap with a symmetrical shallow groove on upper surface. Red ware with fine grits. Rich yellowish-brown glaze much darker on underside. 14th-15th cent.

4. Piece of strap-handle, including edge of upper junction, with a very shallow central

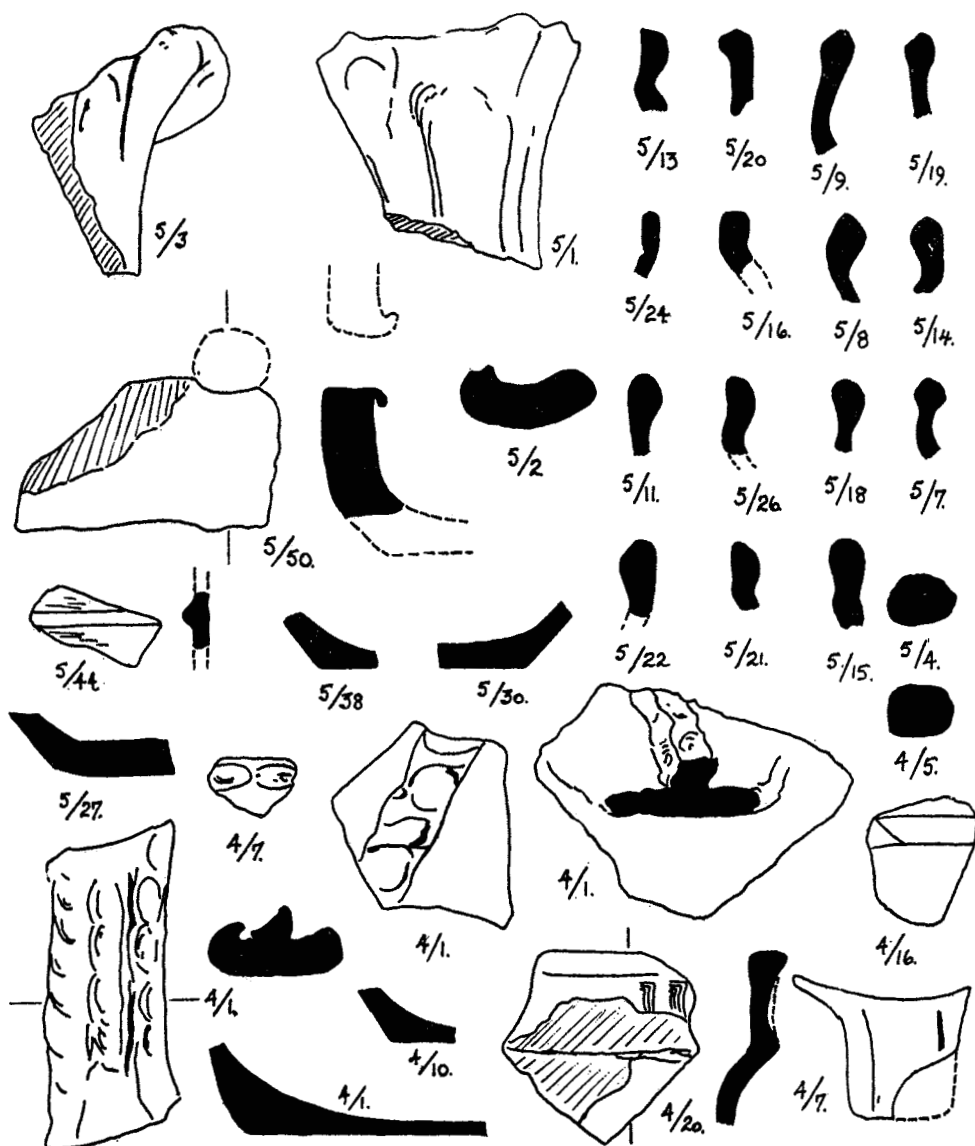
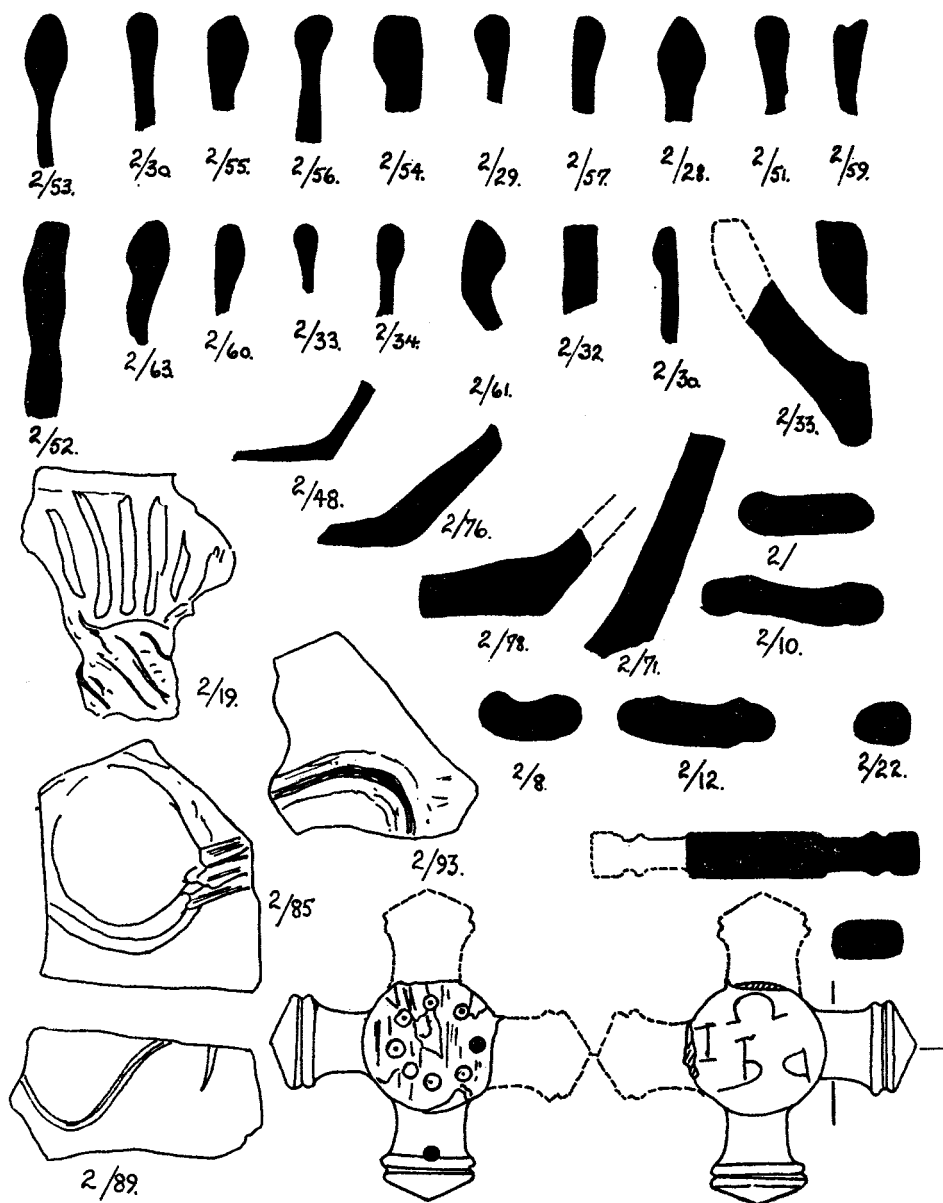


Fig. 7.—Kirkconnell, New Abbey (5), Redkirk Point (4) [$x\frac{1}{2}$].

Fig. 8.—Lochrutton Crannog (2) [$\times \frac{1}{2}$].

groove. Hard pale cream ware with grey core and coarse grits. Rather pale yellowish-green lustrous glaze with many small pits. 13th-14th cent.

5. Much worn rod handle (1.7 cm. in diameter) in a hard pale greyish-pink ware. Slight remains of pale yellow glaze. 13th-14th cent.

6. Small piece of strap-handle: fairly deep asymmetrical groove. Pale grey-pink ware. No traces of glaze left. Undatable.

7. Small almost complete skillet lug in a hard pale grey-mottled red ware: bears remains of thin pale yellow glaze. 13th-14th cent.

8. Outer end of skillet handle, rectangular in section and bearing deep incised decoration. Lower side of end depressed to form a "stop." Very coarse hard brick-like grey-pink ware. No trace of glaze remains. Undatable.

9. Piece of base and lower part of wall in a hard grey ware, buff on exterior beneath caked soot. Remains of a pale yellow-brown glaze on underside of base. 14th-15th cent.

10. Piece of base and lower edge of wall in a thin hard, coarsely gritted red ware. No glaze surviving. Possibly 13th-14th cent.

11. Piece of base and lower edge of wall in a dense very hard ware. Interior face and base red but exterior wall greyish. No glaze surviving. Undatable.

12. Piece of base and lower edge of wall in a hard dark grey gritted ware—very pale yellowish buff externally. Originally glazed but only glaze-pits remain. Suggestion of "boss and pit" ornament around edge of base. Undatable.

13. Pieces of base and lower edge of wall in a pale grey hard ware, finely gritted. Suggestion of grey slip on both faces. No traces of glaze remain: undatable.

14. Very small fragment of base and edge of wall, very similar to No. 10.

15. Piece of ?edge of base, in a very fine bright orange-pink ware. Traces of a brown glaze on exterior, yellow around pits. 13th cent.

16. Small piece of wall in a thin hard pale grey gritted ware. pinkish under glaze. Remains of thin yellow-brown glaze over finely incised linear decoration. 13th-14th cent.

17. Two pieces, probably from base of handle, in a very hard pale cream gritted ware, suggestion of thumb-depression and grooves. Smaller fragment bears part of an applied pellet ornament. Glaze rather worn but material remaining is a very lustrous green-brown. End of 13th-early 14th cent.

18. Four pieces of wall in fine grey gritless ware with strong internal wheel-marks: deep exterior wheel grooves used decoratively. Weathered fine yellow-brown iridescent glaze. 14th cent.

19. Very small fragment of wall in a buff coarsely-gritted ware. Bears traces of a pale-green (where thinnest) to a brilliant malachite green (where thickest) glaze. Darkest green due to sprinkled (?) copper. ?Imported.

20. Piece of wall, with decorative ridge below rim in a finely-gritted grey ware. Pale yellowish buff on rim and outer face of wall. Part of an elaborate stamped ornament (cross with expanded arms?) visible just below rim: traces of another are to be found 1.5 cms. along circumference in same position. Traces of glaze but colour indeterminable. Late 13th-early 14th century.

21. Piece of heavy overhanging rim with piece of wall in coarsely gritted pink ware with grey core where thickest. Flattish upper surface of rim bears two shallow grooves. No glaze remaining. 13th-14th cent.

22. Piece of everted rim and edge of wall in a hard greyish-pink gritted ware. No glaze remaining.

23. Piece of rim and wall in a reddish buff ware with coarse grits. No glaze remaining. 13th-14th cent.

24. Fragment of rim in a soft bright pink ware (cf. No. 15) with fine wheel-marks just below rim internally. Inner edge of rim bears fine brush marks beneath a fine pale brown glaze. 13th cent.

25. Piece of rim (8 cms. diameter) in a finely-gritted buff ware. Glaze much worn but material remaining is a pale yellow-green. Late 13th-early 14th cent.

26. Piece of rim and wall: wall sharply angled inwards from rim: grey finely-gritted ware, pink on outer face with patch of grey on interior. No glaze. 13th-14th cent.
27. Piece of heavy rim and small fragment of wall in a finely-gritted red ware. Fine groove externally beneath rim. No glaze survives.
28. Piece of rim and upper part of wall: rim flat at top: ware grey internally, red both faces: rather thin: no glaze remaining. 13th-14th cent.
29. Piece of rim and upper part of wall in a pale pipe-clay-like very finely-gritted ware. No glaze surviving. ?13th-14th cent. (?)Import.
30. Small, piece of rim and upper part of wall in a grey ware. Pink internally. Retains a rather dark green pitted glaze on top of rim and outer face. 15th cent.
31. Piece of flat rim and upper part of wall in a thin pink ware. Dark slip survives on inner face and on top of rim. Single narrow groove on top of rim, nearer outer edge. 7 cms. diameter. 13th-14th cent.
32. Piece of wall in a fine dark-grey ware, pink under outer face. Glaze very patchy and yellow-green. Not unlike much of the material from Holywood. 14th century.

V. KIRKCONNEL

Nat. Grid. Ref. NX977680

The de Kirkconnel family held this estate from some time before the 1230's, when the first charters show them already in possession. The existing tower-house is late 15th century. A ditched enclosure in the field N.E. of it may represent a moated manor. All the pottery mentioned here comes from the sloping well-drained field west of the tower, and was recovered from an area of about 100 yards by 40 yards, with the bulk coming from a much more limited area. The burnt daub found suggests a village site, and the glaze-coated granite pebble indicates the possibility of a kiln. Four hundred and eight fragments have been recovered of which the following should be noted:

1. Upper part of a broad rather heavy strap-handle in a dark, hard grey ware—pink where unglazed and in the junction with the wall. Well-marked central groove. Good yellow-green to brown glaze on upper surface. 14th-15th cent. Handle width 4 cms.
2. Piece of rather narrow, simple strap-handle with a broad central groove. Very heavy, coarsely gritted with quartz, pinkish buff ware. Glaze yellowish and very corroded. Handle width 3.5 cms. 13th-14th cent.
3. Upper end and junction of a fine, rather ornamental handle—probably strap in form, at least at upper end. Bears thumb impressed flutings at junction. Fine soft pink ware becoming pinkish-grey in core of handle. Yellowish brown glaze. Late 13th-early 14th cent.
4. Piece of small rod handle in a soft pinkish buff coarsely gritted ware. A little yellow-brown glaze remains. 1.8 cms. in diam. Pale grey core. 13th-14th cent.
5. Piece of sharply curved rod handle. Medium hard pink ware with a blackish core. No glaze.
6. Junction and inner part of a heavy thick skillet handle with concave upper surface. Rather soft blackish ware—burnt red where unglazed. Yellow-green to brown glaze.
7. Small piece of rim from a small vessel in a very thin soft pinkish ware—pale grey below glaze. Fine yellowish green glaze. 14th cent.
8. Piece of rim and upper part of wall in a thin cream coloured finely gritted soft ware. No glaze. 9 cms. in dia. (?) Import. 13th-14th cent.
9. Piece of rim and wall in a thin medium hard finely gritted pinkish buff ware. Traces of yellowish run glaze remain. Rim diam. = 9 cms.
10. Piece of rim and upper edge of wall in a thin hard dull pink ware. A little yellowish brown glaze remains. Rim diameter 11 cms. 13th-14th cent.
11. Piece of rim and upper edge of wall in a medium-hard very coarsely gritted pinkish buff ware. No glaze. Rim diameter 9 cms.
12. Piece of rim and upper part of wall from edge of (?) simple pinched spout. Soft buff finely gritted ware. No glaze. Diameter not determinable. 13th-14th cent.

13. Piece of rim and upper part of wall in a rather hard greyish pink finely gritted ware. No glaze. Rim diameter 9 cms. 13th-14th cent.
14. Piece of rim and upper part of wall in a soft pinkish buff ware. No glaze. Rim diameter 11 cms.
15. Piece of rim and upper part of wall in a hard coarsely gritted pinkish buff medium thick ware. No glaze. Diameter not determinable. 13th-14th cent.
16. Piece of rim and upper part of wall in a soft pinkish buff ware with traces of brownish glaze with greenish haloes around pits. Diameter not determinable. 13th-14th cent.
17. Piece of rim and upper edge of wall in a soft pinkish buff ware with traces of dull greenish brown glaze remaining. Diameter 11 cms. 14th cent.
20. Piece of rim and upper part of wall in a hard, finely gritted pinkish buff ware. No glaze. Diameter 11 cms. 13th-14th cent.
19. Piece of rim and upper part of wall in a soft finely gritted pale buff ware with a grey core. No glaze. Diameter 10 cms. 13th-14th cent.
20. Piece of rim and upper part of wall in a hard finely gritted pinkish buff ware. Brushed yellow-green glaze. Diameter not determinable. 13th-14th cent.
21. Piece of rim and upper part of wall in a thin rather soft bright pink coarsely gritted ware. Thin orange brown glaze. Diameter 9 cms. 13th-14th cent.
22. Piece of rim and upper part of wall in a medium hard finely gritted pinkish buff ware. No glaze. Diameter not determinable. 13th-14th cent.
23. Piece of rim at edge of pinched spout in a thick hard very finely gritted buff ware. No glaze. 13th-14th cent.
24. Piece of rim and upper edge of wall near a (?) pinched spout. Thin very hard grey ware with a metallic ring. Olive-green to brown glaze. Rim diameter not determinable. 15th cent.
25. Piece of rim and upper edge of wall in a hard coarsely-gritted buff ware. No glaze. Diameter not determinable. 13th-14th cent.
26. Piece of rim and upper edge of wall in a soft coarsely-gritted buff ware. No glaze. Diameter not determinable. 13th-14th cent.
27. Piece of base and lower part of wall in a medium-soft pink ware. Very thin transparent to very pale yellow-green glaze on both outer and inner faces. Base diameter 16 cms. 13th cent.
28. Piece of base and lower edge of wall in a rather soft pinkish-buff ware. Thin greenish-yellow glaze. 12 cms. diameter. 13th-14th cent.
29. Piece of wall and extreme edge of base in hard pink ware. Traces of transparent glaze remain. Diameter not determinable. 13th-14th cent.
30. Piece of base and edge of wall in rather thin soft coarsely-gritted pinkish-buff ware; traces of dark core where thickest. No glaze. (?) 13th-14th cent. Diameter not determinable.
31. Piece of wall and extreme edge of base in a soft thin finely-gritted pinkish ware. Densely coated with soot externally. No glaze. Diameter not determinable. 13th-14th cent.
32. Piece of wall and extreme edge of base in a very hard pinkish-buff coarsely-gritted ware with thick lustrous bright green to brown glaze in interior. Exterior bears a patchy translucent brown glaze. Diameter not determinable. 14th cent.
33. Piece of base and lower part of wall in a rather thick, medium soft, pinkish-buff, coarsely gritted ware. Burnt pale-yellow glaze with traces of stacking ring. Diameter 9.0 cms. 14th cent.
34. Lower part of wall and edge of sagging base in a thin soft pink coarsely gritted ware. Trace of pale-yellow to burnt brown glaze on interior. Diameter not determinable.
35. Piece of sagging base and lower part of wall in a thick medium-hard buff ware; grey core; no glaze. Diameter not determinable.

36. Extreme edge of base and wall in a rather soft pinkish-buff finely gritted ware. Strong double thumb-pinch at edge of base. A little yellowish-orange glaze remains in the thumb depressions. Diameter not determinable. 13th-14th cent.

37. Edge of base and lower part of wall of a small vessel in a thin medium-hard finely gritted pinkish-buff ware. Strong internal wheel marks under lustrous yellow-green glaze. 9 cms. diameter. 13th-14th cent.

38. Piece of base and lower edge of wall in a soft finely gritted yellowish-buff ware. No glaze. Diameter not determinable. 13th-14th cent.

39. Piece of base and lower edge of wall in a soft greyish-buff finely gritted ware. No glaze. 12 cms. diameter.

40. Piece of base and lower edge of wall in a soft pinkish-buff coarsely gritted ware. Traces of translucent brown glaze. Diameter not determinable. 13th-14th cent.

41. Piece of wall in a dark grey coarsely gritted soft ware. Buff outer skin. No glaze. Strong decorative horizontal rib. 13th-14th cent.

42. Piece of wall in a rather thin, medium-hard pinkish-buff ware. No glaze. Bears strong decorative ridge caused by pushing wall of vessel out when on the wheel. 13th-14th cent.

43. Piece of wall in rather thin hard ware, grey externally, pinkish-buff internally. Coarsely gritted. Bears decorative ridge and groove running horizontally. Pale-yellow pitted glaze externally. 14th cent.

44. Piece of wall in a thin soft coarsely-gritted ware grey externally, pinkish-buff internally. Bears sharp narrow horizontal decorative ridge. Dull yellow-brown pitted glaze. 14th century.

45. Piece of wall in a thin soft pinkish-buff finely gritted ware. Bears very thin sharp decorative ridge and traces of thin yellow glaze. 13th-14th cent.

46. Piece of wall in a very fine orange-buff ware. White slip externally with traces of lime-green glaze. Bears very slight horizontal ridge. (?) Import. 13th cent.

47. Piece of wall in thin hard dull-pink coarsely gritted ware with dull-brown (?) burnt exterior. Bears decorative thickening of wall. 14th-15th cent.

48. Piece of wall in a thin very hard coarsely gritted ware with metallic ring. Dull pinkish-grey ware with dark brownish-grey exterior. Bears (?) painted glaze with very regular circular edge. 14th-15th cent.

49. Flake of wall in a soft pinkish ware. Bears lustrous yellow-green glaze with bright apple-green speckling. (?) Import. 13th-14th cent.

50. Piece of wall and edge of sagging base in a very thick coarsely gritted hard pinkish ware with grey core. Has had bung-hole about 4 cms. above apparent edge of base. Dark olive-brown pitted glaze. 14th cent.

51. Piece of pot lid (?) measuring 6.5 x 4.8 cms. in hard reddish-buff fine ware. Very thin translucent brown glaze. Very strong grass marks on both faces. By glaze not later than 14th cent.

Associated finds include a portion of a hexagonal jet plaque, one piece of heavily patinated glass, and a roasted granite pebble coated with glaze.

VI. LOCHMABEN MOTTE

Nat. Grid. Ref. NY083823

Lochmaben Motte was recorded as in existence in 1166. It became the caput of Annandale by 1204 and the last mention of it is in 1315-21 when King Robert granted the lands of Mouswald to Thomas de Carruthers—the reddendo being a pair of gilt spurs to be delivered "apud manerium nostrum de Lochmaben." (It is possible that King Edward stayed here on 4th-5th September, 1298.)

As a result of tee building operations on Lochmaben Golf Course in November, 1966, 27 fragments of pottery with fragments of heavy unglazed tile, oyster shells, and animal bone were recovered. The following pieces of pottery should be noted:—

1. Piece of rim and upper edge of wall in a thin cream ware, hard and finely gritted. No glaze. Late 12th-early 13th cent.
2. Piece of rim and upper part of wall in a thin coarse dark grey ware—pale grey near outer surface. Outer edge of rim bears notched ornament. Traces of burnt glaze remain. Colour not determinable. Early 13th cent.
3. Edge of base in a soft thin yellowish-pink ware. No glaze.
4. Piece of base and lower edge of wall in a thin, hard, coarse, finely gritted pinkish-buff ware—grey core. No glaze. Late 12th-early 13th cent.
- 5/6. Fragment of wall in a hard reddish-buff finely gritted ware. Strong wheel marks internally. No glaze except for a single curved "painted" line in pale opaque yellow glaze—with green blotches. Late 13th cent.
7. Piece of wall in a hard bright red coarsely gritted ware. No glaze.
8. Piece of wall in a thin hard pale grey ware with a thin bright yellow glaze.
9. Piece of wall in a thin hard coarsely gritted greyish-buff ware—bright red internally. Thick yellow-brown pitted glaze.
10. Piece of wall in a thin rather soft pink ware. Dull yellowish-green glaze with traces of apple-green flecks.

VII. LOCHMABEN CASTLE

Nat. Grid. Ref. NY088813

Lochmaben Castle began as a Pele erected by Edward I. in 1298, and was the centre of the English occupation of Annandale most of the time until 1385, when it became a Scottish royal castle, and continued in occupation well into the 17th century.

Three Fragments

No precise find conditions are known but two of the fragments are from the Society's old collections:—

1. Fragment of wall—probably a jug—in a thin hard pinkish-buff ware with a metallic ring. Dark-green, orange-flecked, pitted glaze. Probably 13th-14th century.
2. Fragment of wall of medium thickness showing a very dull cindered glaze. Fabric very dark and spongy with pink exterior—possibly overfired. The outer surface has been boldly and crudely trimmed with a knife. Undatable. D. and E. 1956.
3. Fragment of a rather thick jug wall with bold incised chevron decoration. The ware is a hard grey and has a good green, brown-flecked, glaze. 13th-14th century.

VIII. CASTLEDYKES, DUMFRIES

Nat. Grid. Ref. NX976746

Castledykes, Dumfries, was built as a royal castle near the existing motte in 1185, strengthened in the 1260's, again by Edward I. in 1300, and was "waste" by 1335. The Chapel of Our Lady of Castledykes, however, remained in occupation until the Reformation. A few worn scraps of pottery came from the robbed wall footings at some three feet depth near the centre of the castle plat, but the great bulk came from six inches depth in the doorway of a small lightly built structure on the east side of the plat at the edge of the moat (trial excavation by Dumfries Museum, 1954). See T.D.G.N.A.S., vol. XXXII., 1953-54, p. 192.

A total of 20 pieces were recovered and the following may be noted:

1. 1/M.C.D. Junction and upper part of a strap-handle with a deep central groove. Fine pinkish-grey ware—bright orange on underside of handle. The glaze, where surviving in the central groove, is thin yellow and pitted. 13th-14th cent.
2. 18/M.C.D. Lower part of wall and edge of base in a rather thin hard grey-buff ware—grey internally. A thumb depression at the base of the wall has pushed the edge of the base downwards. A little dark green glaze survives on the underside of the base. 14th-15th cent. Base 12.0 cms. in diam.

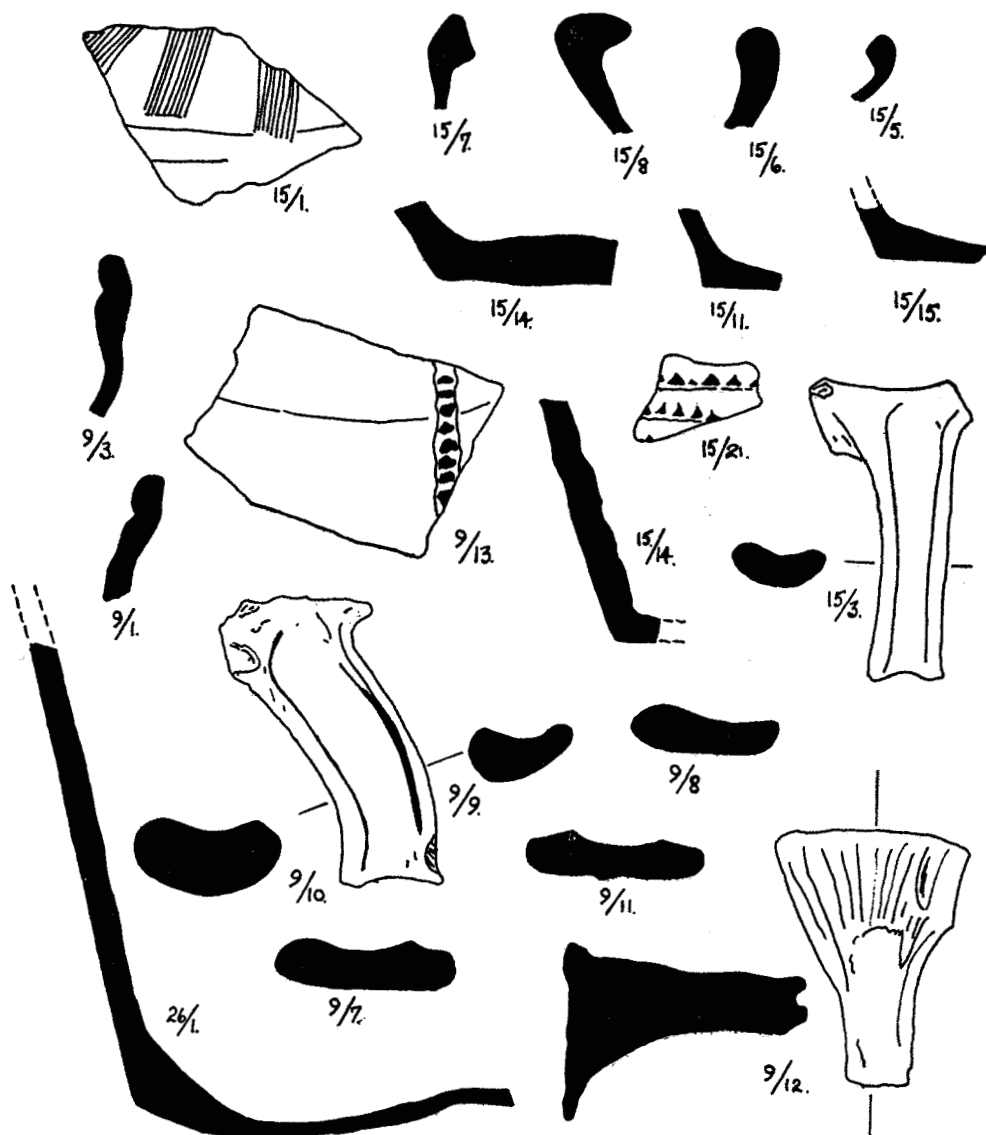


Fig. 9.—Castledykes, Kirkcudbright (15), Dumfries (9) [$\times \frac{1}{2}$].

3. 8/M.C.D. Lower part of wall and edge of base in a pinkish-buff ware with a slightly darker ware. A little yellow brown glaze survives on the underside of base. Base 12.0 cms. in diam. 13th-14th cent.

4. 20/M.C.D. Lower part of wall and edge of base in a medium thick pinkish-buff ware—grey internally. Shows part of a thumb impression just above the edge of the base. Base 12.0 cms. in diam. 14th-15th cent.

5. 2/M.C.D. Piece of wall showing a strong decorative ridge and decorative external wheel marks. Thin, fairly soft, uniform grey ware with a grey-green pitted glaze which fully covers external face. 15th-16th cent.

6. 4/M.C.D. Piece of wall in a thin soft grey ware—paler under glaze. Bears an incised ornamental line across face with three vertical scratches. Traces of a thin pale yellow-green glaze remain. 13th-14th cent.

7. 15/M.C.D. Piece of wall of medium thickness in a soft pale grey gritted ware. Bears vertical shallow parallel grooves on the outer face under a thick yellow-brown glaze. 13th-14th cent.

8. 7/M.C.D. Piece of wall in a thick soft grey ware, pink externally. Shows a portion of thumb impression at edge. Traces of pale yellowish glaze. 13th-14th cent.

9. 10/19/3/9/13/M.C.D. Five pieces from the wall of a vessel in a thick soft grey gritted ware. Bears a heavy pitted yellowish green glaze. 13th-14th cent.

IX. DUMFRIES MEDIAEVAL POTTERY

Eighteen fragments of pottery found in a box at Kirkcudbright Museum—labelled "Dumfries." The exact find locations are unknown.

1. D.M.P./17. Piece of rim with upper part of wall and top end of a rather narrow strap-handle with deep central groove at the junction with the neck. Rim diam. 7.0 cms. Fine pale reddish buff ware with a grey core. Dark reddish brown to green glaze—**patchy generally but pronounced at handle junction.** 13th cent.

2. D.M.P./10. Piece of rim and junction of handle in a very thick pinkish buff ware. Two large thumb impressions at junction of handle. No glaze. Rim diam. 8 cms. 13th cent.

3. D.M.P./9. Piece of rim in a fine hard grey ware—red externally. Neat groove below rim. Run blackish glaze. (?) 16th-17th cent. Rim diam. 7 cms.

4. D.M.P./8. Piece of wall with junction of strap-handle with shallow central groove. Hard rather thin grey ware with metallic ring. Heavy yellowish-brown glaze over a coarsely gritted surface—glaze absent below handle junction. 15th-16th cent.

5. D.M.P./6. Upper end of broad strap-handle—broad shallow groove, making handle concave. Thick soft pink ware with pale grey core. Thick glaze ranging from black to green. 13th-14th cent.

6. D.M.P./4. Top of strap-handle and fragment of wall in a thick soft pinkish ware with a grey core. No central groove but a shallow indentation is shown at the centre of the handle at the junction. The handle has broken at a small circular perforation into which glaze has run (? for suspension). Heavy pale yellow glaze. 13th-14th cent.

7. D.M.P./12. Small piece of strap-handle with a shallow central groove. Hard, gritty ware with a grey core and a pink exterior. Very thin black-brown glaze. 14th-15th cent.

8. D.M.P./7. Upper end of strap-handle with a shallow central groove. Grey ware with pink outer surface. Very thin patchy yellow-green glaze. 14th-15th cent.

9. D.M.P./16. Top of rather narrow strap-handle with central groove. Pinkish ware with grey core. Traces of weathered (?) glaze. Very fine paste. (?) Import. 13th-14th cent.

10. D.M.P./14. Piece of narrow thick strap handle with central groove, in a pink-grey ware. Thick brown glaze. 14th-15th cent.

11. D.M.P./2. Piece of strap handle with central groove. Grey ware, pink where unglazed. Pale yellow glaze. 13th-14th cent.

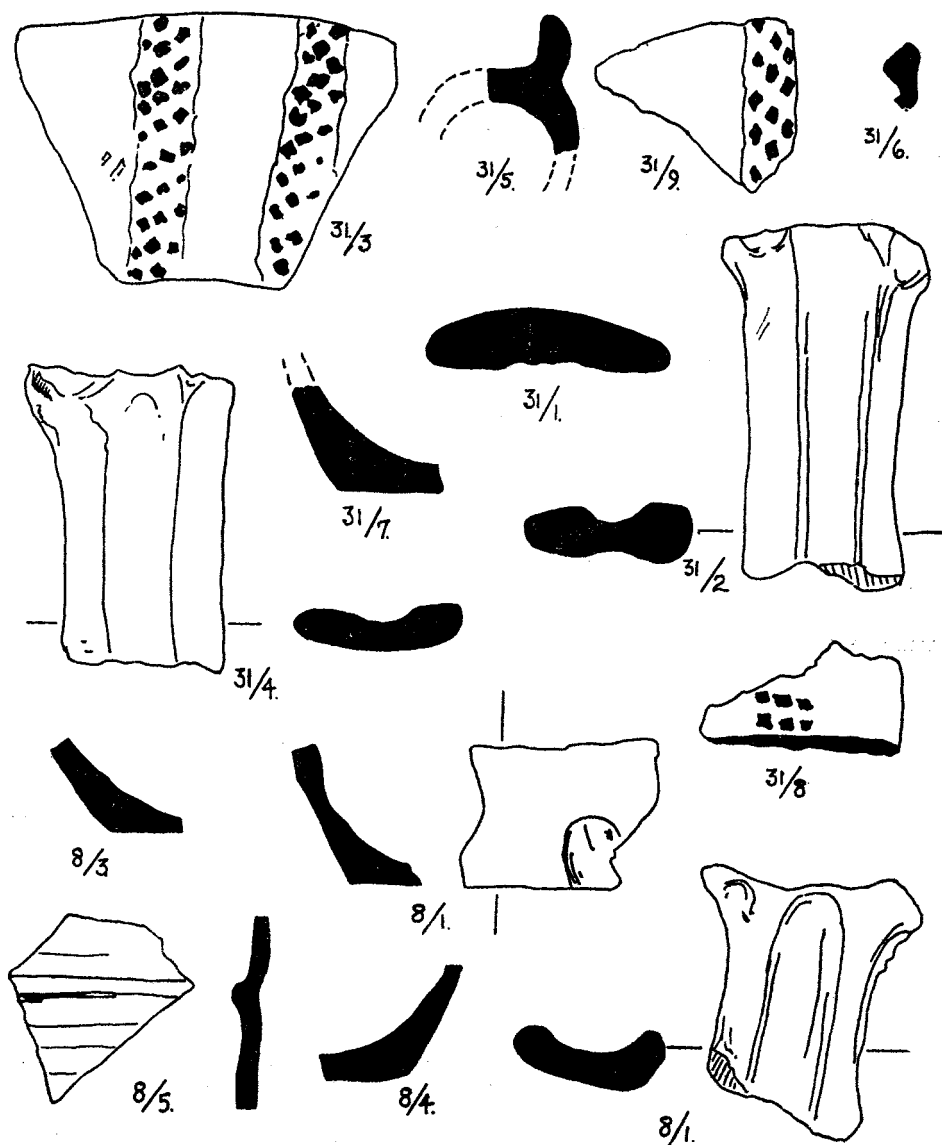


Fig. 10.—Friars' Carse (31), Castledykes, Dumfries (8) [$\times\frac{1}{2}$].

12. DMP/11. Complete handle of the "skillet" type with buttressed junction at one side. Pinkish ware with grits. Tip and one side of handle grooved: groove contains glaze. Heavy dull yellow-green glaze. 13th cent.

13. DMP/1. Piece of wall in a hard dark-grey ware, white below glaze. Band of applied decoration (cf. Lochrutton). Yellow-green glaze. 14th-15th cent.

14. DMP/15. Piece of wall in a soft pinkish-grey ware with a bright pink interior. Good heavy yellowish-green glaze with small brown pits. 14th-15th cent.

15. DMP/5. Piece of undecorated wall in a thin hard grey ware, white below a rather pale yellowish-green mottled glaze. 15th-16th cent.

16. DMP/3, 18, 19. Three small fragments of wall in a fine thin grey ware with a heavy mottled dark glaze ranging from yellow to red-brown. 14th-15th cent.

X. LANGLANDS, DUMFRIES

Nat. Grid. Ref. NX975766

The Langlands site is on a low windy ridge just outside the North gate of mediæval Dumfries, and seems to have housed the town's pottery kilns. The pottery found in the gardens of the houses now occupying the ridge suggests a life of several centuries for the industry. "Potters" appear in the Dumfries records up to the 1640's—but these made and sold brass tripod pots.

61 fragments were found, of which the following may be noted:

1. Fragment of wall with an ornamental ridge and a thin yellowish-brown pitted glaze. The ware is of medium thickness, grey externally under glaze, and red internally. 13th-14th cent.

2. Piece of strap handle of a simple form with a shallow central groove. Hard pinkish ware with a grey core. Olive-green glaze. 13th-14th cent.

3. Piece of rim in a dark grey ware—slightly lighter grey beneath an olive-green pitted glaze. Traces of glaze are also shown on the rim. Rim diam.=7 cms. Probably 15th cent.

4. Piece of base in a thick hard red ware—patchy greenish brown glaze. 13th-14th cent.

5. Small piece of wall in a thin hard pale grey gritty ware—greenish brown glaze. 15th-16th cent.

6. Piece of wall, medium thickness, hard grey ware with olive-green glaze. 15th-16th cent.

7. Piece of wall in a hard grey ware with a red inner face and rather patchy dirty olive-green glaze. 15th-16th cent.

8. Piece of base and edge of wall in a hard grey ware—pale grey internally with white (?) slip, and pink externally. Traces of a thin yellow pitted glaze are shown on the base. 14th-15th cent.

9. Piece of a rather thick wall in a soft pale grey ware with red outer and inner faces. Very thin yellow glaze. 14th-15th cent.

10. Piece of wall in a thin hard dark grey ware with a dull green glaze. 15th-16th cent.

11. Piece of very thin soft ware with a pale grey core, red internally, and mottled grey and white. Traces of a very thin translucent glaze. 13th cent.—cf. No. 2 from Luce Sands.

12. Piece of shoulder or carination in a thick dark grey ware with coarse grits and pink patches on outer face. No glaze present. 14th-15th cent.

13. Piece of fused spongy grey ware: no glaze present: probably a (?) waster.

XI. GREYFRIARS CHURCH, DUMFRIES

Recovered as surface find. See D. and E., 1963, p. 26.

1. Fragment of rim in a fine orange ware showing a strong ridge at lower external edge. Fine thin orange glaze. 14th-15th century. Rim diameter 14-15 cms.
2. Also found were 4 small badly corroded fragments—undatable.

XII. HIGH STREET, DUMFRIES

Found in trenching for a gas main in the mouth of the close immediately to the south of Bank Street.

1. Fragment of jug in a thin hard grey ware with a metallic ring and a thin orange-green glaze. The fabric approaches a stoneware. 16th century or early modern.

XIII. CHURCH STREET, DUMFRIES

Three fragments of pottery were found during soil levelling for the Church Street redevelopment. D. & E., 1963, p. 26.

1. Plain rounded rim and part of wall of a cylindrical jug or jar; rim radius 9 cms.: a dark hard fabric with prominent wheel-marks and a dull green glaze.
2. Fragment of wall from a large bulging vessel in a hard red ware with a little much corroded thin glaze showing red-brown where best preserved.
3. Fragment probably from the shoulder of a bulging (?) jug in a reddish, thick, hard ware—the wheel-marks on the outer surface are emphasized by combing and a thin yellowish-green pitted oxidized glaze.

Probable date of all three (?) 16th century.

XIV. MOTTE OF URR

Nat. Grid. Ref. NX816647

Motte of Urr, one of the two largest in Scotland, was destroyed in the anti-Norman Galloway revolt of 1174 and rebuilt six feet higher than before. The original level must date between about 1130 and the 1160's. A Burgh of Urr existed by 1262, but there seems little trace of occupation after the early 1300's. Excavation was begun under Mr (now Dr) Hope-Taylor in 1951 and 1953, but the pottery from this excavation is not available for report. T.D.G.N.H.A.S.

XIVa. Surface finds during 1965-66 from the motte hill. 14 pieces were recovered and the following may be noted:

1. Piece of wall from a very large vessel in a thin soft reddish, finely gritted ware. Decorated with short combed grooves in groups of 3 or 4 in a raised triangular area. Lustrous heavy brown-green glaze. (One small piece from the same vessel is also present.) (?) Early 13th cent.
2. Piece of rim (12.0 cms. in diam.) with square profile and groove below rim. Hard, gritty, rather thin ware with slight grey core. No glaze (?) 12th cent.
3. Piece of wall in a thin grey ware, pinkish-buff internally, grey beneath glaze. Moderately strong decorative wheel grooves on outer face. Remains of yellowish glaze. (?) 13th cent.
4. Piece of wall in a hard whitish cream ware. Strong internal wheel marks. Glaze has been lime-green with dark apple-green spots (due to (?) copper). Probably an import, 13th cent.
5. Piece of a very small rod handle (diam. 1.2 cms.) in a bright pink ware—slightly grey core. Remains of thin yellowish-brown glaze. 13th cent.
6. Small piece of much worn wall in a thin soft pink gritted ware. Decorated externally with two narrow grooves apparently part of a square with rounded corners visible (cf. Redkirk No. 20). A little (?) yellow-brown glaze is visible in the ornament. 13th cent.
7. Two fragments of thin hard pink gritted ware. One piece bears two converging grooves on the outer face. Lustrous brownish-green pitted glaze. 13th cent.
8. Piece of wall in a thin hard greyish-pink ware, pink internally. Thinly coated with olive-green glaze. 13th cent.

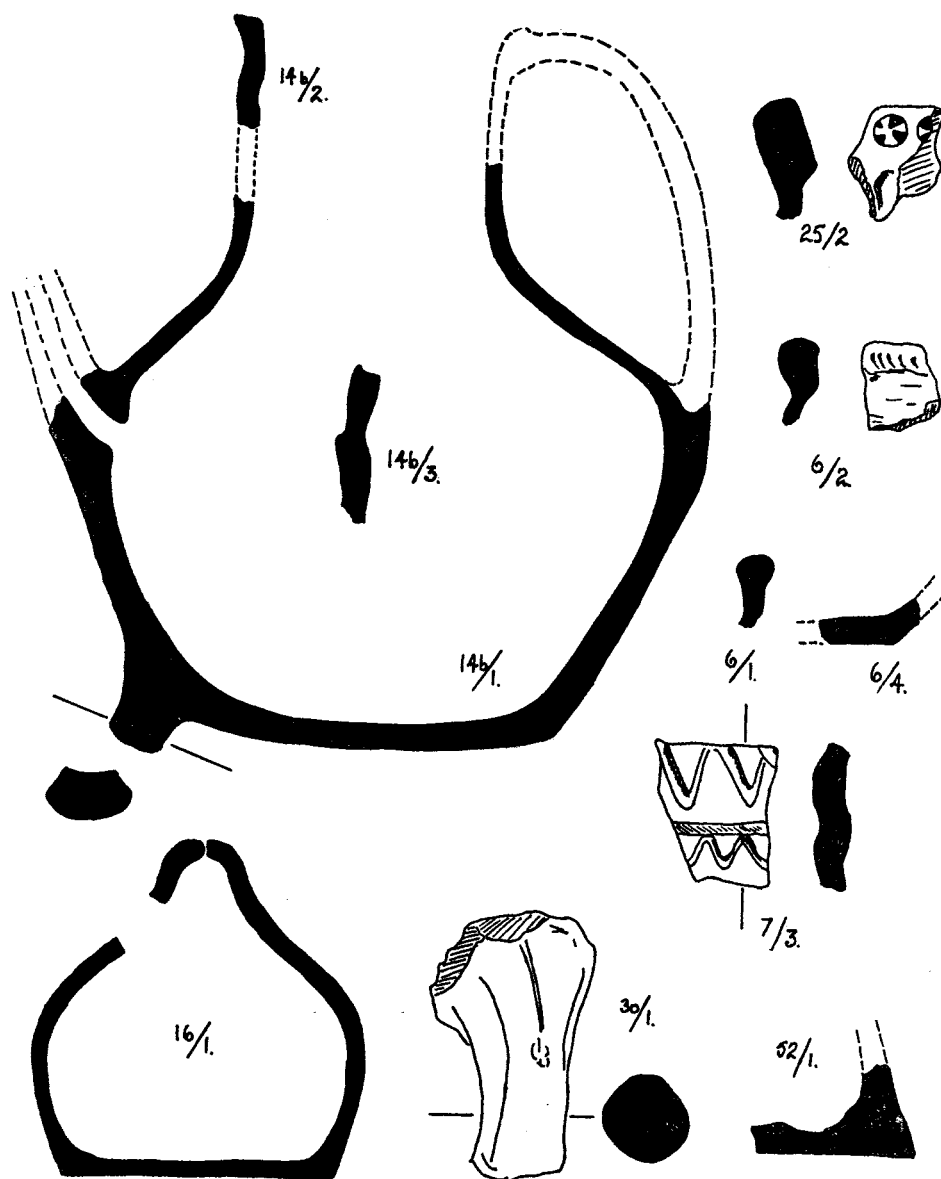


Fig. 11.—Motte of Urr (14b), Torthorwald (25), Lochmaben Motte (6), Lochmaben Castle (7), Birrens (30), Buittle Castle (52), Kirkcudbright (16) [$\times\frac{1}{2}$].

XIVb. MOTTE OF URR

From the immediate motte of Urr district—exact find location unknown. The jug was found in a rabbit scrape with an Irish penny of Edward I.—(?) survivor of a hoard scattered by rabbits. Of the separate rims found at the same time one appears to belong to the vessel, which is a squat globular tripod pot with a tubular spout and elongate neck. The ware is rather thin, hard, and pale grey—reddish where unglazed (especially in the “shadow” of the handle—the handle being lacking). Thumb impressions are present at the tops of two smaller legs and under the base of the handle (handle shows a central dimple at the base). Base slightly sagging. The whole pot has a rather decorative wheel-marking externally and is covered by a rather patchy yellowish green-brown glaze. Base diam. 10.0 cms., body diam. approx. 14 cms., rim diam. 7.0 cms., probable height c. 20 cms. The second rim found is of a hard gritty red ware—grey internally. The rim, which is probably from a jug or jar, is 7 cms. in diam. and grooved as though for a lid. Ornamental ridge below rim. No glaze visible. The vessel and two rims could be dated to the late 13th-early 14th century.

XV. CASTLEDYKES, KIRKCUDBRIGHT

Nat. Grid. Ref. NX677509

Castledykes, Kirkcudbright. Strong courtyard-castle, probably built under Christina, daughter of Alan of Galloway, and her husband the Earl of Albemarle, on or after their inheritance of central Galloway on Alan's death in 1234. It was finally destroyed in the decade or so after 1300.

A full description of the pottery deposited in Kirkcudbright Museum¹ is given by Dunning, Hodges, and Jope in P.S.A.S. Vol. XCI., 1957-58. There is, however, a small collection (50 pieces) in Dumfries Museum—these are described below.

1. Piece of wall in a hard grey-buff ware—orange internally, with a metallic ring. Decorated externally with strip of fine combing: traces of yellow-brown crackled lustrous glaze.

2. 42/C.K.P. Upper part of rod-handle: thumb depression at junction—grey ware, pink on surface, thin patchy yellowish-green glaze.

3. Simple narrow strap-handle with central hollow: thin fine smooth unglazed buff ware, probably imported.

4. 7/C.K.P. Piece of rod-handle in hard pinkish-buff ware, rather gritty surface: dark green glaze on top of handle, showing orange at edges.

5. Rim in fine thin smooth pinkish-buff ware; traces of external grey slip survive in groove under rim, possibly an import.

6. 22/C.K.P. Piece of rim and wall, with edge of a spout, in thick hard gritty red ware—lustrous orange-red glaze.

7. 26/C.K.P. Rim and edge of spout, thin hard, rather gritty pinkish-buff ware—no glaze.

8. 11/C.K.P. Rim and uppermost part of wall, rather thin hard buff ware: no glaze.

9. 1 and 2 C.K.P. Piece of wall and edge of base, rather thick hard pink ware with metallic ring: strong wheel-marks internally at foot of wall: extremely thin skin of glaze making surface a darker red, and visible as lustrous orange spots where thickest. 16 cms. diameter.

10. 43/C.K.P. Piece of wall: very thin soft pink ware with traces of buff slip—compare No. 5.

11. 8/C.K.P. Edge of base and lower part of wall in a very fine greyish ware pink on both faces. Spot of orange-brown glaze on base. Outer face extremely smooth—due to burnishing? 11 cms. diameter.

¹ The whereabouts of the pottery described in Kirkcudbright Museum is at present unknown—excepting the few fragments on display there.

12. 37/C.K.P. Junction of base and wall in a medium-hard grey ware, pink externally. Traces of lustrous olive green-brown glaze. Finger and thumb pinching at edge of base.
13. 15/C.K.P. Piece of base and lower part of wall in pale grey ware—pink internally. Bears dull-green glaze: outer face of (?) base excessively rough. Strong finger pinch at base of wall with only very faint thumb depression adjoining it.
14. 5/C.K.P. Piece of base and lower part of wall in a bright pink soft ware with greyish core. Traces of thin transparent glaze. 14 cms. diameter.
15. 29/C.K.P. Edge of base and lower part of wall, thin hard grey ware: bright pink internally, heavily soot-blackened externally. No glaze. 11 cms. diameter.
16. 18/30/C.K.P. Two fragments of wall of large vessel showing strong external decorative wheel grooves. Brown glaze blotched with yellow. Hard pink ware. Same vessel as in No. 6.
17. 4/C.K.P. Piece of wall in a hard, medium thick greyish-buff ware, bright pink under orange brown pitted glaze. Shows edge of (?) applied strap. [No. 6/C.K.P. is from the same vessel.]
18. Piece of wall, medium hard pinkish-buff ware of medium thickness. Rather darker on outer face where not concealed by yellow-white painted pattern. Bears traces of thin translucent glaze. (c.f. Lochmaben Motte and Kirkpatrick-Fleming.) (?) Import.
19. 24/C.K.P. Piece of wall in very thin rather soft pinkish buff ware, bright pink internally. Shows sharp ornamental wheel-grooves and ridges externally. No glaze.
20. 40/C.K.P. Piece of wall in rather thin very hard gritty ware: white core: buff both faces. No glaze. (?) Import.
21. 46/47/C.K.P. Small piece of wall in medium hard very thin pink ware. Dirty-brown glaze over impressed dog-tooth ornament arranged in close (?) horizontal lines.

XVI. KIRKCUDBRIGHT

Small pirlie pig, base 7.0 cms. in diam., height 9.0 cms. in a very hard dark grey ware; base reddish externally, yellow-brown lustrous glaze. Contained a small coin hoard Mid 16th cent. P.S.A.S., Vol. xlv., p. 352.

XVII. (?) KIRKCUDBRIGHT—Spindle Whorls

Samples ex. Hornel collection—exact locus unknown.

1. Spindle whorl (3.8 cms. in diameter) cut from a rather thick patchy grey-pink ware. Undatable.
2. Small spindle whorl (3.2 cms. in diameter), pink on one side and dark grey on the other. The dark, concave, side is decorated with a simple incised cross. Probably both from Castledykes, Kirkcudbright.

XVIIIa. LUCE SANDS

No exact locations.

Twenty-six fragments, but these are mainly small and fragmentary; however, the following may be noted:

1. Base and lower edge of wall in a dark-grey homogenous ware with a white (?) slip internally and externally. Base 12 cms. in diameter. The wall shows the foot of a bold band of applied ornament. 13th-14th cent.
2. Two fragments of a rim (12 cms. diameter) in a thin dark grey ware—pink externally shading to whitish grey near the rim; the interior is almost entirely whitish-grey. This whitening of a dark fabric could be due to the use of a clay containing salt. 13th-14th cent. (Two pieces of wall in the same fabric also exist.)
3. Piece of wall in a thin pale grey ware with incised ornament. Thin yellow slightly pitted glaze. 13th cent.

4. Piece of wall in a thin dark grey gritty fabric—pale grey beneath an olive green glaze. 15th-16th cent.
5. Piece of inner face of wall in a pale grey ware with a fine olive green glaze very similar to No. 4.
6. Piece of wall in a fine thin ware—dark externally and white internally. No glaze. (?) Imported. 13th cent.
7. Piece of wall in a pale grey rather thin ware showing an incised line as part of a decoration. Dull yellowish glaze. 13th-14th cent.
8. Piece of wall in a thin very soft pink ware with remains of a thin patchy yellow pitted glaze. 13th cent.
9. Piece of wall in a medium hard gritty bright pink ware. Shows large thumb impressions from (?) base of handle. Lustrous orange-brown glaze. 13th cent.
10. Fragment of upturned rim in hard fine bright pink ware, slightly burnt. No glaze. Diameter not determinable.

XVIIIb. POTTERY FROM LUCE SANDS IN STRANRAER MUSEUM

1. 443A. Part of simple broad strap-handle with shallow central groove: medium-hard gritty bright pink ware with grey core: somewhat burnt: originally thin yellowish glaze which survives in places, but much of outer face covered by apparent blackish lustreless glaze. 13th cent.
2. 466A. Fragment of wall and edge of base in a hard pinkish lightly gritted ware: greyish buff externally with red mottling. No glaze. Diameter not determinable. 13th-14th cent.
3. 468A. Piece of wall in a rather thick orange-pink very finely gritted ware. Thick yellow-brown glaze externally. 13th cent.
4. 441A. Three fragments of wall in a very hard thick dark-grey ware with metallic ring: wheel-marks internally and externally: traces of a thin yellowish-green glaze. 15th-16th cent.
5. 467A. Rim and upper part of wall in a thin pale brown-grey ware, very hard, coarsely gritted, burnished black both faces. Rim flat: slightly hollowed band beneath it terminating downwards in a ridge. Diameter about 7 cms. Unlike any mediæval ware in this area. Possibly a post-Roman pre-Norman import.

XIX. TORRS WARREN, GLENLUCE

Upon finding the coin hoard at Torrs an excavation of the adjacent building yielded substantial fragments of 13th-14th cent. and 15th cent. pottery. A full description of the hoard and the pottery is given in *Mediæval Archaeology*, Vol. III., 259-279.

XX. CRAIGNARGET, LUCE BAY

Single fragment of hard (?)overfired ware—grey near outer face, reddish on inner. Rather irregular profile. There is an ornamental ridge below the rim and the glaze is a dull-green to transparent brown. The site and excavation are reported fully in *T.D.G.N.H.A.S.* Vol. 38, p. 83.

XXI. INGLESTON MOTTE, KELTON

Nat. Grid. Ref. NX775579

A little surface excavation by A. O. Curle at this Motte yielded some bone, charcoal, iron nails and a rivet. Also found were a few fragments of glazed mediæval pottery—some showing (?)stamped decoration and applied pellets. An iron padlock of mediæval type was also recovered. Description of the Motte and the excavation is given in *P.S.A.S.* xlvii., p. 189-200. Material in the Nat. Collection.

XXII. KIRKPATRICK-DURHAM—Exact find-place unknown

1. Small jug with vertical neck, with a globular body contracted above an expanded base; edge of base crimped; narrow strap handle with deep central groove. Very thin grey ware (?) slip-glazed externally and internally. Glaze mainly red-brown but where thinnest the grey ware shows through. Base diam. 7.4 cms.; rim diam. 6.6 cms.; height 12.0 cms. 16th-17th cent. (Plate XIV, bottom left).

2. Small jug with flat base, oval body, and flaring rim with a small pinched spout. Narrow strap handle with shallow central groove. Surface much roughened and shows strong brush marks; lower part of jug bears little glaze; neck, handle, and inside of rim are patchily covered by a thick lustrous vivid apple-green transparent glaze. Ware extremely thin and fine—snow-white in colour with no grits. Probably an import—13th-14th cent. Base diam. 6.5 cms., rim diam. 7.0 cms., height 15.0 cms. (Plate XIV, bottom right).

These two jugs were presented to Kirkcudbright Museum with a collection of coins by James McCargo of Kirkpatrick-Durham—later of Dalry (a known coin collector). It could well be that the later in style of the two jugs is associated with the large group of James VI. 16th-17th cent. coins in the collection.

XXIII. CAERLAVEROCK CASTLE

Nat. Grid. Ref. NYO26656

The large triangular castle at Caerlaverock, a Maxwell stronghold besieged by Edward I. in 1300, must have been built about 1290, superceding the older castle a few hundred yards away. Occupation of the new castle continued with only brief interruptions until its destruction after the siege of 1640.

1. During excavations in autumn 1948 on the platform across the road from the moated "Old Castle" site in the wood at Caerlaverock rubble wall foundations of considerable extent were exposed and in one of these were found a much corroded axe-head, a rim, and part of a handle in grey, green-glazed mediæval ware. These finds were deposited with Durham University and have been lost trace of.

2. Pottery from Caerlaverock Moat was exhibited at a *Conversazione* in Greyfriars' Hall, 27th-29th Oct., 1886. Exhibited by Mr W. J. Maxwell. No details known. T.D.G.N.H.A.S. 1886-87, p. 84.

3. Surface Find. Piece of base in a hard dark ware—pinkish buff on one face. No glaze. 15th-16th cent.

CAERLAVEROCK "OLD" CASTLE

The lozenge-shaped site in a broad still wet moat in the wood a few hundred yards from the great triangular castle at Caerlaverock was always known as the "old" castle: then for a few years it was held to be a moated manor of the 15th century occupying a break in the occupation of the main castle. This view has been reversed again, however, and Cruden in his "Scottish Castles" holds it, in view of its fluted walls, to date to about the 1230's: this is inherently likely if it indeed be the first Caerlaverock seat of the Maxwells, as they acquired the estate at this time. The Ancient Monuments Commission record that when making their survey an elderly local informed them that he had been a labourer on a small excavation there in the 1860's and that pottery had been found then, being buried at the spot the Commission mark x on their plan.

XXIV. INGLESTON, NEW ABBEY

Nat. Grid. Ref. NX981651

Ingleston, New Abbey: this large Motte must be that of Richard, son of Troite, a Cumberland landowner, who was granted the lands of Lochenelo here about 1170 by

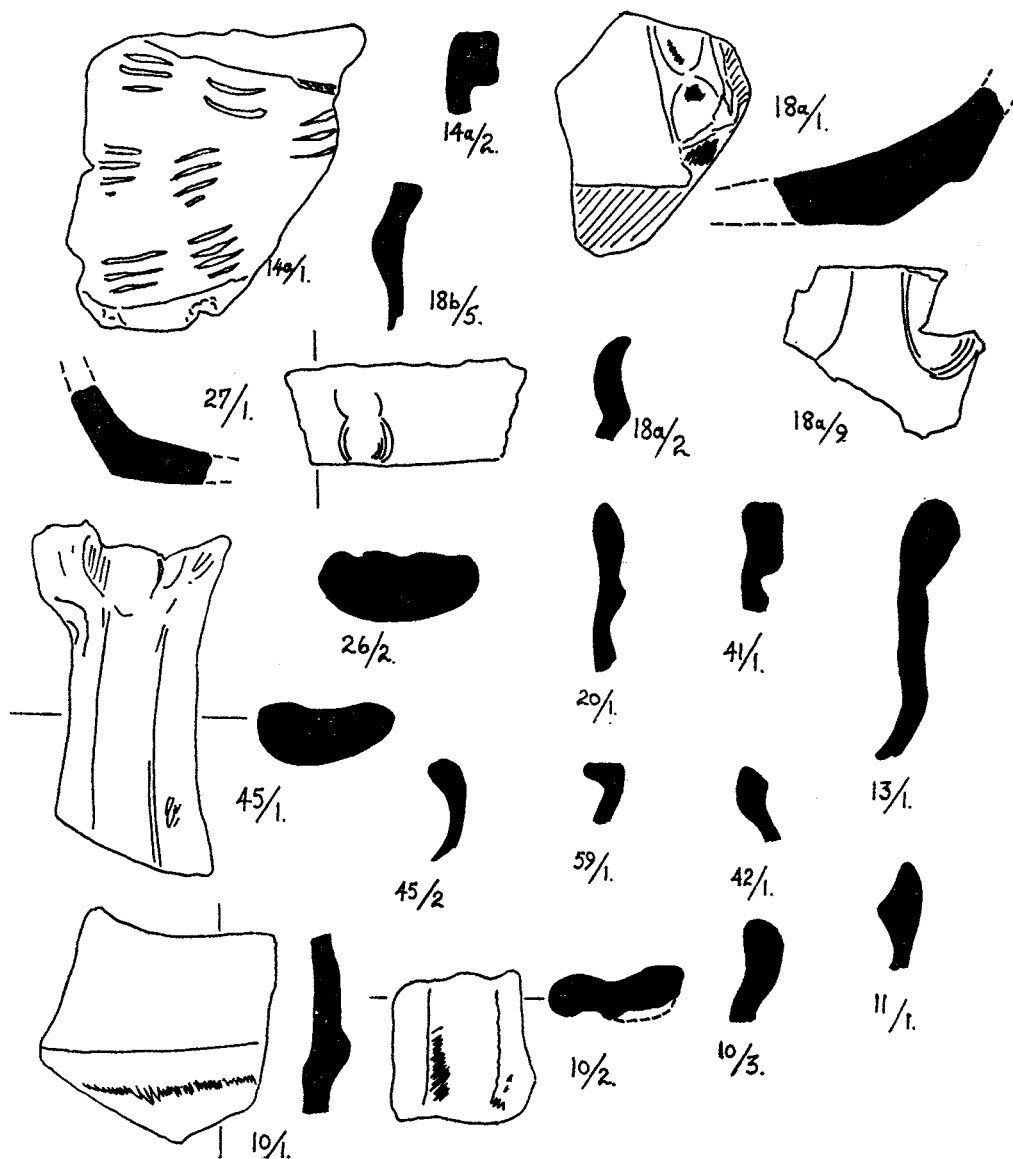


Fig. 12.—Motte of Urr (14a), Luce Sands (18a), Wauchope (27), Thornhill (45), Barjarg (41), Craignarget (20), Blacketlees (26), Church Street, Dumfries (13), Langlands (10) [$\times \frac{1}{2}$].

Uchtred of Galloway. Occupation probably covered the late 12th and most of the 13th century: there do not appear to be any later structures on the motte.

Surface finds during 1966. The only associated material was a little fused lead.

1. 7 pieces of wall in a thin, medium hard, red, gritty ware. A little very thin yellow glaze remains. 13th cent.

2. Single piece of wall in a medium thick hard pink gritted ware with a grey core. No glaze remaining. 13th cent.

XXV. TORTHORWALD CASTLE

Nat. Grid. Ref. NY033783

The castle earthworks seem to suggest a motte-type structure of 12th-century date: certainly the de Torthorwalds had been in occupation prior to the marriage of a cadet of the Kirkpatrick of Auchencas to the de Torthorwald heiress near the end of the 13th century. The existing stone castle is late 14th-early 15th century, probably mainly the work of William de Carleil who married the Kirkpatrick heiress in 1418. Occupation continued till 1715.

Two pieces of pottery were found during surface collections in November 1966, in the field immediately adjacent to the Castle.

1. Piece of wall in finely gritted red ware with traces of olive green glaze. Undatable.

2. Piece of rounded rim in very thick, cream-buff ware with dark grits. Outer edge of rim has borne stamped ornament in the form of a neat cross with expanded arms within a circle. One complete stamp survives along with part of another immediately adjacent to it. Traces of yellow-green glaze remain. 13th-14th cent.

XXVI. BLACKETLEES, ANNAN

Nat. Grid. Ref. NY194691

The Blacketlees pottery comes from a rabbit-hole in sandstone rubble near an old farmhouse site, at the edge of a sandstone cliff above the Annan about a mile North of Annan town, being found in the early 1950's by Mr Aitken, son of the Blacketlees farmer.

1. The material found represents a base and the major part of a large bucket shaped vessel in a finely gritted hard grey ware which shows a patchy yellow-green glaze—the fabric is burnt red where unglazed. The base has been pushed upwards at a point where a stacking ring, 14 cms. in diam., shows on the base. The walls which remain in the rebuilt material are approximately 15 cms. high: at this point the diameter is approximately 20 cms. However, one of the detached pieces shows ornamental wheel-marks which suggest that the vessel contracted sharply towards the neck—(?) 14 cms. as in the stacking ring on the base.

The largest detached fragment shows a large thumb depression at one point suggesting a (?) handle.

2. A single piece (No. 6/M.P./BLA.) of a strap handle represents another vessel from the same site. The ware is pinkish-grey, pink externally, and bears a little yellow-green glaze. The handle has three neatly cut grooves.

Both vessels suggest a 14th-15th century date.

XXVII. WAUCHOPE CASTLE, LANGHOLM

Nat. Grid. Ref. NY357842

During trial excavations at the site of Wauchope Castle in 1966 there was found, in the mediæval levels, a single fragment of base and wall in a hard cream ware, with grey core, and showing one thumb mark at the edge of the base—base slightly sagging. No glaze. 13th cent. Base diam.—13 cms.

XXVIII. WAUCHOPE BRIDGE, LANGHOLM

Nat. Grid. Ref. NY356843

Excavation during August 1965 revealed the abutment of a late mediæval pack horse bridge. A single fragment of 13th-14th cent. pottery is recorded. See T.D.G.N.H.A.S. Vol. xliii. (1966), p. 152-3.

XXIX. SOUTHWICK OLD CHURCH

Nat. Grid. Ref. NX905569

King Edward I. gave 15/- to Our Lady of Suthaye on his progress through Galloway in Summer 1300. The building from its style could date from about 1280.

Two fragments of pottery were found on a flattish boulder at the base of a wall of the Mediaeval Church—apparently lost or broken during the construction of the wall.

1. Large fragment of base in a grey ware with a very thin yellow-brown patchy glaze. Outer surface of base shows two parallel lines of grooves—caused by (?) sitting on dried grass prior to firing.

2. Fragment of wall in a thin ware—grey externally below a yellow-brown glaze and red internally. The glaze is much pitted.

XXX. BIRRENS

Exact locus unknown.

There was a small tower-house within the Roman fort, datable to the 15th and 16th centuries, and occupied by a family of Carlyles. It is not known whether there was an earlier building, but this is likely. There were occupied dwellings within the fort area until well into the 18th century. (Baron Clerk—Prevost, T.D.G.N.H.A.S., vol. xxxviii, (1959-60), p. 128, and General Roy Map.).

The following three fragments were all apparently recovered as surface finds on various occasions:

1. Medium-sized rod-handle, 2.6 cms. diam., of a hard, greyish-buff ware with a fine pale green glaze which shows an iridescent lustre.

2. Fragment of wall of a thin very hard ware with a metallic ring—very poor dull-green pitted glaze.

3. Fragment of wall of pinkish-grey ware with a good orange-green glaze externally—the interior shows a fine thin patchy colourless glaze (almost suggestive of slip glazing). The group as a whole is datable to the 14th-15th century.

XXXI. FRIARS' CARSE LOCH

Nat. Grid. Ref. NX919846

Ex Grierson Collection. Details of finding in P.S.A.S., vol. xvi. (1881-82), p. 73-78. A Crannog site.

Eleven pieces of which the following should be noted:—

1. Piece of base and edge of wall in a soft thick buff-orange gritted ware. No glaze.

2. Upper end of a broad strap-handle with deep central groove. Remains of lustrous orange-brown glaze.

3/8/9. Three piece of wall from a large vessel in a soft orange-pink coarsely gritted ware. Patchy yellow to brown glaze. Bears traces of broad applied strips decorated with a square punched design.

4. Upper end of a broad strap-handle with shallow central groove. Yellow-green to brown glaze.

5. Piece of rim and upper end of a broad strap-handle with deep central groove. Hard orange ware with dark brown glaze.

6. Small piece of angular rim—profile shown—in a soft finely gritted ware. No glaze. 13th-14th cent.

XXXII. KIRKPATRICK FARM, KIRKPATRICK-FLEMING

Fragment of thin buff ware showing two bands on white "paint" on outer face: shows very small fleck of yellow glaze. See D. and E., 1962, p. 27. (?) Associated with iron smelting.

XXXIII. ANNAN MOTTE

Nat. Grid. Ref. NY193667

Annan Motte, at the head of tidal water near the mouth of the Annan, was the first de Brus caput, and must date from very near the grant of Annandale to that family in 1123/24. It was partly washed away by the river about 1204 and certainly before 1218. (Dr R. C. Reid, *The Caput of Annandale*, T.D.G.N.H.A.S. vol. xxxii., p. 155).

Surface find in 1966. Small fragment of coarse yellowish-red ware—probably from a base as there are remains of a stacking-ring. Fine transparent glaze showing the red of the fabric but pale green where less oxidized behind the stacking-ring. Probable date 12th century.

XXXIV. RIGGHEAD, COLLIN

Nat. Grid. Ref. NY037753

A small globular jug in a homogenous reddish ware with a simple handle intermediate in form between a strap and rod. Shows decorative wheel marks externally. Patchy yellow-green glaze. Rim diam. 5.0 cms.; base diam. 9.5 cms.; height 20.0 cms.; body diam. 16.5-17 cms. This jug contained a hoard of over 500 coins—mainly James V. and Henry VIII. but also some of the early coinages of Mary Queen of Scots. Deposited beside a ruined wall c. 1556. (Plate XIV, top).

XXXV. LINCLUDEN COLLEGE, DUMFRIES

Nat. Grid. Ref. NX966779

1. During the late 1950's, at the discovery of a grave, a piece of wall in a hard grey ware with green glaze was recovered. No details known.

2. Lower part of a jug: badly made: sparsely glazed. Max. diam. 5½. Scottish Med. Pottery. S. Cruden. P.S.A.S. 1955-56, p. 74.

XXXVI. SWEETHEART ABBEY

Nat. Grid. Ref. NX965662

Small piece of rim in a badly corroded medium hard, bright red, gritted ware. No glaze remains. Undatable. Surface find.

XXXVII. GLENLUCE ABBEY

Piece of wall in a very hard gritted dull-pink ware. Thin lustrous glaze on both faces. Glaze ranges in colour from yellow-green to orange brown. Slightly pitted. 14th-15th cent. Surface find.

For a description of the pottery recovered during Ministry of Works excavations see T.D.G.N.H.A.S. vol. xxix. (1950-1) and vol. xxx. (1951-2).

XXXVIII. THE BROUGH, DUNJUMPIN, SOUTHWICK (A MOTTE)

Nat. Grid. Ref. NX936570

Surface finds during April 1965 were a little daub and one small corroded fragment of a thin pinkish-buff ware. Probably 13th cent.

XXXIX. THE ABBOT'S TOWER, LANDIS, NEW ABBEY

Nat. Grid. Ref. NX973666

During the trial clearance of a possible cistern beside the Abbot's Tower (built c.1540), two fragments of pot were found.

1. Piece of wall in a very hard (?) overfired ware. Grey ware but buff internally. Partially cindered brown glaze. 16th-17th cent.

2. Very small, highly curved fragment of very thin wall in a hard pale grey almost vitreous ware. No glaze remaining. 16th-17th cent.

XL. MILLHILL, NEW ABBEY

Nat. Grid. Ref. NX964679

See excavation report in this volume.

XLI. BARJARG MOTTE, GLENCAIRN

Fragment of rim—found on the summit of the Motte-hill—of a pale grey ware with a buff inner face. Yellowish-brown mottled glaze with some cindering on the body. 13th-14th century. Rim diam.—10 cms.

XLII. LOCH URR

Nat. Grid. Ref. NX763845

Surface find from the "Castle," apparently a "Hall," on the island in Loch Urr. From the Society's old collections.

1. Rim 13 cms. diam. and edge of wall in a bright orange fabric—no glaze surviving and rim of simple form. (?) 13th century.

XLIII. SOUTHWICK MAINS

Nat. Grid. Ref. NX939567

The standing stone at Southwick Mains Farm. A single fragment of grey ware with a yellow-green glaze. Probably 15th-16th cent.

XLIV. DUNROD MOATED MANOR

Nat. Grid. Ref. NX699459

The pottery recovered during the excavation on this site is fully recorded in T.D.G.N.H.A.S. Vol. XLIII.

XLV. THORNHILL AREA—no precise locus

Ex Grierson Collection.

1. Simple strap handle with central depression. Fine buff ware with a darker core and a pale green smooth glaze. Probably 15th-16th cent.

2. Simple overhung rim in a fine reddish ware—no glaze. 9 cms. diameter.

XLVI. DUMFRIES MUSEUM GROUNDS

Several fragments of mediæval pottery have been recovered from forced soil in the Museum grounds—the origin of the soil is unknown.

XLVII. DINWOODIE GREEN, ANNANDALE

Nat. Grid. Ref. NY107884

Remains of 7 vessels, also odd sherds, mainly 13th century but some (?) 12th and 14th were recovered from the site. See D. & E. 1958, p. 18. Publication is hoped for in T.D.G.N.H.A.S.

XLVIII. TROQUEER MOTTE

Nat. Grid. Ref. NX977748

A large troop-mustering motte of the 12th century. There is no evidence of a later occupation. It lies across the river from the 12th century Motte and later 12th century Royal Castle at Castledykes, Dumfries. Several small fragments have been recovered—the surface of the motte is much disturbed by 19th century landscape gardening.

XLIX. RUE GRAIN KILN

Nat. Grid. Ref. NX908808

A single fragment of late 15th century pottery was recovered during the excavation of the grain drying kiln. See D. & E. 1961 p. 28, and T.D.G.N.H.A.S. Vol. xxxix. (1960-61), p. 80-82.

L. AUCHENCAS CASTLE

Nat. Grid. Ref. NT063035

Auchencas Castle, 1230-1260, was the seat of the Kirkpatricks of that ilk; repaired just after 1300 and then destroyed shortly afterwards. The trial trenching of 1928 revealed, according to the workmen, a great deal of pottery which was simply reburied with the spoil.

LI. ARDWALL ISLAND

Nat. Grid. Ref. NX573495

A mediæval Hall on the site of an earlier church; the pottery suggests an occupation around 1250-1300. See T.D.G.N.H.A.S. vol. xliii., pp. 84-116.

LII. BUITTLE CASTLE

Nat. Grid. Ref. NX819617

Buittle Castle: a large motte in the East bank of the Urr at the head of tidal water and about 3 miles downstream from Motte of Urr. The stone curtain-castle built on the motte is that of Dervorgilla and her husband John Balliol, and the site was their Galloway seat probably from the death of Alan, Dervorgilla's father, in 1234. The motte must have been erected in the 12th century by one of the Lords of Galloway. The castle was destroyed early in the 14th century, probably in 1310-1315. Buittle was chartered as a Burgh in 1324-25.

Single fragment only—surface find in 1966.

1. Piece of base and lower edge of wall from a (?) jug with a spread base. 13 cms. in diameter, thick, fine, dark-buff ware—red externally where unglazed. Patches of yellowish brown run glaze. 13th-14th cent.

LIII. JARBRUCK MOTTE

Nat. Grid. Ref. NX799900

One of the typical Dumfriesshire Mottes—probably of the late 12th century—has yielded a few small fragments. See D. & E., 1956, p. 17.

LIV. GRIERSON AVENUE, DUMFRIES

A few small fragments of pottery were recovered from former arable land—no suggestion of dwellings.

LV. CASTLE LOCH, MOCHRUM

An island site which yielded Roman material and evidence of a 12th century church superceded by a mediæval hall. A good description of the mediæval pottery [which included four small fragments of "Hispano-Moresque" lustre ware. All the pottery appears to be of 15th-16th century] is given in T.D.G.N.H.A.S., vol. xxviii, pp. 59-60.

LVI. GREYFRIARS' CONVENT, DUMFRIES

This religious house was founded c. 1264 and functioned until the reformation. Pottery drain tiles, very similar to those found at Glenluce Abbey, were recorded during building operations in 1961. See D. & E. 1961, p. 27.

LVII. MACLELLAN'S CASTLE

Nat. Grid. Ref. NX683511

A little pottery, as surface finds, has been recovered from this site.

LVIII. EAST PRESTON

Nat. Grid. Ref. NX958558

A little mediæval pottery has been recovered from the fields adjacent to the farmhouse: associated with iron slag.

LIX. LOCUS UNKNOWN

1. Very slightly curved fragment of wall in a fine white pipeclay-like ware, rather thin, with a pale yellowish glaze. 13th-14th century. Probably an import.

2. Fragment of rim and upper wall of a very small pot (rim diameter approximately 8 cms.). An extremely thin, fine ware, pink on the inner face and grey externally with a thin patchy pale green glaze. Rim flat and flaring. 13th century.

LX. EASTCROFT PARK, LOCHMABEN

During drain digging operations in October, 1904, a coin hoard of approximately 470 coins was recovered. The container was the lower part of a jug or jar in a red ware, remains of yellowish-green glaze are visible. The portion found is about 6½ inches in height with a base diameter of 3½ inches. The coins suggest a deposition date in the early 15th century. See P.S.A.S., 1904-05, pp. 403-5. The fragment described above is retained in the National Collection.

LXI. WIGTOWNSHIRE

In the National Collection there is a wide-mouthed cooking pot in a yellowish-white ware; it is 5½ inches in height and 5½ inches in width and apparently unglazed. Find conditions are unknown. See P.S.A.S., 1921-22, p. 30.

LXII. BURNSWARK

Among the list of donations given to the Society of Antiquaries in March, 1899, is "Twenty-six fragments of coarse pottery, some with a greenish-yellow glaze." This material is probably mediæval, although green-glazed Roman wares are known. See P.S.A.S., 1898-99, p. 196.

LXIII. DUMFRIES

A mediæval urinal was found about 9 feet below ground level in Turnpike Close during building operations by Messrs Robinson Bros. The urinal was complete and the greatest diameter was 23½ inches and the body of the urinal was 7½ inches in depth. There was apparently a little decoration near the handle junctions. Present location unknown. For details see "Dumfries and Galloway Notes and Queries" (Courier Press, Dumfries), Part I, Series I, October 9th, 1909.

LXIV. CASTLE POINT, ROCKCLIFFE

Nat. Grid. Ref. NX854524

A small fragment of pale buff, very thin, ware. No glaze. (Surface find during 1955.) See D. & E., 1955, p. 12.

LXV. TYNRON DOON, PENPONT

Nat. Grid. Ref. NX820939

A single fragment of pottery showing the angle between base and wall was recovered during excavations in the Dark Age rubbish spread below the rampart. The fragment is a dark buff finely gritted ware with no apparent glaze, and was exposed in a rabbit-scraper uphill from the excavation. Not datable from appearances to the later mediæval period and is probably of a Dark Age date as is the other material recovered from the excavation. See D. & E., 1964, p. 26. T.D.G.N.H.A.S., vol. xliii., p. 147.

LXVI. CLOSEBURN

On 22nd March, 1844, in a small field belonging to Sir G. Monteath at Croal Chapel, near Closeburn, a large hoard (upwards of 10,000 coins) was disturbed by the plough. Two fragments of the vessel from this hoard appear to be referred to in a footnote in Mediæval Archæology, vol. iii., p. 266. The present location of the fragments has not been checked on.

LXVII. CHIPPERMORE

Nat. Grid. Ref. EN290478

Two unidentifiable fragments of mediæval pottery were recovered from a mediæval shelter in the rampart of an Iron Age Dünan at Chippermore. See T.D.G.N.H.A.S., vol., xxx., p. 148.

LXVIII. DONALD'S ISLE, LOCH DOON

Although strictly speaking in Ayrshire this site is included due to its close proximity to the Kirkcudbrightshire County Boundary. The excavation, under the Marquis of Ailsa, was carried out between 1933 and 1936, on the small island near to the shore. The structure appears to be of the Hall type (cf. *Ardwall Island, Lochrutton, and Loch Urr*). Reasonable quantities of mediæval pottery were recovered. For a full description of the site, see P.S.A.S., 1936-37, pp. 323-333.

LXIX. TORRS CAVE, KIRKCUDBRIGHT

Nat. Grid. Ref. NX675447

During the excavation a few fragments of pinkish buff, brown glazed pottery were recovered from the more recent levels. The material is retained in the Kirkcudbright Museum. See P.S.A.S., 1936-37, pp. 415-30, for a full description of the excavation.

LXX. BANKHEAD KIRKCONNEL

Nat. Grid. Ref. NS747118

During the excavation of this site fragments of iron slag, glass, and mediæval pottery of 15th cent. date were recovered. See D. & E., 1963, p. 27. T.D.G.N.H.A.S., vol. xxxvii., p. 136-143.

MEDIAEVAL FLOOR TILES FROM VARIOUS SITES IN DUMFRIESSHIRE AND GALLOWAY

I. MORTON CASTLE, CLOSEBURN

Nat. Grid. Ref. NX891992

The following three tiles, now in Dumfries Museum, were found "in the rubble" at Morton Castle during last century. Ex. Grierson Collection. Register No. 266:—

1. Tile, 12 x 12 x 3.5 cms., in a coarse, gritty red ware. One side is concave and its opposite bears a triangular ridge with a snapped-off surface. Dull-green glaze on upper surface varying to black-brown where thicker on three of the sides. 13th cent.

2. Fragment of triangular tile in a hard greyish-pink ware—considerably finer than No. 1. Glaze yellow and brown and very patchy. 13th century.

3. Larger part of a square tile, 11.5 x 12.5 x 3.5 cms., in an overfired greyish-pink ware. Very heavy black glaze—possibly due to (?) over-firing. Two of the opposite sides show snapped-off triangular ridge as in No. 1. Probably 13th cent.

II. GLENLUCE ABBEY

The tiles found during excavation on this site are fully described in T.D.G.N.H.A.S., vol. xxx., p. 88.

1. Surface finds from Glenluce kept at Dumfries Museum include pieces of three undecorated glazed tiles. The glaze, where surviving ranges from yellow-green through amber to a lustrous transparent brown.

2. Tile, in Stranraer Museum, from Glenluce. About two-thirds of a tile, stamped with horse pattern and indented maggot ornament, green-glazed: cf. No. 7 of the Glenluce Abbey tiles described and illustrated by Cruden in T.D.G.N.H.A.S., vol. xxx., p. 88.

III. LOCHMABEN MOTTE

Nat. Grid. Ref. NY083823

During the pottery collection in November, 1966 (see site 6) a few fragments of very coarse unglazed tile were recovered. Approximately 4.0 cms. thick.

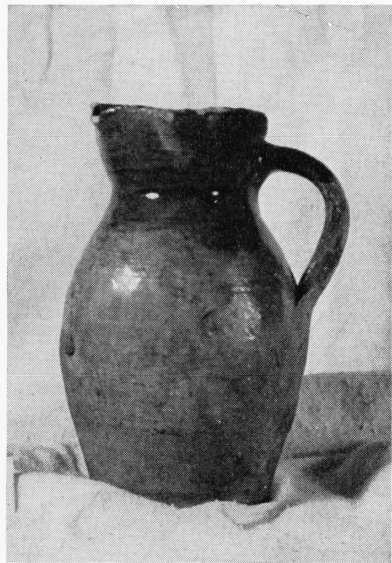
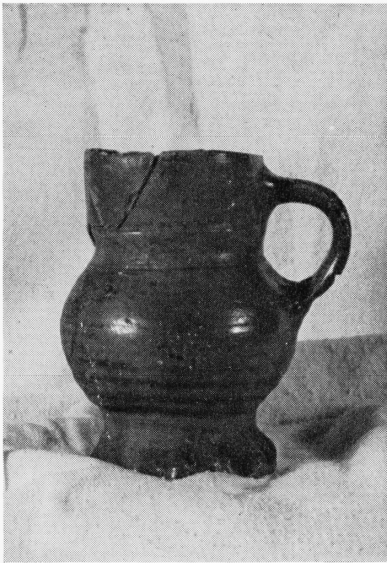


Plate XIV.—Mediæval Pottery: Top, from Rigghead, Collin, c. 1556. Bottom left, from Kirkpatrick-Durham, 16th to 17th century. Bottom right, also from Kirkpatrick-Durham, 13th to 14th century, ? import.

THE PLATTE OF CASTLEMILK, 1547

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This is a brief and by no means exhaustive introduction to a map endorsed, "The platte of Milkcastle," now in the possession of the Marquis of Salisbury,¹ with whose kind permission it is being published.² (Plate XV.)

Anglo-Scottish hostilities of the sixteenth century left a remarkable pictorial and cartographic legacy. As a direct result of war, or the threat of war with England, we have the earliest graphic representations of Scotland. Naturally, Edinburgh received most attention. Hertford's invasion in May, 1544, resulted in the first view of the city which can be treated with any sort of respect.³ The battle of Pinkie, 10 September, 1547, evoked several representations, some crude,⁴ some not so crude.⁵ The siege of Leith in the spring of 1560 left a most remarkable view not only of the port and its fortifications, but also of the city.⁶ Other surveys by the English, for example of Fast Castle⁷ and of Roxburgh⁸ survived and have been reproduced. Nor was the south-west neglected. The Elizabethan survey of 1563-66 is perhaps the best known,⁹ but there were many other rough sketches of the area.¹⁰

This map of the south-west was a fruit of an Anglo-Scottish war which lasted virtually from 1543 to 1550. Popularly known as the "rough wooing,"¹¹ this war concerned the marriage of Mary Queen of Scots. The English fought to effect her marriage to Edward Tudor, hence Huntly's memorable quip after Pinkie; the French entered as allies of the Scots, but on condition that she be married to the heir to the French throne, the future Francis II.

To understand this map it is necessary to survey the military tactics employed. Henry VIII.'s direction of the war, 1543-1546, was characterised by a multiplicity of approaches. He bribed important Scottish nobles (Angus, Glencairn, Cassillis, and especially the Maxwells), gained the unequivocal support of the third person of the realm (Lennox, rival to the governor, James Hamilton, 2nd Earl of Arran), encouraged the reformed faith (Ormiston, Brunstane and perhaps Wishart) and assassination (Beaton), aided internal revolts (the pretended Lord of the Isles, Donald Dhu, was set loose to raid the

1 Cecil Papers Maps, 2/27. My thanks to Miss Clare Talbot, Librarian of Hatfield House for her assistance.

2 C.f. view of Castlemilk in R.C.A.M., County of Dumfries, p. lxii, traced by Robert Bruce Armstrong from same map, but not used by him in his "History of Liddesdale."

3 B.M. Cott. Augustus, 56. Has been widely reproduced, the most useful being in *Hist. Mon. Comm.* (Edinburgh) fig. 59.

4 Patten's crude line drawing is not very illuminating. The expedition into Scotlande of . . . Edward duke of Somerset (London, 1548). That in the Bodleian, MS. Eng. Misc. C 13 R, is somewhat better, if a trifle fanciful. See *Hist. Mon. Comm.* (Edinburgh), fig. 60; *Arch Jour.*, xc (1934), 1-25.

5 Another view, B.M. Cott. Cleopatra, A xi, is somewhat better. It is reproduced in Bertville's *Récit . . . de la bataille de Muscleburgh* (Bannatyne Club, No. 10, 1825).

6 *PSAS*, xciv (1961-62), 280-83.

7 *PSAS*, lv (1920-21), 56-83.

8 *Hist. Mon. Comm.* (Roxburghshire), figs. 517-18.

9 This report and the coloured views contained in it are reproduced in R. B. Armstrong, *The History of Liddesdale, Eskdale, Ewesdale, Wauchopdale, and the Debatable Land*, vol. 1, appendix.

10 E.g. P.R.O., MPF 257; SP 59/5, fos. 44-45; c.f. *CSP Scot.*, 1 No. 393.

11 The best recent history of this war is to be found in Professor Donaldson's excellent chapter V in *Scotland, James V—James VII.*

West coast) and dealt paralysing blows by sheer military prowess (May, 1544, and September, 1545), in addition to continuous raids and harassment. His direction of the war was also characterised by failure. At his death in January, 1547, England was no closer to securing the marriage than four years before; in July, its only two strongholds in Scotland, at St. Andrews and at Langholm, were lost.

Under Edward Seymour, Earl of Hertford and now Protector Somerset, English tactics were much more purposeful and, seemingly, more successful. Somerset first destroyed a Scottish army at Pinkie, 10 September, 1547. He then stationed English forces at Broughty Craig, in the Forth, at Hume, Roxburgh, Lauder, Fast and Eyemouth; in April, 1548, a large force was laid at Haddington, and later in the year a smaller one at Dunglass. Where existing structures existed, such as at Fast and Roxburgh, these were repaired and used; where there were little or none, such as at Lauder, Haddington and Dunglass, entirely new fortresses were constructed. The purpose of these permanent garrisons—at one point over 17,000 troops were stationed in and about Scotland—was obviously to dissipate the ability of the Scottish regency to resist English demands for the marriage and the consequent union of the two realms. However, these forts were also a part of the English attempts to create a body of "collaborators," Scots who for a variety of reasons—faith, fear, feud or greed—would support the marriage and aid the English in subverting the realm. These forts in effect created a "pale"—and the English saw it as such—an area where the king of England's writ ran, where the inhabitants either swore allegiance to Edward or left, and where those who supported England were secure from reprisal. For a while this policy had considerable success, but the arrival of French aid in June, 1548, entirely altered the complexion of the war. Mary was betrothed to the Dauphin and sent to France. Haddington was invested, Broughty Craig repeatedly assaulted. The number and constancy of the collaborators fell dramatically. Haddington was evacuated in November, 1549, Broughty fell three months later and by the Treaty of Boulogne, 24 March, 1550, the English surrendered all remaining strongholds in Scotland and to all intents and purposes renounced hope of marrying the Scottish queen to the English king.

In this war, the south-west played a minor but significant rôle, though one never fully or adequately told.¹² Briefly, during the first part of the war, from 1544 to 1546, the English campaign, under the direction of Thomas Lord Wharton, warden of the West Marches, had remarkable if unsustained successes. Collusion with Robert, 5th Lord Maxwell and his successor, Robert 6th Lord, netted Wharton control over a considerable area¹³ and in late 1544 enabled the English to garrison troops in Threave, Lochmaben and Caerlaverock. Later, Langholm was also held. Many of the kins and surnames of the area, especially

¹² R. B. Armstrong did cover this war in his volume ii, but it was never published. The MS. is in the National Library of Scotland.

¹³ See Wharton's famous boast to Buccleugh in 1544 (*Hamilton Papers*, ii, 468) reprinted in Burton's *History*, iii, 239.

the Armstrongs, were in English pay; Liddesdale and the Debatable Land were under virtual English suzerainty,¹⁴ However, the Scottish regency recaptured the first three castles by the end of 1545, Langholm in July, 1547.

But no sooner had the authority of the Scots been re-established in the south-west than occurred the disastrous battle of Pinkie, 10 September, 1547. On the same day Wharton moved into the area and secured the capitulation of Castlemilk by its tutor, James Stewart.¹⁵ On the 11th, a Scottish force stationed in Annan Steeple was battered into submission, the steeple cast down and the town destroyed.¹⁶ The number, intensity and range of the English raids increased. Troops were stationed at Moffat, and Lamington was attacked. By 20 October Dumfries had surrendered and English troops were laid there. Shortly afterwards, English troops and Dumfries citizens made an unsuccessful attack on Kirkcudbright. Lochwood, the tower of John Johnstone of Johnstone, who had been Wharton's prisoner since April (he had been taken by the laird of Mangerton), was captured at the end of October. At much the same time, another prisoner, Patrick Murray, was finally beginning to request an interview with Somerset to discuss terms for the surrender of his charge, the tower of Cockpool. It, too, was in English hands by 18 November. In other words, a "pale" was being created. This, of course, had an immediate effect upon the numbers of the collaborators or "assured" as they were called. In September, 1547, Wharton could only claim to have pledges for the service of 1900 Scots; by mid-October the figure was 2700; by the end of the month, 5000. On 12 November, the most important personage in the south-west, John Maxwell, styled "Master of Maxwell"—he was eldest brother to Robert 6th Lord—suddenly came to Carlisle and swore to be assured. Wharton's tally leapt to 7008; it seemed the English position was impregnable.¹⁷

In fact, it was extraordinarily fragile. Through a highly complicated series of events the English hold over the south-west collapsed virtually overnight.¹⁸ In late February, Wharton set forth from Carlisle with a force of English foot and horse which was then supplemented by a large contingent of assured Scots. Heading up the Nith to attack James Douglas of Drumlanrig, the last loyal laird in the area of any consequence, Wharton was first attacked by Drumlanrig and Angus, then by his assured Scots who revolted. Barely able to retreat to Dumfries, he did not feel secure even there and quickly retired to Carlisle. On 1 March Maxwell, who had led the revolt, retook Dumfries and began to harass those Scots still assured with the English.¹⁹ Though he retained control

14 So much so that plots in the Debatable Land were given to helpful Scots *Calander of State Papers*, 1601-1603, Addenda 1547-1565. (Hereafter cited as Addenda), 320-21, 370. In 1544, 12 "Liddesdalers" were mustered and sent to fight in France as subjects of the King of England. *Letters and Papers of the Reign of Henry VIII*, 1509-1547 (hereafter cited as LP), xix (1) Nos. 227, 271 (2), 331, 562.

15 CSP Scot., i, No. 42. C.f. RSS, iv No. 3267; TA, ix, 111.

16 C.f. TA, ix, 99, 144.

17 Addenda, 330-54, passim; Armstrong, op. cit., appendix 39.

18 The explanation is to be found in Addenda, 377, 381-82; Lord Herries, *Historical Memoirs of the Reign of Mary, Queen of Scots*, and a Partion of the Reign of King James the Sixth, ed. Robert Pitcairn (Abbotsford Club, No. 6), 22-23; *Scots Peerage*, i, 242; vi, 479; RSS, iii, Nos. 2674, 2698, 2699, 2830.

19 Addenda, 361-65, 374-76.

of Castlemilk, and perhaps of Cockpool and Lochwood, until the end of the war, Wharton was never a serious threat to the Scots again.²⁰

The map which is the subject of this article is part of this larger story. Throughout the war, the English were particularly interested in having plans or prospects—"plattes" as they were called—of those places in Scotland which they attacked or fortified. Almost all of these "plattes" took the form either of a line drawing of the structure, something like a builder's plan, or of a prospect of an area, such as that of Edinburgh in 1544 and, later, of Leith and Edinburgh in 1560. Kelso was surveyed in 1545.²¹ In April, 1547, it was proposed that a 'plat' be made of Langholm, but there is little to suggest that anything came of it.²² In 1548, "plattes" were made of most of the English forts in the east; most of them have survived,²³ though unfortunately that of Haddington did not.²⁴ One natural consequence of this activity was that most of the important English engineers, surveyors and master masons of this time saw some service in Scotland. Sir Richard Lee may well have been responsible for the 1544 view of Edinburgh; in 1548 one of his many tasks was to direct the construction of Dunglass.²⁵ Thomas Petit, the Surveyor of Calais, worked in the east marches during 1548 until he found himself a prisoner in Edinburgh in July.²⁶ William Rogers, the Surveyor of Boulogne, made a flying trip to Tantallon in December, 1543, and in January, 1548, one of his staff was sent to the north to have a look at Kirkcudbright.²⁷ William Ridgeway, later Surveyor of the Works at Berwick, was busy in 1548 overseeing repairs to Eyemouth, Hume and Roxburgh.²⁸ An Italian engineer, Guiliamo di Rossetti, spent a considerable time at Broughty Craig.²⁹ However, one must bear in mind that most of these men's graphic work was along the lines of architectural drawings or blueprints and not so much topographical prospects which gave the "lay of the land." What makes this "platte of Milkcastle" remarkable is that it not only gives the structural dimensions of the tower, but also its prospect and places it in a context of its relation to the whole English "pale" in the south-west. It is what we understand by the term "map," a graphic representation of the relative distances between geographic points of interest.

How this map came to pass is a slightly complex story. On 26 October, 1547, Wharton complained to Somerset that he had no one competent to make a "platte" of the "pale" and his most recent capture, Lochwood Tower.³⁰ At much the same time, Somerset was beginning to consider the advisability of the capture of Kirkcudbright. It was seen as a haven for English supply ships and as a base from which to interrupt French lines of communication

²⁰ *Ibid.*, 367-73, 384, 389, 392.

²¹ *LP*, xx (1), Nos. 99, 141, 142, 146.

²² *Acts of the Privy Council of England 1547-1549*, (hereafter cited as *APC*), 486.

²³ *HMC*, Rutland, i 38.

²⁴ *Odet de Selve, Correspondence Politique, 1546-1549*, ed. G. Lefèvre-Pontalis, (Paris, 1888), 375-79.

²⁵ *DNB*; *P.R.O.*, E 351/3540.

²⁶ *CSP Scot.*, i, Nos. 159, 221, 299, 301, 303.

²⁷ *LP*, xviii (2), No. 473; *Addenda*, 356.

²⁸ *CSP Scot.*, i, Nos. 79, 123, 131; *Addenda* 371.

²⁹ *CSP Scot.*, i, No. 56; *Mary of Lorraine Corresp.*, 188, 204; *APC*, 235, 266. For the career of one engineer of the period, see Lynn White, jr., "Jacopo Aconcio as an Engineer," *American Historical Review*, lxxii, No. 2 (Jan. 1967), 425-44.

³⁰ *Addenda*, 338.

with Scotland, from Brittany through the Irish Sea to Dunbarton.³¹ Furthermore, though Somerset was personally very familiar with the east marches of Scotland, he was not particularly knowledgeable about the south-west. He wished to know the lay of the land, the strength of the English positions, especially Castlemilk, and where best to lay garrisons.³²

Consequently, the Lord Protector proposed to send Ridgeway to view Kirkcudbright "by secret means," in order that a final decision might be made as to its capture. By 5 November, this brief was enlarged to include the entire "pale."³³ Apparently a preliminary survey was made before the 12th, by which time Ridgeway had arrived. On that day Wharton wrote Somerset, "he shall pass to those parts and certify you."³⁴ However, at this same time, Thomas Petit also appeared in Carlisle, having been sent from London on the 9th.³⁵ On the 15th, Wharton wrote he had "despatched the surveyor into Scotland to view the lord Johnston's house, Milk, Cockpool, Lochmaben, Dumfries, Kirkcudbright, and the situation where the tower of Annan was."³⁶ But three days later, the only mention he made of a "platte" was in reference to one of Cockpool, when he stated, "The surveyor of Calais, Mr Petit, will bring you a plan of the tower."³⁷ It is difficult, therefore, to say with certainty which of these two men, in fact, went, surveyed the area and executed this map. On balance it would seem that Petit was responsible. The mention of Ridgeway on the 12th is the last of him being in the area. Furthermore, there is no mention during this war of Ridgeway making a "platte" of any of the several places where he worked. Petit, on the other hand, is noted as having made several "plattes," the largest and most notable being, "The platt of the Lowe Countrey at Calleys,"³⁸ which has some similarities, however inconclusive, in colour and technique, with this map. In any case, when Petit returned to London in early December,³⁹ he probably brought this map with him and presented it to Somerset.

The "platte of Castlemilk" told and showed the English many things. It gave the relationship of all the major points of interest and had estimates of the distances involved.⁴⁰ It also gave a remarkable pictorial representation of the principal towns and castles. At this time, English troops were garrisoned in Castlemilk, Dumfries, Lochwood and Cockpool. Lochmaben and Caerlaverock were still in the hands of John Maxwell, though he was being put under considerable pressure by the English to surrender their control to Wharton.⁴¹ Langholm was probably no longer of much use. The French ambassador in London wrote on 22 July, 1547, that it was "prins et razé" and afterwards it ceased to figure at all in the correspondence of Wharton and Somerset.⁴² Annan most certainly was useless without major repairs; note the

31 *Ibid.*, 341.

32 *Ibid.*, 340.

33 *Ibid.*, 343.

37 *Ibid.*, 349.

38 B.M. Cott. Augustus, I, ii, fo. 57; noted in LP, xx (2), Appendix 36.

39 APC, 149.

40 C.f. distances mentioned in despatches. Addenda, 329; CSP Scot., i, No. 42.

41 Addenda, 358.

42 Odet de Selve, *op. cit.*, 167.

34 *Ibid.*, 346.

35 APC, 143.

36 Addenda, 347.

fallen steeple. The map also located in this context the area inhabited by those people assured with the English: the Grahams, Irvings, Bells, Armstrongs, Batisons, Thompsons and Littles. And it showed the homes of such notable collaborators as the laird of Mangerton and Sandy Armstrong.

Moreover, despite the fact that at this time, December, 1547, ambitious plans were afoot for expansion west to Kirkcudbright and up the Nith valley, the map emphasises the importance attached to Castlemilk as the centre of the "pale." In fact, Castlemilk seems to have been regarded as one of the English border forts. In one reckoning of the cost of the war, made shortly afterwards, it was included with Wark, Berwick and Carlisle as being of the "borders and frontiers against Scotland" and not with Dunglass or Haddington as "Within the Realme of Scotland."⁴³ From the map, it appears the tower stood on an earth bank 150 feet high. The structure itself was fairly small: 33 feet long, 18 feet wide, 33 feet high with walls $7\frac{1}{2}$ feet thick.⁴⁴ Certainly the garrison within was never large. Wharton contemplated putting from 40 to 50 men there at various times,⁴⁵ but the actual figure was never much above 20. Upon its capture, one of the assured Scots was installed as captain of 20 foot, 12 of whom were hackbutters, i.e. carried firearms.⁴⁶ In 1550, the garrison was much the same: one captain, one trumpeter, one surgeon and 20 soldiers,⁴⁷ all of whom were tardily paid.⁴⁸

As for the other points of interest, the map is not so explicit. We do know from Wharton's letters that Annan, Dumfries and, for that matter, Kirkcudbright, were all considered "fair" towns.⁴⁹ When the steeple at Annan was captured, 65 Scots were within. Maxwell's capture of Dumfries in March netted him 179 English troops, not to mention 379 horses,⁵⁰ but it would seem that the normal size of the garrison there was closer to 100.⁵¹ We also know from Wharton's correspondence that Lochwood was quite a large place. A good barbican wall surrounded enough houses to hold 100 horses, and, in addition to these, there was a tower "four houses height" with walls 6 feet thick.⁵² In addition to this paucity of information, the map also suffers because some of the inscriptions are faint or faded. Number 24 seems to refer to a high hill—Burnswark?—a mile distant from Castlemilk, but this is not particularly helpful. Number 23 is also inconclusive. It might be further elaboration about the castle itself, but this does not tally very usefully with the other very clear inscriptions. As to the last phrase of number 19, two interpretations seem feasible. "Invirronis the castell thre querlies & more" could mean that near the castle were three or more quarries; its repair and upkeep were a constant concern of Wharton's. Or it could mean that the bank surrounded the castle three crossbow shots and more, a "querl" thus being a crossbow shot used as a measurement.

Despite its crudities, the map does give what can be regarded as a fairly

⁴³ P.R.O. SP 10/15, fos. 21-22.

⁴⁴ C.f. dimensions given in CSP Scot., i, No. 42.

⁴⁵ Addenda, 329, 343-44.

⁴⁶ CSP Scot., i No. 42.

⁴⁷ P.R.O. A01/283/1067.

⁴⁸ HMC, Rutland, i, 40, 44.

⁴⁹ Addenda, ad indice.

⁵⁰ Ibid., 374.

⁵¹ Ibid., 351.

⁵² Ibid., 337-38.

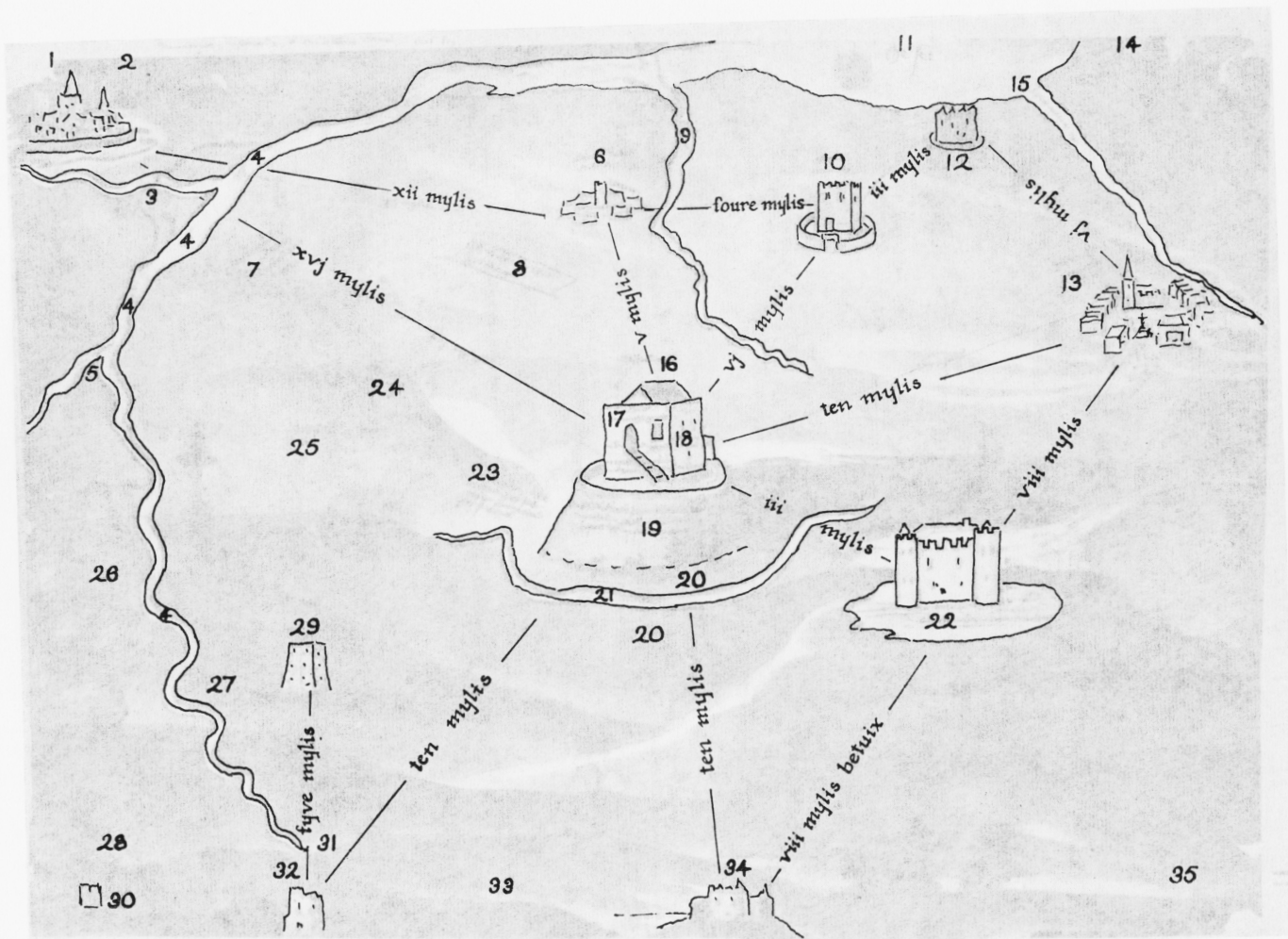


Plate XV Overlay: 8.—Key to the Platte of Castlemilk. The inscriptions to which the numerals refer are given on p. 181.

Plate XV Overlay: 8.—Key to the Platte of Castlemilk. The inscriptions to which the numerals refer are given on p. 181.

accurate representation of what the area looked like. Certainly this portrayal of Castlemilk does not contradict the much more comprehensive survey of 1563-66. The perspective and general outline of Caerlaverock are correct and the view of Carlisle contains an unmistakable attempt to represent the Citadel. If this map is trustworthy, then it is the earliest reasonable view of Dumfries and Cockpool and the only one of Lochmaben.

In execution, it would seem that the basic outline of the structures was done with pen and ink, with a wash brushed on for shadow. All water, save the moat about Caerlaverock, is in white. The general lay of the land is in a variety of light and dark brown with a light "pastel" green and an occasional rich yellow. The dark areas at the foot of the map are a very dark brown. The peaks of the towers of Caerlaverock are green; the roof of Castlemilk is a very dark brown, almost black. The map measures approximately $22\frac{3}{4}$ inches by $26\frac{1}{10}$ inches.

APPENDIX

The Inscriptions on the Map

- | | |
|----------------------------------|----------------------------------|
| 1. [Car]slie. | 20. corne landis. |
| 2. SOWTH. | 21. the watter mylk. |
| 3. edn watter. | 22. lowthmaben lorde maxwell. |
| 4. esk. | 23. [the castell on] |
| 5. levin watter. | the [?] the square |
| 6. annand towin distroyit. | is subiectte yis hill |
| 7. the surnamis | distant I M foote |
| suromys daw | the same square beand |
| glests & subellis | xvj foot thik. |
| & Irrewinges. | 24. the hie hill |
| 8. inhabite by the | [hauf?] the castel |
| Irrewinges. | nar a myle in [di?] |
| 9. annand watter. | stance. |
| 10. cokpule | 25. inhabite by the |
| muray. | bellis. |
| 11. the see. | 26. grahamis upoun esk. |
| 12. karlaverok | 27. debatabill |
| lord maxwell. | landis. |
| 13. drumfreis | 28. lyddisdale |
| towin. | armestrounges |
| 14. WEST. | 29. sande arme |
| 15. the watter neith. | stronges new hous. |
| 16. castell mylk. | 30. the lar/ /de mangertoun. |
| 17. on heitht xj yerd | 31. ESTE. |
| in breid xj yer | 32. langhome. |
| in thiknes | 33. batysonis thomsonis lytilles |
| two yerdes half. | essdale. |
| 18. lenth xj | 34. loithwood the |
| yerdis. | lard johnestoun. |
| on breid | 35. NORTH. |
| vj yerd | |
| 19. this bank is on heitht fyfty | |
| yerdis & abuf & Invirronis the | |
| castell thre querlies & more. | |

THE EARLY PRINTED MAPS OF DUMFRIESSHIRE AND GALLOWAY

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The revival of cartography as a science in the sixteenth century unfortunately did not result in any great increase in published work in Scotland on other than very small scales. With the notable exception of Timothy Pont (c. 1560-1614), Scotland lacked cartographers of the stature of Saxton, Camden or Norden, and indeed after the delayed publication of the work of Pont in 1654, there were few medium to large scale surveys published prior to the late eighteenth century. Nevertheless, some cartographic work was attempted. A few maps were compiled and published either in the form of Atlases, in periodical journals, or in their own right. To the historian, economic historian or historical geographer, indeed to anyone with an interest in past patterns of human distributions, such maps as were published constitute a possible source of information. They are also of interest as a sequence of cartographic development. To the student of historical cartography, they fairly represent a trend in topographic mapping on a county basis, which was apparent throughout Scotland. The achievements of Pont's publishers in the mid-seventeenth century were very far in advance of most subsequent publications, prior to the accurate published surveys of the late-eighteenth and early nineteenth centuries. A period of decline in the application in Scotland of the developing science of cartography occurred between the publications of Blaeu and of surveyors such as Ainslie and Crawford. It is, therefore, with the interests of both the student of the subject matter of historical maps and of the maps themselves, that the following list has been prepared.

The maps are first and foremost topographic maps. No thematic maps concerned solely with, say, geology, soils, archæology, or roads, have been included, although a very few such maps of the area were published prior to the mid-nineteenth century. The maps described are more numerous than specialised maps and seek to locate nucleated settlements within a framework of coastline and river patterns, though usually with some additional information such as relief (by means of hachures), administrative boundaries, castles, estates, churches, routeways, etc. No large scale plans have been included, nor any maps on scales so small that the area appears only as a part of a much greater area of Scotland. The list is confined to maps which specifically set out to portray a large portion of one of the three counties of the south-west of Scotland. An attempt is made to assess briefly the accuracy of each map, but as accuracy in direction and scale on any given publication is frequently variable, the assessment is necessarily in generalised terms.

By 1827, the first accurate and detailed surveys of all three counties had been published in original and a revised form, and these are among the later

items on the list. After 1850, commercial Atlases became increasingly numerous, but are of greatly reduced interest because of the field work of the Ordnance Survey carried out in Wigtownshire, Kirkcudbright and Dumfriesshire between 1845 and 1859, and the subsequent publication of the First Edition, one-inch maps between 1857 and 1864. The list, therefore, concludes at 1850.

1654—BLAEU, W. & J.

[Vol. 5 of Blaeu's "Theatrum Orbis Terrarum," in which the following seven maps are to be found, is recognised as the first atlas of Scotland. It was re-issued in 1662, with no changes to the maps themselves. The maps are based on the manuscripts of Timothy Pont, whose work has been described by Cash.¹ The surviving manuscripts as listed by Cash² are held in the National Library of Scotland.

Caution is called for in respect of the accuracy of all seven maps. Orientation of parts of the coastlines, of parts of the major rivers, and also tributary streams, may be mis-aligned by as much as 20° from the true direction, even allowing for subsequent changes in coast and river orientations. Distance, variably inaccurate on all seven maps, appears to have been constantly underestimated by up to 30 per cent.

The maps are immensely rich in details of the settlement pattern. For example, on map No. 2, over 200 individual settlements are located, and, in addition, a number of churches, castles, estates, mills and towers. Here again, caution must be employed. Typically the maps do not employ a strict system of conventional symbols, and it is sometimes difficult to distinguish between isolated churches and settlements. On some of the smaller scale maps, which employ less perspective drawing and make greater use of a small circle as a conventional symbol for settlement, differentiation is easier.]

1. "EUSDAIL et ESKDAIL"

20.7 in. x 16.5 in.

p. 47 of Blaeu's Atlas. Scale shown as c. 0.9 ml. to 1 in.

Portrays the area within the watershed of the River Esk as far S. as its confluence with the Tarras Water.

2. "THE STEWARTRIE of ANNANDAIL"

20.3 in. x 16.5 in.

p. 49 of Blaeu's Atlas. Scale shown as 1 ml. to 1 in.

Portrays both N. and S. coast of the eastern extremity of the Solway Firth, and S. Dumfriesshire as far W. as the Lochar Water and as far E. as Morton. Distance inland varies from 7 to 12 miles.

¹ CASH, C. G., 1901, "The First Topographical Survey of Scotland," *Scott. Geogr. Mag.*, XVII, pp. 399-414. Edinburgh.

² CASH, C. G., 1907, "Manuscript maps by Pont, the Gordon, and Adair, in the Advocate's Library, Edinburgh," *Scott. Geogr. Mag.* XXIII, pp. 574-592. Edinburgh

3. "THE SHIRIFDOME of NIDISDAIL "
 20.3 in. x 15.3 in.
 p. 51 of Blaeu's Atlas. Scale shown as 1.7 ml. to 1 in.
 Portrays the entire watershed area of the River Nith with W. placed at the top of the map. The scale appears to be particularly variable on this map.
4. "The Steuartrie of Kircubright, The most easterlie part of Galloway "
 20.3 in. x 16.7 in.
 p. 57 of Blaeu's Atlas. Scale shown as 1.3 ml. to 1 in.
 Portrays the eastern half of Kirkcudbright, bounded on the E. and N. by the county boundary, and continuing as far W. as Kirkcudbright Bay. West is at the top of the map.
5. "The Middle-part of Galloway whiche lyeth betweene the rivers Dee and Cree "
 21.7 in. x 16.7 in.
 p. 56 in Blaeu's Atlas. Scale shown as 1.3 ml. to 1 in.
 Portrays the western half of Kirkcudbright, bounded on the W. by the River Cree, except that at the confluence of the Cree and the Water of Minnoch, that part of the county to the W. of the Water of Minnoch is excluded. The eastern third of the map overlaps on to map 4, where the features are re-drawn in less detail, with many features omitted. West is at the top of the map.
6. "The Sherifdome of Wigtoun wt. the Regalitie of Glen-Luze both in Galloway "
 16.3 in. x 20.7 in.
 p. 53 in Blaeu's Atlas. Scale shown as 1.7 ml. to 1 in.
 Portrays the entire county of Wigtown, with notable misalignment of some sections of the coast.
7. "Galloway "
 16.3 in. x 20.7 in.
 p. 55 in Blaeu's Atlas. Scale shown as 2.7 ml. to 1 in.
 Portrays the area covered by maps 4, 5 and 6 on a smaller scale, using smaller lettering, but omitting some settlements, and also some detail of drainage pattern, relief, etc.

1725—MOLL, Hermann

[The following 6 maps were published in an Atlas entitled "A Set of Thirty Six New and Correct Maps of Scotland Divided into its Shires," second edition 1745, and reprinted by R. S. Shearer & Son, Stirling, in 1896. The cartographer acknowledges that "we have made use of Gordonius a Straloch, Tim. Pont, John Adair," and comparison of his work with the earlier Blaeus suggests that they are very little more than crude reductions of the latter.

The combination of a reduced scale and a standard of engraving inferior to that of Blaeu has meant considerable omission, particularly in respect of the settlement pattern. For example, in map 8, there are some 83 settlements shown within the area in which Blaeu includes over 200 settlements on his larger scale map 2. Moll also acknowledges "the generous Informations of some Curious Noblemen and Gentlemen that have assisted in this work." There is, however, very little additional information not included by Blaeu. There is, for example, only one additional place name inserted on map 8, which does not appear on map 2, and that is incorrectly sited. Scale is inclined to vary to a greater extent than in Blaeu's work, notably in map 8, where two of Blaeu's maps appear to have been combined into one, and error in aligning the two maps together has further increased distortion.]

8. "ANNANDALE is Part of Dumfries Shire. EUSDALE or ESKDALE and LIDDESDALE is the South Part of Roxburgh Sh."
10.3 in. x 7.6 in.
Map no. 9 in Moll's Atlas. Scale shown as c. 4.4 ml. to 1 in.
Portrays the entire county of Dumfries, except for that W. of a meridian through Dumfries. Appears to combine Blaeu's maps of "Eusdail et Eskdail" and "The Stewartrie of Annandail."
9. "The Shire of DUMFRIES or NITHISDALE"
10.3 in. x 7.8 in.
Map no. 8 in Moll's Atlas. Scale shown as c. 0.9 ml. to 1 in.
Portrays the area between the Urr Water and the Lochar Water, and includes the entire watershed area of the River Nith.
10. "The East Part of GALLOWAY. Being Part of the Shire of KIRKCUDBRIGHT"
10.1 in. x 7.6 in.
Map no. 6 in Moll's Atlas. Scale shown as 4 ml. to 1 in.
Portrays the area between the River Nith on the E. and the Water of Ken and River Dee on the W.
11. "The Middle Part of GALLOWAY Contains the West P. of KIRKCUDBRIGHT Shire"
10.1 in. x 7.7 in.
Map no. 5 in Moll's Atlas. Scale shown as 4 ml. to 1 in.
Portrays the area between the River Cree on the W., and the River Dee and Water of Ken on the E.
12. "The West Part of GALLOWAY Contains the Shire of WIGTON"
10.1 in. x 7.7 in.
Map no. 4 in Moll's Atlas. Scale shown as 5 ml. to 1 in.
Portrays the entire county of Wigtown.

13. "GALLOWAY Contains the Shires of WIGTON and KIRKCUDBRIGHT"

10.4 in. x 7.7 in.

Map no. 3 in Moll's Atlas. Scale shown as c. 7.5 ml. to 1 in.

Portrays the area covered by nos. 9, 10 and 11 above, by omitting much of the detail, particularly of settlement.

1749—KITCHIN, Thomas

[The following four maps are contained in an atlas entitled "Geographie Scotiae: Being New and Correct Maps of all the Counties and Islands in the Kingdom of Scotland . . ." The Atlas, which was re-issued in 1756, is considered to be the first pocket Atlas of Scotland.

The small scale restricts the amount of information portrayed. Nevertheless, some 80 settlements are indicated for Kirkcudbright, and only a few less for Wigtown. Dumfriesshire is divided into three dales, two of which are portrayed on one map, and it is on these two maps that the greatest errors in distance appear to have been made, particularly in respect of distance between rather than within the dales. Occasionally, routeways are indicated.]

14. "A MAP of ANNANDALE and ESKDALE."

6.7 in. x 5.8 in.

Map no. 3 in Kitchin's Atlas. Scale shown as c. 6.5 ml. to 1 in.

Portrays the area bounded by the watershed of the Rivers Annan and Esk, but also extends W. into Nithsdale, and E. into Liddisdale and Cumberland.

15. "A Map of DUMFRIES SHIRE from the best Authorities"

6.8 in. x 5.8 in.

Map no. 9 in Kitchin's Atlas. Scale shown as c. 6 ml. to 1 m.

Portrays the area bounded by the watershed of the River Nith with only a few points of reference in Annandale and Kirkcudbright.

16. "A MAP of the SHIRE of KIRKCUDBRIGHT from the best Authorities"

6.8 in. x 5.8 in.

Map no. 17 in Kitchin's Atlas. Scale shown as c. 8 ml. to 1 in.

Portrays Kirkcudbright in entirety with some small over-lap into Dumfriesshire, Ayrshire and Wigtownshire.

17. "A MAP of WIGTON SHIRE from the best Authorities"

6.7 in. x 5.8 in.

Map no. 28 in Kitchin's Atlas. Scale shown as c. 7 ml. to 1 in.

Portrays the County of Wigtown together with small parts of Ayrshire and Kirkcudbright.

1771—KITCHIN, Thomas

18. "A MAP of WIGTOUN SHIRE, from the beft Authorities "

6.7 in. x 8.6 in.

Scale shown as c. 4.7 ml. to 1 in.

Published in "London Magazine," Vol. 40, p. 427, September, 1771.

The orientation of the coastline, and to a lesser extent the rivers, are rather less accurate than the same author's smaller scale map of 1749. Scale is, therefore, still variable over the map. However, there is improvement not only in the finer engraving, but in the greater detail of the settlement pattern, in which over 200 individual units are indicated.

1776—KITCHIN, Thomas

19. "DUMFRIES SHIRE from the beft Authorities "

7.1 in. x 9.1 in.

Scale shown as c. 4.5 ml. to 1 in.

Published in "London Magazine," Vol. 45, p. 312, June, 1776. The river pattern shows improvement by comparison with the same author's smaller scale maps of 1749. However, the extent of county is still under-estimated, particularly in an east-west direction, so that scale remains variable. The standard of the engraving is again improved, as is the settlement pattern, with over 150 settlements shown as compared with less than 100 on the two previous comparable maps.

1777—ARMSTRONG, Martyn John

[The following three maps were contained in an Atlas entitled "A Scotch Atlas; or Description of the Kingdom of Scotland": and published by Robt. Sayer and John Bennet. The maps all bear the imprint "Published as the Act directs by Robt. Sayer and Ino. Bennett, 1st Novr., 1777." at the foot. The Atlas was re-published in 1787 by Robert Sayer, but with maps and publisher's imprints identical to the 1777 edition. It was re-issued yet again in 1794 by Laurie and Whittle, with the publisher's imprints removed, but with no other alteration to the maps themselves.

Scale is again variable, though the maps are actually drawn to a scale which is usually smaller than the linear scale which appears on each map. Over 80 settlements are indicated on both the Dumfriesshire and Kirkcudbright maps, and some twenty more in the case of Wigtown. Routeways are indicated on all three maps.]

20. "COUNTY of Dumfries "

5.8 in. x 7.5 in.

Map no. 8 in Armstrong's Atlas. Scale shown as c. 11 ml. to 1 in.

Portrays the County divided into Ewesdale, Eskdale, Annandale and Nithsdale.

21. "COUNTY OF Kirkcudbright"

5.6 in. x 7.4 in.

Map no. 9 in Armstrong's Atlas. Scale shown as c. 11 m. to 1 in.

Portrays Kirkcudbright divided into Mid and East Galloway.

22. "County of WIGTON"

5.7 in. x 7.5 in.

Map no. 10 in Armstrong's Atlas. Scale shown as c. 7 ml. to 1 in.

Portrays the County of Wigtown, with the coastline and river system showing similarity to that of Kitchin, 1771, which appears to be one possible source.

1778—KITCHIN, T. and BARBER, J.

23. "KIRKCUDBRIGHT SHIRE from the best Authorities"

9 in x 7.2 in.

Scale shown as 6 ml. to 1 in.

Published in "London Magazine," Vol. 47, p. 225, May, 1778.

Portrays Kirkcudbright in much greater detail than in Kitchin's 1749 edition, but not thereby achieving any notable increase in the accuracy of coastline or rivers. Scale must still be considered as variable, but the number of settlements indicated are more than double the number portrayed on the 1749 map.

1782—AINSLIE, John

24. "A Map of the COUNTY of WIGTON or the SHIRE of GALLOWAY"

4 sheets, each 21 in. x 15.2 in.

Scale 1 ml. to 1 in.

Second Edition in 1801, under the title of "A TOPOGRAPHICAL MAP of the COUNTY of WIGTON or SHIRE of GALLOWAY"

2 sheets, each 30.5 in. x 20.7 in.

This map represents the first published detailed and accurate survey of the County. In terms of distance and direction, it is of a sufficiently high standard to permit close comparison of features with later Ordnance Survey work. The standard of the engraving is of a high order, and in terms of the detail portrayed, it was not surpassed until publication of the O.S. first edition, six-inch maps in 1847-50. While one may have reservations about the accuracy of the finer details of the river pattern, it is possible to note interesting changes in both open water and streams. The use of conventional signs to portray some of the elements of the vegetation is particularly helpful in locating ill-drained land. But it is in the portrayal of the settlement pattern, both nucleated and dispersed, and also the detailed network of roads, that the map is of inestimable value. The morphology of the large settlements is discernable. The majority of the individual farms or houses

shown are named; over 60 in the Parish of Whithorn, for example. The larger houses even have the name of the owner indicated, e.g. "Castle Kennedy, Earl of Stair."

1782—AINSLIE, John.

25. [A list of the PORTS and LANDING PLACES In the Diftrict Claimed by the TOWN of WHITHORN]

15.5 in. x 15.5 in.

Scale c. 0.7 ml. to 1 in.

A map without any formal title, but showing the outline of the coast of Wigtownshire from Eggerness Point to Point of Lag, the sites of 6 churches, and also 14 ports and landing places, located and listed in a key under the above heading. No other details are shown.

1792—GILLONE, J.

26. "Map of KIRKCUDBRIGHT PARISH and its environs"

7.1 in. x 9.2 in.

Scale shown as 1 ml. to 1 in.

Published in "The Statistical Account of Scotland, 1794," Vol. XI., p. 1, Edinburgh.

A detailed map of Kirkcudbright Parish, and also the W. bank of the River Dee in the "Parish of Twynhame." Vegetation, individual farms and routeways are indicated, but distance would appear to be inaccurate by up to 10%.

1797—AINSLIE, John

27. "STEWARTRY-OF-KIRKCUDBRIGHT"

4 sheets, each 22.7 in. x 20 in.

Scale 1 ml. to 1 in.

Second Edition, 1801, under the title of "A TOPOGRAPHICAL MAP of the Stewartry of KIRKCUDBRIGHT." 4 sheets, each 23 in. x 20.1 in.

This map represents the first published detailed and accurate survey of the Stewartry. It is comparable in quality and content with the cartographer's work on Wigtownshire (item 24).

1800—BROWN, Thomas

[The following 2 maps are contained in an Atlas entitled "Atlas of Scotland." Both have only very small inaccuracy in direction and distance, except for occasional errors, particularly in respect of the rivers. The two maps are engraved by different craftsmen, and comparison clearly indicates the extent to which the style and skill of the individual engraver can influence the visual effect of the finished work.]

28. "A New and Accurate Map of DUMFRIES SHIRE from the latest SURVEYS"

13.2 in. x 11.5 in.

Map no. 9 in Brown's Atlas. Scale c. 4.2 ml. to 1 in.

Some curious irregularities appear in the alignment of the drainage of Nithsdale, but considerable detail of settlement is indicated (e.g. over 40 settlements in the County W. of the River Nith), and also a network of roads.

29. "New and Accurate Map of KIRKCUDBRIGHT and WIGTON SHIRES from the latest Surveys"

12.4 in. x 11.1 in.

Map. no. 10 in Brown's Atlas. Scale 6 ml. to 1 in.

Inaccuracy in detail of the drainage pattern is not difficult to discern, but there is a detailed settlement and road pattern in view of the small scale.

1812—CRAWFORD, William

30. "MAP OF DUMFRIES SHIRE"

4 sheets, each 29 in. x 24.5 in.

Scale 1 ml. to 1 in.

The date of publication of this map is uncertain. Some copies bear the date 4th June, 1812, but other copies have no such inscription. Singer³ (1812) states that "There is a map of Dumfries-shire which was prepared in about ten years, by Mr. William Crawford, land-surveyor, by the desire of the landlords, and published about five years ago." However, Jameson⁴ published in 1805, a "Map of Dumfries shire reduced from the Survey of the County made by William Crawford," which is primarily a locational map for certain geological features, and is not, therefore, included in this list. It is not at all certain from Jameson's text whether Crawford's original was published prior to Jameson's work, but it would seem possible that an undated edition of Crawford's map was published prior to 1812. One authority⁵ tentatively suggests 1804.

The map constitutes the first published accurate and detailed survey of the County, the margin of error in direction and distance seldom exceeding 5%, and therefore affords ready comparison with the Ordnance Survey 1st Edition, dated 1848-59. Hachures are employed to indicate major relief features, and drainage is indicated in detail, though inaccuracy in lesser detail, particularly in headwater areas is apparent. Settlement is shown in great detail, not only nucleations, but also individual farms, the majority of which are named, e.g. over

³ SINGER, Dr. William, 1812, "General View of the Agriculture, State of Property, and Improvements, in the County of Dumfries." Edinburgh, p. 4.

⁴ JAMESON, Robert, 1805, "A Mineralogical Description of the County of Dumfries." Edinburgh.

⁵ Royal Scottish Geographical Society, 1936, "The Early Maps of Scotland." Edinburgh, p. 98.

40 in Holywood Parish alone. A detailed pattern of roads is shown, with differentiation into apparently major and minor categories. Vegetation is also suggested in the case of tree cover and ill-drained land.

1812—MOFFAT, J.

31. "MAP of the County of Dumfries Reduced from the Map of Mr. Crawford and Engraved for the Agricultural Survey of DUMFRIES-SHIRE"

9.5 in. x 7.6 in.

No scale indicated. Reduction appears to be by approximately six times.

The map appears as a frontispiece to Singer's work.⁶ Much of the valuable detail of Crawford (1812) is lost, of course, so that the map is primarily one of parish boundaries, set in framework of relief and rivers, and with the major settlement units and roads.

1814—THOMSON, John

[The following two maps were published in the sixth edition (1814) of "The Traveller's Guide through Scotland and its Islands," edited and published by John Thomson & Co., Edinburgh, Vol. 1, pp. 200 and 225. Identical maps appear in later editions.]

32. "DUMFRIES"

6.5 in. x 3.6 in.

Scale not shown. Drawn to a scale of the order of 8-12 ml. to 1 in.

Some 60 settlements are portrayed within a rudimentary pattern of rivers and roads. Distortion in direction and distance is very apparent, and names are sometimes difficult to relate to a specific location.

33. "KIRKCUDBRIGHT"

6.5 in. x 3.6 in.

Scale not shown. Drawn to a scale of the order of 8-12 ml. to 1 in.

Rather fewer settlements than item 32, but in other respects similar.

1821—THOMSON, John

[Items 34, 35 and 39 were published in Thomson's very fine "Atlas of Scotland," Edinburgh and London, 1831 and 1832. This volume was re-issued again in 1849 by William Blackwood & Sons, each map bearing the name of W. & A. R. Johnston and incorporating some revision of roads and insertion of railways. The maps of each county were, however, published separately on completion between 1820 and 1830.]

34. "KIRKCUDBRIGHT-SHIRE"

2 sheets ("NORTHERN PART" and "SOUTHERN PART") each

20 in. x 26 in.

Scale 1.8 ml. to 1 in.

⁶ SINGER, Dr. William, 1812, Op Cit.

Thomson states that the map is the work of "William Johnson from surveys, assisted with the plans of various proprietors." In discussing earlier surveys, he states that "John Ainslie . . . made one of Kirkcudbrightshire." However, the map shows very striking resemblance to the work of Ainslie (1797), despite the reduced scale. The portrayal of much of the significant detail previously shown is achieved by a very high standard of engraving, by omission of some hachures and vegetation symbols (particularly where a high density of farms are shown, e.g. Troqueer and Terregles Parishes), by occasional simplification of the road network and omission of the names of owners of large properties. In other respects of accuracy and detail, the map is closely comparable with that of Ainslie.

1826—THOMSON, John

35. "COUNTY OF WIGTON OR SHIRE OF GALLOWAY"

21 in. x 26 in.

Scale 1.5 ml. to 1 in.

Thomson states the work was "done from the basis of Ainslie, corrected by Johnson, and other surveyors." Detailed examination again reveals great similarity with the work of Ainslie (1782). The reduction in scale, but retention of almost all of the settlement detail, is again achieved by engraving of a very high order, by re-alignment of hachuring and parish names, and by omission of the names of owners of large properties. The nature of the coastline is not so adequately portrayed and there are occasional small differences in the precise alignment of roads. But in other respects of accuracy and detail the map bears very strong resemblance to that of Ainslie.

1827—LOTHIAN, John

[The following three maps were published in "Lothian's County Atlas of Scotland," the first edition appearing in 1827. Dates indicated on the Frontispieces of several copies show that later editions were published in 1829, 1834, 1835, and 1838, the last under the title "Atlas of Modern Scotland" and paradoxically inscribed "Third Edition." However, the maps were also sold separately, county by county, and as sets of loose maps contained in three cardboard containers. The later maps each bear a publication date which is the one to take into account, since a variety of dates are usually found in the maps of any one volume. In more than one of the later editions of the Atlas, Lothian states in the introduction that revision has taken place throughout. However, a major revision of the three maps listed below seems to have occurred prior to their re-publication in 1835. A grid based on latitude and longitude is added to all three maps at this date.]

36. "DUMFRIES"

9.5 in. x 7.2 in.

p. 1 in Lothian's Atlas. Scale c. 6 ml. to 1 in.

A map of rivers, settlement and roads, incorporating very little of the relief, but accurately portraying a great deal of information about settlement and roads, particularly the former, bearing in mind the scale. Minor details of drainage appear inaccurate. The 1835 edition contains major additions to the pattern of roads and also very occasional additions in settlement, historical sites, and river names.

37. "KIRKCUDBRIGHT"

9.5 in. x 7.2 in.

p. 2 in Lothian's Atlas. Scale c. 5 ml. to 1 in.

Again much detail of settlement, roads and drainage, the latter occasionally inaccurate in lesser detail. The 1835 edition has a few roads added.

38. "WIGTON"

9.5 in. x 7.5 in.

p. 3 in Lothian's Atlas. Scale c. 4.2 ml. to 1 in.

The map contains much detail of settlement, roads, and drainage, but shows occasional local distortion in scale. The 1835 edition has several roads added, and also some further coastal information.

1828—THOMSON, JOHN

39. "DUMFRIESSHIRE"

4 sheets, each 25 in. x 18.5 in.

Scale 1 ml. to 1 in.

The map is the work of William Crawford and Son, and in terms of accuracy and detail, scarcely differs from Crawford's earlier publication (1812). The only major differences are in the much finer engraving and the re-location of some of the larger lettering on Thomson's publication. Very occasional alteration in detail can be found, e.g. alignment of roads near Annan.

1838—BLACKWOOD, William and Sons.

[The following three maps were published in "Blackwood's Atlas of Scotland," first published in 1838, and re-issued in 1839, 1845 and 1853. It appears to have been produced in both quarto and octavo sizes in all editions. Copies also appear to have been produced bearing no date whatsoever.]

The maps also appeared in Vol. 4 of "The New Statistical Account of Scotland, 1845," but in the case of Wigtownshire and Dumfriesshire contain much less detail than both the 1839 edition and an undated edition.]

40. "DUMFRIES SHIRE"

7.5 in. x 9.6 in.

Map no. 8 in Blackwood's Atlas. Scale 5 ml. to 1 in.

An accurate map with the primary purpose of locating parishes but portraying drainage, roads and settlement in some detail. The map

contained in "The New Statistical Account" omits some of the roads and settlement detail, however. There are usually some two to four additional features named in each Parish of the Atlas edition.

41. "KIRKCUDBRIGHT SHIRE"

7.4 in. x 9.2 in.

Map no. 17 in Blackwood's Atlas. Scale c. 6.2 ml. to 1 in.

An accurate map, similar in form to item 40, and incorporating much detail of roads and settlement in the S. and E. bearing in mind the small scale. The "New Statistical Account" map appears to be the same as that contained in the 1839 edition of the Atlas.

42. "WIGTON SHIRE"

7.4 in. x 9.5 in.

Map no. 28 in Blackwood's Atlas. Scale 4 ml. to 1 in.

Again an accurate map similar in form to item 40, but with numerous additions to roads and the naming of settlements and relief features in the Atlas edition.

1847-1850

43. "ORDNANCE SURVEY OF WIGTOWNSHIRE"

38 sheets and index, each 38 in. x 27 in.

Scale 6 in. to 1 ml. Surveyed 1846-49.

The work of the Ordnance Survey in Scotland commenced in Wigtownshire. The above maps were published prior to 1850, and are, therefore, included in this list. For a full account of all later Ordnance Survey publications, see Harley and Philips.⁷

1847—BLACK, A. & C.

[The following three maps were published in "Black's County Atlas of Scotland," published in 1847 and possibly again in 1848. They are a re-issue, with additions, of Lothian's County Atlas of Scotland," 1827.]

9.5 in. x 7.2 in.

44. "DUMFRIES"

p. 16 in Black's Atlas. Scale c. 6 ml. to 1 in.

As per the 1835 edition of item no. 36, but additions include railways, bridges, settlements, parish boundaries and the further naming of rivers.

45. "KIRKCUDBRIGHT"

9.5 in. x 7.2 in.

p. 23 in Black's Atlas. Scale c. 5 ml. to 1 in.

As per the 1835 edition of item no. 37, but with addition of parish boundaries, and also the correction and addition of settlements.

⁷ HARLEY, J. B. and PHILIPS, C. W., 1964, "The Historian's Guide to Ordnance Survey Maps." London.

46. "WIGTON"

9.5 in. x 7.5 in.

p. 39 in Black's Atlas. Scale c. 4.2 ml. to 1 in.

As per the 1835 edition of item no. 38, but with the addition of coastal features, names of rivers, the amendment of or addition to settlement, and notes on roads beyond the County boundary.

In conclusion, it must be acknowledged that the above list is almost certainly incomplete, and the author would be grateful to have his attention drawn to any omissions. In particular, maps held in private collections may well be additional to those which can be located in libraries. All the items listed are held in one or more of the important libraries in Britain, and are therefore readily available.

[The author gratefully acknowledges access to map collections held by Aberdeen University Geography Department, Aberdeen University Library, the Royal Scottish Geographical Society, the National Library of Scotland, the British Museum, Cambridge University Library and the Bodleian Library.]

LETTERS REPORTING THE RISING OF THE LEVELLERS IN 1724

Transcribed and edited by
W. A. J. PREVOST

A paper by Mr A. S. Morton, entitled *The Levellers of Galloway*, was printed in TDGAS Third Series xix (1936), and is a most informative history of the rising from which I have quoted freely. Mr Morton refers to the scattered and scanty records available, so that the following contemporary letters supplement what has already been published. They are not a complete story of the rising and therefore a brief introduction is necessary.

The troubles started when the Galloway lairds began to build farm dykes, to enclose their lands and to do away with the unprofitable small holdings. This not only rendered herding unnecessary but meant the doom of the herds, cottars and small tenants. John Maxwell of Munches¹ writes that 'a vast number of tenants' were ejected at the term of Whitsunday 1723, many of whom from age and poverty became utterly destitute;^{1a} and Joseph Train, in one of his letters to Sir Walter Scott, records that when 'upwards of 500 families in the Stewartry of Kirkcudbright received notice to leave their habitations at Whitsunday 1724, the general distress of the country thus occasioned became most appalling'² No provision seems to have been made for the support or resettlement of these unfortunate people and Mr Morton writes that the sufferers, brooding under their grievances, met at Kelton Hill Fair at the end of June 1723 to consider what should be done.³ It was at this meeting that the question of levelling the stone dykes was first mooted but the first move seems to have been started by a man Robertson, an ejected tenant under Thomas Gordon of Earlston,⁴ and an ejected tenant of Lady Kenmure,⁵ who met in January or February, 1724, and entered into a bond to stand by one another and continue in their holdings no matter what happened. Many were got secretly to sign the bond, and, when their numbers were considered sufficient, they demolished first the dykes recently erected by Lady Kenmure and then those erected by Gordon on Airds.⁶ Probably at about the same time other parishes were also affected and Mr David Frew⁷ writes that "Among the first places visited by the Levellers were Barncailzie and Munches, and probably

¹ John Maxwell of Terraughty and Munches (1720-1814). William Fraser, *The Book of Caerlaverock*, i, 572-580.

^{1a} National Library of Scotland. Abbotsford Collection, MS 874, f 158. Copy of letter 8 Feb. 1811. John Maxwell to W. M. Herries of Spotts.

² Ibid. f i, 8. Letter 14 Jan. 1831.

³ Kelton Hill Fair was held annually on the first Tuesday after 17 June.

⁴ Thomas, son of Alexander Gordon of Earlston. For Alexander Gordon see C. H. Dick, *Highways and Byways in Galloway and Carrick*. 445, 446.

⁵ Mary, only daughter of Sir John Dalzell of Glenæ, who married, in 1711, William, 6th Viscount of Kenmure, who was executed for his part in the Jacobite rising of 1715. His estate was confiscated but her ladyship entered a claim on behalf of her eldest son Robert Gordon, and the claim was sustained. This estate she managed to acquire. *Scots Peerage* v, 129, 130.

⁶ A. S. Morton, "The Levellers of Galloway," TDGAS Third Series, xix, 232.

⁷ David Frew. *The Parish of Urr*, 42.

some of the intervening properties in the parish of Urr . . . ,” but as the Levellers were organised into gangs operating independently throughout the country it is not possible to date any of their movements with certainty. John Maxwell of Munches records that he saw with his own eyes the Levellers, “with pitchforks, gavellocks and spades,” overthrowing the dykes at Barncailzie and Munches at Dalbeattie, and he notes that they did the same with the estates of Netherlaw, Dunrod, etc.⁸

The rising gathered momentum and the Levellers became more emboldened in their work, with a disregard for all law and order, and for a time they had the encouragement of a number of sympathizers. At some time in April, probably in the first half of the month, they fixed a manifesto on the church doors of Tongland, Borgue, Twynholm and others, declaring that they were loyal subjects of His Majesty and had risen only to defend themselves and their families and to suppress the insupportable cruelty of several gentlemen in Galloway.⁹ There is no doubt that the Levellers were well led and organised, and according to Joseph Train the credit for this was due to “Willie Marshall, the King of the Randies.”¹⁰ This famous gypsy is reputed to have been pressed or enlisted in the army seven times¹¹ and his services were no doubt made use of in drilling and training the Levellers in the art of war. By the end of April they were a force to be reckoned with, the situation was getting out of hand, and this is well described in a letter 2 May, 1724,¹² from the Earl of Galloway¹³ at Glasserton to his brother-in-law, Sir John Clerk of Penicuik,¹⁴ in Edinburgh.

“I shall alwise doe whats possible for me to preserve my familie, but at this time our countrie is in the worst situatione possible for monie because of the scarcity of victuall which oblidges our tennanties to send all they can procure to Irland for bread, and if we had not been provided thence I doe belive there had been a famine in this countrie, and I must say the running of brandie does ruine the countrie verie much, but you wold hear the insolencies of ane sett of people that have drauen together and destroyed the whole encloasours in the Stewartrie, and if we have not the protectione of the Govert by allowing troops to march in to the countrie for our assistance, I doe relie belive the whole gentlemen of Galloway will be ruined. Noe doubt you’ve heard of Mr Hamilton’s¹⁵ going to Edinburgh with Earlstoune to represent the grevances of our countrie one (sic) that score and what indignities are used

⁸ In 1724 the laird of Netherlaw was probably Anthony M’Kie, for Fraser, op. cit., i, 578, records that in 1736 he was “of Netherlaw.” Hugh Blair was in Dunrod.

⁹ National Library of Scotland. Wodrow MSS, Folio XL, no 80 on front page index. Noted by Wodrow on the MS. “In April, received May 1724.”

¹⁰ Abbotsford Collection, op. cit., f 13 and f 158.

¹¹ C. H. Dick, op. cit., 98-100.

¹² Scottish Record Office, Clerk of Penicuik Muniments (GD 18), No. 5246/I/142.

¹³ James, 5th Earl of Galloway, who succeeded his brother in 1693. Died in 1746.

¹⁴ Sir John Clerk (1676-1755), 2nd Baronet of Penicuik, who married (1) Lady Margaret Stuart, eldest daughter of Alexander, 3rd Earl of Galloway. See DNB.

¹⁵ Basil Hamilton of Baldoon (1696-1742) who was sentenced to death for his part in the Jacobite rising of 1715, but his life was spared through family influence. His estates were forfeited but his mother claimed them and made good her claim. Hamilton was distrusted and disliked by the Levellers because of the part he played in the rebellion, and in consequence he suffered much damage at their hands.

to themselves in particular, and how all their encloasours are demolished, and even since going to Edinburgh they have comitted the greatest abuses of that kind to the most pairt of the gentrie on the other side of Cree, and are still going one in these illegall practices and we expect to meet with the same usage from them in the shire, and dont know how its possible for us to put ane stop to these insolencies if the troops don't assist us. We shall not onlie lose our encloasours but are in hazard of losing our stocks, having noe fences for them, and most goe a drift through the whole countrie which will be of great disadvantage then [unless] the outer and inner of the countrie is not verie speedlie protected"

"This day I was informed that they were to demolish all the parks upon the Watter of Cree to morrou, and they most either return or enter the shire after its done. Their number is still increasing and are now 8 or 900 hundered,¹⁶ and most of them are said to be armed. The Justice Clerk was to be at Drumfreis upon Friday last where the whole gentlemen in that countrie were to wait one him and represent the hard situation they were in at the time. I know his Lordship has represented the whole to the ministrie above and assured them that the troops wold verie soon have orders to march, but they neglect noe time to accomplish there villanous designs ere we can have anie releif . . ."

The gentry were now very alarmed, besides which there could only have been a very few persons who sympathized with the Levellers. Their illegal practice of throwing down dykes was condemned by a meeting of the Presbytery of Kirkcudbright at "Clachan pluck" on 6 May, 1724, who entered in their minutes that "this practice strikes against the institution of Heaven and tends to sap and overthrown magistracy contrair to the word of God. . . ."¹⁷ The Stewart Depute, who was believed to be sympathetic towards them, was spurred to action, and ordered all heretors, liferenters, wadsetters, and freeholders to assemble at the Steps of Tarff with their best horses, arms and ammunition to proceed against the Levellers.¹⁸ This was done and what happened has been described in a letter 6 May, 1724 (Old Style), from James Clerk,¹⁹ Kirkcudbright, to his brother Sir John Clerk in Edinburgh. James was the Collector of Customs at Kirkcudbright and was to some extent officially involved in the rising in that, as a customs officer, he was approached by the Levellers to take action over certain cattle which they claimed to have been illegally imported from Ireland. In any case he was well placed to keep Sir John informed about the state of affairs in Galloway, and on every Wednesday for five weeks in the months of May and June he despatched reports on what

¹⁶ Morton, op. cit., 234, writes that the Levellers numbered 1100, the majority women and boys.

¹⁷ Wodrow MSS. op. cit., no 77 on front page index, and quoted in full by Morton, 239.

¹⁸ Morton, op. cit., 236.

¹⁹ Other letters in the Clerk Muniments from James Clerk to Sir John are usually full of complaints and frequently contain a request for money. On one occasion he boldly sent a receipt, enclosed with the begging letter. In his memoirs for the year 1722 Sir John writes that James had spent his portion of 15,000 merks which his father had left him by a bond of provision, "yet I paid it to him again." His subsequent career is best left unrecorded.

had happened during the preceding week, and descriptions of events which he himself had actually witnessed.

Wednesday, 6 May 1724 (Old Style). James Clerk, Kirkcudbright, to Sir John Clerk . . . "to be left at his lodgings head of Black fryars Wynd."²⁰

"I received yours of the 20 of Aprile only upon the 3d this month, by which time I judge you would not be at Carlisle but nearer home, especialy when my Lord Justice Clerk told me at Dumfries that he expected you there the 1st of this month. The Stewart Deputy and the Justices of the peace have been reflected on, on account of not applying in time for assistance in the present affair, and the countrey people are now wholly loose and resolute, threatning the persons as well as the inclosures of the gentlemen. They have already thrown down about 12 or 14 gentlemen's inclosures, and are still going on. The dammage they reckon £1000 will not repay and the gentlemen are much out of temper, having little hopes of reparation of these people even in helping to rear them again. Yesterday a party of them about 1000 in number assembled at the Steps of Tarf 4 miles from this town, (this river empties it self into the Dee a mile above this), at which place they drew up, armed in front with 300 good effective firelocks, the rest with pitch forks and clubs and all with resolution enough.

The Stewart Depute, Justices of the peace and Heretors of the Stewartry, met them in a body of about 50 Horse well armed and in good order but with no design to attack if the mobb could be brought to reason. After a treaty of peace was negotiating about 4 or 5 hours and that nothing but repeated threats of the mob to fall upon the gentlemen were made, the gentlemen made them offers in general to build no more park dykes and required them to rebuild what they had demolished, then wheeled about and left them, upon which the other party divided themselves into small bodies and went through the country towards this place to finish any kinds of enclosure they could fall on here. They threaten to come into this town and oblige the officers of the Customs to go with them to assist them in seizures of Irish cattle that they pretend to find among the Enclosures, but whether we are answerable to head or assist a mob let the case otherways be legal enough, is what I know not, and without downright force I'm resolved not to take notice of such proceedings, especialy when I find it will be verry hard for them to make proof that such cattle are the same by head mark, which they saw imported from such ships, into such places which otherways cannot be deemed seizure. In the whole I'm tyred of their proceedings and all the proceedings here, they observing no law or equity with respect either to King or Countrey, either to trade or the improvement of the lands. I offer my hearty respects to your lady and family and all friends and am

Sir,

Your affectionate brother
& humble servant
Ja Clerk.

Kirkcudbright.
6 May 1724.

²⁰ Clerk of Penicuik, *op. cit.*, No. 5288/45.

P.S.—I have just now got account that a peace is concluded and that Laird Haron has given it under hand to let out a great deal of land next week to appease them, but this is what I canna confirm and do not believe.²¹

13 May, 1724. James Clerk, Kirkcudbright, to Sir John Clerk in Edinburgh.²²

"According to desire I give you further account of the Transactions of the Dyke dressers.

"On Sunday the 10th Instant they caused publick proclamation to be made at the doors of eight Parish Churches, ordering all men and women upwards of the age of 15 to repair to the Muir of Bemby two miles distant from this with their best arms and accoutrements, upon Tuesday the 12 Inst, in order to work the Work of the Lord.²³ Answerable thereto, upon an eminence hard by the place of meeting, I saw them yesterday between the hours of 8 & 12 in the morning coming in bodies, from all quarters, meeting about 12 at the place of Rendezvous, making in all a body upwards of two thousand, half of which were armed with good effective firelocks upwards of 400, and pitchforks and clubs; the other half, being the workmen, had long poles for prizing up the seams of the dykes for quick dispatch. About 12 of the clock Mr Basil Hamilton's servants with two or three of this town on horseback advanced to them in order to a Treaty. They were quickly enclosed, dismounted and taken prisoners, and instead of coming to any agreement they were with much difficulty dismissed. The mobb fired three shot upon them in their retreat, then gave the word, "Down with the Dykes," upon which they fell vigourously to work to Mr Hamilton's large dyke, for in the space of three hours they levelled with the ground seven miles of stone dyke in length. After this was sufficiently manadged they blew horn and marched in a body about half a mile to pick a quarrel with another enclosure where I saw them perform wonders, and before they halted brought down four miles of dyke to the ground. There were a great many lusty young women among them who yet performed greater wonders than the men. It cannot be well doubted but perhaps there were several venereal conjunctions among the lads and the lasses, which affairs being transacted in the proper postures dykewards might very much contribute to the carrying on in throwing down the work. I left them still at work about 5 in the afternoon, and since I came home had account that they were to continue at work all that night and this day. Upon coming to town I heard that four troops of Stairs Dragoons²⁴ were marched pretty near this place, the

²¹ Patrick Heron, who died in 1761, aged 89, became laird of Kिरroughtree in the parish of Minnigaff in 1695 after the death of his father, Andrew Heron; and in 1719 built Kिरroughtree House. TDGAS, Third Series, xx (1938), 181. See Morton, *op. cit.*, 237, who writes that Heron arranged a meeting with the Levellers to adjust matters and then both sides dispersed.

²² Clerk of Penicuik, No. 5288/46.

²³ Morton, *op. cit.*, 237. The Levellers had heard that there were to be no negotiations and met on Bombie Moor in the hope that the gentlemen would come.

²⁴ Lord Stair, the colonel of the regiment which Joseph Train called "the Regiment of Black Horse," provided quarters and maintenance for the men and horses. Agnew, in his *The Hereditary Sheriffs of Galloway*, ii, 241, writes that, as Castle Kennedy had been burnt down in 1716, Lord Stair managed to acquire the Castle of Innermessan in the north-west of Wigtownshire for the dragoons. However, it seems that in 1724 the regiment was stationed elsewhere, for Morton quotes the *Caledonian Mercury*, 2 June 1724, which reported that "six troops of Dragoons have been sent to the West."

officers whereof arrived here last night.²⁵ How far this will put a stop to their proceedings time will determine but we have too certain acct that the shires of Air, Galloway and Nithisdale are upon the same footing and like to give trouble enough. We were in great expectation of having the Eclipse of II instant visible, but had thick weather. How it has been with you I know not but by what we could judge by the darkness here it was not near so great as what was asserted"

20 May, 1724. James Clerk, Kirkcudbright, to Sir John Clerk, Edinburgh.²⁶

"Since my last, nothing in particular has occurred in relation to the mobb among us, only we hear that they have separated into several bodies and gone through the countrey throwing down all the dykes in their way, and making a levell work of it. Upon Wednesday last a party of about 100, all armed, came into town, driving before them about 53 Black Cattle which they had, after throwing down the dykes, brought in the name of Irish cattle. They demanded us to assist them in retaining said cattle. Upon our letting them know the Act of Parliament relating thereto and that these concerned in the R had no business in such seizures, but that the Justices of peace, constables, tythingmen, churchwardens and overseers of [the] poor were only obliged to assist and make such seizures; and any other person if they pleased (but no otherways), might make such seizure, as by the Acts Carol: Reg 2d Anno 18 & 20 & 32 appears.²⁷ We thereupon refused to meddle in the affair, especially considered that we writt the Commissioners 15 days ago on that account, and have as yet had no orders to give any such assistance, upon which they drove them out of town and slaughtered each one [of] them in barbarous manner, notwithstanding as law directs proof was made by the owner [and] by two witnesses oaths that they were not imported from Ireland, but bought of a Highland drover.²⁸ We are assured severall of native Irish are come over & have joyned them who have mony in abundance and we cannot know how this affair will determine"

27 May, 1724. James Clerk, Kirkcudbright, to Sir John Clerk, Edinburgh.²⁹

"I hope mine of the 20th instant is arrivd. Yours of the 18 Currt is before me. Thers nothing of consequence has happened in relation to the mob since my last, only huge threatnings. They gave out orders for a general meeting

²⁵ Sir John Inglis of Cramond (1683-1771) wrote to Sir John Clerk on 12 May 1724 and referred to the meeting of the Sheriff Depute at the Steps of Tarf with "the Moabers or Levellers" who were so numerous and insolent that the gentlemen were forced to capitulate. "Stair's dragoons are amongst them by this time and I'm hopefull will be able to put a stop to their insolence." Clerk of Penicuik. No. 5272/13.

²⁶ Clerk of Penicuik. No. 5288/47/1.

²⁷ A most ambiguous reference to the Acts of Charles II. On 31 Aug. 1703 in the reign of Queen Anne, an act was passed by the Scottish Parliament for the more effectual execution of the laws prohibiting the importation of Irish or other victual and Irish cattle and horses. This act refers to an act passed by the second Parliament of Charles II in 1672, and to another act passed by the first Parliament of James VII in 1686.

²⁸ This incident is the one referred to by Lord Galloway in a letter, part of which is unreadable, written to Sir John Clerk in May. The Earl reported that the Levellers were slaughtering cattle which they said were Irish in spite of proof to the contrary "and particulare upon Tuesday the 12 current they slaughtered near Kirkcudbright 55 or 57 cattell belonging to Hugh Blair of Dunrood, notwithstanding he made appear they were bred in Britain, and they have used some of Basil Hamilton's cattell after the same way and manner upon Saturday morning last, and since that time hes carryed of tuo parcells more belonging to two other. . . ." Clerk of Penicuik. No. 5246/161.

²⁹ Clerk of Penicuik. No. 5288/48.

yesterday, the 26, at Keltoun hill about eight miles from this place, where they pretended to double the number in which they appeared last meeting, but by all the information we could have there was no meeting save two Plenipotentiarys from each parish to consider of their further proceedings, which by this time they find to be most unaccountable. They pretend to make favour with the Government by seizing the gentlemen's cattle, and brandy, but their illegall and rebellious proceedings in arms and making the seizures wholly their own, without respect to Law, King or Countrey, make it appear what kind of subjects they are. Last night arrived here four troops more of Stair's Dragoons, of which fifty mounted on horseback, so that we now have the whole Regiment but not compleat, by reason of sundry detachments and grass guards. Major Du Cary commands, and designs to encamp hard by."

"They have emprisoned two in this town who have been active and officious in the affair, and picking up more every day.³⁰ I believe the troops design to go out in bodys, in search of them and to attack them, if they find them in number, but their courage is much abated since the arrival of the forces. I shall give you further account of the matters of fact as they shall occur, to the best of my knowledge and information"

3 June, 1724. James Clerk, Kirkcudbright, to Sir John Clerk, Edinburgh.³¹

"I hope you received my last of the 27 May. On Thursday last the 28, the troops were drawn up and exercisd at the usual time, when the Kings and Royall family healths were drunk in the town house, with the officers, magistrats and gentlemen of the town. This day ended in mirth, ringing of bells and all other signs and demonstrations of joy as usuall. On Friday the 29th all the Justices of the peace and heritors of the Stewartry held a generall council in the Town house to consider of ways and means for the more effectual suppression of the mob. After many debates they all agreed to apply to the Commander General, to order his troops out as occasion should require; to take up so many of them as could be found, and if in bodys after reading the Proclamation and the time by law allowed elapsed, to fall upon them immediatly. This application they made and had a verry civill answer of compliance to their demand."

"On Sunday the 31st the mob gave generall orders at twelve Parish Church doors, for all men and women to assemble together with their best arms as formerly, on Tuesday the 2nd currt, at the Boat of Rouan, a ferry upon the Dee on the confines of a large and beautifull forrest, about ten miles from this town."

"The troops having by courriers had timeous notice of them put themselves in order to receive them, and on Tuesday about three in the morning Major Ducarey, the Commander, set out from hence with two troops of Horse and four troops on foot. He placed one troop of horse in front which he himself

³⁰ One of the first steps taken by Du Cary was to arrest Robertson and three or four of the ringleaders who were committed to prison. Morton, op. cit., 241.

³¹ Clerk of Penicuik. No. 5288/49.

headed. The four troops on foot commanded by Lord Crichton³² and Capt. Auchinleck made up the main body, and the other troop of Horse commanded by Capt. Nugene brought up the rear. We arrived at the place appointed about eight in the morning, and finding to our dissapointment no appearance, halted three hours, in which time the men refreshed themselves and the Horse were turned to grass. About twelve there crossed the river and came up to us severall country gentlemen who, as well as we, were surprized that the Levellers had made no appearance that day, upon which orders were given to march back to the town again. When in our march backwards we had arrived at the Steps of Tarf, a message comes to the major informing that the countrey gentlemen had fallen upon a small party of them of about 50 in number, and had taken sundry prisoners, but in danger of having them rescued without assistance of the forces. Upon which the Major detaches 30 horse to advance with speed to their relief to the place which was on a hill about a mile from us, ordering the men to halt till account of the matter was sent to him.

"This party of a mob of about 50 were all armed with guns, pitchforks and poles. Upon the gentlemens advancing to them, they kept them off with their pitchforks and clubs. One of them pushed at Mr Basil Hamilton with a pitchfork which happened to glance athwart his breast, otherwise if right directed would have prov'd mortall. Another of them struck Mr Heron twice with a hanger but was as many times putt off. Another gentleman was almost knockt off his horse, the women all the while plying them with stones, so that they had work enough among their hands, and would have come off but indifferently had not the detachment of the Horse immediatly come up to their assistance. As soon as the mobb saw them they made off but the horsemen rode up among them sword in hand, disarmed and took 14 of them prisoners, one of which had his ear sliced off to a stitch, besides a large cut in the neck.³³ All being dispersed they brought off the prisoners, came up with us, and joyn'd our main body, upon which they were ordered into the same posture as before and marched directly into town where we arrived at eight at night, a sufficient guard having conveyed the prisoners to the town house. This is all has happened since my last, but I fear not all that will happen to them"

James Clerk wrote again on 23 June, 1724, but he had nothing further to report. However, the rising was by no means over and a "Representation to Major Augustus Duquary from the poor distressed tennants of Galloway, July 1724," which covers 8 pages of foolscap in manuscript, is a mine of information about the rising up to that month.³⁴ This is quoted in full by Mr Morton who writes that the last stand of the Stewartry Levellers was made at Duchrae, in the parish of Balmaghie, in October 1724, and that 200 Levellers were taken prisoner. Though this is by no means the end of the

³² William Crichton-Dalrymple, Lord Crichton, afterwards 4th Earl of Dumfries, who succeeded his mother in 1742. *Scots Peerage*, iii, 236, 237.

³³ Probably the man M'Crabbin referred to by Morton, *op. cit.*, 242, as having had his ear cut off.

³⁴ Wodrow MSS. Folio XL, index no. 79.

story of the rising,³⁵ the following letter 18 Nov., 1724,³⁶ from Brigadier John Stewart, Sorbie,³⁷ to Sir John Clerk in Edinburgh, must suffice to bring this paper to a conclusion.

"I had last week the favour of yours of the 6th last for which I am particularly obliged. Our mobb have nott thought fitt to keep ther words to me. They have only three times opened a hyghway slap and inclosure off myine and made some other slaps in my dicks in the night time which I always rebuilt as soon as I could, that high way being shutt upp by our fathers several years agoe, doeing prejudice to noe body and by the consent of all the people [who] had occasion to travil that road. Since my last they have not been soe violent upon the dicks in genll, but the spirett keeps upp amōngst them. They, one Wednesday night last, mett in a considerable body near Whithorne with sythes, pithfforks (sic) and other wapons, killed and houghed Wig's³⁸ cattle in the inclosure they lately throen down, but being advertised from the toun that the dragoons were mounting to march upon them they dispersed and severalls of them threw away ther wapons which have been since found. They have break to pieces severall of my brother's big yetts upon highways, leading through his inclosures to Whithorne, and they have breack and destroyed almost all the cariages and tools Broughton³⁹ had for making up his inclosures. They have likewise a practise in sending ther emissaries in the night time to the countrey peoples houses, threatning them that iff they doe not join them to burn ther houses and meal stacks."

"I doe nott doubt from all this and from what you writte me as to our improvement by manuffactouries, you must ever surely think we have great numbers of idle people and as is represented for our nighbourhood slaving att dick sides, wheras I can loke upon and be assure to you that in all the four parishes round us wher most off these levellers are, ther is butt one man that has any stock that wants a possession suitable to his desire, and he was but turned outt att Whitsunday last and payed only a thrie part off 400 mks rent, and it will be ffound ther is nothing in all our quarells but a wicked unreasonable humour to follow the example off the Steuartrie without any just ground what ever, and am satisfied we neither have the numbers off people requisitt nor have they a genius ffr such improvements. I have nott yett had occasion to shou my brother your letter butt shall not ffail to doe itt in a day our tuo"

³⁵ 17 April 1725. James Clerk to Sir John Clerk. "P.S. Since the departure of the forces from this town the Levelers have thrown down sixty rood of Dyke to Mr Hamilton" Clerk of Penicuik. No. 5288/54.

³⁶ Ibid. No. 5246/5/144.

³⁷ John Stewart of Sorbie, where he died in April, 1748. He was brother to the 5th Earl of Galloway.

³⁸ William Agnew of "Castle Wigg." Sir Andrew Agnew, *The Hereditary Sheriffs of Galloway*, ii, 238. This assault on Agnew's dykes was due, so it was said, to the fact that "the Laird of Wig promised money to know the men that drew down Broughtoun's dyks, have caused him to have all this loss." Clerk of Penicuik. No. 5246/5/137.

³⁹ Alexander Murray of Broughton. Agnew. *op. cit.*, 223.

THE DEVELOPMENT OF THE ROAD SYSTEM IN THE STEWARTRY OF KIRKCUDBRIGHT, 1590-1890

By ALEX. D. ANDERSON, B.Sc., A.M.I.C.E., etc.

The following paper is based on the various sources mentioned in the footnotes and elsewhere. Lack of time and opportunity has prevented the examination of much other material which may exist, and what follows should therefore be regarded as a precis of these sources rather than an exhaustive history.

The date 1590 has been taken as representing approximately the end of the Mediæval period in Scotland, and also the approximate date of Timothy Pont's survey. 1890 is the year in which the County Council took over from the Road Trustees, and brings us into the era of the internal combustion engine.

Various fragments of Mediæval roads have been located from time to time, but so far not in sufficient number to give a general picture.

Timothy Pont's maps of Galloway show no roads, but do indicate 12 bridges (see Fig. 1). There are two notable omissions—Queen Mary's Bridge at Minnigaff and any bridge over the Palnure Burn. The former stands at a point where two apparently ancient through routes converge,¹ and where crossing by any other means but a bridge would be impracticable. Whether Queen Mary actually crossed it is a moot point. The conditions described by Symson² which necessitated a bridge, namely, the separation of the Kirk from Minnigaff village, would also prevail in earlier times. The site would not be difficult. The "wishing well" could have been used as a post hole for a timber bridge if such a structure preceded the present one.

The existence of a bridge near Palnure, probably on the site of Palnure Old Bridge, is indicated by the nearby Gaelic name "Bardrochwood."³ Other river crossings which may be dated to Gaelic-speaking times are Clattering-shaws,⁴ Anacarry Ford (over the Fleet near Cardoness Castle) and possibly Granyford.⁵ Place names with references to road features are numerous, including several "Gaits," "Boats," "Fords" and "Causeys," also "Goa'end," "Path Brae," "Spittal" and "Ferrytown."

All these references give only isolated points on the various routes. All that can be said with any certainty is that the road system which existed a century later in Symson's time would be generally compatible with these various points, and indeed there is no reason whatever to suspect any sweeping changes.

¹ Part of the "Old Edinburgh Road" and the road from the coast via Kirrroughtree.

² Symson "Large Description of Galloway," compiled 1684, written 1692, published as an appendix to Mackenzie's "History of Galloway," 1841. Page 50.

³ "Bardrochat" on Pont's map. The Rt. Hon. Sir Herbert Maxwell in "The Place Names of Galloway" (1930) gives the derivation as "Barr Drochaid—the bridge hill."

⁴ A Gaelic derivation for Clatteringshaws, referring to a ford, was suggested by Prof. Barrow at a recent meeting of the Society.

⁵ Sir Herbert Maxwell, *op. cit.* (3) "greanach-gravelly."

Apart from the "Causeys" (none of which has survived in any physical form so far recognised) and the Burgh streets, these roads must have consisted of unmade tracks formed by constant use (hence the various hollow sections) as outside the Burghs there was no authority responsible for their upkeep, although some work may have been done by landowners. Some of the bridges may have been of stone—Dumfries Bridge certainly was, and the Old Bridge of Urr may have been built in 1581.⁶ Fleet Bridge, on the other hand, was probably timber, a bridge of that material being swept away in 1721.⁷ The roads would be cheap to "construct" but comparatively difficult to travel on, and thus economy of effort would result in a multiplicity of tracks, each one proceeding as directly as possible between any two points. As construction later became more expensive, and at the same time travelling became easier, it became more convenient to travel along one of a smaller number of main routes with branch roads to points on either side previously served by direct routes. This form of development appears to be a general and logical rule and can be observed operating today in the "primary route" and motorway systems, and also in the railways. A further effect of improving roads is to reduce the number of fords, since it becomes more convenient to travel to the nearest bridge.

After Timothy Pont, the next piece of information appears in the petition of 1642 by the postmasters between Portpatrick and Carlisle.⁸ This describes the route through the Stewartry as Dumfries—"Steps of Or" (probably, but not necessarily, the Haugh)—"Gatehous of Fleit"—"Pethhous" (near Blackcraig) and thence to Glenluce. Unfortunately, the distances are obviously inaccurate, and there are no other details.

The 17th century saw the beginning of legislation for the upkeep of roads, and this was summarised in the 1859 report on Public Roads in Scotland.⁹ Acts of 1617 and 1661 gave to the Justices of the Peace powers to mend highways to or from market towns or seaports. In 1669 a most important step was the introduction of the Statute Labour system whereby tenants were required to give 6 days labour per year on the roads. The system was perpetuated and improved by an Act of 1670, and again in 1686 when the Commissioners of Supply were joined with the J.P.'s in responsibility for the roads. The 1661 Parliament also passed an Act empowering Richard Murray of Broughton to re-build Fleet Bridge and to levy pontages.

Unfortunately, the extant records of the Commissioners of Supply date only from 1728, and it was considered by Colonel Maitland that the discovery of any earlier records was now unlikely.¹⁰

The road system in the latter part of the 17th century can be deduced

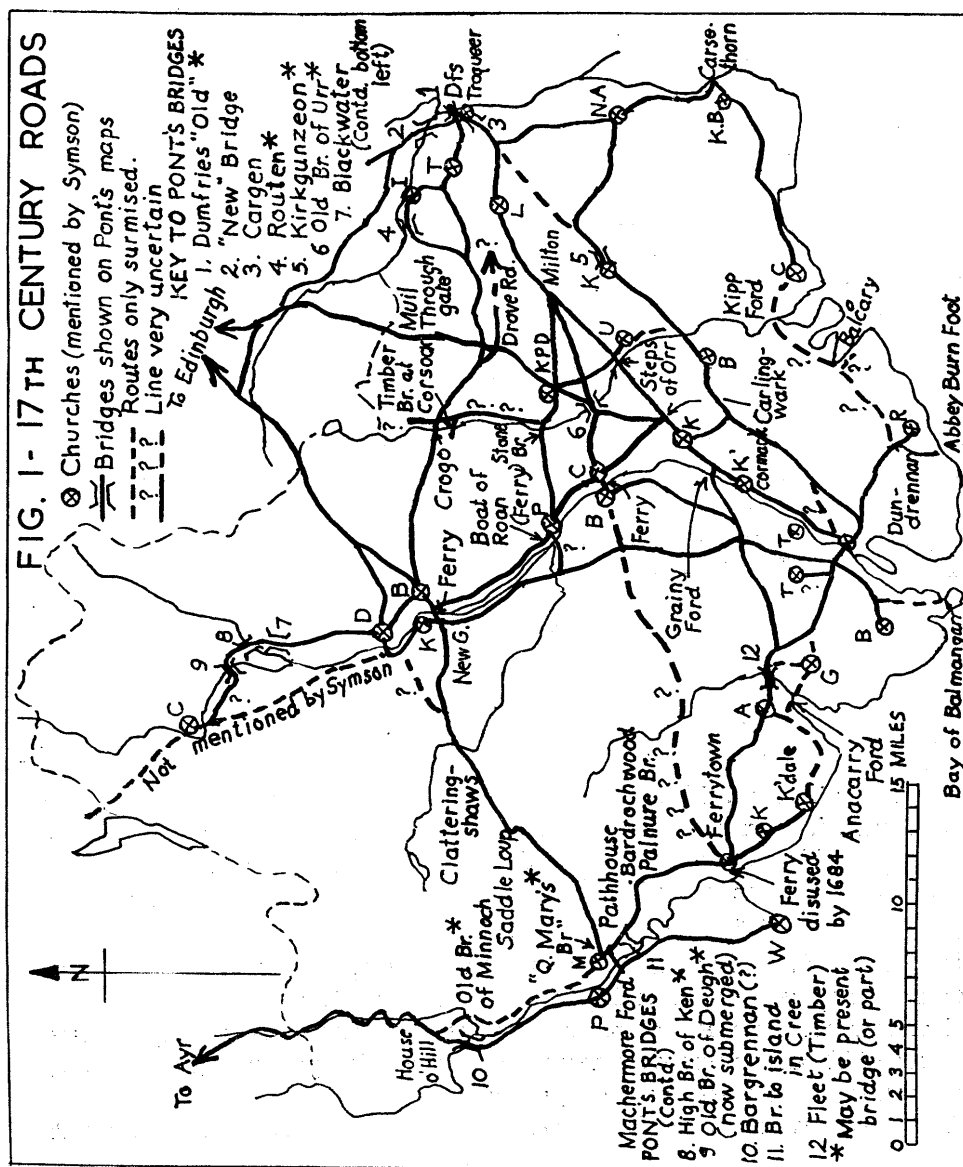
6 M. M'L. Harper "Rambles in Galloway" 3rd edition, 1908, pp. 365-6.

7 Correspondence between Murray of Broughton and the Government. Broughton and Cally Muniments; Scottish Record Office (Information supplied by Mrs E. Murray Usher of Cally). Also contract for a new bridge, 1729 (in the possession of Col. Walter M'Culloch of Ardwall).

8 John M. Corrie "The Dumfries Post Office, 1642-1910" (1912), pp. 5-6.

9 Report of Commissioners on Public Roads in Scotland, 1859.

10 Lt. Col. C. A. S. Maitland, D.S.O., of Dundrennan, "Commissioners of Supply for the Stewartry of Kirkcudbright, 1728-1828" (1933) (Hereafter referred to as "Maitland")—Foreword.



to some extent from a number of sources, principally Symson's "Large Description of Galloway," written in 1692 from notes made in 1684, together with the various papers appended to it. The greatest detail is given for the parish of Kirkpatrick-Durham, including a now disused route from Kirkcudbright to Edinburgh via Kirkpatrick, Muil and Garrieston. Symson also refers to the river crossings involved in routes from Kirkcudbright to the various parish kirks. Fig. 1 indicates the possible routes at this period.

The subject of drove roads has already been dealt with exhaustively by others,^{11, 12} and it is not intended to dwell on it here, except to refer to the marking out, by order of the Privy Council, of a drove road from New Galloway to Dumfries in 1697.¹³

It seems very probable that in the period of 42 years from the Act of 1686 till the beginning of continuous records in 1728 that little but essential maintenance work would be carried out by the Commissioners of Supply.¹⁴ The condition of the roads which they would take over is not described by Symson, but the speed with which the initial movements of the Pentland Rising of 1666 took place suggests that they were not unsuitable even for that somewhat unusual traffic. Sir John Clerk's comments in 1721¹⁵ and 1735¹⁶ were, however, very mixed, and the fact that such a feature as the Saddle Loup was tolerated at all on a through road may indicate what was to be expected. During this period a number of other bodies and persons interested themselves in various works. Dumfries Burgh maintained Bankend bridge in Dumfriesshire, and there is a strong suggestion that they may have been concerned with Cargen and Routen bridges. The road from Brigend to Carsethorn (as shown on General Roy's map) is said to have been constructed by the Town or merchants of Dumfries in the 1660's during a vigorous mercantile effort. The Synod of Dumfries were responsible for the building of the first Clatteringshaws bridge in 1703,¹⁷ and in 1740 the Kirk Session of Twynholm built the bridge in the centre of the village.¹⁸ No doubt other cases occurred. In the case of Fleet Bridge, the County were apparently financially unable to replace the old timber bridge washed away in 1721, and Murray of Broughton agreed to construct it himself, in consideration of the remission of certain annual sums due by him to the Government. While this arrangement was approved by the Barons of Exchequer in 1723,¹⁹ it must have fallen through, since the bridge was not replaced till 1729-30, and then by the Commissioners of Supply.²⁰

11 J. M. Corrie "The Droving Days in the south-west district of Scotland" 1915.

12 A. R. B. Haldane "The Drove Roads of Scotland" 1951. Cap. 9.

13 R. Chambers "Domestic Annals of Scotland," III, pp. 152-3.

14 It has been brought to the writer's notice by Dr T. C. Smout that corn prices, which in the 17th century varied independently in different regions, after 1720 all move together throughout Scotland, and this may have been due to better communications. It is certainly true that the Commissioners of Supply were short of funds for such essential work as rebuilding Fleet Bridge, as recorded in the Cally papers, immediately after 1720.

15 Sir John Clerk of Penicuik "A Journie to Galloway in 1721" ed. by W. A. J. Prevost. DGNHAS. III, xli, p. 186.

16 Ibid. "Sir John Clerk's Journey into Galloway in 1735" DGNHAS, III, xlii, p. 133.

17 C. H. Dick "Highways and Byways in Galloway and Carrick" (1924), pp. 470-1.

18 The writer is indebted to the Rev. John Good for this information.

19 Broughton and Calliv Muniments (See ref. 7, page 206)

20 Minutes of the Commissioners of Supply (Hereafter referred to as M.C.S.), 1729, also Contract for the Bridge, 1729 (In the possession of Col. Walter McCulloch of Ardwall).

It can be deduced that in this "blank" period between 1684 and 1728 there was built Buittle Bridge (of which only the west abutment remains), and perhaps Palnure Bridge (re-built 1739-40) and Moneypool Bridge (collapsed 1769, subsequently re-built).

The enclosures which were made towards the end of this period would almost certainly result in some diversions of roads, at the expense of the landlords concerned, and also the elimination of parallel alternative routes.²¹ Enclosures may be responsible for the tendency of 18th century roads to run in a series of straight lines with comparatively sharp corners, as discussed below.

In 1728 the surviving written minutes begin, and are virtually continuous down to 1890, and indeed to the present day. Extracts from the minutes of the Commissioners of Supply have been published by Col. Maitland,²² and will not be repeated here.

The records begin with a "wave" of bridge building, including some comparatively large bridges, for example, Fleet Bridge in 1729-30, the three bridges of Dee at Tongland (old), Granyford (Old Bridge of Dee) and Mossdale (now demolished) in 1737-40²³ and Cree Bridge (upstream of the present bridge) in 1745-8.²⁴ Occasional financial grants were made for road works, but apparently only in the most exceptional circumstances.²⁵ The Statute Labour system began to show signs of inefficiency, and various proposals were made for its improvement. Local overseers were exhorted to repair certain roads,²⁶ but at this period little progress was made. In 1753 a contract was placed for the repair of all the county bridges (except those under "maintenance" by the builders) for a period of 21 years,²⁷ and other contracts were made later.

Two significant entries appear in 1749 in a list of roads to be repaired. A committee was appointed to decide which road was to be "the only high road" from New Galloway through the Muir of Airy to the Bridge of Dee (Clatteringshaws). A similar inspection was to be made of the road from Balmaclellan to Dumfries.²⁸ These indicate that, in the unenclosed parts of the county, the roads were still in the "Mediæval" state with several alternative tracks.

About 1763 there began what may be termed the first great road-building period. Previous to this no new routes appear to have been opened. It is possible to obtain a picture of the road system immediately before this period from General Roy's survey of 1758 (although the accuracy of this is doubtful,

²¹ Under an Act of Parliament of 1661 alterations in the line of a highway of up to 200 ells were permitted to facilitate enclosures.

²² See footnote 10, page 206.

²³ M.C.S. 6/6/1729, etc.; Maitland, 105-8.

²⁴ M.C.S. 17/5/1745; 21/6/1746 etc.; Maitland 108-9.

²⁵ M.C.S. 2/6/1753 (Conse of Slakes); 26/5/1757 (Craigdarroch).

²⁶ M.C.S. 1/6/1749 (Maitland gives part of this extract on p. 83 but has confused the dates and also omitted the reference to Kelis parish and the Clatteringshaws-New Galloway road), 1/5/1755, 4/6/1759, etc.; Maitland 84-86.

²⁷ M.C.S. 15/6/1753 (Contract with Alexander Lawrie).

²⁸ M.C.S. 1/6/1749.

and it omits some roads which are known to have existed) and from the list of "Great County Roads" made by the Commissioners of Supply in 1759.²⁹ This information forms the basis of the map in Fig. 2.

In 1757 the Commissioners had recommended that they, together with their colleagues from Wigtownshire and Dumfriesshire, should apply to the Government for a road from Carlisle or Sark Bridge to Portpatrick.^{29a} This road—the "Old Military"—became a reality in 1763-4.³⁰ This appears to have been the only road in the Stewartry constructed by military labour.³¹ Details are given in Arnott's paper, and it should be noted that the route passed through Twynholm and not by the older route to the north described as "Old Military Road" on the Ordnance Survey.^{31a} Following the completion of this road various others were constructed by the Commissioners and others, as listed below:³²

Rhonehouse—Tongland—Lower Bridge of Tarff—Twynholm; 1768-72.

Blackcraig—Muirfad—Cuil; 1786-8.

Creetown—Carsluith—Auchenlarie—Newton; 1786-8.

Skyreburn Bridge—Cardoness Castle—Gatehouse; 1790.

The 2-mile "straight" between Castle-Douglas and Greenlaw; c.1794.³³

The western approach to Dumfries (Buccleuch) Bridge; about 1791,

Laurieston—Kenmure; 1775-1785.

"Dub of Hass" (Dalbeattie Port)—Kirkpatrick-Durham; 1772-7.

This list is by no means exhaustive, but indicates a considerable amount of activity.

The Statute Labour system had shown itself more and more inefficient for the repair of the roads, and therefore in 1780 the Commissioners obtained a local Act of Parliament whereby the liability was converted to a money payment, so that repairs could be carried out by contract.

This first road-building period lasted till about 1790 (a road built about 1794 is included above because its character is that of the earlier roads). These roads were set out by various surveyors employed by the Commissioners for specific projects; a Mr Taylor, who held the Government post of Surveyor of Military Roads, and J. Thomson being prominent. The roads of this period have frequently an alignment of "Roman" appearance with long straight sections joined by sharp bends, the latter often occurring at summits. A remarkable instance of this occurs at Hilltop (near Cumstoun) on the Tongland-Twynholm road. Here, what was for those times a substantial cutting has been made in order to maintain a straight line, although only a few yards are saved and the gradient is steepened. This part of the road (surveyed by Thomson)

29 M.C.S. 4-5/6/1759; Maitland 85-86 (The original gives a more detailed description for each parish).

29a M.C.S. 2/8/1757.

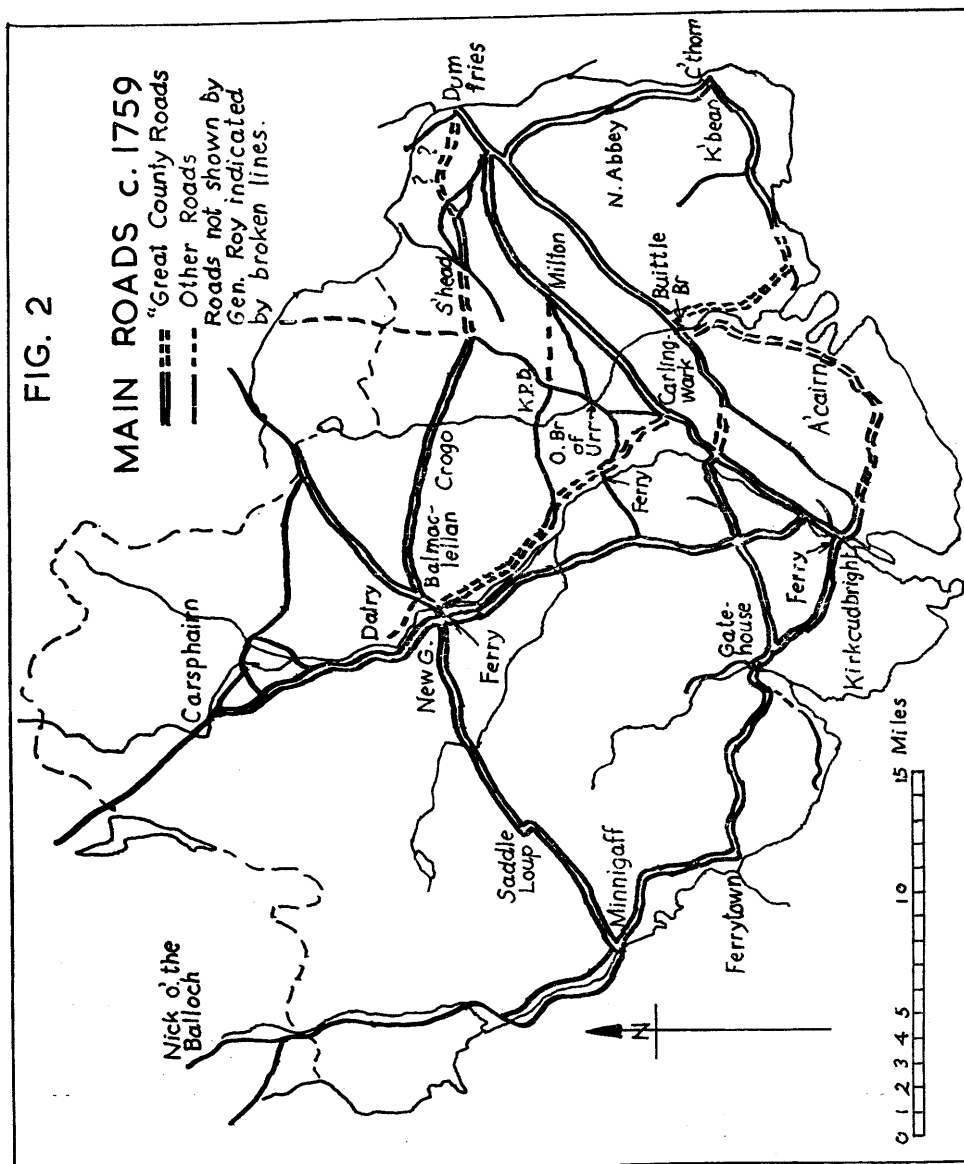
30 M.C. Arnott "The Military Road to Portpatrick, 1763." DGNHAS III, xxviii, 120.

31 Except, perhaps, for the present Dumfries-Stranraer road in the Twynholm area which was, according to local tradition, constructed by French prisoners.

31a It has been confirmed by the Archaeology Division of the Ordnance Survey that the above deductions are correct.

32 M.C.S. under dates mentioned.

33 M.C.S., and also shown as "proposed by Sir Alexander Gordon of Culvennan" on a map in the possession of Messrs Lidderdale and Gillespie, Solicitors, Castle-Douglas.



is generally winding of necessity, but the straight line is reverted to at the top of the hill. In some cases this type of alignment may have originated in earlier times.

These earlier roads may have been surfaced with gravel, but so far few pieces of definite evidence have been found. During the widening of Fleet Bridge in 1965, gravel surfaces were found which could be definitely dated to before the first widening in 1779. The 1729 contract for the bridge called for a causeway, and it may be that this referred to a gravelled rather than a cobbled surface. This may also be the case with other "causeways." In 1763, "slaty gravel" was used on the Military Road.³⁴ Also in 1774 a reference is made to gravelling of the Military Road.³⁵

This first period of road-building may be said to end with the introduction of new ideas in road location by Lord Daar, whose innovations have been described by the Rev. Samuel Smith of Borgue.³⁶ Lord Daar introduced the principle of aligning roads to give an even gradient as determined by chain and level. While the idea of making a road wind in order to ease the gradient was certainly not new, it is only necessary to travel a short distance along a "pre-Daar" road to realise that it was only resorted to when absolutely necessary (as from Lower Bridge of Tarff past Cumstoun) and also strict uniformity of gradient was not necessarily practised. The Rev. Samuel Smith records that these principles were suggested by Sir George Clerk, and adapted by Lord Daar, who trained a surveyor (probably John Gillone, the first County Surveyor) in their application. The first operations were carried out on the Selkirk estates, and probably included the Kirkcudbright-Gelston road from Kirkland to Whinnieliggate, and perhaps the Kirkcudbright-Gatehouse road in the neighbourhood of Kirkchrist. (Both of these sections were already in their present form when the Road Trustees took over.) Shortly before Lord Daar's death a few miles of road were constructed "in a distant part of the county," and this may be the section of the "Old Edinburgh Road" between a point near the Saddle Loup by the Loch o' the Lowes to above Dallash, £150 being paid by the Commissioners of Supply in 1795.³⁷ It is doubtful if much use was made of this road, which was superseded within a few years.

Also about this time more attention appears to have been paid to drainage, and it became more common to build roads on marshy ground. The widths of the roads (between fences) and of the carriageways were also increased.

While an improvement on statute labour, the "conversion money" was now proving insufficient to finance the great increase in road construction which was taking place. Accordingly, it was decided to introduce the turnpike system on the more important roads, and an Act of Parliament authorising this was obtained in 1797 (renewed in 1818 and 1840). The terms of this act have been

³⁴ Arnott, *op. cit.* (30), p. 128.

³⁵ M.C.S. 30/4/1774.

³⁶ Rev. Samuel Smith "General View of the Agriculture of Galloway" 1813, cap. xvii, pp. 310-323.

³⁷ M.C.S. 30/4/1795. There is reason to believe that this road may in part follow the track of a route which went out of use in the early 18th century. It is intended to deal with this in part II.

summarised by Col. Maitland.³⁸ The responsibility for roads was transferred to Road Trustees (who appear to have been largely the same persons as the Commissioners of Supply) and a number of toll roads were authorised.

The road system at this time is clearly shown in Ainslie's map of the Stewartry which was surveyed and published for the Commissioners of Supply in 1796.

The Road Trustees lost no time in beginning their road construction programme, starting with the Dumfries-Castle-Douglas road. To begin with, the roads were laid out strictly according to Lord Daar's principles with regard to alignment. The total width was up to 40 feet with 16 feet of gravel paving. A typical specification is given in Appendix I. A later specification for repairs states that no stone is to be larger than a hen's egg,³⁹ and this is confirmed by the Rev. Samuel Smith,⁴⁰ who also refers to the placing of larger stones at the bottom and the use of a heavy roller, although the latter is not mentioned in any of the specifications. That the "hen's egg" grading was not a new development is shown by old road surfaces, dating back to at least 1779, excavated at Fleet Bridge. This is of considerable interest, as Smith was writing three years before John Louden McAdam was appointed General Surveyor of the Bristol Turnpike Trust (1816).⁴¹ McAdam had earlier been responsible for roads in Ayrshire, and had travelled in southern Scotland examining road construction methods.⁴² It seems very probable that he learnt the principle of using small stones from local practice, although the broken stone which he used, perhaps fortuitously, in England was a more suitable material than gravel.

The Commissioners of Supply continued to be responsible for the construction of certain of the larger bridges and under their auspices, and with the aid of public subscriptions there were erected Tongland Bridge (1804-8),⁴³ Cree Bridge (1812-14),⁴⁴ and Ken Bridge (New Galloway) (c. 1822).⁴⁵

The 1797 act authorised the construction of eight toll roads, as listed in Appendix II. Work was carried out on all these roads over a period of years, and long stretches were constructed on entirely new lines, but in other parts, and especially later on, only structural improvements were carried out without altering the alignment. Subsequent acts added to the number of toll roads, and at the same time various improvements were carried out on the parish roads, which continued to be financed by "conversion money" and "bridge money." As the parishes were entirely relieved of the burden of maintaining the toll roads, some of the less important roads could now be improved, sometimes involving completely new construction.

Under the acts, once toll money had been paid, it could not again be demanded within six miles, and the toll bars were generally at least this distance

³⁸ Maitland pp. 94-5.

³⁹ Minutes of the Road Trustees (Hereafter referred to as M.R.T.) 25/7/1806.

⁴⁰ Smith, *op. cit.* (36), p. 321.

⁴¹ Roy Devereux "John Louden McAdam" (1936), p. 46.

⁴² *Ibid.*, p. 42.

⁴³ M.C.S. 12/3/1804, etc. Maitland pp. 111-2, Smith, *op. cit.* (36), pp. 323-7.

⁴⁴ M.C.S. 13/3/1812, etc. Maitland, pp. 108-9.

⁴⁵ M.C.S. 30/4/1816, etc. Maitland, pp. 103-5, M.R.T. 29/4/1822, 12/11/1822 (There is some doubt about the final date). It is hoped to deal with this in part II.

apart, but such spacing was not always practicable, and where necessary pass tickets were issued. This six mile limit did not apply to tolls charged by other authorities, for instance, tolls were payable at Dumfries bridge to the Burgh and again at Caswaylands or Rotchell to the Stewartry.

In 1803 Thomas Telford made a report to the House of Commons on the Carlisle to Portpatrick road, as part of a more extensive report on communications.⁴⁶ Unfortunately, only a brief summary of his proposals was published in the official report. The only road project mentioned in the summary is a bridge at Kirkcudbright (which did not materialise for over 50 years, unless Tongland Bridge is meant).

There is a reference in the Road Trustee's minutes to a timber bridge at Creetown proposed by Telford, but whether over the Moneypool Burn or the Cree itself is not known. Telford made a further report in 1811, and this may have influenced the Government to give financial support in the construction of Cree Bridge (1812-14) and later Threave Bridge (1824), the latter superseding the narrow and now awkwardly aligned Granyford Bridge which now entered semi-retirement as the "Old Bridge of Dee." Telford's presence in the Stewartry in 1802 would no doubt lead to his appointment as engineer for Tongland Bridge (completed 1808), but he was not the designer of the two later bridges.

Further technical development in road construction took place during this period. In 1820-21 the Postmaster General and certain innkeepers complained of the bad state of the Mail Coach Road⁴⁷ (Dumfries-Newton Stewart). This was apparently due to the unsuitability of rounded gravel as a road-making material.^{47a} The substitution of broken stone for gravel seems to have resulted in an immediate and lasting improvement. At the same time, maintenance was facilitated by the abolition of the contract system for laying gravel, and 1825 saw the "birth" of that well-known figure, the Stewartry roadman. A salaried surveyor was appointed to supervise this work, being styled the "Surveyor of Toll Roads"⁴⁸ (later also of parish roads). The "County Surveyor," whose office was introduced in 1796, remained responsible only for setting-out and levelling new roads, for which he was paid fees for the actual work done. The new Surveyor of Toll Roads, Thomas Blackley, was recommended by the surveyor on the Glasgow-Carlisle road, and continued in office until the 1864 act (see below) came into operation. Other officials appointed by the Trustees included a Clerk and a Cashier. The Superintendent, appointed in earlier years only, was at first concerned with organising maintenance work until this was taken over by the Surveyor of Toll Roads.

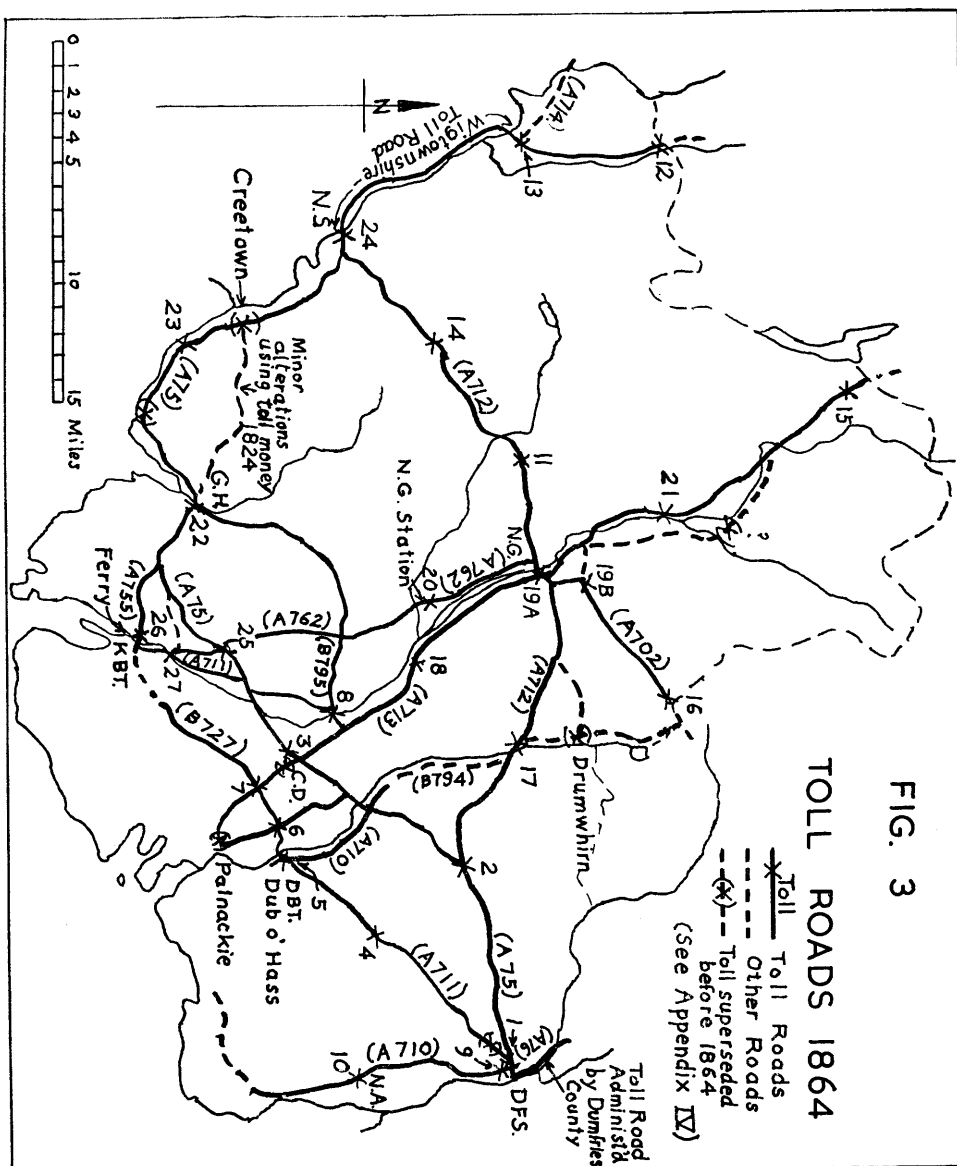
While the toll system undoubtedly facilitated the great improvements which were carried out, it led to many administrative difficulties, particularly in the prevention of evasions, and in the allocation of the funds between the various

⁴⁶ "Survey and Reports of the Coasts and Central Highlands of Scotland in Autumn of 1802," Thomas Telford, 1803, p. 18 (Printed in Vol. 1 of "Reports of Commissioners for Highland Roads and Bridges.").

⁴⁷ M.R.T. 7/12/1820; 29/12/1820; 7/3/1821.

^{47a} Gravel has proved suitable in many cases for roads carrying traffic with pneumatic tyres, but there is a lack of binding action between the stones.

⁴⁸ M.R.T. 30/4/1827.



roads. When a road was to be re-aligned, it was desirable that the first toll bars be set up on a part that was to be unaltered (as at Gatehouse). The impossibility of doing this near Dumfries led to difficulties. The original toll on the Castle-Douglas road was set up on the Old Military Road at Cargenbridge. When the new road was completed, a toll bar was erected at Caswaylands, and the Cargenbridge funds were allocated to the Dalbeattie road. It was found that travellers on the Old Military Road, although in no way evading the tolls, were now contributing to the funds of the "wrong" road, and to remedy this part of the road was closed east of Lochruttongate in 1803. This was soon found to be illegal and the road re-opened five months later.⁴⁹

The prevention of evasions at Caswaylands also resulted in the erection in 1798 of a toll-bar at Palmerston on the old New Galloway road (via Terregles and Shawhead) but this also was found to be illegal and removed in 1802.⁵⁰

In later years a further difficulty arose, in that the "Mail Coach Road" (Dumfries-Newton Stewart) had a surplus of funds, but some of the other roads had serious deficits. It was found that loans from one "trust" to another were illegal, including those which resulted from the deposit of all the funds in a common bank account, with an overall surplus.

Some of these difficulties arose from the division of the system into separate "trusts" for each road, and the small size of the Stewartry trusts was criticised in the report of the Royal Commission on Public Roads in Scotland in 1859.⁵¹

In spite of all these difficulties, the toll system continued until it was finally rendered obsolete by the construction of railways, and abolished by the local act of 1864. Whatever may be their merits for large bridges, tolls were unsuited to a complex road system in which evasion was simple, and anomalies rife. Nevertheless, much was achieved during the turnpike period, and by 1864 the road system was very nearly in its present form. The last important road to be completed, Bargrennan to Barrhill—completing the present Newton Stewart to Girvan road—in 1844 was, curiously, not a toll road, but was constructed with money advanced by the local lairds, and maintained until 1848 as a parish road. From 1848 till 1886 it appears to have been maintained by Ayrshire.⁵² According to the 1859 report,⁵³ the total mileage of roads in the Stewartry was 249½ Turnpike, 511 "Statute Labour," a total of 760½ miles.⁵⁴

While the opening of the railways⁵⁵ reduced the importance of the roads, it also resulted in the construction of a number of new roads and improvement of old ones in order to gain access to the often inconveniently sited stations. Thus in 1858-62 the Gatehouse to Dromore road (now B796) was recon-

⁴⁹ M.R.T. 24/5/1803; 11/10/1803.

⁵⁰ M.R.T. 20/11/1798; 12/10/1802.

⁵¹ "Report of Commissioners on Public Roads in Scotland," 1859.

⁵² M.R.T. 8/10/1839; 12/10/1841; 30/4/1844; 12/10/1886.

⁵³ See reference 51.

⁵⁴ In 1956, the mileages were:

Trunk, Class I. and Class II. (corresponding very roughly to the toll roads), 292 miles.

Class III. and unclassified (corresponding very roughly to the parish roads), 500 miles, Total 792 miles

⁵⁵ Dumfries to Castle-Douglas, 1859; Castle-Douglas to Portpatrick, 1861; Castle-Douglas to Kirkcudbright, 1864.

structed,⁵⁶ and in 1862 Rusco Bridge was built,⁵⁷ thus improving access to Gatehouse Station. The New Galloway to Mossdale road (now part of A762) was also reconstructed in 1862.⁵⁸ The most outstanding work following on the advent of the railways was, however, the erection, now made both more necessary and more easily executed, of the first Kirkcudbright Bridge in 1868.⁵⁹ The method of financing this bridge is interesting and is detailed in Appendix III. Diversions were, of course, also made at the various railway bridges.

While one or two other improvements were made and bridges re-built, there was a general reduction in road works following the introduction of the railways, and the revival of road works caused by the advent of motor vehicles falls outside our period. About 1880, however, the Trustees concerned themselves with the problem of "locomotives,"⁶⁰ i.e., steam traction engines, and a set of rules was drawn up in 1889 for their use, to minimise damage to the roads.⁶¹

The Road Trustees did not adopt the Roads and Bridges (Scotland) Act of 1878, considering that the local 1864 act was sufficient,⁶² but the system was finally abolished by the Local Government (Scotland) Act of 1889. On May 15th, 1890, the roads became the responsibility of the newly-formed County Council.

Throughout these various changes in administration there can be seen the gradual replacement of the feudal by the democratic system, together with the decay of the ancient belief that the construction of roads, and especially bridges, was an act of charity. Prior to the various 17th century Acts, road and bridge construction and maintenance, when carried out at all would generally be a feudal (or burghal) responsibility, as it remains today in respect of many private roads. The Commissioners of Supply and, up till 1864, the Road Trustees, were in effect the feudal proprietors and burghal representatives, acting corporately and armed with statutory powers. Besides earlier examples the "charitable" nature of new works can be seen in the fact that, right up to 1890, these (as distinct from maintenance and re-building) were partially financed by public subscription—even to the extent of holding a bazaar (see Appendix III). Under the 1864 act there were added to the Trustees elected members representing tenants.

Before concluding this part of the paper, reference will be made to certain technical developments. The principles of road construction and alignment have already been referred to, but after the construction of the first "Daar" type roads it became obvious that a rigorous application of Lord Daar's methods resulted in some cases in excessively sharp corners. In 1813 the Trustees therefore ruled that a minimum radius of 150 ft. should be provided in all future work.⁶³ Curves of very large radius were few, two of the earliest examples being at the eastern approach to Gatehouse (1819-23) constructed by Murray of Broughton. Other cases before the railway era are rare, and it may be that the

56 M.R.T. 30/4/1858; 12/10/1858; 30/4/1862.

57 M.R.T. 34/10/1862.

58 M.R.T. 30/4/1862; 14/10/1862.

59 M.R.T. 10/10/1865; 9/10/1866; 13/10/1868.

60 M.R.T. 16/2/1880.

61 M.R.T. 12/10/1886.

62 M.R.T. 30/4/1879.

63 M.R.T. 5/1/1813.

methods of setting-out were not well known. Later examples are the foot of Burnside Loaning, Kirkcudbright (before 1862) and the western approach to Kirkcudbright Bridge (1868).

In the case of bridges, the main development over the whole period has been a gradual increase in the span-rise ratio of the almost universal masonry arch. The oldest bridges have almost semi-circular arches, as at Old Bridge of Urr; by the early 18th century the ratio had been increased from 2:1 to approximately 3:1 at Fleet and Granyford Bridges. The locally-designed bridges of the 19th century have generally ratios varying from 3.5:1 to 5:1 or more. Those bridges which were designed by consulting engineers are more variable, thus we have the flat arches of Cree Bridge, the elliptical arch at Tarff, and the high arches at Tongland, Threave and Ken bridges. Incidentally, a little known fact about Tongland Bridge is revealed by the Rev. Samuel Smith, that the architectural treatment of the exterior was carried out by "Mr Nasmyth, an eminent painter at Edinburgh."⁶⁴

Although the principles governing the design of skew arches were published as early as 1838,⁶⁵ and were liberally applied by railway engineers, there is only one true skew road bridge (not over a railway) in the Stewartry-Garple Bridge, completed in 1890. A tapered arch was used in the widening of Culshawn Bridge (Springholm) in 1833.⁶⁶

The use of granite to form beams, although practised on Dartmoor in late Mediæval times,⁶⁷ is confined in the Stewartry to the widening of Talnotry Bridge about 1834.⁶⁸ While timber bridges may have been comparatively common at one time—two early examples being Fleet and Corsock Bridges—they have now entirely disappeared from the county roads, and none appear to have been built since at least 1728. Cast iron bridges were erected at Greddock in 1861⁶⁹ and Rusco in 1862,⁷⁰ and Kirkcudbright Bridge was of cast and wrought iron. No steel or concrete bridges were constructed during the period under review.

With the construction of bridges over the years there has been a complete disappearance of ferries, and at only two points now is the road system interrupted by water—at Stepend Ford, beside the Mote of Urr—no doubt a very ancient ford—and the Boat of Rhone. Submerged, or partially submerged roads such as the predecessor of A762 along Loch Ken and the old shore road at Kippford have also disappeared.⁷¹

In Part II. it is intended to deal in greater detail with the histories of the

⁶⁴ Smith *op. cit.* (36), pp. 323-4. Sir Alexander Gibb in "The Story of Telford" (1935), p. 263, did not consider the result wholly successful, but was apparently unaware of Nasmyth's part in it.

⁶⁵ A paper on skew arches was published in the "Transactions of the Royal Society of Arts" in 1838 and reprinted in the "Civil Engineers' and Architects' Journal" in 1840. See the "Encyclopaedia Britannica," 1875 edition, article on "Arches."

⁶⁶ Road Trustees' Contract Book, vol. II., p. 173.

⁶⁷ Henderson "Old Cornish Bridges," quoted by Jervoise in "Old Devon Bridges," foreword p. 5.

⁶⁸ M.R.T. 8/10/1833.

⁶⁹ M.R.T. 8/10/1861.

⁷⁰ M.R.T. 14/10/1862.

⁷¹ Part of this road from Kippford to Rough Firth is shown on the 1909 Ordnance Survey, and is shown by Ainslie (1796) extending to the site of Rockcliffe. What was probably an old road surface at beach level was found during recent excavations in the road near the Anchor Hotel. Both Ainslie and the 1909 Ordnance Survey also indicate the track to Rough Island.

more important routes. In conclusion, it may be said that, while this research has, it is hoped, revealed much, it has probably posed almost as many questions as have been answered, and there is a wide field for further investigation.

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The figures are based on Ordnance Survey maps with the permission of the Director General of the Ordnance Survey.

APPENDIX I

Typical Specification for Road Construction, Extract from a contract between the Road Trustees and Robert McCay for the construction of part of the Dumfries and Castle-Douglas road, 16th April, 1798 (Contract Book, vol. I., pp. 6-11).

"——the said Robert McCay has become Bound —— to make that part of the aforesaid Line of Road —— and of the dimensions and in the manner herein after expressed. That is to say First The said Road shall be Thirty five feet wide from Cut to Cut Second It shall be sufficiently gravelled Sixteen feet broad in the middle Twelve Inches thick in the Center (sic), and sloping gradually to Eight Inches thick on the sides, Excepting in such Wet and boggy (sic) places as shall be pointed out —— when the said Road shall be gravelled Eighteen Inches thick in the center, sloping to Twelve Inches at the sides —— Third Water Tables shall be made on each side of the Road Three Feet wide, Eighteen Inches deep in dry ground, and Two feet deep in wet ground, perpendicular on the side next the fields, and having all the slope towards the Road Fourth The remaining space of Six and one half feet on each side of the Gravel shall be made up for a Summer Road with the hardest stuff taken out of the Water Tables to slope gradually from the side of the gravel to the edge of the Water Tables. Fifth The Level or Inclination of the line of Road as laid out by the County Engineer shall be strictly adhered to, and where it shall pass over Rock, the Rock shall be cut down so as to allow the Depth of Gravel above mentioned to ly (sic) above the Rock, without raising the level of the Road, Sixth, where the Road shall go along the side of steep banks it shall have a Water Table only on the upper side of the Road, and in such places the Road shall be made Thirty feet wide from the bottom of the water Table to the outer lip sloping inwards from the outer lip to the edge of the water Table at the rate of One in Twelve, and in such places also the Bank in the upper side shall be cut to a proper slope so as not to be in danger of falling down on the Road and the Earth taken out for forming the Road shall be thrown over and allowed to form its own Angle without any building or artificial means of support —— " etc.

APPENDIX II

List of Toll Roads authorised by the 1797 Act (See Maitland, pp. 94-5):

1. Dumfries—Castle Douglas—Gatehouse—Newton Stewart (at that time known as Newton Douglas).
2. Dumfries—Ken Bridge—Newton Stewart.
3. Dumfries—Dalbeattie—Kirkcudbright—Gatehouse.
4. Kirkcudbright—Dalmellington (as far as the Ayrshire boundary).
5. "High Bridge of Cree" (Bargrennan) to the Ayrshire boundary near Suie.
6. Ken Bridge—Minnyhive (Moniaive).
7. Dub of Hass (Dalbeattie Port) up the Urr valley to the Dumfriesshire boundary.
8. Castle Douglas to Garden Creek (Palnackie).

APPENDIX IV

NOTES ON THE FIGURES

Fig. 1—17th Century Roads

This plan shows more roads than either of the others but this is because all available information has been incorporated, whereas the other two show only the more important roads.

The plan is based on the following principal sources, together with other miscellaneous information:—

Bridges shown on Pont's maps (c. 1595).

Post route 1642 (see footnote 8, page 206).

Symson's "Large Description of Galloway" and other papers appended.

Gaelic derivations (see page 205).

The following old routes of which there are substantial remains and which probably date either to this period or earlier:—

The "Nine Stiles Walk," Kirkcudbright.

The old route from Fleet Bridge to Anwoth Kirk by Trusty's Hill.

The Saddle Loup.

The "Old Pack Road" from Glenlee to Carsphairn and Ayrshire.

The Kirkcudbright—Jordieland road (now starting at the top of Burnside Loaning). When closed in 1801 this road extended towards Ronehouse. There is a slight error in the figure in that this route is shown joining the Buittle road.

Certain routes known or thought to have been used in late mediæval times are also shown. Some ancient tracks, such as that running from near Balcary northwards by Buittle Kirk, Blackerne, Clarebrand etc. have not been shown as there is no evidence so far for their existence as through routes in the 17th century.

The route shown running from Crossmichael Ferry towards the west is extremely conjectural.

Fig. 2—Main Roads c. 1759

Certain other roads may have been indicated by General Roy but are indistinguishable from boundaries of enclosures.

The "Great County Roads" were those apparently regarded as most important and ordered by the Commissioners of Supply to receive priority in maintenance (Minutes, 4/6/1759; 5/6/1759).

Fig. 3—Toll Roads 1864 (Showing their final development)

The Tolls together with their rents in 1864 were as follows (the numbers correspond to those on the plan):—

1. Caswaylands	...	...	...	£301
2. Crocketford	...	...	...	101
3. Buchan	...	...	...	116
4. Breckonside	...	...	...	27
5. Netherplace	...	...	...	62
6. Hardhills	...	...	...	26
7. Burntstick	...	...	...	74
8. Glenlochar	...	...	...	60
9. Rotchell	...	...	...	172
10. Gateside	...	...	...	40
11. Clatteringshaws	...	...	...	10
12. Suie	...	...	...	7
13. Drumlawhanty	...	...	...	8
14. Talnotry	...	...	...	6
15. Brockloch	...	...	...	49
16. Craigmuie	...	...	...	10
17. Corsock	...	...	...	35
18. Parton	...	...	...	68
19. Kenmure Bridge and Bogue	...	...	...	181 (Let together)
20. Bennan	...	...	...	56
21. Strangassel	...	...	...	15
22. Gatehouse	...	...	...	96
23. Carsluith	...	...	...	52
24. Creebridge	...	...	...	121
25. Meiklewood	...	...	...	59
26. Kirkchrist	...	...	...	81
27. Tongland Bridge	...	...	...	84

The sums shown are not directly proportional to the traffic, since in the first place they are estimates made by the tacksmen at the annual roup, and secondly must be adjusted for rent of toll houses and the remuneration of the tollkeepers.

NOTES ON THE STRUCTURES IN THE ANNANLEA SANDSTONES OF
CORSEHILL QUARRY

By ALLAN GIBBS

Corsehill Quarry (Nat. Grid. Ref. NY2070) is situated about two miles north of Annan on the B722. The stone was extensively quarried for building and occurs in thick beds of fine, well consolidated freestone which are free from current bedding and jointing. The two large quarries on the north-east of the old Annan to Kirtlebridge branch line, as well as the cutting itself expose, underlying the good stone, beds of marls and friable sandstone alternating with the well consolidated sandstone.

Fine ripple marked slabs some with vestiges of mudcracks occur extensively in the railway cutting. Mudcracks and rain or spray pitting also occur, although less frequently. The shallow and intermittent nature of the sheets of water which locally inundated the Permian desert in Triassic times is convincingly demonstrated by the ripple marks, mudcracks, spray pitting, and the thinness of the beds which average about nine to twelve inches thick before changing abruptly to a finer or coarser sediment.

Curious structures appear on the undersides of several of the beds both in the railway cutting and the two quarries north of the cutting. The structures are disoriented, bulbous and crescent-shaped projections on the underside of the sandstone extending into the bed below. These are, in fact, load casts which, despite their apparent contemporaneity with deposition, seem to have been formed under water before consolidation when vibrations caused the plastic marl to liquify and allow the sand above to flow into the space. Again the load casts demonstrate the prevalent flooded geosynclinal conditions.

These findings relate quite well with the general picture we have of the Permo/Trias in Britain. Stamp in his "Introduction to Stratigraphy," writes "Triassic areas of deposition may be described as deserts with sand dunes, affected by periodic rushes of water in otherwise dry valleys." This is echoed in most accounts of the period. See for example Wells' "Historical Geology," and Craig "The Geology of Scotland," chap 10. There is a strong indication that the aeolian sands were deposited on or near the coast line, which may account for many of the characteristic structures of Corsehill. See also Delair in these Transactions, Vol. XLIII., "Fossil Footprints from Dumfriesshire." For information concerning the occurrence and formation of loan casts, etc., see Hatch and Rastall "Petrology of the Sedimentary Rocks."

A BEAKER FROM STROANGASSEL, KIRKCUDBRIGHTSHIRE

By M. L. ANSELL

In 1963, Mr G. McAdam of Dalry, observed about half of a beaker appearing in the eroded west bank of the Water of Ken, above Stroangassel Farm, at approximately Nat. Grid Ref. NX605873. It later came into the possession of the writer of this note, who has presented it to Dumfries Burgh Museum. A search was made by the writer at the find spot in 1967 for further prehistoric remains. What appeared to be a pit showed in the bank, but its relationship, if any, to the beaker find would require an excavation. Also found, however, nearby, were a hearth and over 100 flint and chert flakes, blades and a few cores. These seem to be earlier, possibly mesolithic in date, and it is hoped to discuss them in a future number of these Transactions. A neighbouring find, broadly contemporary with the beaker, was a stone axe hammer from the farm of Glenhaul just across the river from Stroangassel—see article by Mrs F. Roe in this volume.

The beaker (fig. 1) is 41/16 in. high, with rim and base diameters of 31/16 in. and 21/8 in. respectively. Made of a dark buff ware, it is decorated externally by three bands of short diagonal incised marks running parallel to the rim. Below the upper band and above and below the lower two are incised grooves, and between the panels and below the lowest are further lightly incised lines parallel to the bands. The interior is undecorated.

A LATE MEDIAEVAL MORTAR IN DUMFRIES MUSEUM

By A. E. TRUCKELL, F.M.A.

In April, 1965, Messrs Gribben, Scrap Merchants, Shakespeare Street, Dumfries, who over the years have saved many important items for the Museum, notified the writer of a large late-mediaeval Mortar which had come in with a mixed load of scrap metal collected locally; the Mortar was accordingly purchased at its metal value.

The Mortar (fig. 2) originally stood eight inches high, the relatively modern iron base ring which has been added, increases the height by almost an inch. Width at the out turned base is eight inches, and at the lip just over nine and a half inches. The metal has a good green patina except in the lower half of the interior which has a powdery very pale green surface, presumably due to chemicals in whatever was processed in the mortar. The two handles bear ornament of two longitudinal lines. One face bears "W P A" in bold raised lettering in characters which in style would fit the 16th century. On the other side is a founder's mark in low relief, evidently scratched on the inside of the mould, an "M" with a horizontal line through it.

At one point near the base the outer skin has flaked off, revealing a casting fault of spongy metal. The bottom has been burst at some time and a large irregular patch now also patinated, applied externally. This patch is now covered by the cross bar of the iron base support. The mortar is probably a Continental import and could well be from the Low Countries.

A RECENTLY DISCOVERED SHOT-HOLE BLOCK AT BONSHAW TOWER

By A. M. T. MAXWELL IRVING

On the 18th June, 1966, the writer quite by chance, whilst clearing scrub from around the old water mill at the bottom of the cliff below Bonshaw Tower in Kirtledale, unearthed a large sandstone block with a dumb-bell shaped musket hole cleanly cut along its length, slightly off centre. (Fig. 3). Its identity was suspected, but we were very fortunate in having Mr McIvor, Inspector of Ancient Monuments for the Ministry of Works, on the spot only two days later to identify it positively and date it to around 1580.

The stone itself has a flat face, 2 ft. by 16 in., is 5 in. thick, and weighs 105 lbs. One

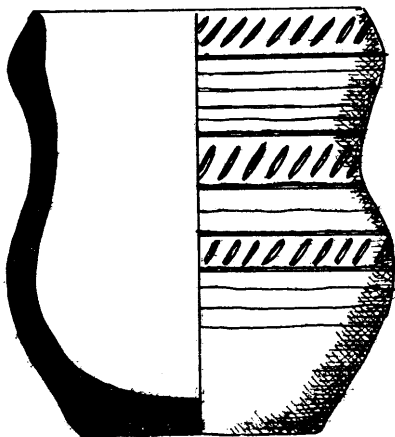


Fig. 1—Beaker from Stroangassel, Kirkcudbrightshire (x4).

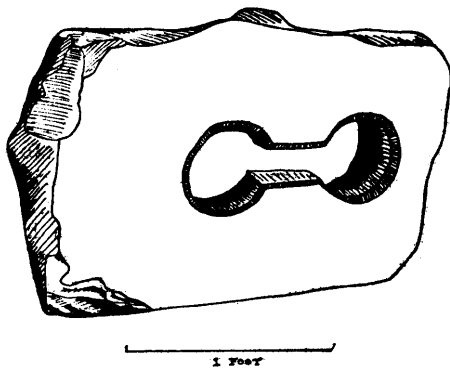


Fig. 3—A shot-hole block from Bonshaw Tower, Dumfriesshire.

long edge is cut square, but the other three and the back face are rough. The dumb-bell shaped hole is carefully and accurately cut into the face of the stone, with the usual chamfer around the entire edge; on the rear side, however, the shot-hole is opened out with rougher chisel work. Clearly the front of the stone was intended to fit flush with the front face of an outer wall, adjacent to an opening or doorway.

There are several possible explanations of how the stone arrived at its resting place. For one thing, the mill itself, built in 1743 by John Irving of Bonshaw, incorporates rubble from an earlier house in its construction, including two stones, one inscribed "W.I." and the other "1696," from a house that presumably superseded the old tower as the principal dwelling house. The Mill, however, is complete in its stonework, so it is more likely that the stone went over the cliff when the whole tower site except the tower itself and some walling and other structures (referred to by McGibbon and Ross as ruinous c. 1890) along the cliff edge were cleared for the new mansion built in 1770. Undoubtedly the shot-hole was incorporated in the outer defences, about which we know nothing except that they took the brunt of the four Maxwell sieges of 1585, and "The gate of the fortalice of Bondschaw" referred to in a Charter of 1582 (D. and G. Trans. 1958-59)—"The Bonshaw Titles," by R. C. Reid). This shot-hole, therefore, with its more elaborate design than the earlier ones in the tower must have been cut and inserted into the outer defensive walls either after the Earl of Sussex's raid in 1570 or after the Maxwell sieges already referred to, during repairs.

One is inevitably drawn to the belief that it was the **outer** defences at Bonshaw that were its prime strength in the 16th century. Otherwise, why would such a shrewd, on-the-spot judge as Lord Scrope, the English Warden of the Western Marches, describe it at the time of the 1585 sieges as "One of the strongest howses of that Border." For, however, strong the tower itself was—and it still is possibly the finest complete tower of its kind in existence, hence the Ministry of Works special interest in it—the complete fortalice, with all its defences, both natural and artificial, withstood a series of sieges in which the tower itself was apparently unscathed. The contemporary accounts of these sieges are very confusing, even conflicting.

The tower at Bonshaw is not structurally any stronger than many of its Border contemporaries, and certainly not worthy of Scrope's description on its own merits. For example, at nearby Stapleton Tower in 1626, it took a Government commissioned force three attempts before they succeeded in evicting two Irvings and a mere handful of retainers, who had obtained illegal possession of the tower; and the final force numbered no less than sixteen noblemen with all their forces. Not only were the outer defences at Bonshaw outstandingly strong, but they were far superior to anything the Irving's close

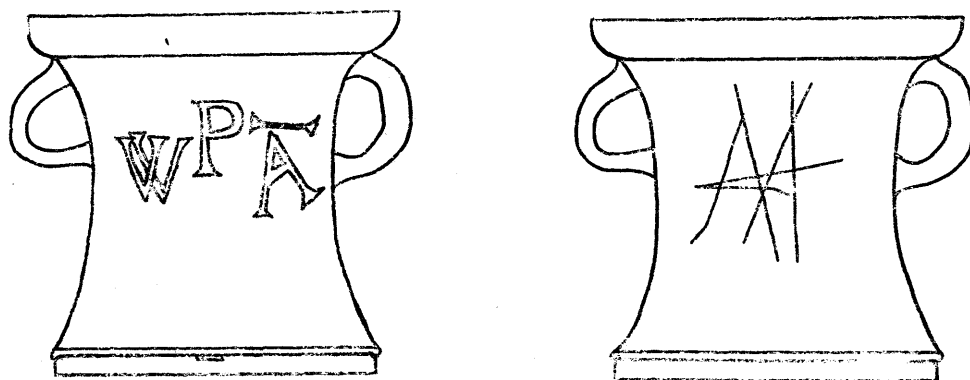


Fig. 2—Mediæval Mortar in Dumfries Museum, (approx. x½).

ally the Johnson chief possessed, as it was to Bonshaw that Sir John Johnson of that ilk, Warden and Justice of the West Marches, fled for safety in April, 1585, after being driven out of his principal stronghold, Lochwood Tower, by the Maxwells.

LANGHOLM MUSEUM

By ALEX. M'CRACKEN

In the early summer of 1966, Mr Tyman, Chairman of the Langholm Library Committee, notified Mr Truckell that the small museum in Langholm Town Hall was to be broken up, and asked if Dumfries Museum would be interested in the exhibits. The writer, being a native of the town, volunteered to sort through the material, and pack it ready for removal.

The majority of the items had been presented by a Mr Bell, a native of Langholm, who had emigrated to New Zealand, and who had sent some ethnographic material to start the museum in the eighties of last century. This collection contained Maori adzes, spears, fish-hooks, a walking stick "carved by a Maori chief" and a few African items.

To these objects were added local curios and antiquities. Some fine Samian pottery from Carlisle, barbarous coins found near Hadrian's Wall, a fine burial urn from Canonbie were prominently displayed. Among more recent articles were a man-trap from Eskdalemuir, a small pocket leister in a leather case (which would screw quite nicely into the bottom of a walking stick, if a tempting salmon were spotted), and a more orthodox, full-sized leister.

It was decided to leave in Langholm the "Waterloo Drum." Langholm Town Band claims to be the oldest established band in the country, and was founded in 1814. One of their first public appearances was when they played in front of the Scots Greys as they marched through the town on their return from Waterloo. This drum is the only surviving instrument from that occasion.

Along with these objects were a few examples of Victorian curios, of which most museums have a stock. There was a section of the first Atlantic cable, a glass globe that had been plunged to an immense depth in the Pacific, without any water entering, an assortment of coffin handles, some bayonets from the Franco-Prussian war, and some sabres and swords, "found locally," but very rusty and lacking their hilts.

But perhaps the most interesting discovery made was a pair of manuscript notebooks. One is the Minute-book of the Eskdale Farmers' Club, founded in 1809, and the other is the Minute-book, kept by the Deputy-Lieutenants of Dumfriesshire for the district of Eskdale, when the militia was being raised in the face of a threatened invasion by Napoleon. Much of the material from this latter book will be summarised in an article in a future volume of these transactions.

OBITUARY

PROFESSOR W. A. F. BALFOUR-BROWNE

Professor Balfour-Browne, who died suddenly in Edinburgh on 28th September, 1967, in his 93rd year, was not only one of the most distinguished entomologists of his generation, but played an important part as Secretary and as President in our Society's affairs at a difficult period in its history.

Born in London in 1874, Professor Balfour-Browne studied at Magdalene College, Oxford, gaining second-class Honours in Botany in 1896. He was called to the Bar in 1898, but returned to Oxford to study zoology the following year, and two years later went to the Marine Biological Association's Laboratory at Plymouth as assistant naturalist. Director of the Sutton Broad Laboratory in Norfolk for a period, he was subsequently naturalist to Ulster Fishery and Biology Department in Northern Ireland:

Assistant in Biology at Queen's University, Belfast, lecturer in entomology in the Department of Zoology at Cambridge University, Professor of Entomology at the Imperial College of Science and Technology from 1925 to 1930, and President of the Royal Microscopical Society from 1934 to 1935.

He was the author of a number of works dealing with insects, among them a "Text-book of Practical Entomology" and "Concerning the Habits of Insects," plus many scientific papers, mainly on entomology—and of course his "The Aquatic Coleoptera of the Solway Up to Date" in our own Transactions, volume XXIII.

Retiring to his ancestral area, he joined our Society in 1941, and took over the Secretaryship from Mr—later Dr—R. C. Reid in March 1943, in the middle of the difficult war years, holding that post until his election as President in October, 1949. His energy and organising skill stood him in good stead in this position: the Society's Rules were thoroughly reorganised and its affairs placed on a businesslike footing. Those of us who were members of the Society's Council in those years can well remember that energy, and the wealth of experience which lay behind all his suggestions. His year of office as President was a very active one for the Society, as Volume XXVIII shows.

Many of our members will remember the hospitality shown by the Professor and Miss Burnand when the Society paid a visit to Brocklehurst on a delightful early-summer afternoon a few years ago.

Professor Balfour-Browne represented our Society for many years at the annual meetings of the British Association, and by his exceptional span of life formed a link with the age of Professor Scott-Elliot and Sir Hugh Gladstone, two other great naturalists, like him with strong local connections, and followed their tradition of work for our Society.

REVIEWS

Sylloge of Coins of the British Isles—National Museum of Antiquities of Scotland—Part 1., Anglo-Saxon Coins, Robert B. K. Stevenson ; Oxford University Press, £4.

So that scholars and students of economics and history, as well as numismatists, may be able to study coins at home as it were, without the inconvenience and expense of travel, the British Academy and British Museum are currently producing a series of excellent volumes on the coins of the British Isles held in the principal museum collections of Britain and Scandinavia. Each volume contains an introduction which often includes the results of new and important studies, followed by a catalogue of coins, all fully described and illustrated.

In some ways Mr R. B. K. Stevenson's Sylloge of the Anglo-Saxon coins in his care is one of the most valuable for the non-numismatist, for unlike the other sylloges, his deals also with associated "foreign" coins. Thus, in addition to 691 Anglo-Saxon coins proper, he also discusses 24 Continental, 3 Hiberno-Norse and 40 Kufic coins found in Scotland. This inclusion of the full composition of hoards greatly increases the interest of the work.

There was, of course, no native coinage in Scotland prior to c.1136 when David I. minted silver pennies. Apart from Scotland south of the Forth and Clyde where there is some slight evidence that Anglo-Saxon coins may have been used as currency in the 9th century, the evidence from the west and north of the country at this time is, in the words of Mr R. H. M. Dolley, of "coinless peoples under attack by coinless invaders (the Norse)." The 10th and 11th century coin hoards, all from the western and northern seaboard must also be attributable to the Norse, but now these are seen as a people familiar with coinage, but who in Scotland in contrast to their relatives in York and Dub'in seem to have held coins as bullion or as raw material for the manufacture of jewellery. The hoard from Talnotrie in Kirkcudbrightshire (these Transactions XXVI., 104), though perhaps not Norse, may be of this nature.

This Sylloge shows well the value of a Museum collection as contrasted with a private one for of Mr Stevenson's 758 coins the provenance of no less than 660 is known or deduced with reasonable confidence, whereas of the 1235 Anglo-Saxon Coins in the Hunterian and Coats collections the original find spots of only 75 at most are known. The photographic illustrations are first class although many of the coins are badly worn or fragmentary.

Mr Stevenson hints at several of the many intriguing vistas which this type of publication opens to the student, for example the distribution of Arabic coins in N.W. Europe. To this reviewer nothing illustrates more vividly the international and indeed inter-continental ramifications of Norse power than the finding in Orkney and elsewhere in western Scotland, of the attractive silver Arabic dirhams, several struck in Samarkand no less, some 3000 miles away to the East. Another curious point which is mentioned is the apparent prejudice against coins with the human face. A valuable side line is the list of Anglo-Saxon personal names (the Hunterian Sylloge lists about 500 moneyers) with contemporary spelling and corresponding orthography.

All students of the history and economics of early Scotland should possess or be aware of this publication, while they and every dark age archæologist should bear in mind the assistance they may obtain from numismatics, as exemplified by these volumes, of which that under review is an excellent representative.

W. F. C.

Illustrated Guide to Newgrange, Claire O'Kelly, 1967 ; John English and Co., Ltd., Wexford, 12s 6d. 103 pp. ; plans, map, and 40 photographs.

As Mr Cormack remarks in another of these Reviews, our South-West is intimately connected, so far as prehistoric cultures go, with Ireland. We have over 220 large circular cairns in our three counties ; most of these are probably Bronze Age but some, like the White Cairn of Bargrennan, are definitely Neolithic : and it is quite likely that if all our cairns were thoroughly excavated some at least would yield carved stones showing links with Ireland.

This is therefore a good reason for here reviewing Mrs O'Kelly's excellent and finely illustrated little Guide to Newgrange, in a handy pocket size : for the spectacular carvings on the slabs at that great Cairn—ranging as they do from patterns close to our familiar Galloway cup-and-ring-marks to chevrons, ripples, and " ferns "—may well have humbler relations on our side of the North Channel. This year's spectacular finds of carvings at Knowth will attract all the more archæological tourists to Ireland, and this little Guide, with its exceptionally fine plates, will make a visit to these great cairns very much more rewarding.

A. E. T.

North Munster Studies—Essays in Commemoration of Mon. Michael Moloney, edited by Etienne Rynne ; Thomond Archæological Society, £3 3s.

At first thought Dumfries and Galloway may seem a far cry from North Munster, but quite apart from the fact that this balanced and well prepared publication has been capably edited by our Society member Mr Rynne, there are several reasons why it is appropriate that this work be reviewed in our pages.

It is characteristic of local societies that they should from time to time be largely sustained by outstanding personalities—our own Sir Herbert Maxwell and Dr R. C. Reid spring to mind. Monsignor Moloney for many years fulfilled a like rôle in Limerick and North Munster. His thorough clerical training enabled him to perceive the many outstanding questions in early Christian and mediæval Ireland, and from the early 1920's until his death in 1964, he studied and published profusely in this period, cajoled others likewise,

stimulated research in Irish history and archæology and recorded ancient monuments and arranged for their preservation—all this in addition to a high devotion to his calling.

The work under review is primarily an excellent example of how the desire for a "Festschrift" can be utilised as an opportunity to publish as a combined whole the latest thoughts and studies on a region. Over 500 pages contain 34 separate papers on archæological, historical and literary subjects relating to Munster and Ireland, many being by internationally known names. One or two of the papers may be mentioned, "Irish Razors and Razor-Knives," by Eileen Binchy; "The Tau-cross at Killinaboy," by Mr Rynne himself; "Irish Soldiers of the '45," by G. A. Hayes-McCoy—this of much relevance to Scotland. There is a major contribution to numismatics, and indirectly of course to Scottish mediæval archæology, in "The Chronology of the first Anglo-Irish Coinage," by Dolley and O'Sullivan. Christopher Lynch in a paper on the Bunratty Folk Park, under his care, provides a most useful description of the removal to Bunratty and re-erection there of several typical Irish houses—a Shannon farmhouse, a Loop Head house, a Mountain Farmhouse, a Cashen Fisherman's house, and so on. The account of this successful enterprise is of much relevance not only to those concerned with the preservation of the recent past, but with the tourist potential of this type of venture.

In the past three or four years writers in these pages dealing with subjects from the Mesolithic to the Viking period have all independently had of necessity to discuss and consider our Society's area in relation to Ireland, and we must welcome a work such as this which can make us more aware of what is common in our heritage and which furthermore shows what a local society can and ought to produce when the occasion arises.

W. F. C.

PROCEEDINGS 1966-67

14th October, 1966.—The Annual General Meeting of the Society was held in the Ewart Library at 7.30 p.m. The President, Mr J. D. Stuart Martin, in the Chair. The Accounts of the Hon. Treasurer were adopted. The President thanked Mr Russell for his great services to the Society as Hon. Treasurer and expressed our regret that Mr Russell had decided to retire from this office. The list of office-bearers and members of Council nominated by Council was adopted. 19 new members were elected. Mr E. K. Adam became Honorary Treasurer. Mr Ian Stewart lectured on "Some Experiences with Swifts."

28th October, 1966.—Dr Ian Cowan of the History Department, University of Glasgow, lectured on "Mediæval Parishes in Dumfriesshire." 8 new members were elected.

11th November, 1966.—Mr Bruce Ing, Warden of the Scottish Field Centre at Kindrogan lectured on "Kindrogan Field Centre" and showed fine coloured slides of the Centre and the countryside around it. Before the opening of the meeting there was a pleasant ceremony at which Her Majesty's Lieutenant for Dumfriesshire, Major-General J. Scott-Elliot, invested Mr K. H. Macarthur with the British Empire Medal, awarded to him in recognition of his studies on the roe deer.

25th November, 1966.—Miss Rosemary Cramp of the Department of Archaeology of the University of Durham lectured on "Recent Excavations of Monastic Sites at Monkwearmouth and Jarrow," illustrating her lecture with slides. 2 new members were elected.

9th December, 1966.—Mr R. B. K. Stevenson of the National Museum of Antiquities in Edinburgh lectured on "New Light on Scottish Coins from recent discoveries in Dumfries and Galloway."

13th January, 1967.—Mr D. Michael Stoddart of the Natural History Department of the University of Aberdeen lectured on "The Ecology of the Water Vole" illustrating his lecture with coloured slides and specimens. 3 new members were elected.

- 27th January, 1967.**—In the unavoidable absence of Mr Delair, Mr Truckell kindly substituted for the lecturer and gave a talk on "The History of Dumfries." 3 new members were elected.
- 10th February, 1967.**—Dr Anne S. Robertson of the Hunterian Museum, Glasgow University, lectured on "Birrens 1962-66" illustrating her talk with coloured slides and a film. 3 new members were elected.
- 24th February, 1967.**—Mr Basil Skinner, Lecturer on Local History at the University of Edinburgh lectured on "Some Private Sources for Local History Research."
- 10th March, 1967.**—Dr J. X. W. P. Corcoran of the Department of Archaeology of the University of Glasgow lectured on "Excavation of Chambered Cairns at Mid Gleniron Farm, Glenluce, 1963-66" illustrating his lecture with slides. 3 new members were elected.

List of Members as at 31st March, 1967

Fellows of the Society under Rule 10 are indicated thus *

LIFE MEMBERS

- Birley, Eric, M.B.E., M.A., F.S.A., F.S.A.Scot.,
Observatory House, Durham City 1935
- Blackwell, Philip, F.B., Lt.-Commander, R.N.
(Ret.), The Ark, Warblington Road, Emsworth,
Hants. 1946
- Borthwick, Major W. S., T.D., 54 Darrick Wood
Road, Orpington, Kent 1943
- Breay, Rev. J., The Vicarage, Shepreth, Cam-
bridge 1950
- Brown, J. Douglas, O.B.E., M.A., F.Z.S.,
Roberton, Borgue, Kirkcudbright 1946
- Buccleuch and Queensberry, His Grace the Duke
of, K.T., P.C., G.C.V.O., Drumlanrig Castle,
Thornhill.
- Burnand, Miss K. E., F.Z.S.Scot., Brocklehurst,
Dumfries (Ordinary Member 1941) 1943
- *Cunningham, David, M.A., 42 Rae Street,
Dumfries (President, 1953-56) 1945
- Cunningham-Jardine, Mrs., Jardine Hall, Lock-
erbie (Ordinary Member 1926) 1943
- Gladstone, Miss I. O. J., c/o National Provincial
Bank Ltd., 61 Victoria Street, London, S.W.1
(Ordinary Member 1938) 1943
- Gladstone, John, Capenoch, Penpont, Dum-
fries 1935
- Geddes, Nathan, Boghall, Buittle, Castle-
Douglas 1955
- Kennedy, Alexander, Ardvoilun, South Park Road,
Ayr (Ordinary Member 1934) 1943
- Kennedy, Thomas H., Blackwood, Auldgirth,
Dumfriesshire 1946
- Lockhart, John L., Suite 316, 1135 18th Avenue
S.W., Calgary, Alberta, Canada 1948
- McCulloch, Walter, W.S., Ardwall, Gatehouse-
of-Fleet 1946
- *MacLean, A., B.Sc., Wayside, Edinburgh Road,
Dumfries (President, 1950-53) (Ordinary Mem-
ber 1944) 1953
- Mansfield, The Right Hon. the Earl of, F.Z.S.,
M.B.O.U., J.P., Comlongon Castle, Ruthwell,
Dumfries 1939
- Paterson, E. A., Lavender Bank, Curlew Green,
Saxmundham, Suffolk 1945
- Perkins, Dr E., Biology Annexe, University of
Strathclyde, Glasgow 1964
- Perkins, F. Russell, Duntisbourne House, Ciren-
cester, Glos. 1946
- Phinn, Mrs E. M., Imrie Bell, Castle-Douglas
(Ordinary Member 1938) 1943
- Porteous, Miss M., Glencairn, Broom's Road,
Dumfries (Ordinary Member 1953) 1954
- Rynne, Etienne, University College, Galway,
Eire 1964
- Shaw, Cunliffe R., M.Sc., F.R.C.S., F.S.A.,
F.S.A.(Scot.), Orry's Mount, Kirk Bride, Isle
of Man (Ordinary Member 1945) 1964
- Skinner, James S, M.A., The Corner House,
Closeburn 1950
- Spragge, Commander H. E., Pincod, Eaglesfield,
Dumfriesshire (Ordinary Member 1931) ... 1947
- Stuart, Lord David, M.B.O.U., F.S.A.Scot., Old
Place of Mochrum, Portwilliam, Wigtown-
shire 1948
- Thomas, C. H., O.B.E., Southwick House, South-
wick, by Dumfries 1950
- Thomas, Mrs C. H., Southwick House, South-
wick, by Dumfries 1950

ORDINARY MEMBERS

- Adam, E. K., M.A., B.Sc., A.M.I.C.E., Gardinia,
Crocketford Road, Dumfries 1963
- Adam, Mrs E. K., Gardinia, Crocketford Road,
Dumfries 1964
- Adamson, David, Doonholm, Castle-Douglas
Road, Dumfries 1958
- Adamson, Mrs D., Doonholm, Castle-Douglas
Road, Dumfries 1958
- Anderson, A. D., B.Sc., Invermeran, Stirling
Acres Road, Kirkcudbright 1962
- Anderson, Mrs E., 14 Oaklands, Chapelcross,
Annan 1960
- Anderson, G., Birchview, Roucan Road,
Collin 1967
- Anderson, Miss Mosa, Charlton Cottage, Peas-
lake, Guildford 1953
- Angus, The Rev. J. A. K., Manse of Hoddam,
Dumfriesshire 1956
- Angus, Mrs J. A. K., Manse of Hoddam, Dum-
friesshire 1956
- Ansell, M. L., Rannoch, Glenlee, New
Galloway 1965
- Aperghis, Mrs Irene, 9 Northfield Road, Don-
caster 1966
- Archer, Mrs E. M., M.A., Trailtrow School-
house, Ecclefechan 1967
- Armstrong, Mrs R. A., Brieryhill, Ewes, Lang-
holm 1946
- Armstrong, William, Thirlmere, Edinburgh Road,
Dumfries 1946
- Balfour-Browne, Miss E. M. C., Goldielea,
Dumfries 1944
- Banks, James, B.Sc., Scarknowe, St. Anne's
Road, Dumfries 1960
- Barr, J. Glen, F.S.M.C., F.B.O.A., F.I.L.,
Southerly Ridge, Beattock 1946
- Barr, Mrs J. Glen, Southerly Ridge, Beattock 1951
- Bartholomew, George, A.R.I.B.A., Drumclair,
Johnstone Park, Dumfries 1945
- Beattie, James, Mains of Westerkirk, Lang-
holm 1960
- Begg, Dr W. G. A., Medical Superintendent,
Garlands' Hospital, Carlisle 1966
- Beresford-Cooke, Miss Katherine, Castledykes
Cottage, Glencaple Road, Dumfries 1962
- Biggar, Miss E. I., Corbieton, Castle-Douglas 1947
- Black, Miss Amy G., Burton Old Hall, Burton,
Westmorland 1946

- Blackett, Major C. W. S., Arbigland, Kirkbean 1960
 Blake, H. Brian, 34 Harboro Road, Sale, Cheshire 1953
 Bone, Miss E., Stable Court, Castle-Douglas 1937
 Boyd, J. D., 355 Linthorpe Road, Middlesbrough 1965
 Boyes, Miss M., 34 Cardoness Street, Dumfries 1957
 Brewis, Mrs F. D. D. M., Ardwell, Stranraer.
 Brown, D. A. G., Cairnsknowe, Whinnyhill, by New Abbey 1965
 Brown, Mrs D. A. G., Cairnsknowe, Whinnyhill, by New Abbey 1965
 Brown, Miss E. M., Glencotho, Broughton, Biggar 1960
 Bryson, Mrs Marjorie, Craigmullen, Dundrennan, Kirkeudbright 1966
 Buchanan, A. V., The Hermitage, Bridge Street, Beccles, Suffolk 1963
 Buchanan, John, Sunnysdene, Mainsiddle ... 1957
 Buchanan Jardine, Lady, Castlemilk, by Lockerbie 1955
 Burwell, Mrs M. E. A., Nithhill, Lovers' Walk, Dumfries 1964
 Byers, Mr R., Munches Kennels, Dalbeattie 1951
 Campbell, Eoin, St. Nicolas, Ballplay Road, Moffat 1961
 Campbell, Mrs Eoin, St Nicolas, Ballplay Road, Moffat 1960
 Campoell, J. Keith, Low Arkland, Castle-Douglas 1959
 Campbell, Mrs J. Keith, Low Arkland, Castle-Douglas 1953
 Carlyle, Miss E. M. L., Templehill, Waterbeck, by Lockerbie 1946
 Carr, J. J., Lanka, 5 St. Anne's Road, Dumfries 1961
 Carroll, Miss K. M., A.R.I.B.A., Meadowside, 14 Summergate Road, Annan 1961
 Carruthers, Mrs M. E. M., 43 Castle Street, Dumfries 1946
 Casson, George, Broadlea, Dalbeattie 1965
 Casson, Mrs George, Broadlea, Dalbeattie ... 1965
 Cessford, G. A., 10 Almond Court East, Braehead Park, Edinburgh, 4 1956
 Chamberlain, John W., c/o 6 Gordon Street, Dumfries 1961
 Charteris, Mrs N. E. B., Kirkland Bridge, Tinswald 1955
 Cheshire, Bernard, B.S.C., Whitelea, 17 Loch Road, Dumfries 1966
 Clavering, Miss M., Clover Cottage, Moffat 1948
 Clayson, Dr Christopher, M.D., F.R.C.P.E., J.P., Cockesknowe, Lochmaben 1965
 Cluckie, James, Rosedene, 17 Ardwall Road, Dumfries 1955
 Cochrane, David, 13 Bloomfield, Dumfries ... 1965
 Cochrane, Miss Margaret, 112 Lockerbie Road, Dumfries 1946
 Coles, Dr John M. (Faculty of Archaeology), 80 Beaumont Road, Cambridge 1954
 Cooper, Mrs, The Breoch, Ae, by Dumfries 1956
 Corcoran, Dr J. X. W. P., Department of Archaeology, University of Glasgow 1965
 Cormack, David, LL.B., W.S., Dunlaverock, Coldingham, Eyemouth, Berwickshire 1913
 Cormack, William, LL.B., W.S., Starney, Lockerbie 1951
 Corsan, John Charles, M.C., F.R.S.A., 110 College Road, Dulwich, London, S.E.21 ... 1961
 Coulthard, William, Wellholme, Scotby, by Carlisle 1959
 Cowan, Dr Ian Borthwick, Ph.D., 119 Balshagray Avenue, Glasgow, W.1 1962
 Cowan, Mrs H., Chapel Hill, Glencaple ... 1958
 Crabbe, Lady, Duncow, by Dumfries 1962
 Crawford, Col. Mervyn, D.S.O., Dalgonar, Dunscore, Dumfriesshire 1963
 Crawford, Mrs Mervyn, Dalgonar, Dunscore, Dumfriesshire 1964
 Croall, M. L., Upper Balmaine, Dalbeattie Road, Dumfries 1964
 Cruickshank, A. B., Extra-Mural Organiser, 4 Lovers' Walk, Dumfries 1965
 Cruickshank, Mrs, 4 Lovers' Walk, Dumfries 1965
 Cunningham, Mrs David, 42 Rae Street, Dumfries 1948
 Cunningham, John, 20 Queen Street, Lochmaben 1965
 Daniels, Charles M., M.A., F.S.A., Museum of Antiquities, The Quadrangle, The University, Newcastle-upon-Tyne 1961
 Darke, Mrs H., 12 Lakeview, Powfoot, Annan 1966
 Davidson, Dr James, F.R.C.P.Ed., F.S.A.(Scot.), Linton Muir, West Linton, Peebles 1938
 Davidson, J. M., O.B.E., F.C.I.S., F.S.A.Scot., Griffin Lodge, Gartcosh, Glasgow 1934
 Deans, W. D., White Lodge, Carsethorn ... 1962
 Deans, Mrs W. D., White Lodge, Carsethorn 1962
 Denholm, Miss Varrie, 37 Castle Street, Stranraer 1965
 Desbruslais, Mrs Mary, Riding Hill, North Street, Annan 1965
 Dickie, J. Wallace, Glenlee, 17 Palmerston Drive, Dumfries 1954
 Dickie, The Rev. J. W. T., 6 Hannay Street, Gatehouse-of-Fleet 1951
 Dinwiddie, N. A. W., M.A., B.Com., 27 Newell Terrace, Dumfries 1937
 Dobie, Percy, B.Eng., 122 Vicars Cross Road, Chester 1943
 Douglas, Robin, Uplands, 83 Edinburgh Road, Dumfries 1966
 Drew, Dr R. L., 19 Milton Hill, Milton, Dunbartonshire 1959
 *Duncan, Sir Arthur, B.A., Gilchristland, Closeburn (President, 1944-46) 1930
 Duncan, Walter, Newlands, Dumfries 1926
 Dundas, Miss Ruth, Kinnaniel, Kirriemuir, Angus 1966
 Dunlop, Mrs A. J., C.B.E., D.Litt., 73 London Road, Kilmarnock, Ayrshire 1952
 Dykes, Thomas, Devorgilla, 9 Solway Crescent, Annan 1964
 Eckford, R. J. A., Summerhill, Grange Road, Moffat (Honorary Member 1967) 1956
 Edwards, Frederick J., M.A., 121 Lockerbie Road, Dumfries 1953
 Fairbairn, Miss M. L., The Lymes, Nelson Street, Dumfries 1952

- Farries, T. C., Craigshields, Newall Terrace, Dumfries 1948
 Ferguson, Ronald, Woodlea House, High Bonnybridge, Stirlingshire 1953
 Flett, David, A.I.A.A., A.R.I.A.S., Mossyard, Gatehouse-of-Fleet 1947
 Forman, The Rev. Adam, Dumcrieff, Moffat 1929
 Forrest, J. H., Ashmount, Dalbeattie Road, Dumfries 1953
 Forrest, Mrs J. H., Ashmount, Dalbeattie Road, Dumfries 1953
 Fraser, Elliott, Burnside, Cummertrees, Annan 1964
 Fraser, Brigadier S. G. G., M.C., 20 Abercromby Road, Castle-Douglas 1947
 Fraser, Dr I. A. M., Westerlea, 39 Roberts Crescent, Dumfries 1963
 Fraser, Mrs I. A. M., Westerlea, 39 Roberts Crescent, Dumfries 1962
 Frood, J., 14 Ednam Street, Annan 1963
 Fullen, Miss Anne E., North Park, 81 Sydney Place, Lockerbie 1961
 Gair, James C., Dorland, Pleasance Avenue, Dumfries 1946
 Gair, Mrs James C., Dorland, Pleasance Avenue, Dumfries 1960
 Gair, John H. D., 2 Greenside, Westerkirk, Langholm 1945
 Galloway, The Countess of, Cumloden, Newton-Stewart 1955
 Gardiner, E., Agra House, 12 Averill Crescent, Dumfries 1967
 Gemmell, Adam, 106 Loreburn Street, Dumfries 1966
 Gibbs, Miss Anne-Marie, Auchlewan, Landheads, Annan 1965
 Gilchrist, George, F.S.A., 6 Station Road, Annan 1964
 Gillam, J. P., M.A., F.S.A., Bank House, Middle Street, Corbridge, Northumberland 1953
 Glendinning, Mrs Mary, 26 Brooke Street, Dumfries 1957
 Graham, Mrs Fergus, Mossknowe, Kirkpatrick-Fleming, by Lockerbie 1947
 Grant, G. D., Kelvin, 7 St. Anne's Road, Dumfries 1962
 Grant, Mrs, Kelvin, 7 St. Anne's Road, Dumfries 1967
 Greaves, Lt.-Col. J. R. H., B.Sc., A.M.I.E.E., Altona, Strandtown, Belfast, 4 1947
 Haggas, Miss, Terraughtie, Dumfries 1944
 Haggas, Miss E. M., Terraughtie, Dumfries 1944
 Halbert, William, Wendover, Castle-Douglas Road, Dumfries 1965
 Hannay, Miss E. Jean, Lochend, Stranraer ... 1951
 *Harper, Dr J., M.B.A. (President 1956-59), 62A Billing Road, Northampton 1947
 Harris, Bernard F. D., Benmore, Pleasance Avenue, Dumfries 1955
 Haslam, Oliver, Cairngill, Colvend, Dalbeattie 1927
 Hawley, H. N., 6 Keble Road, Oxford 1962
 Henderson, I. G., Beechwood, Lockerbie ... 1951
 Henderson, Mrs J. H., Braeside, Moffat Road, Dumfries 1964
 Henderson, Miss J. M., M.A., Ardgowan, 5 Lockerbie Road, Dumfries 1945
 Hendry, Mrs W. E. R., Lochanhead House, Lochrutton, Dumfries 1962
 Hewat, The Rev. Pat., Grantchester Parsonage, Cambridge 1960
 Higgs, G. R., B.Sc., F.I.E.E., The Cleuch, Kirkcudbright 1967
 Higgs, Mrs G. R., The Cleuch, Kirkcudbright 1967
 Hunter, Miss Annie M., 50 Queen Street, Lochmaben 1961
 Hunter, Miss D. M., 74 Trinity Road, Edinburgh 1967
 Hunter, Miss Irene, Dudgeon Flat, Crichton Royal, Dumfries 1961
 Hunter Blair, Edward T., Parton House, Castle-Douglas 1965
 Huntley, Miss, 10 The Grove, Heathhall, Dumfries 1966
 Inglis, John A., Achadhnan Darach, Invergarry, Inverness-shire 1951
 Irvine, Mrs James, 4a Johnstone Park, Dumfries 1952
 Irving, E. J. B., A.I.E.E., Balgownie, Bellevue Road, Kirkintilloch, Dumbartonshire 1959
 Irving, Miss J. P., Charnwood House, Dumfries 1957
 Irving, J. Wyllie, Kirkbrae, Lochrutton, Dumfriesshire 1951
 Jameson, Mrs A. M., Ardmor, Gatehouse-of-Fleet 1946
 Jardine, Dr W. Graham (Geology Department, University of Glasgow), 22 Bute Crescent, Bearsden, Glasgow 1966
 Jobbins, J. K., Greysouthern, 24 Turnberry Road, Newington, Annan 1960
 Jobey, George, 44 Parkside Crescent, Tyemouth 1965
 Johnson, Mrs Anne, White Cottage, Twynholm 1965
 Johnston, Major F. J., 61 Chester Square, London, S.W.1 1957
 Johnston, Miss A., Barony School, Parkgate, by Dumfries 1965
 Johnston, Miss M. D., Nurses' Home, Thornhill 1964
 Johnston, Lt.-Col., Patrick, Bury Hall, Therfield, Royston, Herts. 1956
 Johnstone, Miss E. R., Cluden Bank, Moffat
 Johnstone, J. E., 20 Langlands, Edinburgh Road, Dumfries 1955
 Johnstone, Major J. L., Amisfield Tower, Dumfries 1945
 Kennedy, Mrs T. H., Blackwood, Auldgirth 1967
 Kennedy, Ian A., 22 Ashburnham Drive, Mayals, Swansea, Glam. 1965
 Kerr, C. M., Rubislaw, Hill Street, Dumfries 1961
 Kirkpatrick, H. S., Strathyre, 2 Marchhill Drive, Dumfries 1964
 Knott, Miss Hilda M., M.A., The Lymes, Nelson Street, Dumfries 1964
 Lambie, Ian R., 10 Endor Grove, Burley-in-Wharfedale, Ilkley, Yorks. 1965
 Lambie, Mrs Ian R., 10 Endor Grove, Burley-in-Wharfedale, Ilkley, Yorks. 1965
 Landale, David F., Dalswinton, Dumfries ... 1955
 Lauder, Miss A. T., Craigiebank, Moffat Road, Dumfries 1932

- Laurence, D. W., St Alban's, New Abbey Road, Dumfries 1939
- Leslie, Alan, B.Sc., Schoolhouse, Greta ... 1949
- Lidderdale, John, 21 Withyholts Park, Charlton Kings, Cheltenham, Glos. 1966
- Little, Robert J., East Hayrigg, Lockerbie ... 1961
- Lord, Brian L., Castlehill, Kirkmahoe 1960
- Lye, Mrs, 12 Murray Road, Scone, Perth ... 1966
- Lynch, The Rev. Michael, St Andrew's and St Cuthbert's, High Street, Kirkcudbright ... 1965
- McAdam, Dr William, Maryfield, Bankend Road, Dumfries 1952
- McAdam, Mrs Helen R., Maryfield, Bankend Road, Dumfries 1953
- McCaig, Miss E., 26 Royal Avenue, Stranraer 1953
- McCall-McCowan, Mrs, Dalwhat, Moniaive 1967
- McClure, Miss J., Wellwood, New Galloway 1955
- McConnel, J. C. I., F.S.A.Scot., Church House Stour Provost, Gillingham, Kent 1961
- McCracken, Alex., B.Sc., 10 West Street, Langholm 1961
- McCrae, Mrs Heather, 1 Picket Cross, Bankend Road, Dumfries 1965
- McCulloch, A. J., W.S., Ardwall, Gatehouse-of-Fleet (32 and 43 Castle Street, Edinburgh) 1963
- MacDonald, M. M., Kilmartin, New Abbey Road, Dumfries 1960
- Macdonald, Neville H. Hazelwood, Laurieknowe, Dumfries 1952
- Macdonald, Mrs Neville H., Hazelwood, Laurieknowe, Dumfries 1952
- McDowall, Miss P., Meadowpark, Kirkton 1957
- McElroy, James, 7 Carlingwark Street, Castle-Douglas 1957
- McGhie, Miss Mary, Fairleigh, Dunmuir Road, Castle-Douglas 1957
- McKerrow, Henry G., Whitene, Albert Road, Dumfries 1953
- MacLaren, Alistair, The Royal Commission on the Ancient and Historical Monuments of Scotland, 7 Coates Gardens, Edinburgh, 12 1965
- McLaren, W. G., Fortia, Sherwood Crescent, Lockerbie 1964
- *McLean, Mrs M. D., Ewart Library, Dumfries (President 1959-62) 1946
- MacLeod, I. F., Flat 1, The Stables, Cardross House, Gatehouse-of-Fleet 1963
- Macmillan, Nigel, Overton, Southwick Road, Dumfries 1963
- Macmillan, Mrs Nigel, Overton, Southwick Road, Dumfries 1963
- MacMillan-Fox, Mrs M. M. G., Glencrosh, Moniaive 1950
- MacMillan-Fox, Miss J. M. G., Glencrosh Moniaive 1950
- McNaught, James, M.A., Director of Education, Earlsmount, Keith, Banffshire 1965
- McQueen, John, M.A., 9 Learmonth Gardens, Edinburgh 1952
- McRobert, Mrs F., Whistlebrae, 33 New Houses, Closeburn 1948
- Mangles, The Rev. J. L., Troqueur Manse, Dumfries 1966
- Martin, J. D. Stuart, Old Bank House, Bruce Street, Lochmaben (President 1965-) ... 1946
- Martin, Mrs J. D. S., Old Bank House, Bruce Street, Lochmaben 1946
- Masters, L. J., B.A., 4 Lovers' Walk, Dumfries 1966
- Masterton, The Rev. John, The Manse, Dunscore 1966
- Masterton, Mrs John, The Manse, Dunscore 1966
- Maxwell Major-General Sir Aymer, C.B.E., M.C., R.A., Kirkennan, Dalbeattie 1946
- Maxwell, Capt. G. A., Hedingham Castle, Castle Hedingham, Halstead, Essex 1937
- Maxwell, Mrs Bernard, Steadstone, Dalbeattie 1963
- Maxwell, Stuart, M.A., F.S.A.Scot., Museum of Antiquities, Queen Street, Edinburgh. (23 Dick Place, Edinburgh, 2) 1966
- Maxwell, Mrs Sheena, 15 Gordon Road, Edinburgh, 12 1954
- Maxwell-Irving, A. M. T., B.Sc., Luce Cottage, Luce House, Annan. 1957
- Meldrum, Martin, Sandon, 19 Moffat Road, Dumfries 1965
- Menzies, Douglas H., Elderslie, Gatehouse-of-Fleet 1952
- Menzies, Mrs Douglas H., Elderslie, Gatehouse-of-Fleet 1952
- Millar, James, M.A., B.Sc., Wallacehall, Closeburn 1949
- Miller, Joseph C., Crannog, Annan Road, Lochmaben 1963
- Miller, Mrs Joseph C., Crannog, Annan Road, Lochmaben 1963
- Miller, Lt.-Cdr. Ronald H., V.R.D., R.N.R., Oakmere, South Street, Garlieston Wigtownshire 1963
- Miller, R. Pairman, S.S.C., 13 Heriot Row, Edinburgh, 3 1908
- Mills, A. W. F., Hamara, Dalry, by Castle-Douglas 1957
- Milne, Mrs G. N., Dunesslin, Dunscore, Dumfriesshire 1963
- Mitchell, Mrs E. J., 79 Great King Street, Edinburgh, 3 1953
- Moffat, Miss Norah Bertram, Bridgend Cottage, Annan Water, Moffat 1965
- Morrison, Alex., Department of Archaeology, University of Glasgow 1966
- Morrison, John, Crofthill, Dalbeattie Road, Dumfries 1961
- Morton, Miss J. D., 35 George Street, Dumfries 1947
- Muir, Miss A. N., 3 Janefield Drive, Dumfries 1965
- Munro, Mrs, Ae Schoolhouse, Ae 1966
- Murray, A. L., M.A., 33 Inverleith Gardens, Edinburgh, 3 1957
- Murray, Col. G., Mansefield, Thornhill ... 1953
- Murray, Capt. Keith R., Kirkland-of-Parton, Castle-Douglas 1950
- Murray-Browne, G. A., Kinnelhook, Lockerbie 1953
- Murray-Browne, Mrs G. A., Kinnelhook, Lockerbie 1953
- Murray-Usher, Mrs E. E., J.P., Carstramon, Gatehouse-of-Fleet 1946
- Mushet, Andrew, M.A., Schoolhouse, Penpont 1955
- Newman, F. H., Gallabrae, Barnbarroch, Dalbeattie 1959
- Niblock, Hugh, Garnock, Rotchell Park, Dumfries 1966

- Niblock, Mrs Dora, M.A. 1962
 Nielson, W. W., 33 Spen Road, West Park, Leeds, 16 1967
 Nimmo, Ian, M.R.C.V.S., 3 Moffat Road, Dumfries 1960
 Nimmo, Mrs Ian, 3 Moffat Road, Dumfries 1960
 Nolan, Miss Jacqueline, M.A., 34 Wallamhill Road, Locharbriggs, Dumfries 1966
 Paterson, David, Stenrieshill, Wamphray, Moffat 1965
 Paulin, Mrs D. M., Drumrash, Parton 1950
 Payne, Mrs D. M., Milnhead, Kirkmahoe ... 1953
 Pearson, Gordon, Blencathro, Rotchell Park, Dumfries 1960
 Pearson, Mrs Gordon, Blencathro, Rotchell Park, Dumfries 1966
 Pearson, James, Brynholm, 23 Ardwall Road, Dumfries 1963
 Pearson, Mrs James, Brynholm, 23 Ardwall Road, Dumfries 1963
 Pigott, Lady, Closeburn Castle, Thornhill, Dumfriesshire 1945
 Prentice, William F., North Laurieknowe House, Maxwelltown, Dumfries 1966
 Prentice, Mrs Judith Ann, North Laurieknowe House, Maxwelltown, Dumfries 1966
 Prevost, Major W. A. J., 26 Coates Gardens, Edinburgh, 12 1946
 Pullen, O. J., B.Sc., c/o Barclay's Bank, 150 The Parade, Leamington Spa 1934
 Quinn, H. G., 65 Queen Street, Lochmaben 1966
 Rae, Dr I. P. F., Lochmaben Chest Hospital, Lochmaben 1962
 Readman, James, Dunesslin, Dunscore 1946
 Rees, Dr Joan R., B.Sc., Ph.D., 125 Woodhill Road, Bishopbriggs, Glasgow 1961
 Reid, D. H., Glengariff, Suffolkhill Avenue, Dumfries 1964
 Reid, Mrs D. H., Glengariff, Suffolkhill Avenue, Dumfries 1964
 Reid, Mrs R. C., Cleughbrae, Mouswald, Dumfriesshire 1963
 Reid, R. W. Kenneth, M.A., An Rainoch Mhor, Killlearn 1965
 Richardson, J., 37 Upper Millburn Avenue, Dumfries 1966
 Roberson, Mrs Betty Beck, 520 S. Butte Avenue, Pacific, Washington 28047, U.S.A. 1965
 Robertson, Alex., M.A., Kenyon, Albert Road, Dumfries 1957
 Robertson, Dr Anne S., Hunterian Museum, University of Glasgow 1965
 Robertson, D., 253 Annan Road, Dumfries 1966
 Robertson, Mrs D., 253 Annan Road, Dumfries 1966
 Robertson, Ian M., B.Sc., 3 The Rounall, Heathhall, by Dumfries 1966
 Robertson, James J., 316 Broughty Ferry Road, Dundee 1962
 Robertson, James, O.B.E., Laneshaw, Edinburgh Road, Dumfries 1936
 Robertson, Gordon S., Laneshaw, Edinburgh Road, Dumfries 1962
 Robertson, Miss Jean, Ceol Mhor, Hardthorn Road, Dumfries 1966
 Robertson, Mrs M. A. K., 11 Albany Place, Dumfries 1933
 Rodgers, Dr J. B., Mountainhall, Bankend Road, Dumfries 1952
 Rodgers, Mrs Joyce, Mountainhall, Bankend Road, Dumfries 1952
 Rogers, D. B., Elanoy, Victoria Avenue, Dumfries 1954
 Rogers, Mrs D. B., Elanoy, Victoria Avenue, Dumfries 1954
 Ross, Mrs E., Clifton, Rosemount Street, Dumfries 1952
 Russell, H. McA., Nara, Dalbeattie Road, Dumfries 1953
 Russell, Mrs H. McA., Nara, Dalbeattie Road, Dumfries 1954
 Russell, Ian R., M.A., F.S.A.Scot., Gorseridge, Cormaddie, Newbridge 1944
 Sainty, D. L., M.A., Ll.B., Waterside, Ringford 1944
 *Scott-Elliot, Maj.-Gen. J., C.B., C.B.E., D.S.O., Kirkconnel Lea, Glencaple (President 1962-65) 1957
 Scott-Elliot, Mrs J., Kirkconnel Lea, Glencaple 1962
 Simpson, Derek, Department of History, University of Leicester, Leicester, 199 Scraptoft Lane, Leicester 1963
 Smail, Miss Isabel, 11 Erlington Avenue, Old Trafford, Manchester, 16 1952
 Smith, C. D., Laight, Bowling Green Road, Stranraer 1944
 Spilling, R. H., 105 Catherington Lane, Horndean, Hants. 1966
 Spilling, Mrs, 105 Catherington Lane, Horndean, Hants. 1966
 Stewart, James, Rowanbank, Victoria Road, Dumfries 1953
 Stewart, Mrs James, Rowanbank, Victoria Road, Dumfries 1965
 Stone, J. C., Trelill House, Trelill, Bodmin, Cornwall 1958
 Straton-Ferrier, Mrs E. I., Bonshaw Tower, Kirtlebridge, by Lockerbie 1959
 Sydserrf, Peter M., Rucklaw, 7 Lockerbie Road, Dumfries 1950
 Sykes, Mrs H. H., Craigdarroch, Moniaive 1967
 Tait, Dr A. C., Netherlea, Bankend Road, Dumfries 1960
 Taylor, James, M.A., B.Sc., Drumskeoch, Colvend, Dalbeattie 1933
 Taylor Mrs James, Drumskeoch, Colvend, Dalbeattie 1961
 Thomas, Charles, M.A., F.S.A., F.S.A.Scot., Department of Prehistoric Archaeology, University of Edinburgh, 15 Moray Place, Edinburgh 1961
 Thomson, Miss Mary, 7 Carlingwark Street, Castle-Douglas 1959
 Todrick, Dr A., Windrush, Rotchell Park, Dumfries 1958
 Tolson, Arthur, Border Esk Cottage, Langholm 1964
 Truckell, A. E., M.A., F.S.A.Scot., F.M.A., 12 Summerville Avenue, Dumfries 1947
 Truckell, Mrs A. E. 12 Summerville Avenue, Dumfries 1958
 Urquhart, James, M.A., 5 Braehead Terrace, Rosemount Street, Dumfries 1946

LIST OF MEMBERS

- Vaughan, Mrs M., Broomside, Beattock 1962
 Walker, Dr Mary B., Croft-an-Righ, Wigtown 1960
 Walker, Miss M., Dryfeview, Lockerbie 1960
 Walker, Lieut.-Col., George G., C.B.E., M.C., T.D., D.L., Morrinton, Dumfries 1926
 Walker, W. M., 17 India Street, Edinburgh, 3 1960
 Watson, Miss E., Ashby Grange, Annan 1964
 Weeks, Dr D. J., 16 The Jennings, Welwyn Garden City, Herts. 1960
 Weeks, Mrs Sheila, 16 The Jennings, Welwyn Garden City, Herts. 1960
 Welsh, Adam, Greensleeves, Watery Lane, Weymouth, Dorset 1959
 Wilkinson, William, Craiglochar, The Crescent, Annan Road, Dumfries 1966
 William, B. R. H., Longmynd, 8 Gollands Drive, Brixham, Devon 1965
 Williams, James, 2 Langlands, Edinburgh Road, Dumfries 1964
 Williamson, Miss M., Stanedykes, Hardgate, Castle-Douglas 1961
 Willis, Miss V. V., 10 Albert Place, Annan 1966
 Wilson, Arthur W., Heston, Alexandra Drive, Dumfries 1964
 Wilson, Mrs J., Glenbo, Solway Drive, Dumfries 1957
 Wilson, Paul A., Reform Club, Pall Mall, London, S.W.1 1961
 Wishart, Eric, 3 Catherine Street, Dumfries 1959
 Wolfe, A. Curtis, F.R.I.A.S., A.R.I.B.A., A.M.T.P.I., The Toll House, Gatehouse-of-Fleet 1959
 Wolfe, Mrs A. Curtis, The Toll House, Gatehouse-of-Fleet 1963
 Wyse, Mrs, Glenbo, Solway Drive, Dumfries 1964
 Young, J. F., Waterside Mains, Keir, Thornhill 1966
 Young, Mrs M. W., Coppelia, Mile House Crescent, Edinburgh Road, Dumfries ... 1946

JUNIOR MEMBERS

- Barbour, Sean M., 34 Golf Avenue, Summerhill, Dumfries 1966
 Bell, R., Hillside, Rigg of Greta 1963
 Fairbairn, David, 16 Greencroft Wynd, Annan 1964
 Gibbs, Allan, Auchlewan, Landhead, Annan 1962
 Gillies, Kennedy, 100 Queen Street, Dumfries 1967
 Halbert, Brian, Wendover, Castle-Douglas Road, Dumfries 1965
 Hendry, Miss Linda, Lochanhead House, Dumfries 1963
 Huntly, Michael, 10 The Grove, Heathhall 1966
 Griffith, Richard, White Cottage, Twynholm 1965
 Lynn, Alistair, 17 Closehead Avenue, Annan 1964
 McAdam, Miss Ellen, Maryfield, Bankend Road, Dumfries 1962
 Miller, Malcolm B., Oakmere, South Street, Garlieston, Wigtownshire 1963
 Mushet, Miss Angela, Schoolhouse, Amisfield 1963
 Porter, W., 16 Albert Place, Annan 1966
 Robertson, Miss M. H., Aldworth, Annan Road, Dumfries 1962
 Thomas, A., 14b The Grove, Edinburgh Road, Dumfries 1964
 Todrick, Miss Fenella, Windrush, Rotchell Park, Dumfries 1964
 Todrick, Miss Catherine, Windrush, Rotchell Park, Dumfries 1964
 Urquhart, David, 8 Tweedie Terrace, Annan 1966
 Vaughan, Miss, Broomside, Beattock 1962
 Wells, Robert, 10 Heckett Place, Amisfield 1967

EXCHANGES

- American Museum of Natural History, Central Park West, at 79th Street, New York 10024, N.Y., U.S.A.
 Andersonian Naturalists' Society, Tech. College, George Street, Glasgow.
 Ashmolean Museum, Oxford.
 Archaeological Society of Glasgow, 4 Clifton Street, Glasgow, 3.
 Ayrshire Archaeological and Nat. Hist Society, Carnegie Public Library, Ayr.
 Belfast Field Naturalists' Club, The Museum College, Belfast.
 Belfast University Library, Belfast.
 Botanical Society of Edinburgh, Royal Botanic Gardens, Edinburgh, 4.
 British Museum, Bloomsbury Square, London, W.C.1.
 British Museum (Natural History Dept.), London, S.W.7.
 Cambridge University Library.
 Carnegie Trust for the Universities of Scotland, per Prof. T. Erskine Wright, Merchants' Hall, 22 Hanover Street, Edinburgh, 2.
 Cumberland and Westmorland Antiquarian Soc., Tullie House, Carlisle.
 Council for Nature, Intelligence Unit, 41 Queen's Gate, London, S.W.7.
 Durham and Northumberland Architectural and Archaeological Society, Prebends' Gate, Durham.
 Edinburgh Geological Society, Grant Institute of Geology, King's Buildings, West Mains Road, Edinburgh, 9.
 Glasgow Geological Society, Mitchell Library, North Street, Glasgow.
 Hawick Archaeological Society, Public Library, Hawick.
 Isle of Man Nat. Hist. and Antiquarian Society, Manx Museum, Douglas, I.O.M.
 Lund University, Lund, Sweden.

- National Library of Scotland, Edinburgh, 1.
 National Library of Wales, Aberystwith, Cardigan-shire.
 Oxford University, The Bodleian Library, Oxford.
 Rijksdienst voor het Oudheidkundig, Bodemonderzoek, Amersfoort, Kleine Haag, Nederland.
 Royal Irish Academy, 19 Dawson Street, Dublin, 2.
 School of Scottish Studies, c/o Journals Dept., University Library, South Bridge, Edinburgh, 8.
 Smithsonian Institute, National Museum, Washington, D.C., U.S.A.
 Society of Antiquaries of London, Burlington House, London.
 Society of Antiquaries of Scotland, Queen Street, Edinburgh.
 Stockholm ö, Bibliotek K. Vitterhetsakademien, Storgarten, 41 Sweden.
 Ulster Journal of Archaeology, 14 Sans Souci Park, Belfast, 9.
 United States Geological Survey, Room 1033, General Services Administration Building, Washington D.C. 25, U.S.A.
 Uppsala Universitets Biblioteket, Uppsala, Sweden.
 Yorkshire Archaeological Society, 10 Park Place, Leeds.

INSTITUTIONAL MEMBERS

- Aberdeen University, King's College Library, Aberdeen.
 Belfast Library and Society for Promoting Knowledge, per Lt.-Col. J. Greeves, Linen Hall Library, Donegall Square North, Belfast, 1.
 Birmingham University Library, Edmund Street, Birmingham, 15.
 California University Library, Serials Dept., Research Library, University of California, Los Angeles, California 95616, U.S.A.
 Cleveland Public Library, 325 Superior Avenue, Cleveland, Ohio 44114, U.S.A.
 Cumberland County Library, 1 Portland Square, Carlisle.
 Douglas Ewart High School, Newton Stewart, Kirkcudbrightshire.
 Dumfries County Council Library Service, Ewart Library, Dumfries.
 Edinburgh City Libraries, George IV. Bridge, Edinburgh.
 Edinburgh University Library, Serials Dept., Old College, South Bridge, Edinburgh, 8.
 Essex Field Club, Passmore Edwards Museum, Romford Road, Stratford, London, E.15.
 Exeter University, Exeter.
 Glasgow Corporation Libraries Dept., Mitchell Library, North Street, Glasgow, C.3.
 Glasgow Museums and Art Galleries, Kelvingrove, Glasgow, C.3.
 Glasgow University Library, The University, Glasgow.
 H.M. Ordnance Survey, Archaeological Office, 43 Rose Street, Edinburgh, 2.
 Illinois University Library, Serials Dept., University of Illinois, Urbana, Illinois 61801, U.S.A.
 Institute of Archaeology, London University, 31 Gordon Square, London, W.C.1.
 Institute of Historical Research, London University, Senate House, London, W.C.1.
 Kentucky University Library, Lexington, Kentucky, U.S.A. (per James Thin & Co., 55 South Bridge Street, Edinburgh).
 Kirkcudbrightshire Education Committee, Education Offices, Castle-Douglas, Kirkcudbrightshire.
 Kungl. Vetenskapsakademiens Bibliotek, Stockholm 50, Sweden.
 Leicester University Library, University Road, Leicester.
 Liverpool University Library, Liverpool, 3.
 London Library, 14 St James Square, London, S.W.1.
 National Reference Library of Science and Invention, Bayswater Division, Porchester Gardens, London, W.2.
 Nature Conservancy, 19 Belgrave Square, London, S.W.1.
 Newcastle University Library, Queen Victoria Road, Newcastle upon Tyne.
 New York Public Library, U.S.A. (per B. F. Stevens & Brown, Ltd., Arden House, Mill Lane, Godalming, Surrey).
 Niedersächsische Staats- und Universitätsbibliothek, Prinsenstrasse 1, Göttingen, Germany.
 Redpath Library, per Prof W. S. Reid, McGill University, 3459 McTavish Street, Montreal, 2, Canada.
 Royal Scottish Museum Library, Chambers Street, Edinburgh, 1.
 St Andrews University Library, St Andrews, Fife.
 Scottish Record Office, H.M. General Register House, Edinburgh.
 Sheffield University Library, Western Bank, Sheffield 10.
 Society of Antiquaries, Black Gate, Newcastle upon Tyne.
 Society of Writers to H.M. Signet, The Signet Library, Edinburgh.
 South Wales and Monmouthshire University Library, Cathays Park, Cardiff, Glam.
 Trinity College Library, Lyndoch Place, Glasgow, C.3.
 University of Guelph, 9952-23 College Avenue, Guelph, Ont., Canada.
 Wigtownshire Education Committee, County Library, London Road, Stranraer, Wigtownshire.
 Wisconsin University Memorial Library, Exchange Section, University of Wisconsin, Madison, Wisconsin 53706, U.S.A.

RULES

As revised and adopted at the Annual General Meeting held on 14th October, 1966.

Name of the Society

1. The Society shall be called "The Dumfriesshire and Galloway Natural History and Antiquarian Society."

Aims

2. The objects of the Society shall be to collect and publish the best information on the Natural Sciences and Antiquities (including History, Records, Genealogy, Customs and Heraldry) of the three counties of Dumfries, Kirkcudbright and Wigtown; to procure the preservation of objects of Natural Science and Antiquities relative to the district; to encourage local research and field activities in Natural Science and excavations by private individuals or public bodies and afford them suggestions and co-operation; to prevent as far as possible, any injury to Ancient Monuments and Records, etc.; and to collect Photographs, Drawings and Descriptions and Transcripts of the same.

Membership

3. The Society shall consist of Life Members, Honorary Members, Ordinary Members, and Junior Members.

Life Members

4. Life Membership shall be gained by a composition fee of £25, or such sum as may be agreed on at the Annual General Meeting or at a Special Meeting, which shall entitle the Life Member to all the privileges of the Society.

Honorary Members

5. Honorary Members shall not exceed twenty in number. They shall be entitled to all the privileges of the Society, without subscriptions, but shall be elected or re-elected annually at the Annual General Meeting. Honorary Membership shall, as far as possible, be reserved (a) for those who have aided the Society locally, or (b) for those of recognised attainments in Natural History, Archaeology, or kindred subjects.

Ordinary and Junior Members. Annual Subscription, Privileges of Members

6. Ordinary Members shall be proposed and elected at any Meeting of the Society by a vote of the majority present. They shall contribute annually on the 1st October or within three months thereafter £1 10s, or such other sum as may be agreed upon at the Annual General Meeting, or at a Special Meeting. All Ordinary Members shall be entitled to attend the Meetings of the Society and shall receive gratis a copy of the "Transactions" of the Society on issue.

When more than one person from the same family and residing in the same house joins the Society, all after the first may pay half the subscription rate or such sum as may be agreed upon at the Annual General Meeting or at a Special Meeting, and shall enjoy the privileges of the Society except that they shall not receive gratis a copy of the "Transactions."

Junior Members are those who have not attained the age of twenty-one. They shall be proposed and elected in the same way as Ordinary Members, but shall pay an annual subscription of Two Shillings and Sixpence (2s 6d) or such other sum as may be agreed upon. Junior Members shall be entitled to all the privileges of membership, except that they shall have no vote nor shall they receive gratis a copy of the

"Transactions." Junior Members shall be liable for the Ordinary Membership subscription on the first day of October following their twenty-first birthday, or within three months thereafter.

Subscriptions from newly elected Members are due immediately after election.

Overdue Subscriptions

7. Members whose subscriptions are in arrears shall not receive the "Transactions." If in arrears for fifteen months and having received due notice from the Treasurer, they shall cease *ipso facto* to be Members of the Society.

Strangers

8. A Member may introduce a friend to an Ordinary Meeting of the Society.

Office-Bearers. Council. Election.

9. The business of the Society shall be conducted by a Council composed of a President, Past Presidents, four Vice-presidents, Secretary, Treasurer, and twelve Ordinary Members, together with a Librarian and Departmental Curators, if any. They shall be elected at the Annual General Meeting and shall be eligible for re-election with the following provisos:

The President shall not occupy the Chair for more than three years consecutively and shall not be eligible for re-election until the expiry of one year.

Each year one Vice-president and three Ordinary Members shall retire and shall not be eligible for re-election until the expiry of one year. In deciding who shall be ineligible for re-election, the Council shall take into account length of service and attendance at the Council meetings, but if vacancies occur owing to voluntary retirement or death, these vacancies shall reduce the retiring quota.

The Council shall have power to fill casual vacancies occurring during the year. Any person thus appointed shall be subject to the same conditions as those applicable to the person whom he replaces.

Quorum

Five Members shall form a quorum at a Council Meeting.

Fellows

10. On retiring, Presidents shall become Fellows of the Society. This honour may also be conferred upon Members of the Society who have done outstanding scientific work for the Society. Such individuals shall be proposed by the Council for election at an Annual General Meeting. A Fellow shall be eligible for any office for which he is qualified.

Committees

11. The Council may appoint Committees for any specific purpose, and with such powers as may seem warranted by the occasion; any such Committee to be composed of not less than three Members of the Society, exclusive of the President and the Secretary, who shall be *ex officio* members of all Committees. Every Committee shall have power to co-opt.

Secretary's Duties

12. The Secretary shall keep a Minute Book of the Society's Proceedings, shall conduct the ordinary correspondence of the Society and shall submit a report on the previous year's activities at the Annual General Meeting. The Secretary shall call all Meetings.

Editor

13. The Council shall appoint a Member of the Society as Editor of the "Transactions," who shall be *ex officio* a Member of the Council.

Treasurer's Duties

14. The Treasurer shall collect the subscriptions, take charge of the funds, and make payments therefrom under the direction of the Council, to whom the Treasurer shall present an Annual Account made up to 31st March, to be audited for submission at the Annual Meeting.

The insurance against fire and theft of all the belongings of, or of articles in charge of, the Society shall be the responsibility of the Treasurer.

Invested Funds

15. The Invested Funds of the Society shall be in the name of the President, Secretary, and Treasurer, for the time being, conjointly. Life Membership fees are to be regarded as capital, and are to be invested at the discretion of the above-named three Office-Bearers in any Stocks known as Trustee Securities, or in a Bank Deposit.

Meetings

16. The Meetings of the Society shall be held, as arranged by the Council, and at such meetings papers may be read and discussed, objects of interest exhibited, and other business transacted.

Field Meetings

17. The Field Meetings shall be held as arranged by the Council, to visit and examine places of interest, and otherwise carry out the aims of the Society.

Annual General Meeting

18. The Annual General Meeting, of which not less than fourteen days' notice shall be given, shall be held in October, and at this Meeting the Office-Bearers, Members of Council, and two Auditors shall be elected. Fifteen Members shall form a quorum.

Reports (general and financial) shall be submitted and any other competent business transacted. Office-Bearers and Members of Council shall be nominated by the outgoing Council, but it shall be competent for any two Members to make alternative or additional nominations, provided that they are in the hands of the Secretary, together with the consent in writing of the nominee(s), at least seven clear days before the meeting. A ballot shall be held if necessary.

Special Meetings

19. The Secretary or the President shall at any time call a special meeting of the Society on receiving instructions of the Council, or a requisition signed by six Members. Every Member of the Society must be informed of any such Special Meeting, of which not less than seven days' notice must be given. Fifteen Members shall form a quorum.

Transactional Right To Publish Papers

20. The Council shall have the right to publish in the "Transactions," or otherwise, the whole, or part, or a résumé of, any paper read by any member or person at a meeting of the Society, and the Council shall decide what illustrations, plates, or diagrams shall be reproduced with any such papers.

Separate Copies of Papers

21. Contributors of papers to the Society shall be entitled, if such papers be published in the "Transactions," to receive ten copies gratis of such papers as "separates" in pamphlet form.

Loans

22. The Society is prepared to accept articles of interest for exhibition on loan, but they will not be responsible for their damage or loss by fire, theft, or any other cause. It is desirable that parties lending articles should state the value put upon them, that the Society (in their discretion) may insure the articles for a similar amount. The Council shall have the power to terminate or to refuse, the loan of such articles as they may from time to time see fit.

Rules

23. These Rules cancel all other Rules previously passed. They shall be printed in pamphlet form and a copy shall be supplied to every member and to every new member on his election. They shall take effect from the date of the Annual General Meeting at which they were adopted.

Alteration of Rules

24. Alterations of these Rules or the addition of any new rule shall be made only with the consent of three-fourths of the Members present and voting at an Annual General Meeting, or at a Special Meeting, notice of such proposed alteration or addition having been given in writing to the Secretary not less than fourteen days previous to such Meeting. The Secretary shall intimate to all Members that a change in the Rules is proposed.

Publications of the Society

Transactions and Journal of Proceedings: 1st Series—(a) 1862-3, (b) 1863-4*, (c) 1864-5*, (d) 1865-6*, (e) 1866-7*, (f) 1867-8. New or 2nd Series—(1) 1876-8*, (2) 1878-80*, (3) 1880-3*, (4) 1883-6, (5) 1886-7, (6) 1887-90, (7) 1890-1, (8) 1891-2*, (9) 1892-3, (10) 1893-4, (11) 1894-5*, (12) 1895-6*, (13) 1896-7, (14) 1897-8, (15) 1898-9*, (16) 1899-1900, (17) 1900-5 (in 5 parts), (18) 1905-6, (19) 1906-7, (20) 1907-8, (21) 1908-9, (22) 1909-10, (23) 1910-11*, (24) 1911-12. 3rd Series—(i) 1912-3, (ii) 1913-4, (iii) 1914-5, (iv) 1915-6*, (v) 1916-8, (vi) 1918-9, (vii) 1919-20*, (viii) 1920-1, (ix) 1921-2, (x) 1922-3, (xi) 1923-4, (xii) 1924-5, (xiii) 1925-6*, (xiv) 1926-8, (xv) 1928-9, (xvi) 1929-30, (xvii) 1930-1, (xviii) 1931-3, (xix) 1933-5, (xx) 1935-6, (xxi) 1936-8, (xxii) 1938-40*, (xxiii) 1940-5, (xxiv) 1945-6, (xxv) 1946-7, (xxvi) 1947-8, (xxvii) 1948-9 (Whithorn Vol. 1), (xxviii) 1949-50, (xxix) 1950-1 (with Index of Vols. I to XXVI) Vol., (xxx) 1951-2*, (xxxi) 1952-3* (Hoddam Vol.) (xxxii), 1953-4, (xxxiii) 1954-5, (xxxiv) 1955-6 (Whithorn Vol. 2), (xxxv) 1956-7, (xxxvi) 1957-8, (xxxvii) 1958-9, (xxxviii) 1959-60, (xxxix) 1960-61 (with Index of Vols. XXVII to XXXVIII), (xl) 1960-62* (Centenary Vol.), (xli) 1962-63, (xlii) 1965 (new format), (xliii) 1966, (xliv) 1967.

Prices:

Series 1 and 2. On application to Hon. Librarian.

	Members	Non-Members
Series 3, Vols. 1 to 27, each	10s	12s 6d
28 to 33, "	15s	£1 1s 0d
34 to 43, "	£1 1s	£1 5s 0d
44, "	£1 10s	£1 15s 0d

Runs of Volumes—On application to Hon. Librarian.

A List of the Flowering Plants of Dumf. & Kirkcud., by James McAndrew, 1882*.

Birrens and its Antiquities, by Dr J. Macdonald and James Barbour, 1897. 7s 6d, post free.

Communion Tokens, with a Catalogue of those of Dumfriesshire, by Rev. H. A. Whitelaw, 1911*.

History of Dumfries Post Office, by J. M. Corrie, 1912*.

History of the Society, by H. S. Gladstone, 1913*.

The Ruthwell Cross, by W. G. Collingwood, 1917*.

Records of the Western Marches, Vol. I, "Edgar's History of Dumfries, 1746," with illustrations and ten pedigree charts, edited by R. C. Reid, 1916*.

Records of the Western Marches, Vol. II, "The Bell Family in Dumfriesshire," by James Steuart, W.S., 1932*.

Records of the Western Marches, Vol. III, The Upper Nithsdale Coalworks from Pictish Times to 1925, by J. C. I. McConnel, 1962. 15s.

Notes on the Birds of Dumfriesshire, by Hugh S. Gladstone, 1923*.

A Bibliography of the Parish of Annan, by Frank Miller, F.S.A.Scot.*.

* Indicates out of print.

REPRINTS

ARCHAEOLOGICAL

Bronze Age Metalwork in Dumfries and Galloway by Dr John M. Coles (1965), 38 pp. with 11 figs., 1 pl., and inventory of 233 finds. 4/- post free.

Food Vessels in S.W. Scotland by D. D. A. Simpson (1965), 26 pp. 76 vessels illustrated, described and fully discussed. 3/6 post free.

Excavations at McNaughton's Fort, Kirkcudbright by J. Scott Elliot, D. D. A. Simpson and J. M. Coles, (1966), 7 pp. 3 pl., 3 figs. 3/- post free.

Fragments of a Roman decorated lead sarcophagus from the Grierson Museum, Thornhill, by Prof. J. M. C. Toynbee, (1966), 4 pp., 6 pl. 5/- post free.

Ardwall Isle; The excavation of an early Christian site of Irish type by Charles Thomas, (1966). 33 pp., 1 pl., 4 figs. 5/6 post free.

11th Century War Axe in Dumfries Museum by J. G. Scott (1966), 4 pp., 2 figs. 2/6 post free.

Moffat Spa in the 17th and 18th Centuries by W. A. J. Prevost (1966) 10 pp., 2 pl. 4/6 post free.

NATURAL HISTORY

Fossil Footprints from Dumfriesshire with description of new forms from Annandale by J. B. Delair (1966), 17 pp., 4 figs. 2/6 post free.

Fish Fauna of the Castle and Mill Lochs, Lochmaben, with special reference to the Lochmaben Vendace, *Coregonus Vandesius* Richardson by Dr P. S. Maitland (1966), 18pp., 2 pl., 2 figs. 2/6 post free.