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Contents

EDITORIAL

The article in this volume by Dr E. J. Perkins on the Marine Flora and Fauna of the Solway is the first of a series of three on this subject. The series is intended not only to be a general guide but an authoritative record of the general ecology of the Solway at the time when Dr Perkins was working in this area. This volume also sees in the article on Cinerary Urns by Mr A. Morrison another of the corpuses of archæological material in this area, which are essential to the periodic re-appraisement of our knowledge of prehistory. In course of preparation is a corpus on Beaker pottery from S.-W. Scotland.

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. 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.

NORTH SOLWAY BIRD REPORT No. 2—1966

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

As far as space allows, we have tried in this report to introduce a few notes and comments which we hope will emphasise some points of interest and lessen the impression of a mere catalogue of dates and numbers of species recorded.

As in 1965, a number of the commoner birds are included at the end of the Classified Notes, not because they are without interest but because we had nothing of special value to say about them in this particular year. All species recorded in 1966 are therefore at least mentioned and all possible care has been taken to include only records of undoubted accuracy.

The Ringing section in the Appendix is the work of the very active North Solway Ringing Group, with a very few additions from other ringers. Abbreviations: D—Dumfriesshire; K—Kirkcudbrightshire; W—Wigtownshire.

County initials have not been repeated every time when a place name appears frequently.

CLASSIFIED NOTES

Black-throated Diver. Pair on a loch in (W), June and early July. Pair still in full breeding plumage on a loch in (K), 20th August.

Red-throated Diver. Single birds Portowarren, Southerness (K) and Loch Ryan (W) 24th December. 3 Knock Bay (W), 11th April. Dead birds found at Waterfoot, Annan (D), 8th May, Balcary Bay (K), mid-May, and Caerlaverock, 15th November (Regular sightings of "Divers" in small numbers off Southerness, January-March and November-December, species not determined).

Great Crested Grebe. Widespread on coasts, from Browhouses (D) to Loch Ryan (W), out of breeding season. 21 were in Wig Bay, Loch Ryan on 8th December. Pairs on lochs in spring and summer at 3 localities in (D), at least 4 in (K) and at least 2 in (W). 34 including 24 juveniles was a high count even for Lochmaben (D). Present on lochs in the Ken Valley (K) from mid-March till early November. A nest on Loch Ken in May almost certainly lost when water level rose.

Red-necked Grebe. I off Innermessan, Loch Ryan, 17th December, and 2, there, 29th December.

Slavonian Grebe. 3 South of Leffnol Point, Loch Ryan, 26th January. 1 Luce estuary (W), 5th November. 1 Wig Bay, Loch Ryan, 8th December, and 1, there, 29th December.

Black-necked Grebe. 3 Adults at a loch in (K) in June and 2 at a neighbouring loch during September, 1 in July at a loch in (W). No proof of breeding. Winter records are all from Loch Ryan, a regular haunt, where 1 was seen on 26th January, 4 on 11th March, 4 on 8th December, and at least 6 on 29th December. They were seen off Innermessan Point, near Stranraer town and at the Wig.

Little Grebe. Bred at a number of localities (D) and (K) and on at least 3 waters in (W). Widespread in Winter on fresh water all 3 counties. At one haunt in (K) breeding failure of 3 pairs considered due to increased disturbance.

Fulmar. No definite change in breeding distribution (K and W) from 1965. 6 pairs were at Portowarren on 29th December.

Gannet. No count made of breeding colony on Scar Rock. Widely noted off coasts of (W). An adult off Portowarren (K), 29th December.

Cormorant. High counts for (D) were 141 at Browhouses, 9th September, and 154 off Caerlaverock, 22nd November, including only 12 first winter birds. Numerous inland records outwith the breeding season, notably from Lochmaben (D), Carlingwark (where trees on island used as roost) and Loch Ken (K), 33 were on the shore South of Leffnol Point, Loch Ryan on 29th September. Breeding population in North Solway for 1966 estimated at 526 pairs.

Shag. No details noted on established breeding colonies. Regularly seen in Stranraer harbour in Winter. An adult at Southerness (K), 27th December.

Heron. Bred all 3 counties. A heronry at Muirburnhead, Canonbie (D) was of 17 nests, in tall spruce trees. 15-20 pairs nested in Minnigaff (K) heronry, where 4 young were found dead in one nest. Frequent on tidal waters, July onwards, often in loose groups of 4-7; 21 from Caerlaverock-Lochar river mouth (D) was a high count on 7th August.

Bittern. One at Loch Connell (W), 7th August. One at Barclosh, Dalbeattie (W), 26th October.

Little Bittern. A bird which was almost certainly of this species was seen by a Forestry Commission Keeper at Auchinleck Loch (K), 30th May. Unfortunately the distinctive wing pattern was not noted, but the size, general appearance and posture seemed to rule out any other species. It had gone next day.

Mallard. The high numbers in December were notable, as by this time many have usually moved out of the region; there were then known to be at least 6000 birds, with the main concentrations at Sanquhar, Thornhill, Lochmaben, Browhouses, Caerlaverock (D), Dee Valley, Carsethorn (K), Luce Bay, Loch Connell and Lochinch (W). On 18th September, 800 were on a small loch near Loch Ken, with less than 100 on Loch Ken itself the same day.

Teal. Reports of Winter numbers show that while they were much reduced at some regular haunts relatively high counts were made in some lesser known places. In September there were 620 at Caerlaverock, 250 at Lochmaben, 100 at Waterfoot, Annan, and 105 at Loch Ken. On 30th December a total of 800 was noted on seven waters in (K).

Gadwall. The only record was of 2 on Loch Ken on 6th February.

Wigeon. No breeding records. Widespread inland and on the shore in Winter. The 3 counties held a population of at least 10,000 in mid-Winter.

Pintail. At least one pair bred Loch Ken, a duck with brood of 5 being seen by one observer and one with a brood of 3 by another, in early July. At Carsethorn/Drumburn 50 on 14th October, increasing to 600 by 17th November, and to a peak of 1400 on 27th December. Winter numbers at Loch Ken fluctuating, with peaks of at least 60, probably over 100, on 2nd March, 55 on 15th March, 70+ on 18th November. The last figure closely followed a count of only one on 13th November.

Shoveler. Present in Summer in (K) but no details of breeding obtained. Highest Winter count in (D) was 50+, Waterfoot, Annan, on 11th December, but small numbers widespread, especially in (K). Highest numbers on Loch Ken and Loch Erncrogo (K) were on 18th September, 25 and 30 respectively. Numbers on Loch Ken dropped to nil in January, with less than 6 in early February, but it is usual for most to leave there in cold weather. The slight increase in March (10 on 15th) does not compare with the numbers at this season a decade ago.

Scaup. Winter population over a long stretch of coast believed from notes received to be about 3000. Several counts of the Loch Ryan flock in January and December, varying between 90-215. 3 were in Loch Ryan, 10th July. Several inland records, not cited, possibly involved hybrids.

Tufted Duck. Bred at one locality (D). Present in Summer on at least 6 lochs (K), 2

broods of young seen Loch Ken on 3rd July. No breeding details obtained for (W), widespread winter records include 500 on 7 waters (K) on 30th December, 50 Loch Ken on 16th January, 40-50 on Carlingwark on 31st January. 40+ Castle Loch (D) on 30th December, 8 on Loch Ryan (Sea) in December.

Pochard. Though breeding has recently been suspected in (K) proof has long been wanting, as far as we know. Following the 1965 record of a pair courting on Loch Erncrogo a duck with a half grown young was seen there this year, between 26th June-6th July. 6 drakes were sitting on a muddy spit on Loch Ken on 3rd July but no ducks or young were seen. Otherwise widely noted from November-March. Counts included 25 Carlingwark, 31st January; 12 L. Ken, 15th March; 53 Castle L., Lochmaben, 16th November; 17 Lochinvar, 20th December; 67 L. Kindar (K), 27th December; 10 Auchenreoch (K); 20 L. Ken; 35 Milton (K), 30th December.

Goldeneye. Widespread winter records of small or moderate numbers on fresh water. Highest numbers on Loch Ken were 110 on 16th January, 85 on 13th February, 70 on 15th March, and 50+ on 30th December; last there in Spring 4 on 5th May and first in Autumn one on 18th September, 70+ Carlingwark on 30th December. Small numbers frequently on rivers such as Deugh and Black Water of Dee, as well as on lochs. Quite large gatherings at favoured spots on coast including 73 at Browhouses (D) and 100+ there on 19th April. There were over 40 at Loch Ryan, where many are often gathered near Stranraer, on 14th December, rather more on 29th December, including a high proportion of adult drakes. A pair were displaying at an inland locality in (W) on 10th June.

Long-tailed Duck. Adult females or first Winter birds were at Kirk Loch, Lochmaben (D), 16th October, Waterfoot, Annan, 26th December, the Wig, Loch Ryan (first Winter male), 8th December, Carlingwark, 28th December, Loch Ken, 30th December (these 2 perhaps the same bird) and 2 Southerness, 30th December. An adult male was at Caerlaverock, 28th November.

Velvet Scoter. Recorded in February and October, Carsethorn, maximum 21 on 16th February. Small numbers also reported in winter, Garlieston Bay (W).

Surf Scoter. Drake at Southerness, 1st January, and on several dates up to 27th February. Evidently present since 27th December, 1965 (Scot Birds 4 : 294). A duck was also present on 2nd and 5th January.

Common Scoter. Winter flocks of up to 300 reported intermittently at Southerness and Garlieston; up to 50 regularly at Port William (W) and Loch Ryan. Summer flock in Wigtown Bay thought to exceed 450.

Eider. Small numbers off Southerness, January-March and from 17th October-December. Up to 20 in Loch Ryan in Winter. Duck with young off Sandgreen, Gatehouse-of-Fleet on 8th/9th June was first record of breeding in (K) since 1908, though a nest is believed to have been photographed in a recent year. As in 1965 successful breeding was reported at Knock Bay (W) on the Rhinns coast, where ducks were seen with broods of 2, 3, 3, 5 and 5 young.

Red-breasted Merganser. No change noted in breeding distribution. Duck with brood of 9 Mochrum Loch, late June/early July; 4 young there 12th August. 5 young on Loch Ryan, 13th August. Out of breeding season records of small numbers in Nith Estuary, Carsethorn, Southerness, Dee Estuary, Luce Bay, inland on Lochmaben, Mochrum Loch and Lochinch. On Loch Ryan, the most notable haunt in the region, 100 were seen on 29th September, fewer in Winter.

Goosander. Bred (D) and (K) but no breeding records from (W). Six nests were found in Eskdale alone in (D). Again, as in 1965, post breeding flocks of ducks with young on Loch Ken were much smaller than in the recent past, the largest noted being 17 off Ringour on 10th August. Widespread inland in Winter, but counts on Loch Ken mostly very small, highest 25 on 16th January.

Smew. One redhead Carlingwark Loch, 31st January; one similar Loch Ken, 6th February.

A redhead again on Carlingwark and Loch Ken between 13th November and 28th December. Possibly all these records involve the same bird—it is certainly known that many duck leave Carlingwark for the lower part of Loch Ken/River Dee when the former freezes over, but it is of course much more speculative though not unlikely that the same bird returned to the area after a summer away.

Shelduck. A summer count of 14 main localities on 3rd July, from Annan to Luce Bay (W) gave a total of 2300 of which 24% were birds of the year.

Greylag Goose. The increasing and artificially distributed feral population now thoroughly confuses migration dates, especially when small parties are involved. The first immigrants in autumn were apparently 13 which flew south over Lockerbie on 4th October. Arrivals from the north were noted passing over Dalry on 23rd October, 250 being at Loch Ken by 25th October.

National Goose Counts:

5th March (D) 1790, (K) 880, (W) 3950 = 6620
6th Nov. (D) 690, (K) 700, (W) 3310 = 4700

There were 700 in the Dee Valley (K) on 28th December, when the population in (D) was almost nil.

Greenland White-fronted Goose. A single immature, Caerlaverock, 4th November-30th December. 1500 Loch Connell (W) and 60-70 in Bladnoch Valley (W), 9th November (the large flock at Loch Connell suggest they may have been Irish wintering birds on passage). At Moor of Genoch (W) there were 71 on 25th November and 84 later. Numbers in the Ken Valley were generally rather low, January-April, with 245 a maximum count on 13th February. Northward departure over Dalry was observed on 21st and 25th April (about the usual dates). First in Autumn were 170 on 20th October. At least 400 had arrived by Loch Ken on 7th November, including good numbers of young. Numbers thereafter were rather lower, highest December count being 350+ on 20th December.

Bean Goose. The first arrivals in the usual haunts near Castle-Douglas had been on 26th December, 1965, as already noted, in the 1965 report. Numbers had risen to 43 on 1st January, 44 on 2nd January, and 64 on 3rd January. 80 were seen on 30th January, and about 100 on 6th February. They probably left the district soon after this date.

Pink-footed Goose. A single bird with Bean, near Castle-Douglas, 3rd January; one with White-fronts, Loch Ken, 13th February.

National Goose Count:

5th March (D) 3700, (K) 290, (W) nil = 3990

Northward migration noted 1st May when 170+ were still at Glencaple. First Autumn arrivals were 51 flying south at Applegarthtown (D), 4th October. By 9th October 700+ were at Kinmount (D) and 5000 by 27th October. During October-November one was again with White-fronts by Loch Ken.

National Goose Count:

6th Nov. (D) 1920, (K) 1410, (W) 650 = 3980

After the initial build-up in late autumn in (D), many birds left the area, numbers dropping as low as 50 in November and December, when there were very large flocks in Perthshire.

Brent Goose. An immature of the pale-breasted form was at Caerlaverock with the Barnacle flock from 4th November to 30th December.

Barnacle Goose. The first autumn arrivals at Caerlaverock were 1200 on 26th September, numbers increasing to 2500 by mid-October. The flock remained at an average of

2000 till the end of the year, small parties being seen at Holywood (D), Southerness (K), Luce Bay and Lochinch (W).

Canada Goose. The breeding stock at Kinmount is sadly reduced. Bred Lochinch (W)—where hybridising with feral Greylag—and Loch Maberry (W).

Mute Swan. Bred all 3 counties. Counts at Annan, Lochmaben, Dumfries, Carlingwark, Loch Ken, Kirkcudbright and Stranraer harbours and Loch Ryan gave a total of about 220 birds during November.

Whooper Swan. Numbers at Loch Ken were between 20 and 30 in January and February, rising to a spring peak of 31 on 15th March. Smaller numbers were noted at Carlingwark and at other neighbouring haunts. 53 were still at Cargen (K) on 13th April, but none there later. A small party was still at Loch Ken on 1st May. The first noted in Autumn were 3 at the Wig, Loch Ryan, on 10th October, with arrivals at Lochmaben and Dalbeattie on 16th October. The regular flock at Islesteps (K) had risen to 64 by 28th December, on which date there were 18 at Carlingwark, 43 at Loch Ken, 3 in Fleet Bay and 24 at Loch Ryan. 53 alternated between Loch Connell and Wig Bay (W) in December of which some 25 were found dead. Post-mortems on some of these gave no firm indication of cause of death.

Golden Eagle. One pair hatched 2 young, both of which died, possibly the result of human disturbance at the nest. A second pair abandoned their eyrie early in the season and a third young pair briefly occupied a new site but did not complete a nest. There was a possibility that one nest may have been successful.

Buzzard. A good breeding season in (D) especially in Nithsdale where it is considered to be increasing. A good many nests noted in (K), but the rather meagre details on success indicate some failures and at least 2 with only one young surviving. Frequent and widespread records out of breeding season in (D) and (K) often of parties of up to 5 and one of 7 at Thornhill.

Sparrow Hawk. Bred well in (D) where one forest was known to have at least 10 nests, though fledging success was poor in relation to eggs laid. Lack of detail on breeding elsewhere, but pairs fairly widespread in (K) at least.

Goshawk. Occasional records, as in other recent years.

Hen Harrier. Since a general reference to breeding in S.-W. Scotland has recently been made in " British Birds " there seems no point in maintaining secrecy except in details of localities. It may be appropriate to give a brief résumé of recent breeding status. Since extermination in the late 19th century, there were only 2 probable attempts at breeding, before 1959, one on the Dumfries-Cumberland Border in 1925, the other, less certain near Closeburn in 1920. In 1958 a cock was seen in summer by Commander J. Graham in a likely breeding area (evidence suggests that nesting may have occurred before this), and in 1959 A. D. W. and A. W. F. Mills found a nest there. This reared 4 young, a result which was perhaps aided by careful guarding and secrecy. Breeding pairs have been present and nests observed in all subsequent years. The discovery of nests in quite different areas in 1960 and 1963 suggested that colonisation, though sparse, was taking place over a wide area. The number of known successful nests remained very small. In spite of the law which provides heavy penalties for destruction of these birds or their nests, it seems almost impossible to prevent some game preservers from shooting or trapping Hen Harriers, although vigorous attempts have been made. The situation is particularly ironical in view of the new law in force from 1968 which makes it illegal even to disturb such birds at the nest without special licence. On one large estate in (W) the head gamekeeper has more than once stated that it is his routine policy to destroy all Hen Harriers which attempt to nest on grouse moors. In 1966 only 2 successful nests were known each rearing 3 young while at least another 4 pairs were in breeding territories.

Osprey. One at Loch Ken on the early morning of 1st May was seen to catch and eat a perch. This was only the second definite record for (K) this century. An

unprecedented number of sightings—8 between 14th and 25th August—in (D) may have all been of one bird.

Peregrine. Breeding success remains low. Some improvement maintained in 1963, but no significant change from 1965. See "The Peregrine situation in Great Britain 1965-66" by D. A. Ratcliffe, in Bird Study, 14.4. It does not seem advisable to specify details of eyries by counties with this much threatened species. Of at least 12 eyries known to have been occupied by pairs (one or two others were visited by single birds), the outcome was unknown in 4, young did not hatch in 4 others (one pair making 2 unsuccessful attempts) and a total of 5 young were reared from a further 4, one rearing 2. Details of appreciable amounts of toxic chemicals in eggs from 3 sites are given by Ratcliffe, in none of which young were hatched. Frequent and fairly widespread records in winter, especially on coasts where various waders and teal noted as quarry.

Merlin. Bred (D) and (K) and probably in one area in (W). At least 5 pairs were known in (K). One nest hatched 5 young from a clutch of 5, 4 fledgling. The cock of one pair in (D) was killed by a Peregrine in March. Frequent in late autumn and winter at regular haunts such as Caerlaverock, Carsethorn (where one was found shot on 27th October), Southerness, Loch Ken, Luce Bay and Loch Ryan.

Kestrel. Widespread breeding; especially in (D) and (K) with many successful nests, nine were found in Eskdale alone. As usual in (K) hydro-electric dams provided one or two sites; on 24th March, 11 birds were seen on a drive between Dalry and Moniaive.

Partridge. Continues scarce generally, although evidently much depends on good management of stocks. Many good coveys seen in (K) and (W) where cereal crops are on coastal cliff tops.

Quail. One calling at Applegarthtown (D) 8th July, where regularly recorded since 1963.

Water Rail. At least 4 known breeding sites in (D). Fairly frequent and widespread winter records in suitable habitat, one at Loch Connell (W) on 28th August.

Spotted Crake. A bird considered to be of this species was heard calling at Carlingwark Marsh on 28th December.

Corncrake. Earliest one calling near Canonbie between 1st-15th May; heard at least 5 localities in (D) by 30th May; breeding details lacking. Scarce in (K), one near Creetown June/July. Bred (W), 2 nests each with 10 or 12 young destroyed accidentally by Forage harvester at Killantringan on 4th and 8th June.

Moorhen. It is not certain, though possible, that winter numbers are even larger than in summer. Flocks in winter of up to 50 regularly collect, for example near Thornhill, where there is outside feeding of farm stock.

Coot. Several observers have noted rather large concentrations in all 3 counties, particularly in cold spells. A small flock were feeding on the muddy shore of Loch Ryan on 29th September, and this habit continued through the winter, at least 60 being counted in October and December.

Lapwing. In (D) a marked shift was noted in breeding preference from low-lying fields to higher ground, where loose colonial nesting of up to 21 pairs was not uncommon, especially in Nithsdale. In (D) numbers were considered completely recovered since 1963. Numbers in (K), at least on some low ground in Glenkens still well below pre 1963. Many first clutches on hill ground in (K) lost in April snowstorm. Specially large autumn and winter flocks noted in Lochar Estuary (D) and Luce Bay (W).

Ringed Plover. Continues to be a widespread and numerous breeding species, especially along the coasts of (K) and (W). One observer counted over 18 nests in June, the Port William-Mull of Galloway coastline being most favoured. A flock of 400-500 at Caerlaverock on 15th November were small dark birds and were considered to be most probably of the tundra race, C. maticula tundrae.

Grey Plover. Recorded in small numbers, Carsethorn, Southerness and Luce Bay. 11 at Caerlaverock were in partial breeding plumage on 20th August. An exceptionally large count of 120 were at Waterfoot, Annan, 5th November.

Golden Plover. Movement to the moors was noted in (K) as early as 6th February. Migrant flocks of northern birds included 200 at Hayfield, Thornhill, and 75 at Cummertrees, during April. Winter flocks at regular haunts were of 1000 or more, 2000 at Wigtown Bay on 28th November.

Jack Snipe. Though much overlooked by bird watchers, reports indicate that small numbers continue to frequent winter haunts, such as Hightae Marsh, Castle-Douglas. 2 were at Powfoot (D) on 24th December.

Woodcock. Numbers observed roding in afforested parts of (K) indicate a high breeding density there. One had a regular roding flight over the main street of Dalry.

Whimbrel. Regular in small numbers in spring over Caerlaverock Merse and at Waterfoot, 5 near Priestside 8th-22nd May. 3 at Caerlaverock, 20th August. Not noted passing over Glenkens in May this year—perhaps only due to insufficient observation.

Black-tailed Godwit. Several Kenneth Bank (D), 16th April. 10 Luce Bay, 1st May. 27 Glencaple, 2nd July, increased to 70 by 22nd July. A count of 73 at Carsethorn, 28th August, may have been of the same flock. 43 were at Glencaple, 20th September. Numbers at Carsethorn had dropped to 4 by 27th November. One at Luce Bay, 17th August. 2 on 23rd August, and one on 29th August. The only winter record was of 3 at Waterfoot, 11th December.

Bar-tailed Godwit. 20 at Waterfoot, Annan, on 13th March, 59 on 1st July and 400+ on 9th October. 700 at Southerness, 20th October, decreased to 200+ by 29th December. Small numbers in autumn and winter at scattered points elsewhere on coasts of (K) and (W).

Green Sandpiper. Single birds at Islesteps on several dates from 2nd January to 8th February, and from 18th-21st August. One at Caerlaverock, 26th August.

Common Sandpiper. First spring arrival was at Waterside Mains, Keir (D), 27th March. Several were noted between 4th and 20th April, at various localities. Coastal breeding in (K) is well known but it is perhaps worth recording that a nest at Balcary, with 4 eggs on 15th June, was only a few yards from the tide-wrack. Return passage on the shore was noted by July, with 7 at Waterfoot, a few at Caerlaverock and 14 near Creetown (K)—but the last may have included local coastal breeders. Last 2 at Waterfoot, 21st September.

Redshank. Large autumn movement noted by 7th August, where many hundreds were at Waterfoot, 1000+ at Carsethorn, and 400 at Southerness. On 1st September, 1000 at Waterfoot and 700 at Carsethorn. One found dead at Piltanton, Luce Bay on 10th September, was of the larger Icelandic form as were 7 examined after being shot by wildfowlers at Caerlaverock during November.

Spotted Redshank. Single birds Luce Bay, 1st May, Loch Dornal (W), 19th June, 2 Loch Ryan, 17th September, and 3 Wigtown Merse, 18th September, 2 on 14th, and 4 on 21st September, Waterfoot.

Greenshank. Winter records were 2 at Skyreburn, Gatehouse-of-Fleet, and one inland at Lockerbie, 23rd January. One at Southerness, 27th December, 2 at Fleet Bay (K), 28th December, and at least one regularly at Caerlaverock. On passage in spring one flew over Dumfries on 22nd May, in autumn one was at Loch Ryan on 9th July, and 4 at Waterfoot by 27th July. Thereafter there were small numbers at the usual haunts, several being seen flying up the River Annan, one as late as 8th November. Quite a few visited Loch Connell (W) in autumn, and 2 were seen at Dunskey Loch (W).

Knot. Winter flocks included up to 600 at Waterfoot, 4000 at Caerlaverock, 6000 Carsethorn/Southerness, 300 Luce Bay, 200 Loch Ryan.

Dunlin. Bred, but nowhere numerous (D) and (K). Widespread on coasts out of breeding season. 350 were at Waterfoot on 8th May, and 100+ on 8th July, 300 at Fleet Bay, 28th December, 2000 Southerness, 29th December.

Sanderling. 10 at Waterfoot, 8th May, and one there 25th July. 6 at Southerness, 14th August and at least one there 27th November, 2 Carsethorn, 29th December.

Ruff. No spring records. One Luce Bay, 29th August, 3 at Cummertrees (D), 4th September, one inland at Morrishead (D), 15th September.

Arctic Skua. Several records of single birds, Southerness, between 10th August, and 20th September.

Great Skua. One with gulls, Moor of Genoch (W), 26th February.

Common Gull. Bred all 3 counties. In (K) the Lochinvar colony was of 20 pairs, rather more at Loch Skerrow, only one or two pairs at Clatteringshaws and few at Kendoon. Breeding was suspected at Loch Enoch. 2 pairs bred at Rough Island. Of several very large autumn/winter roosts, that at Browhouses held 3000 birds by 9th September.

Kittiwake. An immature at Lorg, Upper Ken Valley (K) on 22nd May in wild weather with N.-W. gale and rain. First inland record for (K).

Common Tern. Counts of some of the colonies in (K) were made as follows: 40-50 pairs, Skyreburn, 30-40 pairs Mossyard, 8 pairs Garvellan Rocks, off Mossyard Bay, 40-60 pairs Rough Island, also 10 pairs Terally Bay (W).

Arctic Tern Single birds reported in June-July, River Cree and Luce Bay.

Roseate Tern. On 5th/6th June at least 6 were seen at a colony of Common Terns and on 10th June 2 were at a different colony. No evidence of nests.

Little Tern. Always a very local breeder in our area, this species is especially vulnerable to human disturbance on beaches. In 1966 no nests were reported, the only record being of 2 near Drummore (W), perhaps nesting, in late June-early July. One observer made an extensive search for nesting pairs along coasts of (K) and (W) without success.

Sandwich Tern. Although small numbers were quite widely noted on coasts, a search for nesting colonies covering much of the coast of (K) and (W), but not all islands, revealed none. Several still at Loch Ryan on 29th September.

Black Guillemot. 2 Loch Ryan, 26th January. Pairs, presumably breeding, were noted quite widely on coasts of (W); of 5 pairs at Portpatrick in June, 3 were on islets and 2 in harbour walls; 2 pairs were at Mull of Galloway and some south of Garlieston. A pair were seen at Rockcliffe (K) and thought to be breeding in the vicinity.

Puffin. 2 were seen passing the Mull of Galloway flying towards the Scar Rocks, in early July.

Collared Dove. Bred (D) and (W). Proof of breeding was lacking at Dalry (K) where one or two were about April-June. Apart from the colony already noted at Garlieston, a number apparently bred on the Rhinns where at least 4 pairs were at Dunskey; also seen at Kirkcolm, Stranraer, Glenluce town and Killantringan.

Cuckoo. In late May was considered scarcer than usual in New Galloway—Clatteringshaws—Cain Edward. Meadow Pipits are common host species in this area and there is a possibility that cuckoos are less attracted as afforestation increases and grows denser.

Barn Owl. Widespread, as usual in parts of (D) and (K), but reported "not common" near Langholm (D), where a nest was found. One bird was found under a bed in a house at Auchencairn (K) in June. Fairly frequent winter records (W).

Little Owl. One found stunned by a car—and photographed, near Glenluce Abbey, on 3rd December, is the first definite record for (W). We are informed, however, that others have been seen in the district recently; 2 at Caerlaverock Castle, 26th-30th December.

Long-eared Owl. Lack of reports in (D) and (K) may exaggerate the undoubted scarcity of this owl during the year. Single, Caerlaverock Castle, 26th December.

Short-eared Owl. Bred widely but nowhere in abundance and commonly seen, mainly on low ground, in winter.

Nightjar. Reports were rather conflicting. In (K) none could be found at one regular haunt but one observer reported birds at "several" sites, especially near Gatehouse, in late June-early July. A probable record comes from near Canonbie on 8th May.

Swift. First in spring at Dumfries, 1st May, and at Dalry (K), 3rd May.

Kingfisher. Bred successfully in at least one locality in (D). Breeding also reported at one place in (K). Occasional records of birds elsewhere in (D) and (K).

Green Woodpecker. Observations in (K) suggest no falling off in numbers, perhaps even an increase. A pair with flying young at Wood of Cree were the most westerly yet recorded.

Great Spotted Woodpecker. Not scarce but in parts of (K) some decrease was suspected.

Skylark. An extraordinary movement affecting both (D) and (K) took place on 19th February when at least 45,000 birds were involved. 15,000 were estimated to have passed eastward at Powfoot (D) in the morning while " thousands " were reported from Kirkcudbright where some entered houses and many were found dead.

Shore Lark. During the large movement of Skylarks on 19th February, a male was seen at Powfoot, at least 3 being heard calling among the passing flocks as well. These records are the first for (D).

Swallow. First in spring were 2 at Duck Farm, near Moffat, 17th April. Widespread records by 21st April, main arrivals somewhat later. Last seen, Dumfries, 27th November.

House Martin. First in spring were 2 at Applegarthtown, 22nd April, widespread by 7th May. Last seen at Dumfries, 28th October.

Sand Martin. First in spring at Dumfries and Loch Arthur (K), 6th April. At least 400 were over Loch Ken on 10th April in cold weather, feeding among Blackheaded Gulls, out from the mouth of Louran Burn. At least 2000 were at Mersehead (K), on 17th July.

Raven. Bred all 3 counties. In (K) it is notable that the distribution of inland nests is now mainly or possibly entirely outwith the area planted by the Forestry Commission. A number of coastal sites were occupied especially in (W).

Carrion/Hooded Crow. Many reports of hybrids or at least of birds showing some grey in their plumage. None could certainly be called " pure " Hoodies. At least 2 birds near Clatteringshaws (K) in May had some white on neck or breast.

Magpie. Some evidence of increase in (W), where now numerous in Sorbie-Whithorn area, and in (K), where considered fairly widespread in lowlands, away from keepered ground, with several pockets of birds in afforested hill country.

Jay. Reports indicate no change from 1965.

Chough. Reported at a different coastal locality from either of those where birds were seen in 1965.

Willow Tit. Bred (D) and (K). A pair by Loch Ken had begun excavating a nest-hole on 27th March and were still working at it on 10th April. During November-December at least one visited 2 different bird-tables for peanuts in Dalry.

Coal Tit. The large breeding population in conifer forests in (K) are clearly largely ground nesters, one site even being at the top limit of tree planting, among boulders on a steep hill face.

Long-tailed Tit. A successful breeding season indicated. Large families were especially commented on in the Cree and Fleet Valleys in (K).

Nuthatch. One was seen at a locality in (K) where it had also been present in 1965. It visited a garden between September and November.

Mistle Thrush. Flocks of 20 or more were a feature of a young conifer plantation in (K) (K) during July-August.

Fieldfare. Notable spring passage at Laverby (D), 19th April, along with a fair number of Mistle Thrushes. First in autumn were 20-30 at Beattock on 26th September. A few were near Dalry (K) on 30th September, and near Stranraer on 1st October. One of the largest movements recorded, along with Redwings, took place over a wide area between 5th-9th October. " Thousands " came down the Crawick Valley and 5000 flew south through the Cairn Valley on 9th October. Over 1000 were noted

at Thornhill, Powfoot and Caerlaverock and many in the Glenkens (K) at the same time. By about the end of October the berry crop was obviously depleted and many birds had moved on.

Redwing. First in autumn were over Dumfries at 10 p.m. on 28th September. In the large movement on 6th October, Redwing numbers even exceeded Fieldfares in some flocks. The recovery of a Dumfriesshire ringed bird in Portugal (see Appx.) is an example of later onward passage.

Ring Ouzel. First in spring was one at Shaw Hill (K) on 27th March. First in (D) at Wamphray, 29th March. Hardly widespread before 12th April, though a pair were in breeding territory in (K) on 2nd April. 20 were in a flock at Beattock on 12th September.

Blackbird. The usual November immigration was evident in the Loch Ken region, especially on 12th-13th November.

American Robin. A single bird at the north end of Woodhall Loch (K) on 12th May (see Scot. Birds 4. 376) was the first record for the Solway area and the second for Scotland.

Wheatear. First in spring were 2 males west of New Galloway on 28th March. On 3rd April at least 2 were near Gatehouse and one at Glenkiln. Many ("scores") by the Deugh Water near Carsphairn on 14th August, suggest a big passage movement.

Stonechat. At least 2 pairs in (D), where none were found at previous inland haunts. On coast of (K) only one pair in May at Balcary where there are usually several. Inland in (K) breeding pairs were near Murray's Monument, at Loch Skerrow and near Little Fleet Viaduct (in young forest, where young seen) and at the Clints of Drummore (pair with young in nest, 1st July). These records suggest little change in this area from 1965. In (W) continues a common breeding bird on much of coast. Fairly widespread, mainly near coasts of (K) and (W) in winter.

Whinchat. First in spring at Dunragit (W), 29th April. Widespread by 10th May. On 27th May, 9 were counted by the roadside, in breeding territories, between New Galloway and Clatteringshaws. Although a very common breeding bird over large areas of young forest, the density of pairs along this stretch of road, which is not all afforested, is particularly heavy. Last seen on 12th September, near Dalry.

Redstart. First in spring was a male at Kenmure (K), 21st April. The first noted in (D) was at Applegarthtown on 26th April, and several in the Glenkens by 24th April. Widespread arrivals by 10th May.

Robin. A tame bird, probably the same as in 1965, entered a car to be fed, by Loch Ken, in January and again in December.

Grasshopper Warbler. First in spring at Waterside Mains (D), 25th April, and one at Dunragit (W) on 26th April. Widely reported in (K), especially, as usual, in young conifer forest where in places as many as 5 singing birds could be heard at one time. Still in song at Munches (K), 7th July.

Sedge Warbler. First in spring was at Loch Ken, 1st May, First in (D) at Applegarthtown, 3rd May. Widespread all 3 counties by 10th May.

Blackcap. First in spring were males at Port William (W) and Waterside Mains (D) on 25th April. This was a good year for this species, with widespread breeding in (D) and (K).

Garden Warbler. First in spring were at Woodcockair (D) on 1st May and at Kenmure (K) on 2nd May. In a part of Cairn Edward Forest (K) where a few old hardwood trees remain among fairly young conifers, 3 or 4 were in song in quite a small area on 27th May.

Whitethroat. First in spring was an early bird at Munches (K) on 18th April, followed by one at Dunragit (W), 26th April, and one at Applegarthtown (D) on 27th April. Widespread all 3 counties by 7th May.

Willow Warbler. First in spring was one at Port Logan (W), 7th April. One was singing

by Loch Ken on 14th April and another at Cummertrees (D), 16th April. Large arrivals between 18th-25th April. Marked autumn passage noted in (D) where over 700 were trapped and ringed.

Chiffchaff. First in spring by Loch Ken on 15th March—an early date. One singing in a different place in the same region on 19th March. Not noted in (D) till 28th March (Waterside Mains, Keir).

Wood Warbler. First spring arrivals in (D) at Woodcockair, 29th April, with at least 4 in song there on 1st May. First in (K) at Garroch on 2nd May. A good year for this warbler, in (D) and (K), with many records in (D) from an area where not previously known.

Spotted Flycatcher. First spring record was at Waterside Mains, Keir. on 3rd May. Not noted in the Glenkens till 14th May. Last seen near Annan, 11th September.

Pied Flycatcher. First in spring in (D), Woodcockair, 1st May, and in (K), near New Galloway, 2nd May.

Tree Pipit. First in spring were at Carminnow (K), 24th April, and at Munches on 26th Is well established in conifer forest of about 10 years old in (K), particularly near broad fire-breaks.

Grey Wagtail. The number of pairs at breeding sites in (D) and (K) were well up to average.

Yellow Wagtail. A male was seen at Gatehouse-of-Fleet at the end of June—there have been no recent reports of nests in the area but isolated pairs or even small colonies may await discovery or recording! One at Applegarthtown on 6th August was presumably on passage.

Waxwing. Single at New Galloway, 6th February; 4 at Langholm, 17th November; 12 at Stranraer, 20th November; a flock of about 50 near Rockcliffe, 9th November; one at Mennock (D), 27th November; at least 5 near Sanquhar, 30th November, and 2 at Kenneth Bank (D), 24th December.

Great Grey Shrike. One was seen near Laurieston (K) in early January. In autumn and early winter, records of single birds as follows, Clatteringshaws-Cairn Edward Forest, 21st October, and in November; Dundrennan (K), 25th October; Drumlanrig (D), 10th November; Dalry area, 22nd and 23rd November; Woodhall Loch, 4th December.

Siskin. 10 at least at Munches (K), 13th April; 2 Drummore Harbour, 2nd October, were probably migrants, but there was no evidence of a large winter arrival in the Loch Ken area. c70 were on alders by the Nith, near Dumfries, 24th December; 20 at Carsethorn, 27th November, and still several there on 28th December.

Twite. A report of nesting on the west coast of Rhinns (W) was almost certainly reliable. A small flock was at Lady Bay, Loch Ryan during September; one near Deoch, Loch Ryan, on 29th September, and a few at Killantringan about the same time. 33 were seen on the Piltanton Estuary, Luce Bay, 12th November, 45 in a turnip field near Wigtown Merse, 18th December, 40+ at Caerlaverock during November, decreasing to 4 on 30th December, 30 were near Gatehouse-of-Fleet, 28th December, and 2 at Southerness, 29th December. These records suggest that in winter at any rate Twite may be more widespread and plentiful than has been thought in the recent past.

Crossbill. The first 12 birds of a considerable invasion were noted in Cairn Edward Forest on 25th June, attacking cones on quite small trees of Pinus Contorta. 12 briefly visited a Scots pine in a garden in Dalry, 2nd July. The first noted in (D) were parties of 11, 7 and 5 flying south over the Forest of Ae, and one at Applegarthtown, all on 8th July. At Munches the first 4 were seen on 11th July; 40 on 12th July; and 50 on 14th July. There was a dearth of records after this until several were seen at Gelston (K), 10th November, and 23 at Munches on 23rd November, with 36 there on 26th November. A small party were on larches near Dumfries on 4th December,

and 4 at Palnackie (K), on 12th December. The head of a freshly killed Crossbill was found among prey at a Hen Harrier's nest on 12th July. Crossbills are hitherto unrecorded as prey of Hen Harriers.

Brambling. 30 were still at Applegarthtown on 7th April. The first in autumn was one there on 21st October, followed by small parties at Poldean, near Moffat, Caerlaverock and Sanquhar, by 20th October. These were the fore-runners of a spectacular immigration. The birds became so common that observers ceased to count them, but there were many reports of over 100 and several of 200-300. The largest numbers were in (D). One was reported at Killantringan (W) on 6th November.

Snow Bunting. 12 at Wamphray (D), 12th February, up to 30 near Sanquhar until 1st March, several at Waterhead of Dryfe (D), 1st December. Generally scarce in (D), especially at coastal haunts. In (K) many were on hill ground between Laurieston and Gatehouse-of-Fleet in October, a few still there in late November, and a few on Fingland Hill, near Dalry, mid-November.

Corn Bunting. Continues to be a widespread bird in many lowland areas, especially near coasts (D), (K) and (W).

Tree Sparrow. C150 at Waterfoot, Annan, on 24th December—the largest flock yet recorded in (D). Many records in (D) of up to 20s e.g. at Caerlaverock, Thornhill. One just north of Crossmichael on 18th September, where not previously seen. A large flock seen near Wigtown (W) in October/November.

The following species were also seen during the year:

Red Grouse	"Rock Dove"	Meadow Pipit
Pheasant	Wood Pigeon	Rock Pipit
Golden Pheasant	Tawny Owl	Pied Wagtail
Turnstone	Rook	Starling
Oyster Catcher	Jackdaw	Greenfinch
Snipe	Blue Tit	Goldfinch
Curlew	Great Tit	Redpoll
Purple Sandpiper	Tree Creeper	Linnet
Great Black-backed Gull	Wren	Bullfinch
Lesser Black-backed Gull	Dipper	Chaffinch
Herring Gull	Song Thrush	Yellowhammer
Razorbill	Goldcrest	Reed Bunting
Guillemot	Dunnock	House Sparrow
Stock Dove		

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APPENDIX

NORTH SOLWAY RINGING GROUP PROGRESS LIST, 1963-66:

Species	1963-65	1966	Total
Gannet	100	—	100
Cormorant	5	—	5
Heron	—	2	2
Mallard	112	1	113
Eider	5	—	5
Greylag Goose	127	39	166
Mute Swan	85	—	85
Buzzard	14	1	15
Sparrow Hawk	9	2	11
Peregrine	3	—	3
Merlin	2	—	2
Kestrel	64	17	81
Water Rail	3	—	3
Moorhen	6	19	25
Coot	1	—	1
Oyster Catcher	24	16	40
Lapwing	242	243	485
Ringed Plover	6	4	10
Golden Plover	4	—	4
Snipe	1	1	2
Woodcock	1	—	1
Curlew	60	25	85
Common Sandpiper	8	4	12
Redshank	31	10	41
Greater B.B. Gull	2	—	2
Lesser B.B. Gull	132	1	133
Herring Gull	135	1	136
Common Gull	29	—	29
Black-headed Gull	449	380	829
Kittiwake	20	—	20
Common Tern	—	41	41
Razorbill	2	—	2
Guillemot	97	—	97
Stock Dove	6	1	7
Wood Pigeon	7	—	7
Collared Dove	1	—	1
Cuckoo	—	2	2
Barn Owl	13	9	22
Tawny Owl	33	15	48
Long-eared Owl	3	—	3
Short-eared Owl	5	6	11
Skylark	24	7	31
Swallow	436	318	754
House Martin	126	76	202
Sand Martin	438	148	586
Raven	30	4	34
Carrion Crow	3	1	4
Rook	6	—	6
Jackdaw	9	—	9
Great Tit	217	49	266
Blue Tit	648	167	815
Coal Tit	29	20	49
Willow Tit	24	21	45
Long Tailed Tit	57	66	123
Tree Creeper	35	22	57
Wren	95	102	197
Dipper	11	9	20
Mistle Thrush	23	10	33
Fieldfare	16	30	46
Song Thrush	211	138	349
Redwing	20	26	46
Ring Ouzel	17	1	18
Blackbird	758	314	1072
Wheatear	10	3	13
Whinchat	16	1	17
Redstart	45	30	75
Robin	365	155	520
Grasshopper Warbler	2	—	2
Sedge Warbler	55	115	170
Blackcap	12	10	22
Garden Warbler	4	60	64
Whitethroat	96	139	235
Willow Warbler	700	737	1437
Willow Warbler (Northern)	1	—	1
Chiffchaff	20	22	42
Wood Warbler	2	—	2
Goldcrest	21	26	47
Spotted Flycatcher	61	54	115
Pied Flycatcher	71	29	100
Dunnock	412	157	569
Meadow Pipit	23	19	42
Tree Pipit	2	7	9
Pied Wagtail	56	114	170
Grey Wagtail	4	15	19
Starling	528	472	1000
Greenfinch	279	222	501
Goldfinch	5	6	11
Siskin	—	7	7
Linnet	9	19	28
Redpoll	48	197	245
Bullfinch	60	28	88
Chaffinch	767	566	1333
Brambling	29	4	33
Yellow Hammer	169	82	251
Corn Bunting	5	—	5
Reed Bunting	246	103	349
Snow Bunting	4	—	4
House Sparrow	159	3	162
Tree Sparrow	66	43	109
	9432	5814	15,246

Grand Total, 1963-66: 15,246 birds of 99 species

SELECTED RECOVERIES REPORTED IN 1966

Ring No.	Species	Ringed	Date	Found	Date
1024510	Gannet (Pull)	Scar Rocks, Luce Bay	25.7.65	Asserac, France	23.10.66
EC 94734	Kestrel (Pull)	Nr. Moffat, Dumfries	30.6.66	Nr. Innerwick, East Lothian	10.8.66
EC 94680	B.H. Gull (Pull)	Loch Urr, Auldgirth	21.6.66	Callander, Perth	26.7.66
AT 92194	B.H. Gull (Pull)	Loch Urr, Auldgirth	16.6.65	Banbridge, N. Ireland	10.1.66
HC 62847	Swallow (Pull)	Hayfield, Thornhill	1.8.66	Bedworth, Warwicks.	8.10.66 (Re-trap)
423220	Raven (Pull)	Nr Sanquhar, Dumfries	1.4.64	Dalton, Lockerbie	3.2.66
AX 28168	Wren	Keir, Thornhill	28.8.65	Ecclefechan, Dumfries	26.9.66
CV 28450	Redwing	Keir, Thornhill	13.10.66	Mogofores, Portugal	7.12.66
CB 29966	Blackbird	Keir, Thornhill	15.10.65	Nr. Stavanger, Norway	10.10.66
AR 93580	Garden Warbler (Pull)	Keir, Thornhill	10.6.65	Keir, Thornhill	7.8.66 (Re-trap)
AR 11941	Whitethroat	Keir, Thornhill	11.5.65	Keir, Thornhill	15.5.66
HE 98072	Pied Wagtail	Keir, Thornhill	17.8.66	Abergele, Denbigh	10.10.66
HC 62115	Redpoll	Keir, Thornhill	1.8.66	Charleroi, Belgium (caught and caged)	25.10.66
AJ 68327	Mallard (Pull)	Crossmichael	16.6.65	Upper Lough Erne, Co. Fermanagh	29.1.66
SS 34215	Kestrel (Pull)	Langholm	21.6.65	Crainlington, Northumberland	6.2.66
ED 15473	Kestrel (Pull)	Langholm	31.7.66	Kirkby, Liverpool, Lancs.	2.10.66
2075430	Lapwing (Pull)	Langholm	4.6.64	Rahara, Co. Roscommon	16.1.66
AX 20024	Sand Martin (Ad)	Tarcoon, Canonbie	27.7.65	(Where ringed)	7.8.66
				Braidside, Boston, Lincs.	5.9.66
641576	B.H. Gull	Horpestadvatnet, Klepp, Norway	28.6.63	Redkirk Point, Gretna	28.4.66
CK 32413	Starling (Ad. Fem.)	Attenborough, Beeston, Notts.	9.1.63	Langholm	20.4.66
3071029	Kestrel	Polmaddy Glen, Nr. Carsphairn	11.6.63	Penpont, Thornhill	10.1.66
—	Sand Martin	Polcree Farm, Gatehouse-of Fleet	3.7.66	Timsbury, Hants.	30.7.66

(A small number of these recoveries were of birds marked by ringers working independently.)

The North Solway Ringing Group gratefully acknowledges financial support received from the Dumfriesshire and Galloway Natural History and Antiquarian Society.

THE MARINE FAUNA AND FLORA OF THE SOLWAY FIRTH AREA

I.—Introduction

By E. J. PERKINS

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Although the title has, perhaps, an authoritative ring, this work does not pretend to be an exhaustive account of the life of this large and extremely interesting area. Firstly, it must be appreciated that the limits of the Solway Firth enclose an area of the order of 1000 sq. miles. Secondly, I have worked in this area only from 1961 and at no time have the teams, with whom I worked, consisted of more than four biologists. Thirdly, because the acquisition of knowledge of much of the fauna and flora has been incidental to the study in hand, the organisms listed are, inevitably, those forms which generally occur commonly and are of such a size that they may be identified on sight.

THE ESTUARINE ENVIRONMENT

The Solway Firth is really a very large and, apparently, very complex estuary. To appreciate more clearly the biology of the area, it is essential first of all to understand the underlying physical and chemical processes which make up the environment.

The Physical Nature of the Environment

Estuaries represent a meeting place of fresh-water as run-off from the land and the sea, consequently, the environmental conditions show violent fluctuations when compared with the open sea or truly fresh water conditions.

(a) **Temperature range.** The temperature range increases and onset of seasonal changes of temperature takes place earlier than in the open sea. At the same time, the range of temperature tends to be greater in the surface rather than the bottom water; while the greatest relative temperature stratification tends to occur in the middle third of an estuary (Nash, 1947). These conditions also pertain to the Solway Firth. In addition, it is important to realise that the large areas of sand flats exposed by retreating tide may have a marked effect upon the rate and scale of temperature changes in adjacent waters. In Whitstable Bay, for example, the effect of this phenomenon is such that it tends to elevate the mean sea temperature above that of the mean air temperature in summer and the reverse in winter. This is, of course, the opposite of what one is taught to expect for conditions in the open sea. It must surely have been of great importance in the Solway, to the east of Annan, in the winter of 1962-63; large areas of water were

covered by a sheet of ice to a depth of 6 in., and composite blocks 6 ft. or more in height were stranded on the shore.

(b) **Salinity range.**

The salinity is the amount of salt dissolved in sea water and is described in parts per thousand. In the open sea this concentration tends towards 35 parts per thousand, and this value is taken to be the value for normal sea water. As one might expect, both the density and specific heat of sea water are dependant upon the salinity.

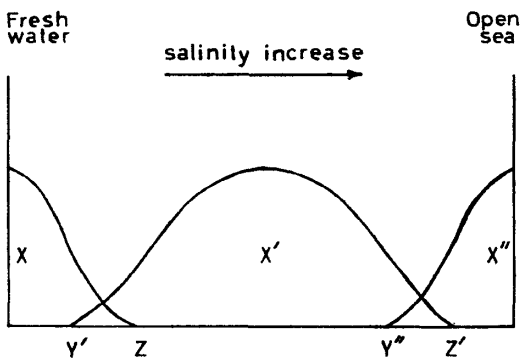


FIG.1. GENERALISED PICTURE OF ENVIRONMENTAL CONDITIONS IN ESTUARIES.
X,X',X" = Optimum , Y',Y" = Minimum and Z,Z' = Maximum conditions for growth, reproduction and migration.

The salinity range is greater in surface waters and tends to be lower in spring and summer and greater in autumn and winter; but it may show marked fluctuations within each period depending upon run-off from the land Clearly, as one moves upstream the salinity decreases or tends to decrease. These conditions are summarised in fig. 1. While the salinity normally decreases towards the head of an estuary this is by no means true at all times. Indeed, this condition depends on the relative balance of three interacting factors viz., (1) the amount of run-off from the land, (2) the amount of rain falling directly upon the estuary, and (3) evaporation from the surface of the estuary. Where the run-off is high, the last two are unimportant, and the reverse is also true. For example, in the River Blackwater estuary, Essex, the amount of water lost by evaporation can in the hot, dry summer months exceed the amount of fresh water gained by run-off and direct rainfall. A similar phenomenon has been observed, in the neighbouring River Crouch estuary, where in a hot dry summer a "plug" of water of high salinity may develop at its landward end.

Such an environment with its widely fluctuating salt content presents severe problems in adaptation to would-be colonisers. Reduced to their simplest condition, all marine organisms are a mixture of salts, proteins, fats and carbohydrates invested by a semi-permeable membrane i.e. a membrane which is permeable to water solvent, but not to the solute (salts, proteins, fats and carbohydrates). In the open sea, these conditions represent no especial difficulty for salinity tends to be stable at or about 35 parts per thousand, and the organisms which dwell here can adjust fairly readily to whatever small fluctuations occur. However, in estuaries the problem assumes quite different proportions, for the salinity may, indeed does, change rapidly and an organism may find itself in an environment containing a significantly lower concentration of salts than are present in its body fluids. Under such conditions, the animal's body becomes subject to the forces of osmosis and if it cannot control this phenomenon its body swells and eventually bursts. Marine animals possess an ability to control this osmotic flooding to varying degrees. It is achieved by a process known as osmo-regulation which in turn is linked to a process controlling the salt balance of the body known as ion-regulation. Animals which are unable to osmo-regulate to any significant degree and whose body fluids are always isosmotic (i.e. having the same osmotic concentration) as the external environment are known as "poikilosmotic forms." On the other hand, those organisms which can maintain an internal osmotic environment significantly different from the external environment are known as "homoiosmotic forms." Maintenance of an internal concentration greater than that of the external environment is known as hyperosmotic regulation (e.g. the shore crab **Carcinus** has this ability); other animals can maintain the reverse condition known as hyposmotic regulation, while still others can regulate hyperosmotically at low salinities and hyposmotically at higher salinities (e.g. the prawn **Palaeomonetes varians** which is often abundant in brackish ponds in marshes demonstrates this remarkable ability). Finally, organisms may be able to perform the function of osmo-regulation only within narrow limits when they are said to be stenohaline, while those animals which are said to be euryhaline can osmo-regulate within wide limits.

Because the open sea is a relatively stable environment having a salinity which varies only slightly, a stable, buffered pH (mean 8.2) and small diurnal temperature variations, most marine animals are poikilosmotic forms and relatively few have a homoiosmotic response. This is why numbers of species decrease with increasing distance from the mouth of the estuary, and why so few species are able to colonise upper estuaries. For example, the spider crab **Hyas araneus** is common and has a widespread occurrence in the Outer Solway, it is, however, a poikilosmotic form and does not penetrate the Inner Solway to any marked degree, on the other hand, **Carcinus maenas** is poikilosmotic at high salinities and homoiosmotic at low salinities, it therefore occurs commonly and widely throughout the Inner Solway. With respect to the

polychaete worms, the sea mouse **Aphrodite aculeata** is a poikilosmotic form and lives in more saline areas, whereas the rag-worm **Nereis diversicolor** is a homoiosmotic form and can live in salinities at low as 4-5 parts per thousand. It is the relative inability of poikilosmotic forms to control their internal osmotic environment which influences the wanderings of the vagile epifauna, and restricts its invasion of upper estuaries to warm, dry summer months

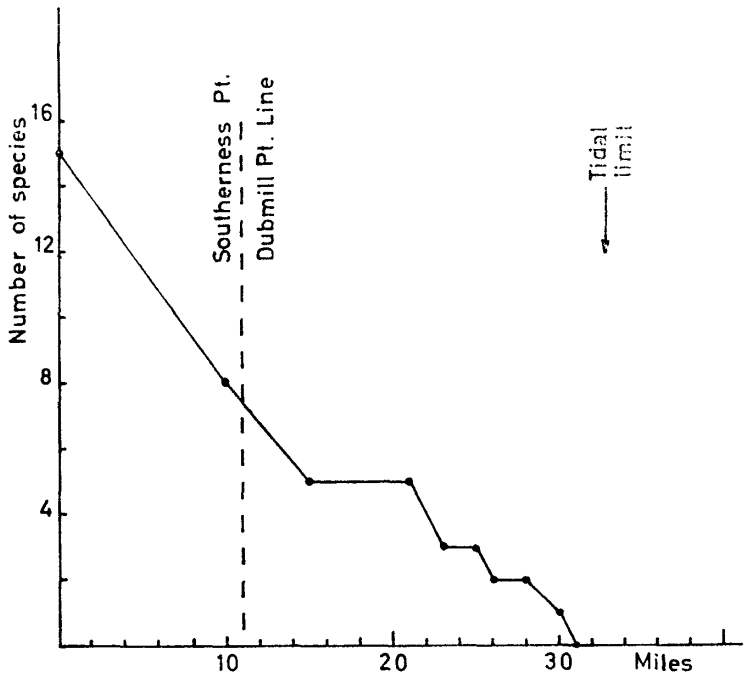


FIG. 2. VARIATION IN THE NUMBER OF SPECIES OF BIVALVE MOLLUSC ALONG THE SOLWAY FIRTH.

when the salinity is high. Still other animals which are poikilosmotic make use of environmental phenomena to assist them in penetration of areas which would otherwise be inhospitable. The lug-worm, **Arenicola marina,** is a poikilosmotic form, but it lives within the soil in which the salinity is more stable than the overlying water, and can, therefore, survive in reaches of the estuary where, otherwise, the salinity at times would be too low for survival.

A dependence upon the relative movement of fresh and salt water also explains why infauna which lives at higher shore levels can penetrate further upstream than those which would live in a zone further downshore. To sum up, then, the ability of an animal to successfully colonise a given part of an estuary depends upon its own ability to successfully perform osmo-regulation, and upon the salinity regime at that point. In the Solway Firth the principle that the number of species declines with increasing distance from the sea is illustrated by fig. 2.

(c) **Depth of light penetration**

Light penetrates sea water to varying depths, in an estuary 90% of the incident light may be absorbed in the surface 25 feet, but in the clear waters of the Sargasso Sea, on the other hand, 490 feet of water is required to absorb 99% of the incident light. A differential absorption occurs, also, such that red light is absorbed first while blue light shows the greatest penetration. The extensive occurrence of red algae at E.L.W.M.S.T. and in the sub-littoral is related to this phenomenon. It is of interest to note that the red algae which colonise higher shore levels, viz. **Porphyra** and **Gigartina** have the red colour masked by a brown pigment.

The absorption of light in water (or indeed any substance) is defined by the extinction coefficient (μ). Measurements of extinction coefficient may be made by use of a Secchi Disc; this disc has a standard diameter of 30 cm., and may be painted entirely white, or in alternating quadrants of black and white. The Secchi disc is suspended in water and the depths, in metres, at which it disappears and then re-appears is noted, a mean value of these two figures, is taken to be the maximum depth of visibility (D), when the

$$\text{Extinction Coefficient } (\mu) = \frac{1.7}{D}$$

Clearly, more sophisticated techniques are available, but this method has the virtue of simplicity and is widely used in estuarine investigations.

In estuaries, the penetration of light into water increases with proximity to the open sea, and also with seasonal changes of incident solar radiation, with salinity and with turbidity. These considerations are true for the Solway Firth, where measurements of D = 0.6m. and 3m. at Newbie and Two Feet Bank respectively, in 1961-64. The relative inability of light to penetrate turbid estuarine waters has important consequences. In the open sea, it was recognised early that the phytoplankton is the primary source of food, however, in estuaries these effects have led to the recognition of other sources of primary production, viz. littoral diatoms.

(d) **Waves.**

The wind is the most potent force in the economy of the world's oceans, since it brings about wind-drift currents which may transport water in one and the same direction over vast areas, if the wind blows from one prevailing direction, e.g. the effect of the Trade Winds in producing the Equatorial Currents and upwellings of cold, deep water off the western coasts of continents (e.g. Africa). In shallower water, however, the importance of wind drift currents decreases while that of waves alone increases.

The simplest water waves are oscillatory, e.g. ocean swell passing through calm water, and consist of regular undulations of the sea. The form of these undulations moves along at a steady speed, in the direction of propagation and perpendicular to the line of the wave crest. Basically, all waves are

straight and parallel, and each is identical with its neighbour. A wave which is one of a single wave train has four principal characteristics, wave length (l), height (H), period (t) and velocity (v) (see fig. 3); of these four characteristics only wave length and height need concern us with respect to the Solway Firth.

The initial height of a wave depends upon (i) wind strength, (ii) wind duration, and (iii) the extent of open water over which the wind blows,

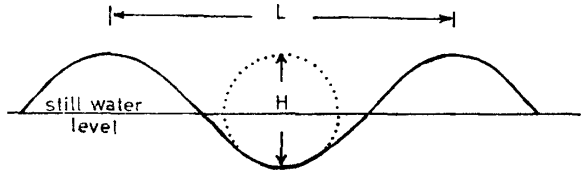


FIG. 3. CHARACTERISTICS OF OSCILLATORY WAVES.
.....Circumference of particle orbit corresponding to Wave height (H), L = Wave length.

i.e. **The Fetch.** As we shall see, it is the fetch of the wind which is important in the Solway Firth, rather than strength or duration.

The fetch may limit the size of waves, and restrict the time for which waves of infinitely low height can have been moving under the action of wind. If we consider a pond, when a breeze springs up, then small ripples first appear and soon increase in size towards the leeward. In other words, the waves will be small on the windward side, however long the wind blows. On the other hand, those on the leeward side, benefiting from the length of fetch, soon develop into waves of some size due to:

(1) the direct effect of the wind, combined with

(2) waves originating on the far side of the pond.

So that, waves are limited by fetch at places close to the windward shore, and duration at great distances from it. For example, if a westerly gale had been blowing for 24 hours waves arriving at the West Coast of Ireland would be limited by duration; fetch or distance from the American continent would have no effect. On the other hand, fetch is a limiting factor in the Irish Sea, and here for ordinary gales $H = 1.5 \sqrt{F}$ ft. where H = wave height, and F = Fetch in sea miles. In the Irish Sea however long the wind blows the wave height will not increase beyond a certain value characteristic of the particular fetch. It has been found that the expression quoted above is surprisingly accurate even though it takes no account of wind strength.

This result has significant consequences for the Irish Sea and Solway Firth region, for the depth to which wave action can effectively occur depends upon the wave height.

Oscillatory waves are moving in orbits 1/535 as great as those on the surface at one wave length depth. Now the diameter of the orbit at the

surface is equal to the wave height (H) which as we have seen is proportional to the Fetch. Clearly, then, in the North-East Irish Sea with its restricted fetches, and, therefore, restricted wave heights, it is easy to see why so much silt has accumulated on the sea bed at such shallow depths.

Stevenson (1886) made a comparison between the depths at which mud reposes on the sea-floor in different parts of the North Sea and the vigour of wave action in these places. He found that the phenomena were directly related, viz., the depth at which mud accumulates increases in much the same proportion as the intensity of wave action. The distribution of mud on the bed of the Irish Sea is widespread below the depth of 10 fm. This, as we shall see when we consider the shore and marshes, has profound consequences for the economy of the Solway Firth.

Wave length is also of importance when related to height, the ratio of wave height to wave length giving a function known as the wave steepness. For example, a wave 4 ft. high, 600 ft. long and steepness (H:L) of 1/150 is a low wave, whereas one 4 ft. high, 60 ft. long and steepness of 1/15 is a steep wave; storm waves are higher and steeper than a moderate sea. If we neglect for the moment the factor of obliquity in wave approach, It is interesting to note that wave steepness is of considerable significance in the building and erosion of shores. Bascom (1960) found on the coast of California that the beaches were built up dramatically under the influence of the long, low waves of summer, but decayed equally dramatically under the influence of the short, steep waves of winter. Finally, he showed that the grain size of the shore was proportional to beach face slope and this in turn is proportional to the intensity of wave action.

This onshore movement of sand can be observed during the summer in the outer area of the Solway Firth, and the reverse process can also be noted in winter. However, it has to be looked for closely, and has not the same startling results as the movements on the coast of California. This is not surprising in view of what we have already noted about the effects of the wind fetch, and as we shall see, of the dominant action of the tides in this area.

Finally, it is essential to consider the effects of the oblique incidence of waves upon the materials of the shore. That a wave which arrives obliquely upon a shore produces a net movement along the shore away from its point of impingement on the shore was first noted by Palmer in 1834. This movement is summarised in fig. 4. In essence, a wave which arrives obliquely upon a shore carries material forward, up and across the beach face, as it retires gravity tends to carry the water plus the sediment it has moved straight back down the shore, so that the sediment will have been moved on from the position it formerly occupied, and so on. In fact, the sediment particles on the shore move in parabolic paths for distances which are inversely proportional to their size. This movement is known as the littoral, beach, or longshore drift; while the water which has been similarly moved gives rise to a

longshore current. The strength of the littoral drift is proportional to the length of the fetch. However, the prevailing wind is not necessarily the most important in producing the littoral drift; for example, on the North Kent coast, the prevailing wind is south-westerly, but since it blows offshore it is ineffective, and the effective wind blows from the north-east and produces a littoral drift which moves from east to west. Very pronounced beach drifting

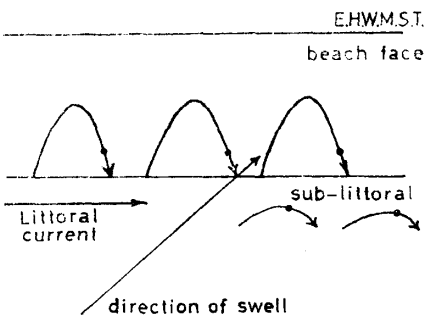


FIG.4. LITTORAL DRIFTING DUE TO OBLIQUE INCIDENCE OF WAVES.
= Path of sediment particle movement.

depends upon three factors which may either work in concert, or may produce a resultant which induces the drift. They are:

(1) The direction from which ground swells approach the shore.
(2) The direction of prevailing winds or dominant storm winds.
(3) The direction of greatest fetch. Weak winds blowing over a long fetch may develop larger waves than strong winds blowing over a short fetch.

Beach drifting may occur on a prograding beach to which materials are added, on a retrograding beach from which materials are removed, or on a beach at grade when the net effect is zero.

It is difficult in most cases to obtain an accurate estimate of the quantities of sediment which may be moved by the littoral drift, but in some cases truly enormous amounts are known to be involved. For example at Rye 48,000 cu. yds. arrive per year; off the California coast at Santa Monica, a breakwater allowed the material being transported to settle out and the rate of accumulation was estimated to be 340,000 cu. yds. per year; at Madras Harbour after all original forecasts had been shown to be serious underestimates, it was found that sediment was accumulating at the rate of 1,000,000 tons per year.

The process of beach drifting in the Solway Firth. is negligible when compared to these enormous amounts of sediment moved. Apart from the obvious features at high shore levels along the English coasts seawards from Grune

Point, little evidence of longshore drift is to be noted. On this shore, a north-easterly drift of shingle at higher shore levels can be deduced from the accumulation of material at the groynes between Dubmill Point and Grune Point and the presence of smoothed and rounded pieces of coal derived from the mining area to the south-west of Maryport.

The evidence provided by these groynes suggests that the forces of beach drifting are relatively weak even at high shore levels. However, such groynes as there are, and the comparatively small amounts of material accumulated by them, are enough, apparently, to starve the Grune Point/Skinburness shore of sediment, and erosion along this shore is evident at the present time. At Grune Point itself, a re-curved spit is still in a state of development.

At lower levels, on these shores i.e. below M.H.W.M.N.T., the sediment distribution is typically that of a shore affected or produced by tidal transport mechanisms viz. soil particle size increasing towards L.W.M. Because the banks provide a marked degree of shelter below M.H.W.M.N.T. wave action in the Solway Firth can be expected to attain long fetches and a reasonable degree of working only at the time of high water spring tides.

(e) Tides.

The tides are a periodic movement of the waters of the earth produced by the gravitational pull of all the celestial bodies, and in particular of the sun and moon. The motion produced corresponds approximately to the oscillation described by a sine curve, or in other words a harmonic rise and fall about an imaginary still water level, the mean sea level.

The world's oceans are incompletely separated into a series of natural basins, and in general these bodies of water have a natural period of oscillation of approximately twelve hours. This natural period of oscillation corresponds to the diurnal rhythm of gravitational forces exerted by the sun and moon; and it is considered that these forces are responsible for the maintenance of this oscillation in these bodies of water.

As one might expect, the oscillation produced is by no means uniform, indeed, the incomplete separation of the oceanic basins, alone, would ensure this. In the open ocean, the tidal oscillation or range is little more than 3 ft. However, as the tidal waves move round the earth, they are checked by the shallower water near the coasts and their height increased. Around the British Isles, the average height of tides is about 15 ft. and 11½ ft. at springs and neaps respectively. As has already been implied the configuration of the land is important; in the Bristol Channel, at Avonmouth, the tidal range is 42 ft. and 30 ft. at springs and neaps respectively, whereas at Ayr in the Firth of Clyde, it is 10 ft. and 8½ ft. at springs and neaps respectively. As some parts of the sea have extremely high tides, so others have no tidal oscillations, these situations are known as amphidromes or amphidromic points. In addition to

the influence of the earth's morphology in modifying the tidal oscillation, short term effects may be induced by meteorological phenomena such as changes in barometric pressure or by the wind. Indeed, the severe flooding which affected coastal areas of south and east England and Holland in 1953 were caused by strong and prolonged winds which coincided with a very high

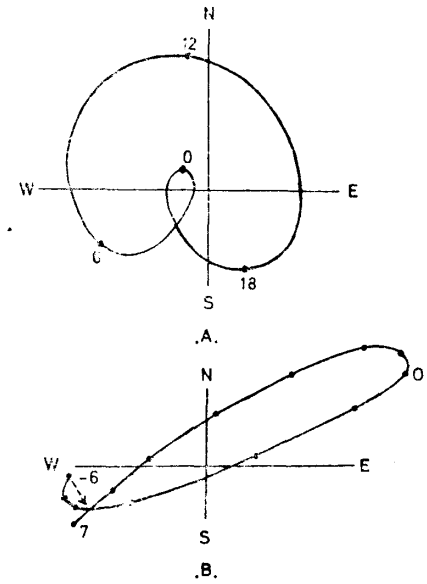


FIG. 5. CONFIGURATION OF TIDAL EXCURSION IN A. OPEN SEA AND B. ESTUARIES. N.B. Not to scale.

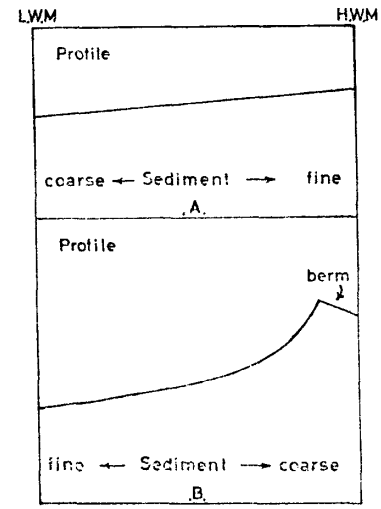


FIG. 7. LOW GRADIENT SHORE FORMED BY TIDAL PROCESSES. B. STEEP GRADIENT SHORE FORMED BY WAVE ACTION. N.B. Backward facing slope of berm.

spring tide. The extraordinarily high tides thus produced breached the sea defences with disastrous effect.

In the Solway Firth, the tidal rise, in common with other parts of the North-East Irish Sea is considerable with a rise, above datum, of ca. 25 ft. and 20 ft. at springs and neaps respectively at Whitehaven, 23 ft. and 17 ft. at springs and neaps respectively at Kirkcudbright, and 29 ft. and 20 ft. at springs and neaps respectively at Annan.

So far the terms spring and neap tides have been used without definition. It will be recalled that the earth not only has a daily rotation, but it also orbits around the sun; at the same time the moon orbits around the earth. At new and full moon, the sun, earth and moon are more or less in a straight line, so that the combined pull of the sun and moon is a maximum; at these times the vertical range of the tide is also at a maximum, and we have **spring tides.** It must be appreciated that, in this case, spring has nothing to do with the season of the year. For seven days after the new or full moon, the sun

and moon move further out of a straight line until when the moon is in quadrature, the sun and moon, are situated at right angles relative to the earth and their combined gravitational pull is at a minimum, the tidal range is also at a minimum and we have **neap tides;** after the neap tides the range increases once more to the succeeding spring tide; and so on.

Because the earth is in orbit around the sun, an annual rhythm is superimposed on the monthly rhythm. As the equinoxes (about March 21 and September 21) are approached, the spring tides become progressively larger, for it is only at these times that the earth, sun and moon are situated exactly in a straight line. At the time of the summer and winter solstice (about June 21 and December 21), the pull of the sun and moon are most out of alignment, relative to the earth, and the springs, although greater than the neaps, are much smaller tides than those which occur about the equinoxes.

While the oscillatory movement of the tides is a vertical movement, and indeed in the open sea comparatively little horizontal movement results, nevertheless horizontal movements do occur, and these movements are known as tidal currents. The period which occurs from the time of high water to the time of low water being known as the ebb tide, while the reverse is known as the flood tide; the corresponding horizontal water movements are the ebb and flood currents respectively.

In the open sea, the orbital path of the oscillatory tidal wave is undisturbed, hence the flood and ebb movements persist for some time after high and low water. At the same time, it has been shown by measurements at light-ships, for example, that tidal currents in the open sea normally rotate (fig. 5a). The velocities of these currents are normally low and the maximum ebb current velocity = maximum flood current velocity.

In coastal and estuarine waters, the orbit of the tidal wave becomes a much flattened ellipse; there is a shoreward movement of the water particles until the time of high water, after which a movement seaward takes place (fig. 5b).

As the tidal wave moves in from the oceans, past continental shelves, into the arms of the sea enclosed by land, viz., gulfs, bays and estuaries, a modification of the shape of the tidal wave takes place such that the period of the flood becomes shorter than that of the ebb. This condition is normally true for estuaries which have no complicating hydraulic factors. Associated with this distortion of the tidal wave in shallow waters is a sharper rate of tidal rise and a slower rate of fall. In other words, the maximum velocity of the flood current is greater than the maximum velocity of the ebb current. In the Solway Firth, at Powfoot, the flood and ebb tides have a duration of four and eight hours respectively, with a maximum flood tide current velocity of six knots, and a disparity of 2.5 knots between the maximum flood and ebb tide current velocities. This asymmetry and its effects can be detected at Workington Bank, and even on the sea bed to the north and west of St Bees Head. In such conditions the tidal currents produced have important consequences upon navigation and life in the area. In all estuaries, because of the

quick changes in direction of the tidal currents which take place at the time of low and high water, the ebb and flood currents not only tend to, but, in fact, do follow different courses. Clearly, where there is no sediment to work, no effects can be observed.

However, the North and Irish Seas are filled with detritus produced by the glaciers of the Pleistocene Ice Age. This material has been reworked into and has choked the estuaries bordering on these seas. The effect of ebb and flood currents has been to produce channels, as in fig. 6. Ebb channels are produced where the ebb current is stronger than the flood and flood channels

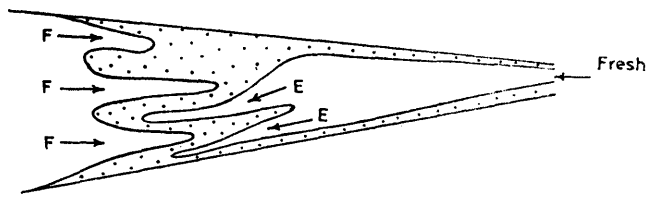


FIG.6. EBB-FLOOD CHANNEL SYSTEM IN AN IDEAL ESTUARY.
E = Ebb channel, F = Flood channel, ⋰ = Sand-banks.

where the flood current is stronger than the ebb. These channels may be simply distinguished thus: the flood channels have blind ends towards the land, and are continuous with the open sea, while ebb channels exhibit the reverse condition. These channels are important to shipping and dominate the important Thames, Mersey and Humber estuaries; they are absent in the English Channel which was beyond the Pleistocene Ice Sheet.

To summarise, these systems require the following conditions for their formation. These are:—

(i) An adequate tidal range, accompanied by rectilinear tidal streams,
(ii) an adequate thickness of sediment covering the true rock floor of the estuary, and
(iii) sediment cover consisting of particles which can be eroded and transported by tidal streams whose velocity seldom exceeds three knots. Inman showed particles of ca. 0.2 mm. diameter to be the most easily moved; this size of particle predominates in the Solway Firth.

The form of the ebb-flood channel system depends upon the individual characteristics of each estuary or bay. In the Solway the flood streams are much stronger than those of the ebb and the whole area is dominated by the flood channel system. In the open sea, ebb and flood channel elements tend to be equal, but an extensive system of flood channel elements can be demonstrated in the bed of the North-East Irish Sea and extreme Outer Solway Firth.

The tidal currents may be responsible for the transportation of considerable amounts of sedimentary materials. Man has long made use of this fact in reclaiming land by "warping techniques." The importance of these currents in the sedimentation of estuaries seems to have been first realised by Skertchley in 1877. They are effective at 720-800 ft. (120-130 fm) depth in Beaufort's Dyke

(North Channel) and on Caister Shoal, coast of Norfolk. Russell and Macmillan (1952) stated that there is a widely held belief that the littoral drift takes place in the direction of the flood current, but that this is true only in some situations. They emphasised, as did Robinson (1956), that where a maximum flood current velocity exceeds the maximum ebb current velocity by not more than $\frac{1}{2}$-$\frac{3}{4}$ kt. even at springs, then there is a steady net transference of sediment towards the head of the estuary. In the Solway Firth, this disparity may reach, as we have seen, a value of 2.5 kt. This is evidently an important

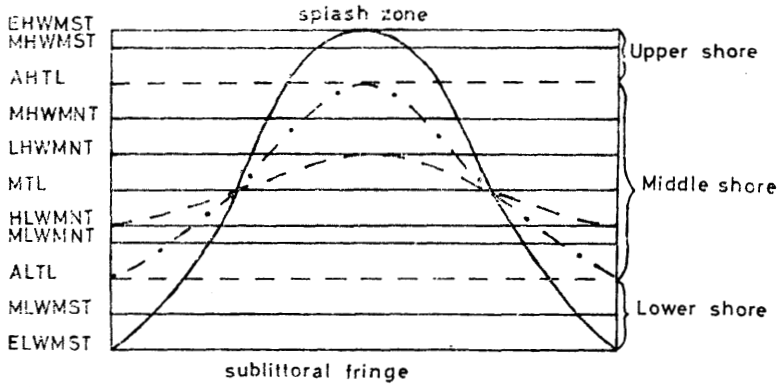


FIG. 8. TIDAL LEVELS OF THE SHORE. Amplitude of spring tides ——, neap tides — — , average tides — • — .

(after C. M. Yonge).

factor here. There is no doubt that effects due to the marked tidal asymmetry have often been ascribed to the weak littoral drift.

The importance of the tide and its currents in shaping the shores of the Solway Firth may be deduced from the fact that a shore predominantly shaped by the tides normally has coarse and fine sediments at L.W.M. and H.W.M. respectively, with a gradation in size between these two extremes, and on the other hand the reverse is true for a shore dominated by wave action (see fig. 7).

Before concluding a consideration of tides, it is important to realise that it is the vertical movements of water, and its variation, resulting from the tidal oscillation which creates shores. The shore is, of course, a complex situation which is subject not only to diurnal tidal changes, but also those which result from the cycle equinox to solstice to equinox to solstice and so on. Consequently, the shore can be divided into a series of horizontal zones related to the amounts of exposure and water cover experienced by each zone. Each zone represents a distinct environment for the plants and animals. This phenomenon is most obvious on a rocky shore where it is evident even to the untutored eye, but a similar division can be demonstrated with respect to those

organisms which live in sandy and muddy shores. The basic divisions upon which zonation depends are given in fig. 8. The levels shown may be described as follows:

E.H.W.S.T.—Extreme high water level of spring tides, and

E.L.W.S.T.—Extreme low water level of spring tides, are the highest and lowest levels attained, but only occur a few times per year, at the time of the equinoxes.

M.H.W.S.T.—Mean high water level of spring tides and

M.L.W.S.T.—Mean low water level of spring tides, represent higher and lower levels reached by half of the spring tides in the year.

M.H.W.N.T.—Mean high water level of neap tides, and

M.L.W.N.T.—Mean low water level of neap tides, are the highest and lowest levels which ordinary neap tides attain, while L.H.W.N.T.—Lowest high water level of neap tides and H.L.W.N.T.—Highest low water level of neap tides occur at the time of the solstices.

M.T.L.—Mean sea level.

A.H.T.L.—Average high tide level and A.L.T.L.—Average low tide level indicate the average of tidal range between the extremes of springs and neaps.

It should be appreciated that just as the E.H.W.S.T. and E.L.W.S.T. levels are covered and exposed only at the times of the equinoxes, the zones between M.H.W.S.T. and L.H.W.N.T., and H.L.W.N.T. and M.L.W.S.T. are completely exposed and covered, respectively at the time of neap tides, and that this holds true also for some part of the cycle of transition from neaps to springs to neaps. Consequently, some more delicate forms can invade the lower levels of the shore, while the residents at the higher levels must be very tough indeed; infrequent immersion renders them liable to diurnal temperature variations, terrestrial in scale, with rainfall, ice and snow at the appropriate times of the year.

(f) Non-Tidal Circulation.

In every estuary, if correction is made for tidal movements, there is a resultant or non-tidal circulation. This circulation is generated by fresh water in the river/s entering the estuary, and mixing with more saline water from the open sea.

If the amount of fresh water run-off is large, the tidal velocities are low, and the estuary narrow, then the fresh water runs out over the salt and a distinct boundary is formed between the two (fig. 9a). The fresh water moves out towards the sea, and generates an upstream, or reaction current, in the salt-wedge. This is known as a Type A—or salt-wedge estuary. The salt-wedge will carry pollutants and silt upstream (i.e. against the river flow) at ca. $\frac{1}{2}$ kt. per day to the limit of the salt wedge. An example of this type of estuary is the R. Mississippi.

If the inflow of fresh water is reduced somewhat or if the tidal range is increased, or the estuary widened, the distinct boundary (or salt-wedge) is lost and the partially-mixed, Type B, estuary is attained. The strongest flood current is near the bottom, the strongest ebb current is near the surface (see fig. 9b). Pollutants entering the bottom at the mouth of such an estuary will be distributed throughout the whole. An example of such an estuary is the R.

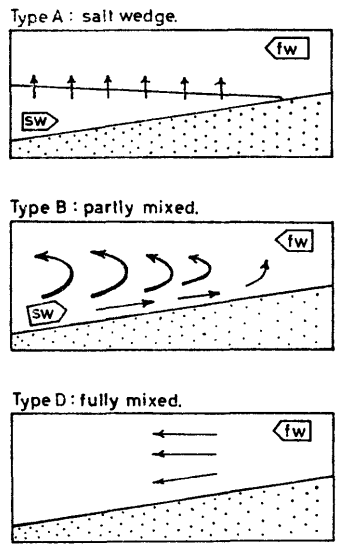


FIG. 9. ESTUARINE CIRCULATION TYPES.
fw = fresh water, sw = salt water.

Columbia, Oregon, where above 28 ft. depth the flow is outwards and below 28 ft. depth an upstream flow exceeding 7 miles per day is generated.

If the inflow of fresh water is decreased still further, then a vertically homogeneous, Type D, estuary results (fig. 9d). This estuary is well mixed from surface to bottom, there is no evidence of a salt wedge or partial mixing. There is a slow sea-ward drift at all depths. The salt here moves upstream against the drift by diffusion, and a pollutant entering the mouth will disperse throughout the whole estuary. Here, the tidal asymmetry may become very important. The Solway Firth belongs to this class of estuary.

An estuary tends to shift from Type A, through Type B/C to Type D; with:—

(a) Decreasing river flow,
(b) increasing tidal range,
(c) increasing width, and
(d) decreasing depth.

Other factors which may have an effect are (i) wind velocity, (ii) air temperature, (iii) solar radiation, and hence evaporation, and (iv) bottom roughness.

Clearly, an estuary may change type depending on the time of year. Pritchard (1955) instanced the Savannah River which resembles a Type A (salt-wedge) estuary for river flows of 60,000-70,000 sec.-ft., but at flows from 5000-10,000 sec.-ft. has Type B characteristics.

Estuaries may also be defined by their **flow-ratio** which is the ratio of fresh water discharged during half-tidal cycle of 12.4 hours to the volume between M.H.W.M. and M.L.W.M.; Type A $\equiv$ Flow ratio $\geq$ 1.0, Type B $\equiv$ Flow ratio = 0.2-0.5 and Type D $\equiv$ Flow ratio $<$ 0.1. Thus it can be shown that within an area bounded by the old Seafield-Bowness viaduct the flow ratio is 0.01; by this criterion also the Solway Firth is clearly a Type D estuary. Further off to sea, i.e. west of the outer banks, this seaward drift continues but other factors are evident and the non-tidal circulation is no longer simple. Here wind can be important, and currents flowing from the west of the Isle of Man, through the channel between the Point of Ayre and Burrow Head, can have significant effects.

Reaction currents may be important in their effects on the larvæ of bottom dwelling animals, for it is commonly found in an estuary, e.g. R. Blackwater, Essex, that large beds of young oysters occur upstream of the parent stock. On the other hand, the Santee-Cooper project at Charleston, North Carolina, diverted water from the Santee River into Charleston harbour, and changed a Type D estuary into a Type B—partially mixed system. As a result shoaling and silting of the harbour occurred and dredging costs rose from $10,000 to $1,000,000 per year.

The Chemical Nature of the Environment.

Unlike the physical environment relatively little is known of the chemical environment in estuaries. While an estuary can be markedly affected by fertilisers applied to the land and then washed out by heavy rainfall, there is no simple pattern of availability of nutrients in the spring and autumn such as occurs in the open sea. Instead, much nutrient material is locked up by attachment to silt and is only released when the bottom sediment is agitated by gales (Oliver, 1961, Rochford, 1951). The deficiency of silt noted in the Solway has serious consequences, therefore, for the waters are particularly deficient in phosphate.

The sea is a well-buffered environment, that is it has a stable acidity/alkalinity which is not easily disrupted. This buffering depends on the system—

$$\underset{\text{Air}}{Co_2} \rightleftharpoons \underset{\text{Water}}{Co_2} \rightleftharpoons HCo_3^- \rightleftharpoons Co_3^=$$

Normal sea water has a mean pH of 8.2. In the Solway Firth, a pH range of 7.8-8.8 (mean 8.3) has been recorded in open water. At any one time this parameter may be stable over hundreds of square miles of sea. Some individual

variations occur close inshore, while some others may be attributed to pollution. Even over longer periods, the stability is still very evident.

TYPES OF SHORE

As we have already seen, the shore is produced as an effect of the tides. It is an area where sea and land interact, and where the extreme forces of both environments (e.g. waves, frost) combine to produce a habitat which is as varied as it is interesting, and one which is a scene of endless change. Shores range, in type, from the vertical surfaces of cliffs falling sheer into the sea, to the peaceful haven of salt marshes. There is, of course, every conceivable type between these two extremes, viz., reefs which are only exposed by good spring tides, boulder strewn scars, chattering shingle and the large areas of golden sand beloved by the holidaymaker. Each must be considered separately, although all can be divided into Upper, Middle and Lower shores.

The Upper shore is that area which lies above average high tide level, and is only reached by the highest tides. This is the most rigorous part of the shore colonised by living organisms. In this zone, many salt marsh plants occur, and channeled wrack, **Pelvetia canaliculata,** the sea slater, **Ligia oceanica,** and the rough periwinkle, **Littorina saxatilis,** are found here. The shore crab, **Carcinus maenas,** may be found here, in the warm days of summer.

The Middle shore comprises the large area bounded by the average high and low tidal levels. This is the zone which normally experiences a twice daily exposure and immersion by the tide. The residents, which can be considered typical shore dwellers, include egg or knotted wrack, **Ascophyllum nodosum,** bladder wrack, **Fucus vesiculosus,** mussels, **Mytilus edulis,** winkles, **Littorina littorea,** dog-whelks, **Nucella lapillus,** acorn-barnacles, **Elminius modestus,** the shore crab **Carcinus** and many more.

The lower shore is a relatively narrow region, and as the upper shore is only covered by the biggest tides, so it is only these tides which expose the lower shore. Its residents are much less hardy than those of the middle shore, and include painted top shells, **Callistoma zizphinum,** tortoiseshell limpets, **Acmaea tessulata,** purple-tipped sea urchins, **Psammechinus miliaris** and many others.

The Sublittoral Fringe lies immediately below the Lower Shore, and its residents although truly marine are nevertheless subject to more extreme conditions than residents of the open sea. This zone is characterised by the brown oar-weeds, **Laminaria,** a profusion of species of red algæ, and such animals as the edible crab, **Cancer pagurus,** and the lobster, **Homarus vulgaris.**

The Splash Zone, on the other hand, lies above the extreme high water level of spring tides, and as its name indicates is an area above the true shore which may be drenched with salt spray. The channeled wrack, **Pelvetia,** may extend its range into this zone while the small periwinkle, **Littorina neritoides** lives here, often in the most exposed places and returning to the sea only to

breed. Probably the most obvious and characteristic inhabitants of this zone are the lichens, the stiff, grey-green **Ramalina,** or the coarse, orange **Xanthoria parietina.** However, the sea-pink **Armeria** or sea-campion **Silene** also occur here, and, of course, cliff dwellers to a considerable height receive significant amounts of spray during gales.

While the zones and their inhabitants defined above are associated in a general way, as in all things, circumstances alter cases. For example, **Calliostoma zizyphinum** which may be found living on the shore on the coast of Devon, is found only below L.W.M. in the Solway Firth.

A. Rocky Shores.

Rocky shores occur mainly on the north side of the Solway Firth. They are very varied in character, and range from the sheer cliffs at the Mull of Galloway to the reef at Southerness Point and the confusion of stones and boulders at the base of a tree and scrub covered cliff around Ravenshall Point.

(i) Bare Rock Surfaces

No truly bare surface of rock occur anywhere in the Solway Firth, although it is possible that pollution, as much as exposure, is responsible for the poor fauna and flora which occurs at Parton, near Whitehaven. Where there are no seaweeds as at Ravenshall Point and eastwards to Auchenlarie, the rock surfaces are covered by animals well suited to live in such conditions viz., acorn barnacles, **Balanus,** limpets, **Patella,** dog-whelks, **Nucella.** Even on this shore the oar-weed, **Laminaria,** occurs at extreme low water mark, and a pathetic fringe of channeled wrack, **Pelvetia,** and flat wrack, **Fucus spiralis,** at high shore levels.

(ii) Weed-covered Rocks.

These replace the bare rock surfaces in more sheltered conditions, and represent a major floral and faunal area. The seaweeds are not only affected by zonation, but by the presence of a fresh water inflow, and other less obvious features. For example, while I have found thong-weed, **Himanthalia elongata,** and **Alaria esculenta,** at Port Logan on the North Channel, I have so far not found either within the Solway area; the sea-lettuce, **Ulva lactuca,** flourishes only where fresh water occurs. **Ascophyllum nodosum** may extend well up estuaries, and on sheltered rocky beaches will produce a luxuriant blanket; as the degree of exposure increases, however, it becomes less luxuriant such that in conditions of moderate exposure, it will be represented only by a hold-fast and a pathetic tuft of straps. The filamentous alga, **Polysiphonia lanosa,** which associates with **Ascophyllum** seems to reach a reasonable degree of abundance at situations such as Southerness Point where the **Ascophyllum** is only incompletely sheltered. Salinity is important and, like the molluscs, the species of attached algae decline in numbers with increasing distance from the open sea; only bladder-wrack, **Fucus vesiculosus,** and flat wrack, **F. spiralis,** together with the

brackish-water dwelling **F. ceranoides** penetrate the Solway east of a line drawn from Redkirk Point in Dumfriesshire to Bowness in Cumberland.

These attached algae shelter an abundant and varied population of animals from the sponge, **Sycon,** the hydroid **Dynamena pumila** and snake-locked sea-anemones **Anemonia sulcata,** to limpets, rough periwinkles, flat periwinkles, winkles, crabs, porcelain crabs and sea-urchins. While some are permanently attached, most crawl actively upon the weed which gives shelter against dessication when the shore is exposed. Few eat the algae, others prey on their fellow inhabitants, while still others obtain sustenance from the passing water either by use of stinging cells—sea anemones and hydroids, of by filter feeding upon the plankton.

(iii) **Rock pools.**

Localised portions of the rocky substratum which never dry out are called rock pools. Many of the organisms which occur in them cannot withstand dessication. These microcosma can be the means of observing forms which normally occur off shore. A hand put in a rock-pool will cause panic among the more active residents who then hide, but when the original panic has subsided, they emerge to resume their normal activities.

One's attention is immediately drawn to this extremely beautiful facet of life on the rocky shore by the contrasting pink-red of the corallina alga, **Corallina,** and the more purple-pink of **Lithophyllum** against the green background of **Cladophora.** The animals which occur here include the beautiful beadlet anemone — **'Actina equina,** dahlia anemone — **'Tealia felina, Pomatoceros triqueter** a tubiculous worm, and here, if care is taken to avoid casting a shadow, the acorn barnacle, **Balanus,** may be seen to feed by literally kicking its food into its mouth. Sea-urchins, starfish, prawns, small crabs, and fish frequently occur. Not only macroscopic forms find this a hospitable environment, for here too an abundance of microscopic forms occur; these include diatoms, ciliate protozoa, amoebae, foraminifera, nematodes, harpacticoid copepods, ostracods and dipteran larvae.

(iv) **Overhangs of Rock.**

The protection provided by an overhang or cave permits the development of a particularly rich fauna which may often be brilliant in colour. Encrusting forms predominate and include sponges, hydroids, sea anemones, tubiculous worms, sea squirts and many others. The resemblance between intake culverts of power stations and this portion of the rocky shore habitat, must surely be one of the principal reasons why such growths develop and flourish in these culverts and cause such trouble as a result. The hydroid, **Tubularia larnyx,** will form vast mats which filter out fine suspended matter, and eventually collapse under their own weight; mussels, tube worms, **Pomatoceros,** and acorn barnacles all live happily in this environment. All can bring about a costly train of destruction.

(v) **Crevices.**

The damp and shady crevices in rocks, resembling miniature overhangs as they do, constitute a specialised part of the rocky shore environment. The populations which can dwell in such circumscribed surroundings are as one might imagine small, but they are both diverse and interesting, including crustacea, molluscs, polychaetes, mites and insects. Perhaps the most obvious member of this group is the insect **Anurida maritima** so often seen in the upper half of the shore floating in groups on the surface film of rock pools in the exposure period, but seeking shelter in the rock crevices at the time of high tide.

(vi) **Within Rocks.**

The habit of burrowing within rock seems to have evolved from the habit of seeking shelter within rock crevices. The rock borers, e.g. **Cliona, Pholas,** possess the ability to invade a whole range of substrata, from wood through stiff clay to rock of a moderate degree of hardness, only the truly hard rocks are immune to their attack. In the Solway the boring sponge **Cliona** and the polychaete **Polydora** have been found living in calcareous stone and particularly in the dead valves of molluscs. The piddocks are represented only by the dead valves of **Barnea candida,** found off Heston Island.

(vii) **Beneath Boulders and Stones**

Rock detached as boulders and stones shelters a rich and varied fauna. On the upper surface, the flora and fauna is much what one would expect from the neighbouring rock surfaces. However, flat worms, polychaete worms, gastropod and lamellibranch molluscs, crabs, hermit crabs, starfish, sea urchins, sea squirts and fish may be found beneath them either attached to the particular stone or boulder, or burrowing in the underlying substratum. Care should **always** be taken to replace stones and boulders as they were. Failure to do so will kill the animals exposed and smother those animals and plants which live on the upper surface. Granted this happens naturally from time to time, but a shore which has been so abused may be rapidly and completely spoiled.

B. Shingle Beaches

Shingle beaches are composed of rounded stones and pebbles, and on the south side of the Solway Firth similarly rounded pieces of coal. Such a beach is normally subject to considerable wave action, and it is here that the action of beach drifting processes are most evident. For this reason, it is common to regard a shingle beach as devoid of life; however, this is a misconception.

Clearly, where the shingle beach is in active motion no living organism could withstand the abrasive action due to the motion of the stones. This situation is representative of the face at which motion is taking place, only. Shingle beaches often grow in width, or at a shingle spit in length and width. In the latter case, the growth of the spit may permit the development of a salt marsh as at Grune Point; but the older, higher levels of a shingle beach or spit

may be removed by some distance from the site at which motion occurs. In such stable positions an interesting flora will develop and include such forms as sea-kale, sea-pink, sea-campion, stonecrops, and at the highest levels such hardy land dwellers as the docks and gorse. Such communities may be observed at Abbey Burnfoot, Auchencairn Bay and Grune Point. The amphipod sand hoppers, **Talitrus,** and sea-slaters, **Ligia,** and centipedes may also be found at some depth in the shingle.

C. Sandy/Muddy Shores

Soil grade analysis has shown that unlike the muddy estuary of the R. Blackwater, Essex, in which the sediment may contain 90% as the silt/clay fraction, sediments in the Solway rarely contain 50% of this fraction, and most soils contain significantly less than this amount. The most abundant grade is ca. 0.2 mm. diameter.

Sand, and particularly sand at this grade size, has a number of interesting properties. If the water content is low, a person walking upon such sand will notice that it pales around his foot, and is one of the overt signs of the phenomenon known as **dilatancy,** which is caused by an increase in the soil resistance as the force applied increases. The reverse phenomenon which takes place at a higher water content is known as **thixotropy,** here as the force applied increases so the resistance decreases. The most extreme state of this phenomenon is known as quicksand. Thixotropy is extremely important to burrowing animals, such as the lug-worm **Arenicola** which can penetrate a thixotropic soil merely by exerting a pressure with its proboscis. When the pressure is relaxed the soil hardens once more, so forming a burrow around the lug-worm.

Shore soil hardness, as we have seen, is dependent upon the water content of the individual soil. If we study the soil hardness, therefore, we can make certain deductions about its water content. By this means it can be shown that the water content of a shore sand may rise (and the soil soften) 50 m. or more in front of the advancing tide edge. At the same time, because a stable, anaerobic layer may be present at the depth of a few centimetres, it can be deduced (a) that these anaerobic layers are not receiving significant quantities of aerated water from the sea water above the soil, and that consequently (b) there is, within the soil, a tide of deaerated water moving under the influence of the overlying water. This deduction indicates that the problem of salinity relationships between interstitial and overlying water are complex, and probably invalidates beliefs currently held.

The anaerobic layer supports vast numbers of bacteria which maintain their oxidative processes by the reduction, to sulphide, of the sulphate present in sea water; hence the foul odour of H_2S often associated with such soils. It should be noted that this phenomenon like that of thixotropy is found only in those sandy shores which have a very low gradient, of the order of 1/100 or less, and are poorly drained in consequence.

Some consider that this environment will be subject to little fluctuation in temperature, but measurements show that under appropriate conditions the temperature at 6 cm. depth can rise by 4.5C° in three hours, and the whole system is, of course, affected by tidal inundation and exposure twice daily.

Sandy/muddy shores are considered, erroneously, by some to be devoid of plant life; a moment's reflection will show that the plants of a salt marsh and their precursors live on the shore below the level of E.H.W.M.S.T. Even where no macrophytic vegetation is visible, the sandy shore is inhabited by large numbers of littoral diatoms and dinoflagellates. In the turbid waters of estuaries, light penetration of the water is poor, the phytoplankton is at a disadvantage and cannot make a significant contribution to primary production. However, many workers have shown that the littoral diatoms constitute a major food source for many animals which include protozoa, nematodes, copepods, ostracods, polychaetes, molluscs and crustacea. In the Solway Firth these diatoms abound in the more silty areas towards the H.W.M., where they form dark, olive-brown patches over the surface of the soil. They also occur in more sandy areas, but are apparently less abundant and produce a golden coloration only. Changes in the colour of these patches have been widely used to study diatom behaviour, which it was thought exhibited a "tidal-rhythm." Later work demonstrated that the littoral diatoms exhibited a diurnal response to the presence or absence of light only. In the daylight they rise to the surface of the soil and stay there throughout the hours of daylight provided that their water cover is not turbid, which causes them to descend into the soil. Regarding the emergence of these diatoms after dawn, it must be appreciated that light can penetrate littoral soils and has a finite extinction coefficient. When the light intensity at 2 mm. depth reaches an appropriate value, thought to be ca. 2.4 ft. candles, the diatoms rise to the surface. It is interesting to note that this phenomenon, especially with reference to the flatworm **Convoluta roscoffensis,** led to the development of theories relating to physiological rhythms, and eventually circadian rhythms. However, the whole structure of these theories is, unfortunately, based upon a misconception by Bohn who irradiated **Convoluta** with a radiation source of unknown composition and at an unknown dose rate, and concluded quite wrongly that his observation could be related to the effects of light on this organism. He then founded a structure of physiological rhythm theory on this basis; and however valid circadian rhythm theory may be, one at least of its foundations is spurious.

The faunas of the sandy/muddy shores exhibit zonation and, with the exception of **Corophium volutator** and **Hydrobia ulvae,** are those found between M.H.W.M.N.T. and L.W.M.S.T.; few animals penetrate the salt marshes above this level.

In the Inner Solway, this zonation fell into the pattern **Corophium volutator** and **Scrobicularia plana,** living in the soils of higher silt content, to **Macoma balthica/Arenicola marina,** to **Arenicola marina/Cardium edule** to **Bathyporeia** sp./stunted **Lanice conchilega** living in the coarser sediments at L.W.M.

In the Outer Solway, the animal zonation fitted a pattern from M.H.W.M.S.T. to E.L.W.M.S.T., thus **Corophium volutator, Macoma balthica/ Arenicola marina, Arenicola marina/Cardium edule, Tellina tenuis/Owenia fusiformis, Tellina fabula/Abra alba/Nucula sulcata/Donax vittatus.** In the tributary estuaries on the north side of this area the fauna more nearly represents a microcosm of the Solway itself, rather than any one part of it. The middle banks have a very poor, sparse fauna, but on the fringe banks the fauna tended to become richer with increasing distance from the channels and reaching a maximum of abundance in the **Macoma balthica** zone.

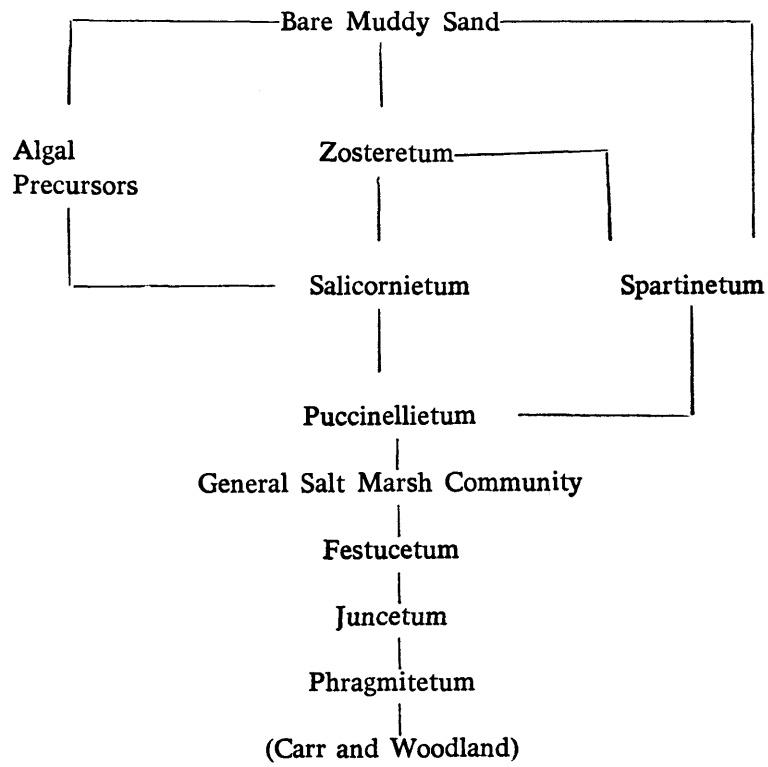
D. Salt Marshes

For some inexplicable reason, salt marshes are often ignored in considerations of shore life, although they clearly represent a particular portion of the zonation sequence on sandy and muddy shores. They occur in sheltered areas either at the head of estuaries and bays or within shingle spits. At the head of estuaries as one might expect from the principle that coarse sediments occur near the L.W.M. and fine sediments towards the H.W.M., salt marshes occur at the higher levels of shore which contain relatively the greater proportion of the silt/clay grades (i.e. less than 0.0625 mm.).

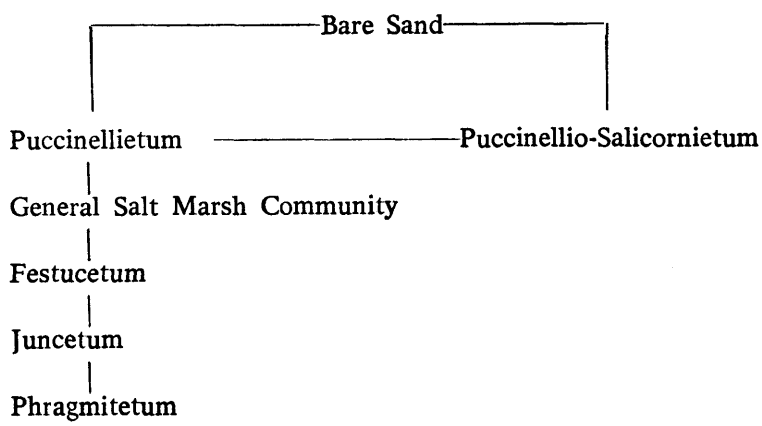
Chapman (1960) classified the maritime salt-marshes of the world. Like the whole of the west coast of Britain, the Solway marshes fall into subgroup (a) of Group I, North European marshes, "sandy and sandy-mud types dominated by grasses," which have the following characteristic features:

(1) Terracing (2) Absence of **Halimione** and restriction of **Limonium** to ungrazed areas, (3) Simplicity of sere, (4) Production of close sward, and (5) Poor algal vegetation, and especially absence of marsh fucoids. The abundance of **Puccinellia** and **Festuca** he considered to be associated with the heavy grazing of these marshes, with a correlation between the sandy nature of the soil and inhibition of the **Salicornia** species as successful primary colonists, their place being taken by **Puccinellia maritima.** He also considered that grazing had largely eliminated **Halimione** and **Limonium,** reduced the part played by other species in the General Salt Marsh community, and simplified the succession.

In general, the investigations, with which I have been associated, since 1961, have confirmed Chapman's conclusions. However, certain features of significance were not noted by him. In essence, the Solway Firth salt-marshes fall readily into two groups. The first group occurs along the Scottish Coast from Wigtown Bay to Southwick Merse, and is associated with an area of silt held below low water mark, by dominant flood tides. In this area only is a **Zosteretum** and a **Salicornietum,** which here forms distinct zones, markedly developed. In this area, the marsh succession may be summarised thus:



The marshes of the Scottish and English shores of the Inner Solway, i.e. within a line drawn from Southerness Point to Dubmill Point, make up the second group. In this group, the primary community is either a **Puccinellietum** or a **Puccinellio—Salicornietum.** The **Salicornia** spp. are poorly developed and a small stunted **Salicornietum** is found only on Skinburness Marsh. The succession, in this group, may be summarised thus:



To sum up, the Solway Firth marshes as a whole tend to show little development of the zones of primary colonisation, which are best developed along the Scottish coast to the west of Southwick Merse. Even here, the silt content of the soils tends to be low when compared to the more muddy marshes away from the west coast of Great Britain. The lack of diversity of the primary zones seems to be due to the lack of silt since **Salicornia** spp., at least, are not normally successful colonists of sandy soils. Work in recent years by a number of authors has shown that silt plays a more important rôle than merely providing a more stable substratum than sand for colonisation. Vitamin B12 and phosphate (as FePo4) are known to be associated with silt, while in estuaries significant amounts of phosphate are made available to plants in the phytoplankton only as a result of agitation by gales. It seems then, that the lack of silt in the Solway marshes is important, not only because sand is more readily moved and therefore less stable without it, but in its absence much vital nutrient material is lacking.

It is of some interest to consider why the marshes of the east and west coasts of Britain should be so different in the silt content and fertility of their soils, and clearly the answer must lie in a knowledge of the basic hydrography of the area.

In the Solway Firth, which as we have seen has been filling up with sediment since the Pleistocene, the most potent force of sediment transport is the asymmetrical tidal wave producing such a marked disparity of maximum flood and ebb tide velocities, while in the area in which silt lies on the sea bed, i.e. mostly beyond the 10 fm. contour, the North-East Irish Sea is so enclosed that it is relatively little agitated by wave action. Silt or muddy soils while they are readily transported when in suspension, are not easily moved, initially. For effective transport to occur, from the sea bed in the region of high silt content to the shore where silt is relatively lacking, it is necessary for greater wave action than normal to agitate the sea-bed and make its silt accessible to the tidal streams. In the North Sea, on the other hand, a tidal asymmetry also occurs, but here with the greater wind fetches involved, most of the sea bed, particularly in the southern North Sea, where the marshes are richest, is very subject to wave action, and the silt is thus readily available for transport inshore. Therefore, the factor, most effective in creating fertile salt marshes is wave action which reaches and agitates the offshore sea bed, rendering the fertilising silt available in suspension for transportation inshore by currents or tidal asymmetry. Such a deduction demonstrates very clearly how a narrow investigation of one particular area can arrive at erroneous conclusions and supports the contention of Bascom (1960) that a beach may be considered as the whole of that area affected by wave action, and **not just** the area from L.W.M. upward. In his particular context, he took the beach to be an area extending from a depth of 30 ft. below E.L.W.M.S.T., which is the level below

which ordinary wave motion does not have sufficient energy to move sand. Clearly, this can be qualified in the light of what I have said above, but it is a reasonable practical limit.

THE SEA BED

In the Inner Solway Firth, the distinction separating sea-bed from exposed fringe and middle banks is somewhat artificial, but much of the bank sediment is a fine grade sand, and in the channels some medium grade sand occurs.

In the Outer Solway, fine sand is still a dominant component of the sediment, but well defined areas of more silty soil as well as hard stony bottoms occur; there are no truly muddy bottoms in the area for the silt/clay fraction rarely approaches 50%, unlike the truly muddy bottoms of the estuaries of Essex where this fraction may make up 90% of the total. However, a bottom having a higher fraction of silt/clay dominates the outer fringes of the Solway Firth, and on the north side in the vicinity of the Abbey Head.

The stony areas of the sea-bed resemble scar ground in nature and this sediment contains large numbers of dead lamellibranch valves, predominantly oyster, **Ostrea.** These stony bottoms are limited in extent and form only a small portion of the total area of the sea-bed in the Outer Solway.

It should be appreciated that animals and plants described in this section are normally only seen in a healthy condition when obtained by use of trawl, dredge and grab. However, many may be torn from their normal habitat by gales and thrown up on the strand-line. The strand-line may be a rich source of material for those who are either unable to sample offshore, or who require a basis upon which to found a limited offshore sampling programme. For example, because of such strandings, it was known in 1964 that the common or painted top-shell, **Calliostoma zizyphinum** was living somewhere in the vicinity of Workington; in 1968 it was found in abundance below L.W.M. at Moss Bay. By the same token I know from the many freshly dead shells of the European Cowrie, **Trivia monacha,** that this species is present somewhere in the vicinity of Maryport Bay, near Drummore, although I have not yet been able to find the living animal.

(i) The Inner Solway

In the Inner Solway, the channel beds are composed either of fine or medium grade sand. They tend to be barren in themselves and carry relatively small amounts of water at the time of low tide. Like the Danish Waddensea they are characterised by an absence of infauna, and a vagile (vagrant) epifauna. This vagile epifauna consists of **Crangon vulgaris** and **Platichthys flesus** predominately, but during the summer months, especially with warm sea temperatures and higher salinities, less robust forms such as **Eupagurus bernhardus** and **Heterosepiola atlantica** may penetrate as far upstream as Newbie. By winter, of course, **Crangon** and **Platichthys** preceded by the more

delicate forms have all migrated seawards. It is of interest to note that while channel beds are barren in themselves, and present no intrinsic attraction for fish, they are a refuge for these animals, while the vast areas of sand flats bearing rich food supplies are exposed by the ebbing tide; without this concentrating mechanism trawling for shrimps or flounders would be uneconomical here, for trawl catches are very poor indeed when the fish are dispersed on their feeding grounds.

(ii) **The Outer Solway**

In the Outer Solway, the sea-bed is much more varied in character, and because of the greater depths of water, subject to much less extreme conditions generally; consequently, it has a more varied and rich fauna than the Inner Solway. As one might expect, a vagile epifauna is present and represents the source of those forms which invade the Inner Solway in the more favourable months of the year. Interesting forms such as the spider crabs **Macropodia rostrata** and **Hyas araneus,** the swimming crabs, **Portunus depurator** and **P. holsatus,** the starfish **Solaster papposus,** brittle starfish **Ophiura texturata** in addition to the more "ordinary" **Carcinus maenas** and **Asterias rubens** occur here.

The areas of stony ground have a characteristic epifauna which is typified by the bivalve mollusc **Modiolus modiolus** and the cherry-red sea-squirt **Dendrodoa grossularia** which is a non-colonial form often found living abundantly in such close association they become fused into a common base. Although, these two species characterise the fauna of these grounds many other interesting organisms occur in association with them. These are hydroids such as **Abietinaria abietina** and **Dynamena pumila,** soft corals **Alcyonium digitata,** polychaetes including the reef-forming **Sabellaria alveolata** (which may cover large areas of sea-bed and exert a stabilishing influence) and the polyzoans **Flustra foliacea** and **Membranipora membranipora.** Off Workington, and especially in Moss Bay, a particularly interesting association occurs despite the close proximity of industry and its resultant effluents. As one might expect this association includes the species already mentioned, but has in addition such organisms as the beautiful, but destructive boring sponge **Cliona celata,** the hydroid **Tubularia larynx,** the gastropod mollusc **Calliostoma zizyphinum,** the echinoderms **Echinus** and brittle stars, and the colonial ascidian **Botryllus schlosseri.** In this area, too, the red alga **Delessaria sanguinea** occurs abundantly, while further offshore large and beautiful examples of the filter-feeding sea-anemone **Metridium senile** may be taken by dredge or trawl. It is of interest to note that the fauna of this ground shows strong similarities to that found on the hard, stony ground between the mouth of Thirslet Creek and the Stone, on the River Blackwater, Essex, and with the stony margins of many of the sea-lochs on the West Coast of Scotland viz. Gareloch, Loch Long and Loch Fyne.

As I have already indicated, much of the sea-bed of the Outer Solway is made up of sand. The fine sand especially at the edges of the banks is

characterised by the molluscs **Mactra corallina** and **Donax rittatus,** and the fine and medium sands by the mollusc **Spisula solida.** The finer silt and mud containing sands, on the other hand, are characterised by the polychaete **Nephthys** and the molluscs **Nucula sulcata, Abra alba** and **Tellina tenuis.** Although these species characterise particular communities, others occur in association with them. In the grounds of finer grade, the infauna may be supplemented by the polychaete **Aphrodite aculeata,** the molluscs **Fusus antiqua, Philine aperta** and **Pharus legumen,** and the echinoderm **Astropecten irregularis** while in the muddy-gravels of Wigtown Bay, the strange and attractive Pelican's Foot Shell **(Aporrhais pes-pelicani)** occurs. On the grounds which contain less fine material the tubiculous polychaetes **Pectinaria koreni,** and **Lanice conchilega,** the crustacea **Corystes cassivelaunus,** and **Crangon vulgaris,** the molluscs **Philine aperta, Natica catena,** and **Cyprina islandica** together with the echinoderms **Astropecten irregularis** and **Echinocardium cordatum** occur. On occasion **Asterius rubens** occurs in extreme abundance on these grounds, especially to the south-west of Heston Island where it is not unknown for it to fill a trawl to such a degree, that it seems likely to burst.

Rocky sea-bed occurs mainly along the north shore from Heston Island and Balcary Point west to the Mull of Galloway. I have little information on the fauna of this area. However, lobsters—**Homarus vulgaris** are widely fished on these grounds; the edible crab — **Cancer pagurus** is also taken, but the economics of fishing are such that it is not profitable to market, it is therefore normally returned to the sea. Both these species are also taken on the stony grounds off Workington; here I am led to believe the archaic hoop-net is used in addition to pots.

Plankton

The plankton of the Solway Firth area is relatively poorly known. The more obvious members are jellyfish, of which the species **Aurelia aurita** is often abundant in the early summer months. This harmless scyphozoan is succeeded by **Chrysaora hysocella** and **Cyanea capillata.** The latter species is well known for its ability to sting humans and is a pest to fishermen and swimmers alike. However, despite the lethal nature attributed to it by Sir Arthur Conan-Doyle in the Sherlock Holmes adventure of the The Lion's Mane, it is harmless. Apparently, the only truly lethal jellyfish, **Chironex fleckeri** and **Chiropsalmus quadrigatus** live in Northern Australian waters; even the notorious Portuguese Man of War has not, in fact, been known to kill anyone. From September onwards, the harmless **Rhizostoma octopus** which feeds through numerous small mouths upon planktonic organisms, becomes predominant. This organism with its typically compact tentacle and mouth structure and a blue-purple edge to the bell which is divided into many small lobes, is frequently washed up in large numbers and stranded on the Barnhourie Sand, and from Southerness Point north to Carsethorn, in October. Large numbers of the amphipod **Hyperia galba** are normally found living in the cavities of this jellyfish. The

comb-jelly, **Pleurobrachia pileus** may also occur throughout the year, but seems to reach a maximum of abundance in late spring. These animals are obvious because of their size, but they are also of importance as predators—**Aurelia, Rhizostoma** and **Pleurobrachia** upon small organisms, **Cyanea** and **Chrysaora** on large active forms. While many diatoms species must occur in the plankton, only the species **Coscinodiscus lineatus, Actinoptychus undulatus** and **Rhaphoneis amphiceros** var. **rhombica** have been recorded.

The isopod, **Idotea,** may be observed swimming in the surface layers as indeed may the swimming crabs, but this is more a facultative condition (i.e. tychopelagic) than a full adaptation to the planktonic life (i.e. holoplankton) and these forms are normally taken with bottom sampling equipment, e.g. dredge and trawl. For this reason, too, the interesting, small cephalopod **Heterosepiola atlantica** was included in the vagile epifauna, and indeed this form often burrows into sand.

Although this represents the extent of the direct information which can be offered regarding the plankton of the Solway Firth, it should be appreciated that many of the bottom dwelling animals, e.g. hydroids, polychaetes, many molluscs, echinoderms, polyzoa, ascidians and fish have planktonic larvæ. At the appropriate time of the year, these larvæ must swell the numbers of those animals which assume this drifting form of existence.

By means of planktonic larvæ, the Australasian barnacle **Elminius modestus,** brought to this country, on the bottoms of fast ships, during the 1939-45 war, has been able to spread successfully from each of the original sites of colonisation. When this species reached the Solway Firth colonisation took place rapidly and it may be found at many places where a suitable substratum occurs.

Note.—This paper will be continued in future numbers of the Transactions.—Ed.

A MESOLITHIC SITE AT LOW CLONE, WIGTOWNSHIRE

By W. F. CORMACK, W.S., F.S.A.Scot., and JOHN M. COLES, Ph.D., F.S.A.[1]

Introduction:

Within the last few years extensive surface collections of flints have been made from a series of coastal sites extending from the Mull of Galloway in the west to Southerness at the mouth of the River Nith in the east. In 1964 a numerical analysis was made of the flints then available[2] but realising the limitations of a study based solely on surface finds, the writers decided that one of the sites should be excavated to obtain, if possible, a fully representative flint industry and to gain further information regarding the nature and affinities of the culture concerned. Accordingly, in 1965 and 1966 excavations were carried out on the southern of the two sites on the farm of Low Clone, in the Parish of Mochrum, Wigtownshire. By no means the whole of the site was explored but sufficient results have been obtained to justify this report.

The site:

The east side of Luce Bay, where the site lies, exhibits topographical features characteristic of much of South-West Scotland. In shore from the present high water mark is a raised beach, composed at Clone of rounded boulders and pebbles interspersed with a grey sand, and carrying nowadays the main coastal road. This beach is that of the early Post-Glacial high sea which invaded the land during the Atlantic period.[3] On the inner edge of the raised beach is a prominent erosion scarp which forms a line of low cliffs marking the greatest extent of the marine transgression. At Clone, the scarp, known locally as the Heugh, is situated some 500 feet from the present high water mark and is about 50 feet above ordnance datum. The site under discussion is situated on the top of the Heugh in the angle between the latter and a ravine in which runs the Clone burn (fig. 2); it was therefore well above the reach of the waves but conveniently situated for access to the (now) raised beach. This situation, on the cliff top, near a stream, is typical of these coastal sites. The site at Clone has a pleasant southerly aspect over the raised beach to the sea with the Isle of Man a prominent landmark in the distance. On the site the ground falls away to the south at a slope of 1 in 20 and this slope shelters it to some extent from northerly and easterly winds (Plate I.).

1 The excavation was carried out by W. F. Cormack, the analysis of the flints by J. M. Coles, while the remainder of the paper is a joint effort.

2 **New Aspects of the Mesolithic Settlement of South-West Scotland,** J. M. Coles. These Transactions Vol. XLI., p. 67. From the list of sites in the work cited should perhaps be deleted Luce Sands and Blairbuy and to the list should be added Mull Glen (1964), Drummore (1964), Gillespie (1965), and Innerwell (1964), in Wigtownshire, and Mossyard (1964), Gillfoot (1965), Maxwellfield (1965), Powillimount (1964), and Tallowquhairn (1965) in the Stewartry of Kirkcudbright (fig. 1). The dates refer to the issues of Discovery and Excavation (Scotland) from which further details may be obtained.

3 In a recent study—**Post Glacial Sea Levels in South-West Scotland** by W. Graham Jardine—**Scottish Geographical Magazine,** Vol. 80, 1 (1964), p. 5—the commencement of this transgression is given as c. 8000 years B.P., and an upper limit for the inundation at c. 4740 B.P. The highest point to be affected by the waves in Luce Bay is shown to be about 30 feet above Ordnance Datum-Newlyn.

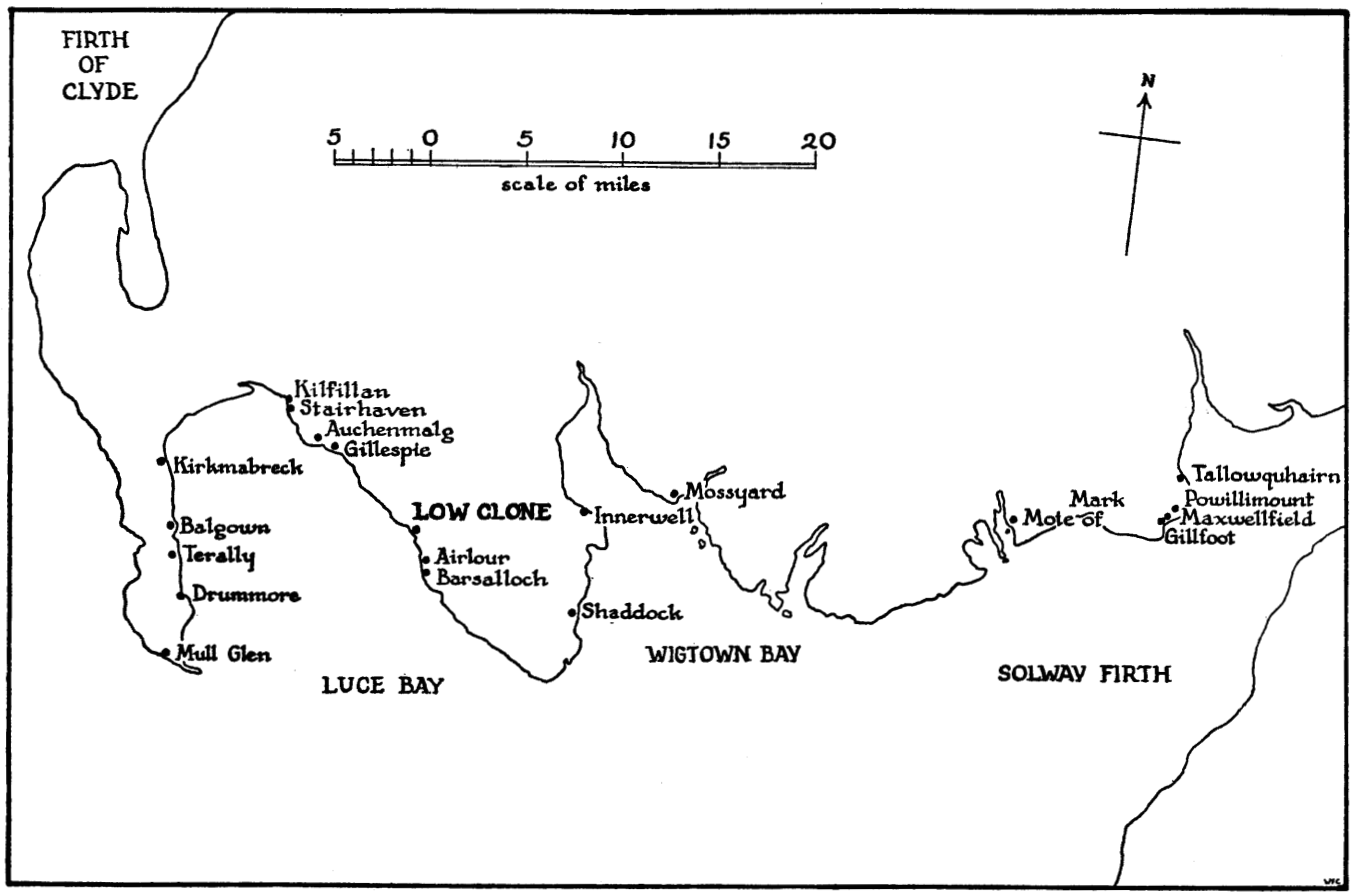


Fig. 1—The principal coastal mesolithic sites now known in Galloway.

Beneath the topsoil at the site itself are graded layers of sands and gravels dipping towards the present coastline. Among these gravels are lenses of water-worn stones varying from small gravel, through cobble size, to rounded boulders the size of the human head. These gravelly deposits, probably laid

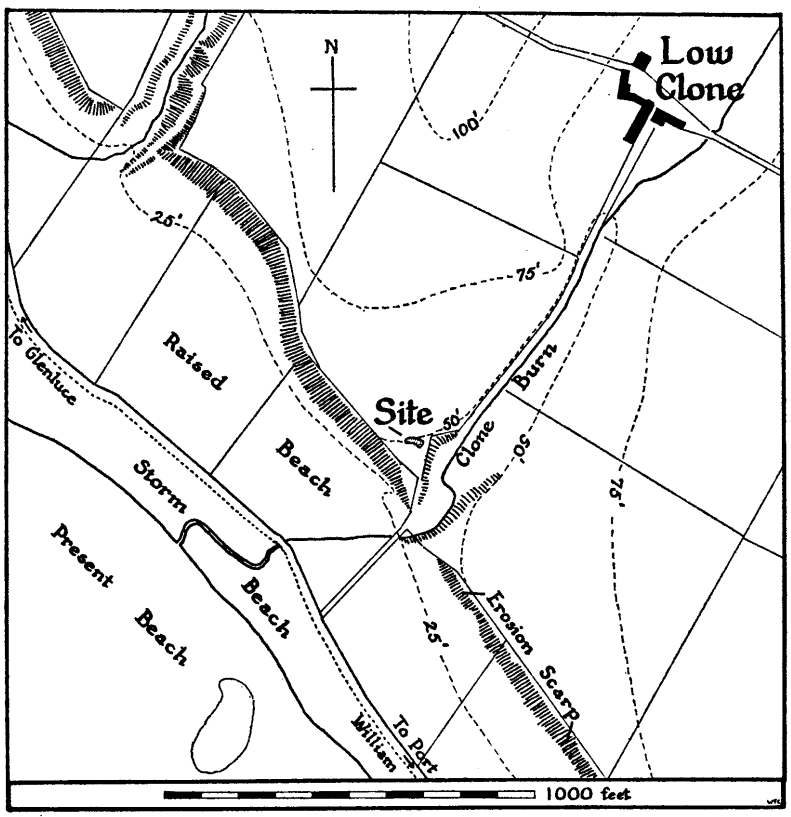


Fig. 2—Map showing situation of the southmost of the two mesolithic sites on Low Clone relative to the early Post-Glacial raised beach

down by a late glacial sea,[4] themselves overlie boulder clay which in turn overlies palaeozoic rock. An occasional nodule of flint can be picked up both in the present beach and the early Post-Glacial raised beach—the largest being about the size of a fist. These flint nodules are, however, rare on the eastern shore of Luce Bay, but are more readily available on the western, although even there they are by no means common.[5]

4 A raised beach appearing elsewhere on the shores of Luce Bay at about the 50 foot mark seems to represent this late glacial inundation e.g. at Barsalloch 2 miles to the south-east of Clone, and it is to this time that the marine clays laid down at Terally on the west side of Luce Bay at about 50 feet above O.D., should probably be attributed.

5 Four small unworked nodules found at Clone had an average weight of 95 gms. and length of 4.5 cms.

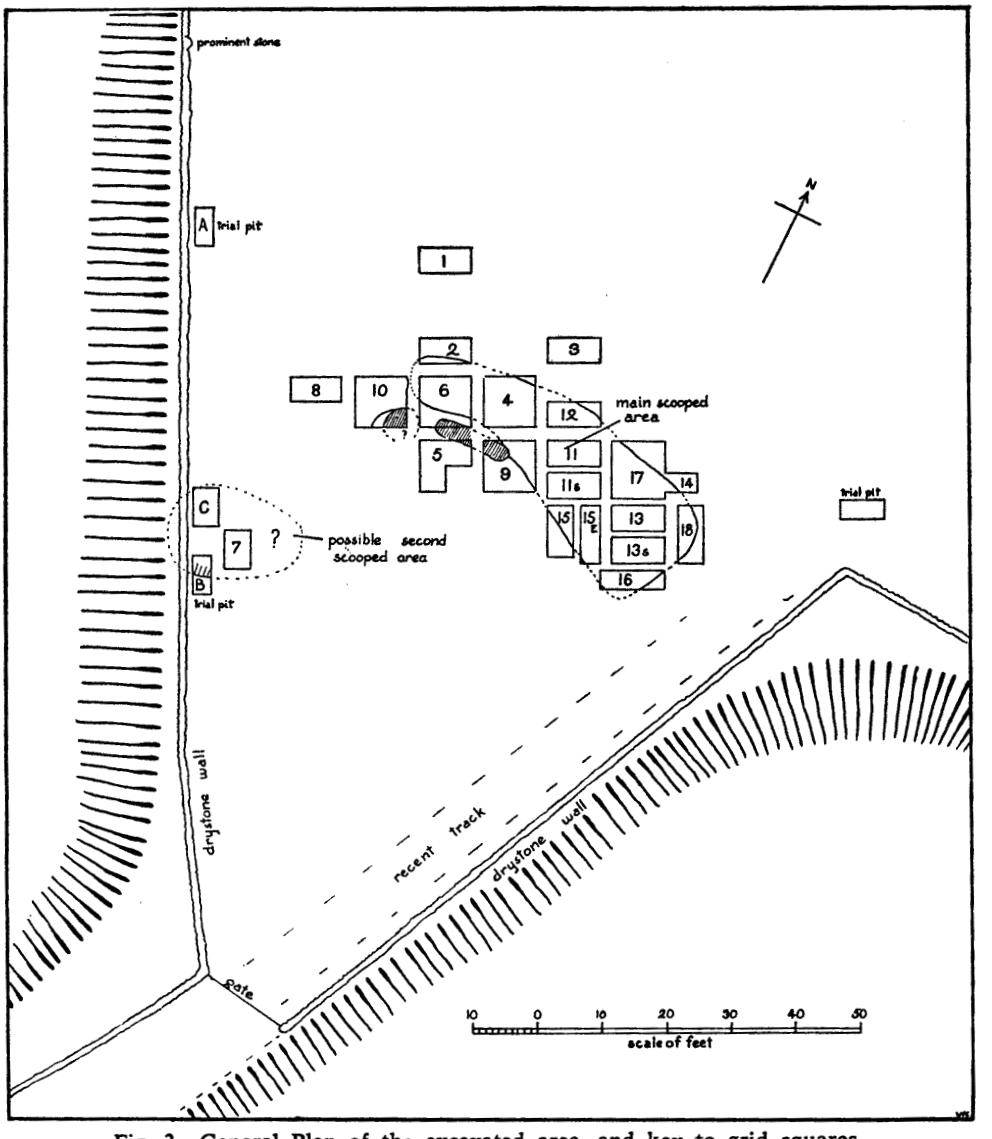


Fig. 3—General Plan of the excavated area, and key to grid squares.

The excavation:

A grid of 10 foot squares was laid out over the site, which had been disclosed by a scatter of flints which had appeared after ploughing (fig. 3). But before commencing operations two trial pits were opened closely adjoining the south-western edge of the field. The northmost trial pit (A) disclosed 9 in. of dark brown topsoil free of flints above a 4 in. layer of red brown sandy soil containing worked flints. This red brown layer lay directly on the subsoil

and may represent an ancient ground surface. This profile was not repeated elsewhere on the site, probably because more intensive agricultural activity away from the edge of the Heugh had there mixed the flint bearing layer with the modern topsoil.

The southmost trial pit (B) disclosed 9 in. of topsoil lying directly on the natural subsoil but at the north end of the pit it encroached on a seemingly artificial scoop in the subsoil. The filling and bottom of this scooped area contained flints. A third trial pit (C) opened to the north of B showed this scoop extended at least 13 feet in this direction. One part-square, 7, adjoining test pit B, confirmed the existence of the scoop, but was not developed below 12 in. from the surface, at which depth the bottom had not been reached. This scoop remains for future investigation. Three half-squares opened, 1, 3 and 8, disclosed only sterile subsoil 9 in. to 10 in. below the surface of the ground, so were not developed further.

Scooped area:

Disclosed in the centre of the site was a large scooped area which was fully investigated (fig. 4). Somewhat like a boomerang in shape it had a total length of 45 feet and was no less than 18 feet wide at its widest part, the south-east end. Flat bottomed, its depth was a consistent 22 to 24 in. below the present ground level, except in square 13 where it sank to some 30 in. deep. At the east end it shallowed up until at the east side of square 16 it was only 10 in. below the present ground level.

Along the north and north-east side the edge of the scoop was sharp and clearly defined, but the south side was somewhat encumbered with rather stoney re-filled material — see sections of N. sides of squares 9 and 15. This stoney re-filled material, which also seemed to occur on the south part of square 4, was in marked contrast to the remainder of the filling which was a soft brown loam. Signs of interference by burrowing animals occurred in places in this soft fill, particularly in squares 6, 4 and 11.

Worked flints occurred throughout the topsoil and fill, scattered both vertically and horizontally without any definite stratification. Several rough stone settings occurred in the fill as well as two layers of dark occupation soil. Other features in the scoop were three signs of stakes, and a patch of clay-like material which is discussed below. In the fill were occasional sherds of recent pottery, some recent animal bones in squares 6 and 10 and, half-way down the fill, in square 11S, a recent (1797) coin. Other finds in the fill and topsoil were between 20 and 30 fragments of burnt bone, where identifiable being from red deer, also 2 fragments of antler cortex and, in 11 and 13, 2 "hammer stones" occurred. Outside and adjoining this scoop were two large black deposits referred to below as fire spots.

Stone settings:

At the bottom of the scoop a rather odd line of flat topped stones appeared in the subsoil (squares 11 and 12). Also in square 17 was what at first glance

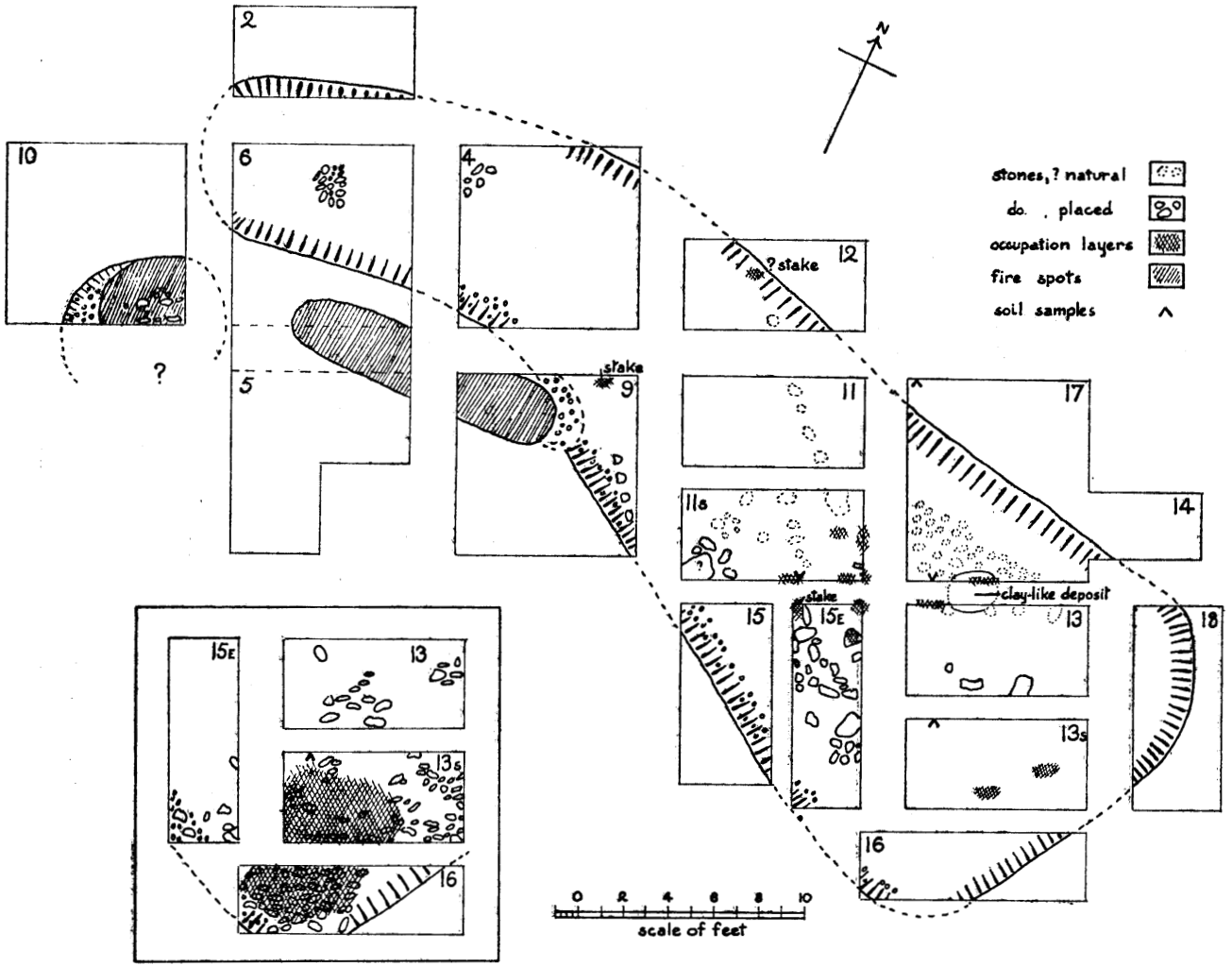


Fig. 4—Plan of the main scooped area, showing lower occupation. The inset at the bottom left shows the upper occupation in squares 13, 15 and 16.

seemed a cobbled area at the bottom. Although the matter is not beyond doubt, the writers consider that these stones, in spite of their artificial appearance, were natural. The brown sandy fill stopped an inch or two above them. While an occasional flint was found lying on them, none was found beneath. Furthermore, around and below them, the sandy subsoil seemed clean and untouched although very soft in places. It appears that the prehistoric excavators had dug down through the relatively soft sands and gravels until they came to a natural lens or deposit of stones. The outcrop of a lens on the bottom of the scoop would explain the straight line. These natural stones are shown dotted in fig. 4.

There is, however, no doubt that the following stone settings were artificial. These fell into two categories: (a) those laid on the bottom of the scoop (fig. 4), and (b) those in the fill itself (fig. 4—inset).

Into the first category, (a), fall a neat D-shaped stone setting in square 6, 18 ins. by 24 ins., and containing stones each about 6 ins. in diameter; settings also occurred in squares 4, 9, 11S, 13 and 15E, all as indicated on the plan (fig. 4). In square 9, four stones lay in a line, while a scattered setting in 15E also formed a rough line, in part double, with soft filling suggestive of a stone footing for a light timber wall or screen. As will be noticed, the west end of this setting terminated in a strong black vertical stain, alongside of which a flat stone was placed vertically. This was strongly suggestive of a post or stake hole (see sections in fig. 5). While no evidence of stratification occurred throughout most of the scooped area, in squares 11S, 15E, 17, 13 and 13S, dark greasy deposits occurred in several discontinuous patches on a level with the top of these lower stone settings.

Stone settings falling into category (b) were a slight one in square 6 and a fairly extensive area in squares 13, 13S, 15E and 16 (fig. 4—inset). This latter setting formed a rough rectangle 8 feet by 10 feet. At the east edge of the scoop this setting lay only some 9 ins. below the surface while at the west edge of the setting it lay 15 ins. below the surface. It had, however, been laid level and the apparent increase in depth was due to the rise in the surface of the ground. The southern portion of this stone setting was overlaid by a dark greasy deposit 3 or 4 ins. thick. A patch 24 ins. by 40 ins. and 2 ins. thick of clay-like material appeared at the bottom of the baulk between 17 and 13 and overlying and surrounding several natural stones. This patch may be the natural remains of a decayed boulder.[6]

Stake holes:

As stated, a stake hole occurred in the west corner of 15E, the surviving length being 6 ins. and diam. 2 to 3 ins. A similar stake hole appeared on the N.-W. side of square 9 and was furthermore in prolongation of the setting

6 In a preliminary note the excavator hazarded the opinion that these stones had been set in clay. He is indebted to Mr Allard Johnson, a soil chemist, for pointing out that natural disintegration of a fine grained boulder would explain the feature. A boulder in course of disintegration was later found in the bottom of square 11S.

of 4 stones in that square. A black hole 3 ins. diam. appeared on the edge of the scoop in square 12. These 3 traces were quite unlike the ?mole tracks which appeared here and there in the fill. However, while those in squares 9 and 15E must be contemporary with the scoop, since they are covered by brown fill, that in 12, being just below the topsoil may be due to a stake having been hammered into the ground in recent times.

Soil profile:

Profile samples of the filling were taken at the points indicated on fig. 4. Preliminary tests show that the soil in the fill has a pH value of 5.2, and is thus inimical to the preservation of unburnt bone or antler. Pollen may, however, be preserved and a full report will follow, if results warrant it.

Fire spots:

A trough of black greasy soil 12 feet long, 2 feet 6 ins. wide and 8 ins. thick extended from square 6 to 9. It contained many flecks of carbon and several largish stones. At the east end it petered out in an area of mixed stoney fill. The section of the N.-W. side of square 9 seemed to indicate that here it had been laid in a larger trough of mixed but clean stoney fill. This fire spot contained one or two flints, including one unburnt microlith, and the calcined fragment of a foot bone of an immature red deer. Another black area of similar nature occurred in square 10. This second " fire spot " had been set in a stoney pit, in the W. side of which was found a recent animal bone. In the bottom of the fire spot was a flue-like line of stones. The majority of the fragments of burnt bone were found on the south side of the scoop, as might have been expected from the position of the fire spots.

Stratification:

The existence of two levels of dark greasy material in the south-eastern part of the scoop has already been commented on, seemingly implying two periods of occupation. But this conclusion was not borne out by the position of the flints, which, as stated, occurred throughout the filling with no definite horizontal concentrations. It appears that the scoop was occupied seasonally for a number of years while the fill was accumulating. On two occasions, however, this occupation was sufficiently intensive over part of the fill to form these two levels of greasy material. The fineness of the fill could be attributed to windblown sand gradually filling up a feature not unlike a golf-course bunker.

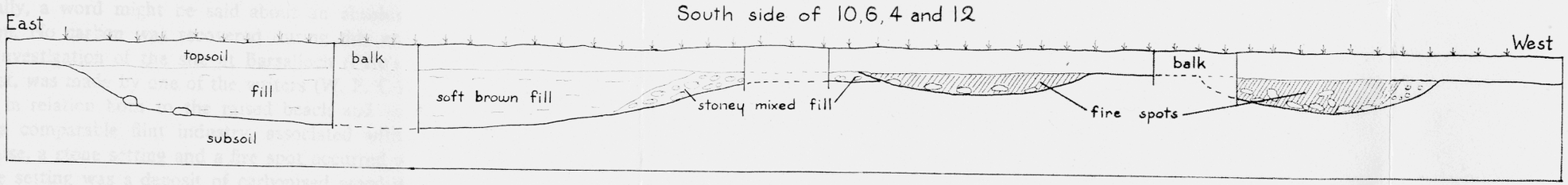
The southern parts of squares 5 and 9 showed a thin line of mixed material lying between the modern topsoil and the subsoil which may be the ploughed down remains of a mound or bank made along the south side with the material excavated from the scoop. This view would appear to be confirmed from the paucity of flints outside the scoop on the S. side in contrast to those found outside the scoop on the N. side, since, any flints deposited outside the scoop on the S. side would have been on this bank, and accordingly long since ploughed away with the upper portion of the bank.

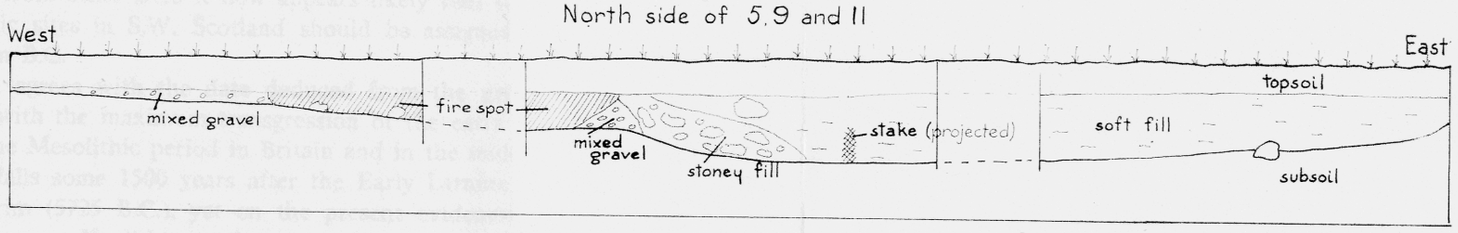
Along the inside of the scoop on the south side was a deposit of fairly clean, stoney fill, with only an occasional flint in it. This may represent slip into the scoop from the bank on the south side. The fine fill was clearly deposited on top of this stoney fill. The relationsnip between the bank and the larger fire spot, while not free from doubt, can perhaps be stated as follows. The section along the E. side of square 5 seemed to show that the upper fill covered part of the fire spot and hence was later, while the sections along the south side of 6 and north of 9 show that the black fire spot material had been deposited in a trough dug into the bank and underlying subsoil.

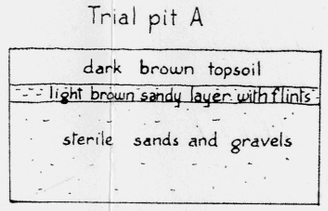
The sequence therefore would be (1) Excavation of scoop, and piling of material on S. side to form a bank. (2) Slip from bank into S. side of scoop fairly rapidly before many flints could be deposited or fine fill commence to form. (3) Excavation of and use of fire trench in bank and gradual accumulation of fine fill throughout the remainder of the scoop. During this accumulation two periods of more intensive occupation are represented by the two levels of stone settings with greasy occupation material above. (4) In recent times burrowing animals have caused some mixing in the fine fill and introduced an occasional recent sherd and animal bone (and coin) into it, while the top of the fire spots and all but the lowest inch or two of the bank have been ploughed away.

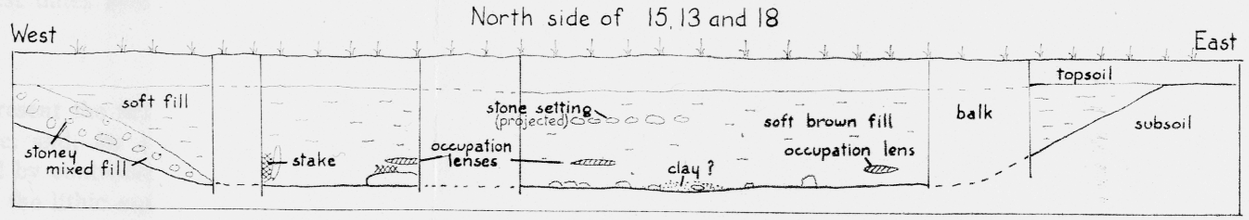
Indeed this mixing, which was more pronounced in the W. half of the scoop, may have destroyed evidence that what is shown as a single scoop on the plan was in fact two successive scoops overlapping about the balk between squares 4 and 12. The shape is perhaps suggestive of this, as also is the fact that the longer fire spot seems to be oriented along the west part of the scoop, but extends rather uncomfortably onto the very edge of the E. portion of the scoop. Since the fire spot overlies the latter to a small extent, the western portion would be the second of the two to have been made.

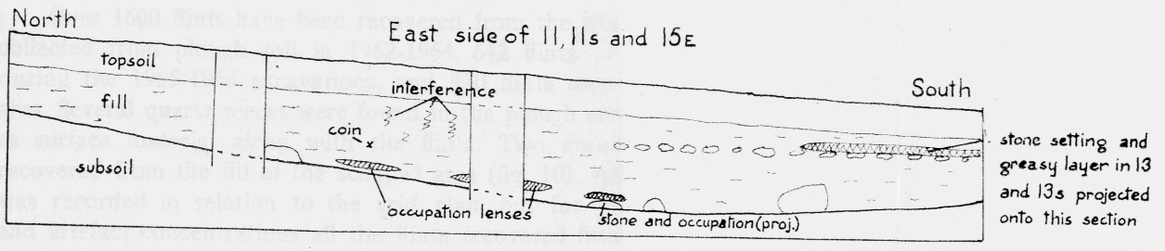
There appears no doubt that a structure of sorts, in the nature of a light shelter or habitation, was associated with the flint industry and scooped area at Low Clone — the stone settings and stake holes would imply this. Slight but definite dwellings are not unknown throughout the Mesolithic period in Britain. In the pre-Boreal period, hunters and fishers at Star Carr in Yorkshire had occupied as winter quarters, a lakeside brushwood platform. At Farnham, Surrey, several scooped areas, of an average length of some 20 feet and depth of 18 ins., also a much larger natural hollow, were associated with a prolific flint industry ascribed to the Boreal period. At Deepcar, Yorkshire, a slight natural hollow contained oval stone settings and a Mesolithic flint industry. Evidence was found at Warcock Hill in the Marsden District of the Pennines that certain summer sites may have consisted of small clusters of shelters built with twigs and heather. In Scotland, however, the evidence is scanty. Apart from some post holes, believed to be later, in the "Obanian" site at Cnoc Sligeach on Oronsay, and fire spots associated with shell middens at other sites,

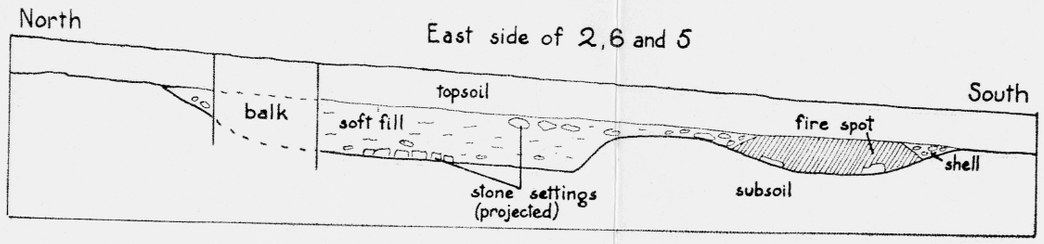












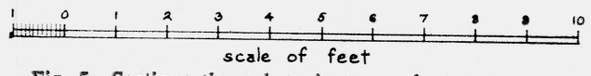


Fig. 5—Sections through main scooped area.

Low Clone provides the first definite example in Scotland of a dwelling site of the Mesolithic period.

Finally, a word might be said about an absolute date for the site under discussion. No carbon was recovered during this excavation, but during 1967 a brief investigation of the site at Barsalloch (Pate's Port), three miles to the south-east, was made by one of the writers (W. F. C.). This latter site, similarly situated in relation both to the raised beach and to a stream of fresh water, yielded a comparable flint industry, associated with a natural sandy hollow. Shell refuse, a stone setting and a fire spot occurred on the site. Sealed beneath the stone setting was a deposit of carbonised wood which has yielded a radiocarbon date of 4050 B.C. $\pm$ 110 (GaK 1601). While this date will require corroboration from other sites it now appears likely that the floruit of these coastal Mesolithic sites in S.W. Scotland should be assigned to the end of the fifth millenium B.C.

This agrees with the date deduced from the geological evidence since it accords with the maximum transgression of the early Post-Glacial sea. Coming late in the Mesolithic period in Britain and in the middle of the Atlantic pollen zone, it falls some 1500 years after the Early Larnian industry at Toome Bay, Co. Antrim (5725 B.C.), yet on the present evidence substantially before the earliest known Neolithic settlement in Scotland, the earlier of the two dates at the chambered cairn at Monamore, Arran, being 3160 B.C. $\pm$ 110 (Q 675), and in eastern Scotland one of the earliest dates being from Pitnacree, Perthshire, 2860 B.C. $\pm$ 90 (GaK 601).

The Flint Industry:

The flints from Low Clone South represent the first industry from Scotland associated with a "Mesolithic" structure, and, for south-west Scotland, this industry is the first to have been obtained by controlled excavation. It is therefore possible to obtain a fuller picture of the lithic equipment of these hunter-gatherers, although all trace of equipment made on bone and antler has been lost.

Over 1600 flints have been recovered from the site, consisting of 130 flints collected from plough soil in 1962-1964, 642 flints obtained from plough soil during the 1965-1966 excavations, and 910 flints associated with the scooped area. Several quartz pieces were found in the plough soil, and have been treated as surface material along with the flints. Two abraded stone pebbles were recovered from the fill of the scooped area (fig. 10). All the excavated material was recorded in relation to the grid plan, but for purposes of density plots and artefact concentrations all the flints recovered from plough soil have been treated as surface material not in situ. Nevertheless, it should be noted that material obtained from plough soil outside the scooped area was sparse compared with the quantities of flints lying in soil above the scoop. The total number of flints from the site, divided into basic classes, is given in Table I., and a density plot appears in fig. 6.

TABLE I.

TOTAL FLINTS FROM LOW CLONE, SOUTH

Grid. Ref.	Cores		Rejuv. Flakes		Bashed Lumps		Chips		Primary Flakes			Secondary Flakes			Blades		
	No.	Ut.	No.	Ut.	No.	Ut.	No.	Ut.	No.	Ut.	Ret.	No.	Ut.	Ret.	No.	Ut.	Ret.
2F	—	—	—	—	2	—	6	1	1	—	—	2	—	—	1	1	—
4F	2	1	1	1	4	—	39	2	5	1	—	18	4	1	6	1	—
4B	—	—	1	1	—	—	6	—	3	—	2	11	3	2	2	—	2
5/6F	—	—	—	—	—	—	7	—	1	—	—	1	1	—	2	—	1
6F	1	1	—	—	1	—	10	—	3	3	—	9	2	—	2	—	2
6B	1	—	—	—	3	—	9	1	3	1	—	4	2	1	2	—	—
9F top	—	—	—	—	—	—	3	1	—	—	—	1	1	—	1	—	—
9F	1	—	—	—	—	—	16	—	2	1	—	5	1	—	4	—	2
9B	—	—	—	—	1	—	2	—	—	—	—	3	—	—	—	—	—
10 Black edge	1	1	—	—	1	—	3	—	—	—	—	5	1	1	—	—	—
10 Black	—	—	—	—	—	—	2	—	—	—	—	2	—	—	—	—	—
11F	1	—	—	—	1	—	23	—	1	1	—	17	6	—	5	1	—
11B	2	1	—	—	4	—	30	1	4	1	—	15	1	3	—	—	—
11SF	—	—	—	—	1	—	7	—	—	—	—	10	4	1	—	—	—
11SB	—	—	—	—	—	—	21	—	1	—	—	21	6	1	1	—	—
12F	2	—	—	—	—	—	25	2	1	—	—	16	3	1	1	1	—
12B	1	—	1	—	—	—	5	—	1	—	—	5	—	1	1	—	1
13F	1	—	4	2	3	—	42	—	10	—	1	30	8	2	3	1	2
13 low F	2	—	—	—	4	—	28	—	4	1	—	18	4	—	1	—	1
13SF	1	—	—	—	3	—	12	—	2	—	—	17	3	—	3	2	1
13SB	1	—	1	1	1	—	18	—	4	—	—	12	3	—	2	—	1
15F	—	—	—	—	—	—	8	2	1	—	—	2	—	—	1	1	—
15EF	—	—	—	—	—	—	29	—	3	1	—	15	3	4	3	—	1
15EB	1	1	—	—	1	—	27	—	5	—	—	7	1	—	2	1	—
16 stone	—	—	—	—	1	—	5	—	3	—	—	2	2	—	2	1	—
17F/B	3	1	1	1	4	—	31	1	10	—	—	34	5	2	1	—	1
18F	—	—	—	—	—	—	17	—	4	1	—	14	1	2	—	—	—
Hollow total	21	6	9	6	35	—	431	11	72	11	3	296	65	22	46	10	15
Surface total	29	14	15	10	41	2	295	15	107	13	12	244	54	24	41	14	11
Site total	50	20	24	16	76	2	726	26	179	24	15	540	119	46	87	24	26

Hollow total = 910. Surface total = 772. Site total = 1682.

Note: Flints from filling of scooped area listed by grid reference, all others combined as surface total. Abbreviations: Ut., utilised; Ret., retouched; F., Filling; B., bottom of filling.

The 1962-1964 surface collections of flints from Low Clone South yielded 130 flints, and in view of the fact that surface collection will probably always tend to be a major source of Mesolithic flints in this area, as in most of Scotland, it has been of some interest to compare the results of the Low Clone surface finds with those obtained in the excavations. For the latter figures we have included all the excavated flints, including those contained in topsoil, and

not merely those flints from the filling of the scoop. This procedure appears a reasonable one, because it is the comparison of flints found on the ground surface with those contained beneath the surface that is of interest (for practical purposes, the same results were obtained by employing only the flints associated

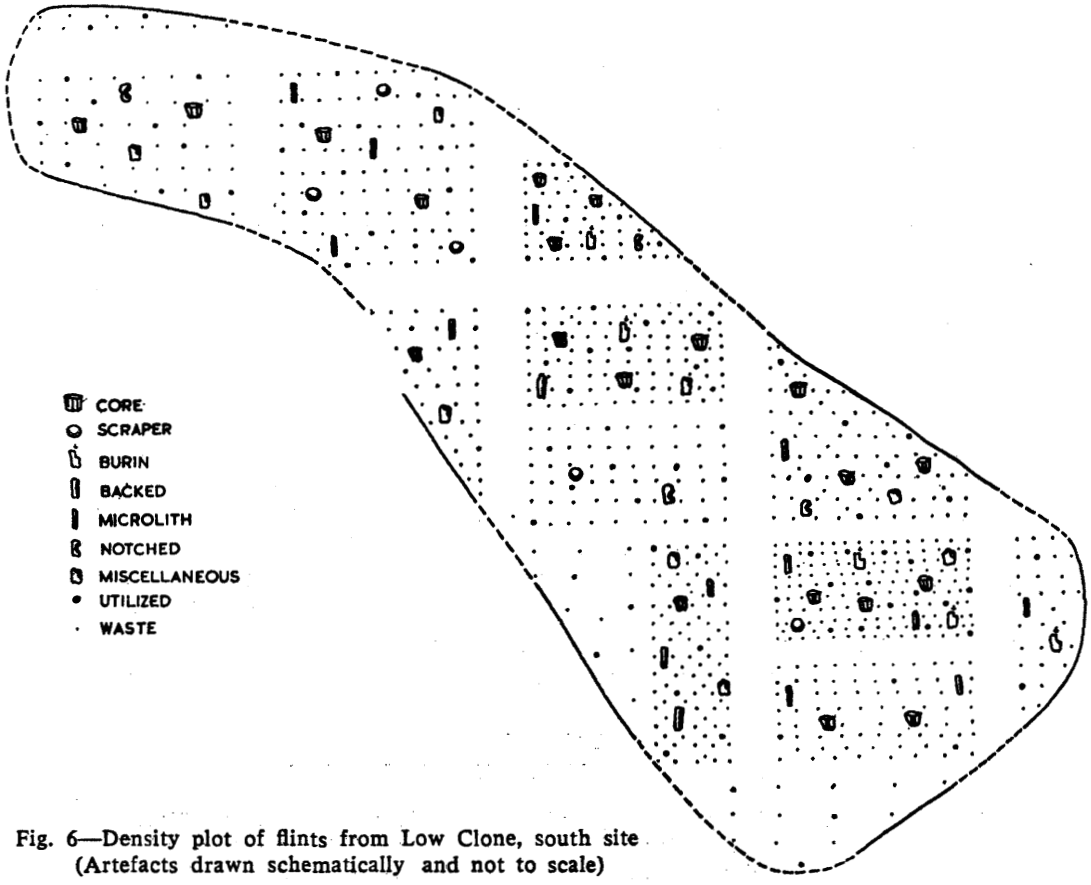


Fig. 6—Density plot of flints from Low Clone, south site
(Artefacts drawn schematically and not to scale)

with the scooped area). The figures appear in Table 2 and require little explanation. It will be seen that the surface collections represent 8% of the total of flints from the site. Although sampling errors in sums of the magnitude with which we are dealing are large, nevertheless it is apparent that cores, primary flakes and bashed lumps were more readily visible for surface collection than smaller-sized materials. On the other hand, chips were grossly under-represented in the surface collections, as were retouched and utilised blades; the retouched blades in this industry are of microlithic size, and were not found on the surface. The conclusion from these figures is inescapable, that if we are to obtain a true picture of the lithic equipment of these Mesolithic people, surface collections are inadequate and will tend to present not only an insufficient quantity of material but also a distorted view of the assemblages.

TABLE 2
SURFACE COLLECTIONS COMPARED WITH EXCAVATED COLLECTIONS AT LOW CLONE, SOUTH

	Cores	Rejuvenation Flakes	Bashed Lumps	Chips	Primary Flakes	Secondary Flakes	Blades	(Blades util. and ret.)	Totals
Surface	9	2	10	11	36	53	9	(0)	130
%Surface of total	18%	8%	13%	1.5%	20%	10%	10%	(0%)	8%
Total	50	24	76	726	179	540	87	(50)	1682

The flints from the site have been classified in several ways. The principle behind the study was that every flint should yield some information, of greater or lesser value. Broad divisions of the material were adopted as a preliminary step; these divisions were cores, rejuvenation flakes, bashed lumps, chips, primary flakes, secondary flakes and blades. Descriptions of these are given below, but the aim of such primary grouping was to determine if specific areas of the site had been used for flint-knapping, blade production, retouching into tools, etc. Table 3 shows that the combination of cores, bashed lumps, rejuvenation flakes and primary flakes, all products of primary flaking, when expressed as a percentage of the total, suggests that two areas of the scoop were used for primary work. These areas were grid 2-6-4, in the extreme western end of the scoop, and grid 17-13-16 in the eastern end of the scoop; the figures indicate only that it is likely that preliminary flaking of cores took place at both ends of the scoop. There is little indication from this Table that secondary flakes, blades and retouch were produced in any particular area of the site (see also fig. 6).

TABLE 3
PRIMARY AND SECONDARY WORK AREAS

Grid	Cores, Lumps, Primary and Rejuvenation Flakes as % of total flints	Secondary Flakes, Blades and Chips as % of total flints
2	25	75
6	25	75
4	16	84
12	9	91
9	10	90
11	13	87
11S	3	97
15	8	92
15E	11	89
17	21	79
13	13	87
13S	17	83
18	11	89
16	31	69

The material from Low Clone South consists of the following types:

Cores.

The defining features are the striking platform and the working face. The platforms on almost all the cores are plain, without any sign of faceting. Cores may have a single platform, or up to four platforms in this industry. The single platforms may be annular (flakes struck from around the complete periphery of the platform, fig. 7 : 1, 6), penannular (more than 50% of the edge used for flake detachment, fig. 7 : 3) or may take the form of an arc (less than 50% of the platform used, fig. 7 : 5). The working faces of the single platform cores may converge (conical type of core, fig. 7 : 1, 3) or be parallel (cylindrical type, fig. 7 : 6). The double platform on cores may be opposed (with parallel platforms at opposite ends of the core, fig. 7 : 7), convergent (platforms tending to converge along the back of the core), divergent (platforms with a common edge, and at less than right angles to one another, i.e. faceted platforms, fig. 7 : 4), or bidirectional (platforms in different planes, fig. 7 : 2).

The working face of these double platforms may be integrated (forming a saddle-type of core, fig. 7 : 7), the scars may be parallel but separate, or the scars may touch at their bases. These definitions and sub-classifications may be compared with those from sites such as Deepcar (Yorkshire) and from industries such as the geometric microlithic assemblages.

TABLE 4
CORES

Type A: Single platform.	1: annular	a: cylindrical	1
		b: conical	4
	2: penannular	a: cylindrical	6
		b: conical	6
	3: arc		6
Type B: Double platform.	1: opposed		5
	2: convergent		3
	3: divergent		5
	4: bidirectional		5
Type C: Triple platform			4
Type D: Quadruple platform			2

The cores range in size from 45-15 mm. long, 45-15 mm. wide, and 25-8 mm. thick. Cortex remains on over ⅔ of the cores, and it is evident that small nodules of flint were collected from the beach and turned into cores. The working faces of the cores indicate the size and type of flake removed, and flake and blade scars are equally represented on the 50 cores from the site.

TABLE 5
CORES

Flake scars	Blade scars	Flake and Blade scars	Total
(16) 32%	(14) 28%	(20) 40%	100%

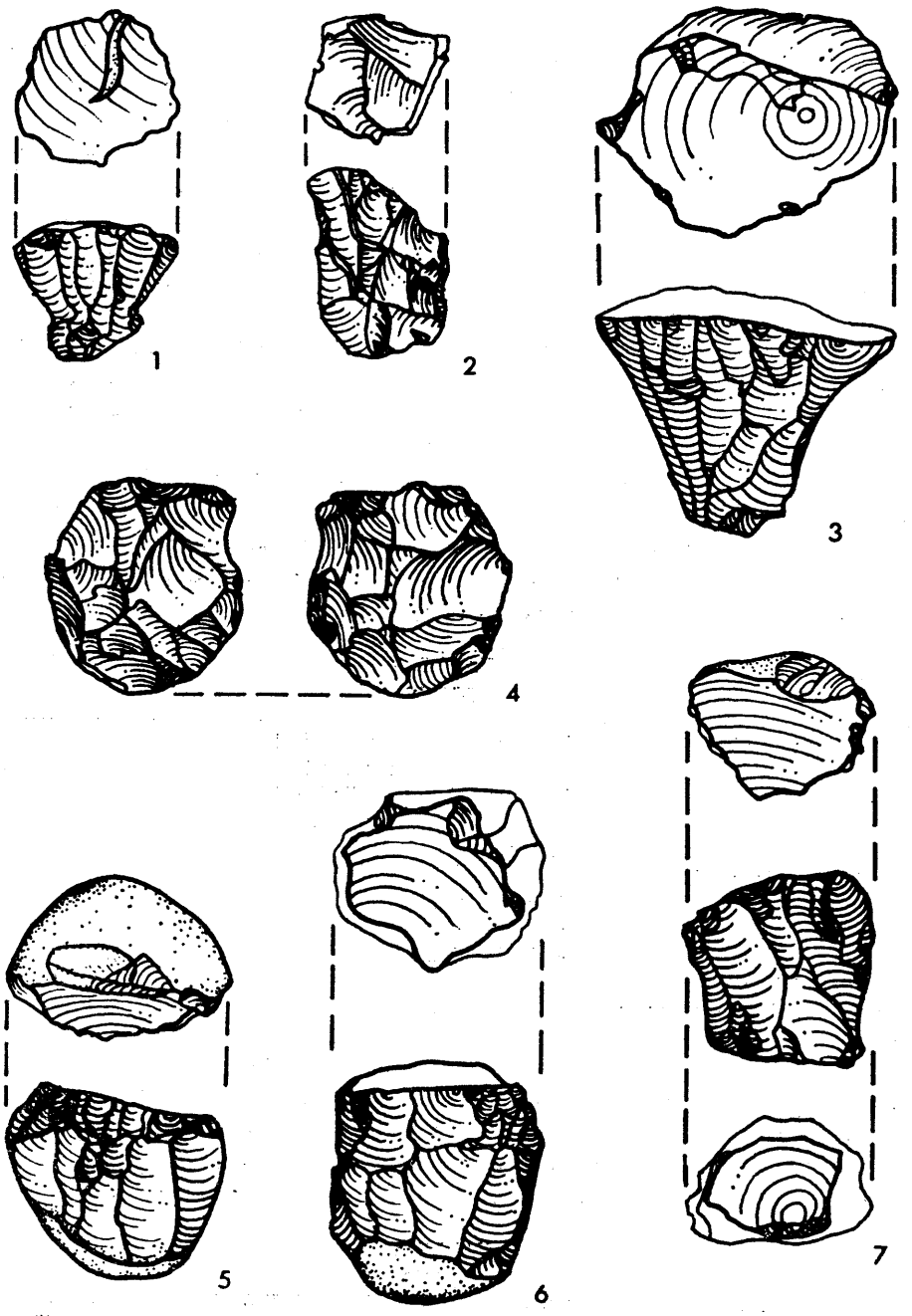


Fig. 7—Cores. 1, 4, 5, 7: surface; 2: grid 13; 3: grid 4; 6: grid 15E. Scale 1/1.

Rejuvenation Flakes.

These are flakes detached from cores in order to prolong the life of the core, by clearing away a defective or over-worked platform, or by cleaning up the working face where flake scars may have been too short, leaving irregular peaks on succeeding flakes. These are, of course, intimately associated with cores. Few at Low Clone bear any cortex, and many (67%) show signs of utilisation of naturally sharp edges or ends. The flakes are divided more or less equally between those running at right angles (fig. 8 : 4) to the previous scars (e.g. by removing a bruised platform edge), and those running parallel (fig. 8 : 8) to the previous scars, but generally struck from the opposite end. A few blades with damaged edges represent resharpening or rejuvenation of blade cores or possibly artefacts (fig. 9 : 2).

Bashed Lumps.

This seems a useful descriptive term for products of unsuccessful flint-knapping, generally caused by previous damage and cracking by natural mechanical or thermal action. In theory these are cores, and were so classified previously. A very few, with sharp edges, were utilised.

Chips.

These are generally to be associated with the production of flakes and blades, the secondary retouch of artefacts, unsuccessful knapping, and broken material. About half of the 727 chips from Low Clone are less than 1 cm. in length; by definition, none has a bulb of percussion. Small broken flakes, with bulb preserved, are listed either as primary or secondary flakes (see below). Cortex remains on about $\frac{1}{3}$ of these chips. Very few (4%) show signs of utilisation, and 7% have been burnt.

Primary Flakes.

These are flakes with cortex remaining on at least 25% of the dorsal surface; they represent flakes detached from the core during its initial shaping. The angle of the striking platform to the ventral (bulbar) surface may be 90° (40%) or inclined at 110° (60%). Almost $\frac{2}{3}$ of these primary flakes range between 2 and 4 cm. in length, and few are longer than 4 cm. Only 15% of these primary flakes shows definite signs of utilisation, and a few were retouched (see below).

Secondary Flakes.

These flakes have less than 25% cortex on their dorsal surfaces, and most have no cortex at all. They represent a second stage in flake production, after the core had been roughed-out and a platform prepared. Of 217 unbroken flakes from the fill of the scooped area and fire-spots, nearly $\frac{1}{2}$ (47%) are less than 16 mm. in length, and only 15% are over 25 mm. Nearly $\frac{1}{4}$ of the large group of secondary flakes, over 25 mm., come from square 17, and probably represent activity on one or two particularly large cores; one of the largest cores from the scooped area was found in this square.

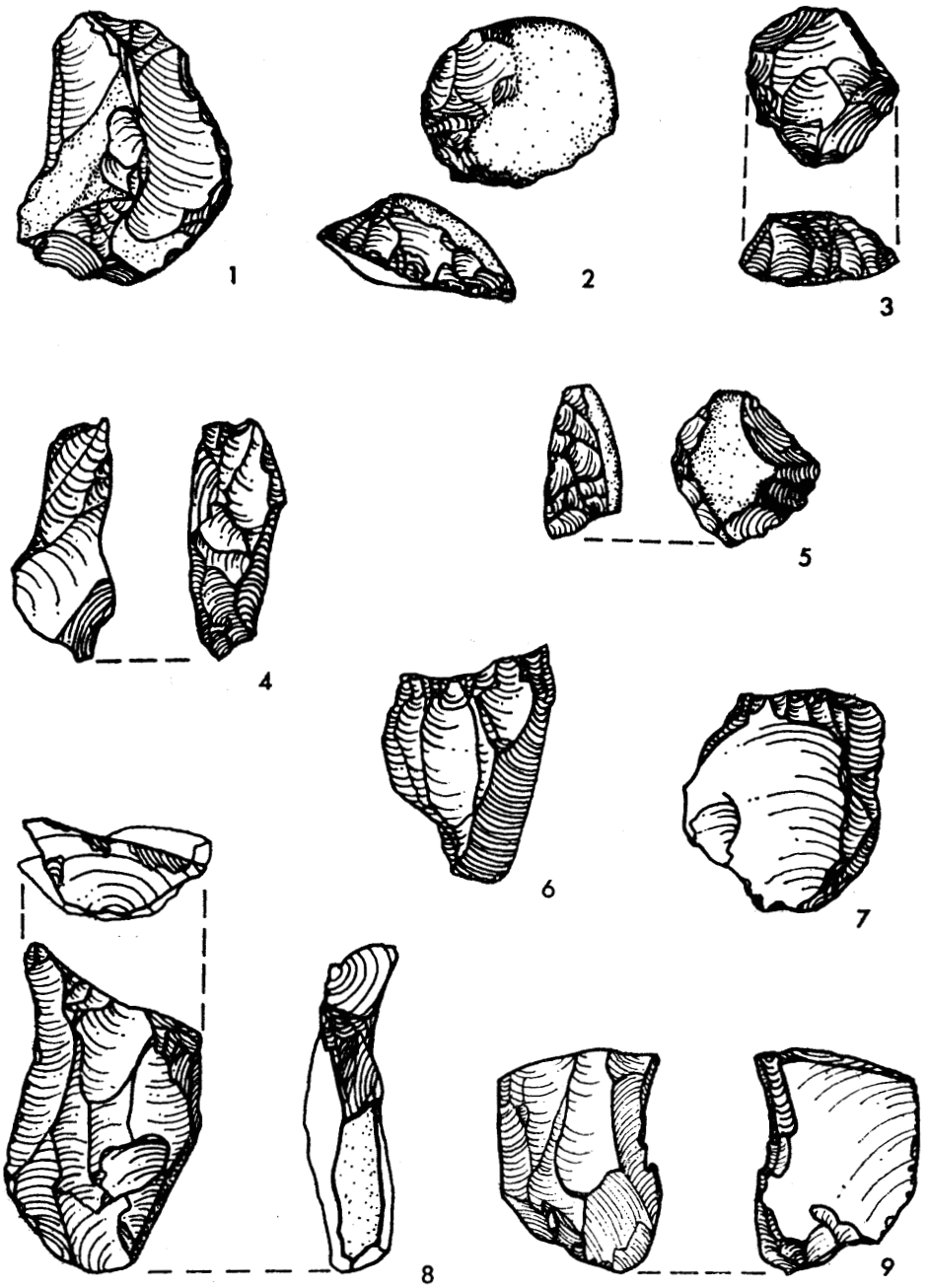


Fig. 8—Artefacts and flakes. 1: irregular retouch; 2, 3, 5: steep retouch; 4, 8: rejuvenation flakes; 6, 7, 9: burins; 2, 3, 5, 6, 7, 8: surface; 1: grid 4; 4: grid 17; 9: grid 13. Scale 1/1.

Most of these secondary flakes from the scooped area had undamaged platforms, which could be measured. The angle between the bulbar surface and the platform tends to range between 90° and 115°, and 60% of these flakes had platforms at right angles to the ventral surface. These proportions are the reverse, in fact, of the primary flake platform angles. The inclined platform, greater than 100°, is often assumed to represent an anvil or allied technique of flaking, where the core was struck against a fixed anvil and the resultant flake tended to have a bulbar surface at an inclined angle to the point of impact (platform). Such a technique might well have been employed more for the initial fashioning of a core, by breaking off the cortex surface, than for the secondary detachment of flakes, where greater control over the size and shape of flake was required. About ⅓ of the flakes from the site as a whole bear signs of utilisation, taking the form of nibbled edges or ends not certainly the result of deliberate retouch. Of the secondary flakes in the scooped area, 6% have been retouched (see below), and less than 2% show signs of heat.

Blades.

True punch-struck blades are conspicuously rare in the Low Clone industry, representing only 11% of the total flake element, 14% of secondary elements. Blades are sometimes defined as narrow flakes, with a width less than half the length, and with more or less parallel sides, but flakes of this shape can be produced from suitable cores by ordinary soft hammer percussion. The use of the punch, however, producing indirect percussion, results in a flake with particular characteristics at the bulbar end, which differ from those of long narrow flakes struck off by direct percussion. The bulb of the punched blade is diffuse, there is no bulbar scar, and the platform is minute. Blade-like flakes occur at Low Clone, but only punched blades have been singled out for comment here. In length these range from 12 to 35 mm., but most fall between 12 and 20 mm. From one to five truncated blade scars are visible on the dorsal surface. Utilisation traces are visible on about 30% of the blades, and consist of small damaged areas along the naturally-sharp edges; in some cases such damage occurs on both dorsal and ventral surfaces. One-third of the blades from the scooped area have been retouched (see below).

The low proportion of blades in the industry contrasts with the evidence of the cores, as will be most easily seen in Table 6:

TABLE 6

RATIOS OF FLAKES AND BLADES REPRESENTED BY CORE SCARS, SECONDARY FLAKES AND BLADES

	Flake	Blade	Flake & Blade	Total
Cores Scars	32%	28%	40%	100%
Secondary Flakes & Blades	86%	14%		100%

On core figures we might have expected to find approximately twice as many blades on the site as did in fact turn up. However, it should be noted that a higher proportion of retouch occurs on blades (30%) than on flakes (9%) and the type of retouched tool that was being produced also differs between flake and blade. Microlithic forms made on blades may well have been employed as armatures for arrowheads and are less likely to be represented on the site than flakes retouched into scrapers or burins.

The six groups of material described above, and listed in table 1, represent the total number of flints recovered from Low Clone South except for a few flints excluded by patination differences, and others showing only thermal fractures. The patination on the bulk of material is white with a tinge of grey; a few flints are distinctly grey (light) and have been included in the industry, but browns have been excluded. There is no evidence, on the basis of patination and retouch, to suggest that two industries are represented here, and the brown flints and thermally-fractured flints are without doubt natural objects probably derived from the underlying beach deposits by plough action.

During the excavation, although the flints appeared throughout the filling of the scooped area, they were divided into two main groups, those occurring within the fill, and those near or at the bottom of the scoop. The relative numbers of the finds on this basis appear in Table 7:

TABLE 7

DISTRIBUTION OF FLINTS IN FILL AND AT BOTTOM OF SCOOPED AREA (SQUARES 4, 6, 9, 11, 11S, 12, 13, 13S, 15E)

	Cores	Rejuv. Flakes	Lumps	Chips	Primary Flakes	Secondary Flakes	Blades
Fill	9	5	13	206	27	138	28
Bottom	8	3	14	146	25	96	11

The only difference between these two sets of figures is in the increase of blades in upper deposits, but the number of cores with blade scars does not increase proportionately in the upper level.

Retouch

Only 9% of flakes have been retouched, compared with 30% of blades. Table 8 lists the number of retouched artefacts by general provenance, and fig. 6 shows the tool types in the grid plan of the site as well as densities of flakes, utilised flakes and cores.

TABLE 8

RETOUCHED ARTEFACTS

	Microliths	Backed	Burins	Miscell.	Steep ret.	Burin/Steep	Notched	Awls
Scooped area fill and fire spots	16	2	5	5	6	—	4	2
Surface	14	—	8	10	15	1	6	1
Totals	30	2	13	15	21	1	10	3

Of the retouched flakes, almost equal proportions of primary and secondary flakes were retouched; the small size of primary flakes, and their natural rounded dorsal surfaces, appear to have made them suitable for retouch into small steep scraper-type tools (fig. 8 : 2, 5). The precise functions of these are unknown. Steep retouch was also applied to short secondary flakes (fig. 8 : 3) and to several thermal flakes, to form a group which might be classified as high-backed scrapers. The retouch may extend completely around the flake, forming a button-like tool, or may only extend for around 10% of the edge; most of the retouched edges are curved, but straight or irregular edges also occur (fig. 8 : 1). Almost all show signs of utilisation of the edges. Two thick unretouched flakes of exactly the same shape and size as the above groups were probably utilised in the same manner as the retouched tools.

A second small class of artefact is the burin or graver. These specimens from Low Clone are in no way classic in appearance but there is no doubt that they represent attempts to obtain a strong sharp edge-tool. The characteristic Low Clone burin is made on a thick broad flake, with from 1-9 facets running down the edge and the ventral surface, and intersecting with an upper edge which may be either retouched or a natural fracture (fig. 8 : 6, 7, 9). Three of these burins also have traces of additional retouch, including one double burin with steep retouch. The feature of most of the burins from this site is the width of the burin facet; the maximum width ranges from 6-10 mm.

The microlithic forms from Low Clone South have been classified into a number of groups, in order that the assemblage could be compared with other industries from northern and western Britain. Over half of the total microliths bear straight or very slightly curved retouch, generally of blunting character, down all or most of one blade edge (fig. 9 : 5-7, 12). Included in this total of 16 are 8 fragments which seem without much doubt to have been of this type; three other fragments, however, are less certainly of this group, and have been listed separately in Table 9.

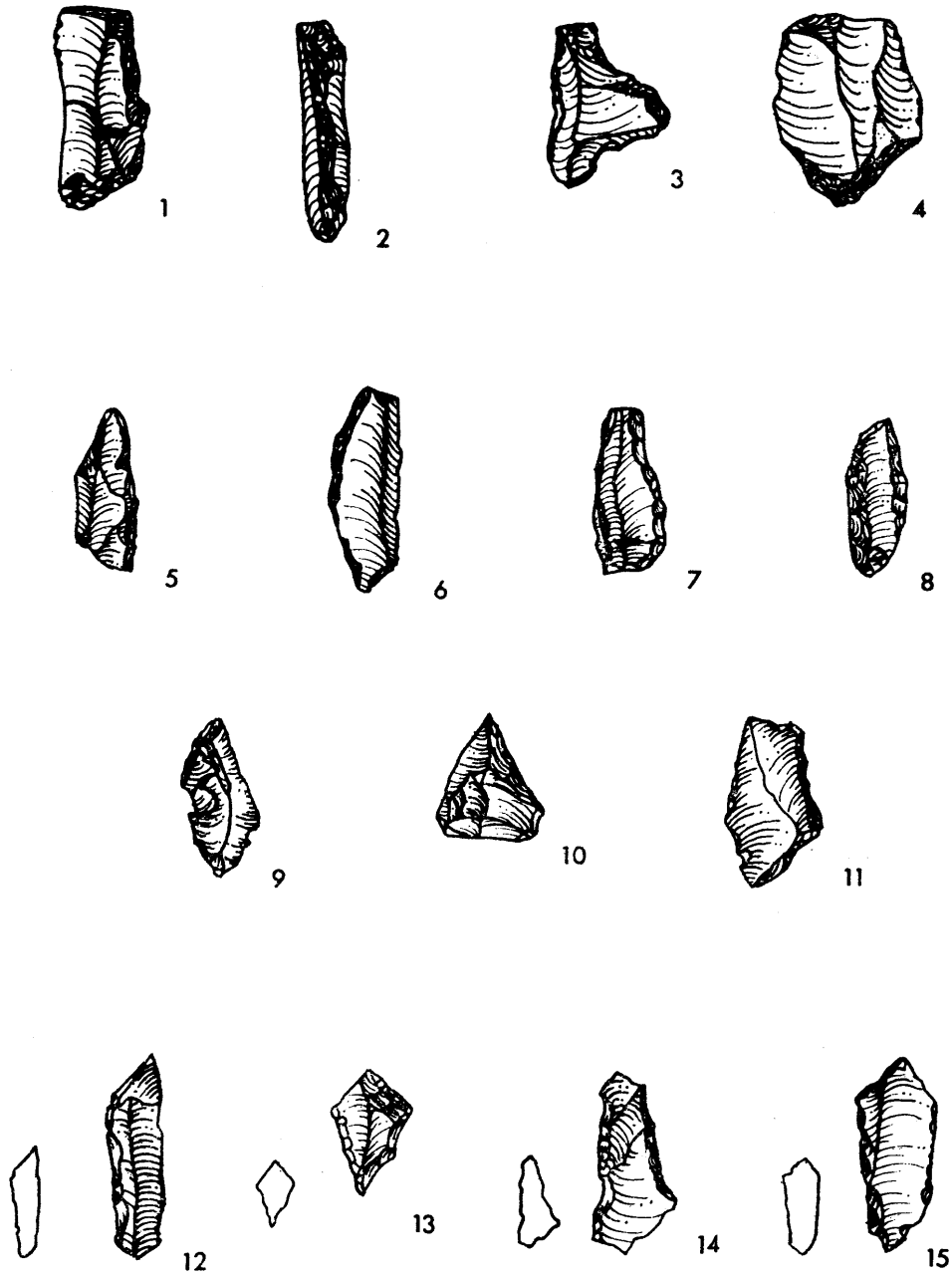


Fig. 9—Artefacts and microliths. 1: backed blade; 2: rejuvenation blade; 3: notched flake; 4: awl; 5-15: microliths; 3, 4, 5, 6, 7, 10, 11, 13: surface; 1: grid 11; 2, 8: grid 12; 9: grid 13; 12: grid 15E; 14: grid 6; 15: grid 9. Scale: 1-11 : 1/1; 12-15 : 2/1.

TABLE 9

MICROLITHS

Straight or slightly curved retouch	16
Obtuse angled retouch	4
Needle-like retouch	3
Oblique retouch	4
Fragments unclassifiable	3
	30

The microliths with obtuse angled retouch are not true triangles; two of the blades are very narrow (fig. 9 : 15), the other two are broad (fig. 9 : 11), and one of each has nibbled retouch or utilisation traces on the edge opposite the angled retouch. Three needle-like objects bear retouch on edges converging to a sharp point (fig. 9 : 8, 13, 14); it is probable that all three have or had retouch extending entirely around the blade. The needle-like group and the obtuse angled group are probably related in function, but are separated here for comparison purposes. Three rather broader blades, and one flake, have oblique retouch extending across the line of the flake to a point (fig. 9 : 9, 10).

The overall impression of this microlithic group is that it is entirely non-geometric, lacking true triangles and trapezes. No certain microburins have been recognised. The standard of retouch on the microlithic forms varies from steep blunting retouch to a flatter form, and several of the blades included above are poor imitations of their companions in the groups. The classification of all these microliths into groups is rendered difficult by the fact that half are incomplete, but the attempt has been made as objectively as possible.

Blunting retouch was also applied along a straight edge of one blade and one flake to produce backed knives (fig. 9 : 1). Two short and broad flakes bear rather steep retouch converging on a broad awl projection (fig. 9 : 4); one blade, also classed as an awl, has constricting retouch at the bulbar end of a blade in "Larne flake" fashion. Retouch was also delivered on ten flake edges to form irregular notches, sometimes with straight retouch on the same edge; one flake in this group has three concave edges formed by retouch (fig. 9 : 3).

Of the 95 retouched artefacts, 14 bear miscellaneous retouch, which generally takes the form of nibbled retouch on one side nearing a pointed end; it is possible that this nibbling is due partly or entirely to the utilisation of a naturally sharp edge.

The retouched artefacts, and utilised flakes and blades, are evenly distributed over the area of the scoop although material of this character is rather sparsely represented near the western end (fig. 6). The total impression of the industry is the contrast between the fine technique visible on some blade cores and microlithic forms on one hand, and the overall lack of character about the flakes which often are of irregular shape with uneven dorsal surfaces. The raw material available to the inhabitants of the scoop area must have been subject to

great differences in quality, probably dependent upon the degree of weathering and rolling obtained in the beach below the cliff. It may be that the size of pebble was so small that only rarely could the surface area, with its incipient cracks, be removed to expose successfully a firm core large enough for blade production. It is interesting, if profitless, to speculate upon the character of the industry which would be produced by these people given an ample supply of

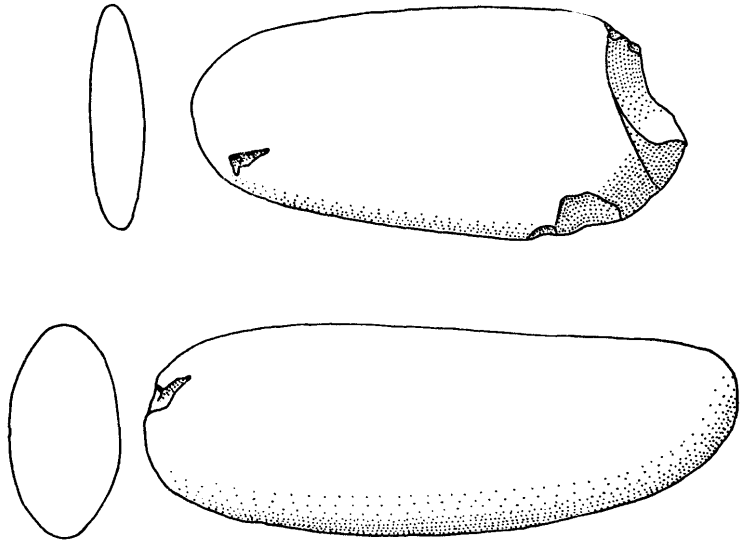


Fig. 10—Abraded pebbles. Upper: grid 13; Lower: grid 11. Scale ½.

unweathered raw material. An alternative to the above explanation of the contrast in the technique is that the scooped area at Low Clone contains part of the industries of a number of different groups, perhaps only two, who happened to occupy the site intermittently over a period of years.

Discussion:

The flints from Low Clone South represent one of the very few Mesolithic industries obtained from controlled excavations in Scotland. In the absence of stratigraphical evidence to the contrary, it has been treated as a homogeneous collection representing a single tradition, although it is likely that the flints are the residue of a number of occupations of limited duration and (?)sporadic occurrence.

In the publication of the surface collections from the Wigtownshire coastal sites, particular attention was paid to industries in western Scotland and north-eastern Ireland, in an attempt to ascertain the degree of relationship that might have existed within this North Channel region. Comparisons were made with industries from Campbeltown, Risga and Cnoc Sligeach in Scotland and Curran Point, Cushendun and Sutton in Ireland. The conclusions of this pre-

liminary study were that although the Larnian industries of Ireland did not appear on lithic evidence to have contributed to the origin of the Wigtownshire collections, differences in raw material sources might well mask a shared interest in similar economic circumstances. The lack of antler and bone artefacts preserved in Larnian and Wigtownshire sites made comparisons based on limited evidence difficult. In broad terms it was considered that the industries on both sides of the North Channel were probably related in a traditional economic subsistence pattern, and that they were more a unity in themselves than with coastal Mesolithic industries from Wales and England.

The differences between the Welsh coastal Mesolithic industries and the Wigtownshire industries were believed to be considerable, primarily on the basis of the extreme rarity of microlithic forms in the latter assemblages. But it was suggested that the Wigtownshire blade cores indicated that a stronger microlithic component might be revealed by excavation, in which case shared industrial material might be demonstrable. This has in fact turned out to be the case, and not only has an important numerical element (33%) been added to the retouched artefacts in one of the Wigtownshire industries, but the microlithic types involved are such that fruitful comparisons can be made not only with the Welsh coastal industries but with assemblages from northern and western England.

Table 10 presents some data from a number of sites; the quantities of material have been extracted from published reports, in which numerical quantities are sometimes not provided, and the figures are therefore subject to some uncertainty. In all cases, however, the classification of material has been either checked by personal inspection of the artefacts or supplemented by use of illustrations. Although some subjective element must occur in any grouping of artefacts of this character, the figures presented here are believed to represent a true statement of the content of these industries.

A detailed comparison between the Wigtownshire surface material and the excavated Albyn Distillery, Campbeltown, industry has already been presented, which suggested that the two groups might well be related by a general community of typological ideas, although differences of quantity were apparent. The industries from Wigtownshire, as represented now by Low Clone South, have been augmented by the addition of an appreciable quantity of microliths, and this supplement appears not to be duplicated at Campbeltown. More extensive excavations in the area may well bridge this gap, or confirm that the absence of microlithic forms is real. It should be noted that two microburins were obtained at this site.

The Obanian material from Cnoc Sligeach (Oronsay) and Risga is not listed here as it has already been presented but it might be noted that microlithic forms do not figure in the Oronsay industry, and the Risgan assemblage, apart from having a large variety of blunted although hardly microlithic forms, must remain as a suspected mixture of industries or sites until further examination is com-

TABLE 10

ARTEFACTS

	Microliths														
	Straight and curved	Oblique	Needle	Geometric	Angled	Frag.	Microburins	Backed blades	Burins	Burin-scrapers	Short scrapers	Straight and notched	Awl	Non-standard	Other
Low Clone	16	4	3	0	4	3	0	2	13	1	21	10	2	15	pebbles, Larne flake
Campbeltown	0	1	0	0	0	0	x	0	x	x	xx	xx	x	xx	truncated, Larne flake
Dozmare	10	40	4	1	4	0	0		x	0	x	x	0	0	truncated
Aberystwyth	8	6	2	1	3	0	x	x	0	0	xx	x	0	0	pebbles
Shapwick	4	16	4	0	1	0	x	x	x	0	x	x	0	0	axe flake
Deepcar	29	25	12	0	2	5	xx	0	x	0	xx	xx	x	x	truncated, ? axe flake
Dryburgh	22	2	18	18	11	0		x			xx	xx		x	truncated

x: present xx: numerous

pleted. The abundant bone and antler equipment at both island sites, and the absence of diagnostic organic material at Low Clone should not be forgotten. Without doubt the economic subsistence patterns on these small islands differed in some degree from those on the mainland, and these would be reflected in the material equipment even if the equipment was made by the self-same groups. Such a possibility exists.

On related grounds the Irish Larnian material cannot be said to demonstrate such a close relationship as was previously thought. The extreme rarity of microlithic forms, and the presence of other equipment such as "Bann points" and "Larne picks," makes typological comparisons difficult but the same argument noted above might be applied, in this case, however, centred on differing degrees of abundance of raw materials.

The Mesolithic industries from Wales have recently been described and assessed. Three different groups were listed, one with Sauveterrian affinities (geometric microlithic), one with Maglemose elements (flint axes), and one based upon a "coastal economy." Typical of the last-named group is an excavated industry from Aberystwyth which contained blade cores, short end scrapers and round scrapers on primary flakes, serrated blades, and microlithic forms consisting of obliquely-retouched blades, slightly curved and straight-backed blades, needle-points, blades with angled retouch and one isosceles triangle. Limpet-scoops or hammers, made on mudstone and averaging 8 by 3 by 1.2 cm. in size, were well represented. In these respects the industry has close affinities with the Low Clone South material.

The affinities of the Aberystwyth industry are believed to lie with assemblages from south-western England. The surface material from Shapwick in Somerset and Dozmare Pool in Cornwall consists of the same microlithic forms and short end and round scrapers, as well as burins and an axe-sharpening flake from Shapwick. The microburin technique was practised on these sites as well as on some of the Welsh sites.

The south-western English industries, and the Welsh coastal assemblages, are considered to be related to Maglemosian industries of south-eastern England. At Broxbourne in the Lea Valley, and in the Colne Valley in Essex, the microlithic component of the industries mainly consist of obliquely-blunted points, with a few curved-backed blades, needle points, and angle retouched blades. These Maglemose sites differ from the Maglemose of the continent, and Star Carr, in that geometric triangles and trapezes do occur in the industries of the latter "classic" sites.

More recently, the Mesolithic industries of the Pennines have been examined in the light of excavations at Deepcar, Yorkshire. The Deepcar industry, associated with some sort of structural remains, contains obliquely-retouched blades, straight or slightly-curved blades, needle points and one or two blades with angled retouch. No true triangles or other geometric forms occur. Backed blades, short round scrapers and notched scrapers are well repre-

sented. Burins were poorly made and are sparsely represented. The microburin technique was practised. This industry has been compared and linked with the Pennine Broad Blade industries, which themselves contrast with other Pennine and north English assemblages containing geometric forms of microlith and fewer obliquely-blunted blades.

The same contrast may be seen between the Low Clone industry and the microlithic assemblages of inland Scotland. Collections from Dryburgh Mains, Berwickshire, contain the usual heavier equipment of short and round scrapers, straight-retouched flakes and notched flakes, waste flakes, chips and cores, as well as microlithic forms. The latter include triangles, angle-retouched blades, needle points, straight and curved backed blades, truncated blades and only one or two obliquely-retouched blades. From a collection at Banchory, Kincardineshire, microlithic forms consisted of triangles and crescents, angle-retouched blades, straight and curved backed blades, and needle points. Microburins were represented as well as blade cores; several burins were noted, as well as rather large obliquely-truncated blades. The material from these two collections shows the presence of microlithic industries containing geometric forms, in contrast to the Low Clone South industry which lacks geometric types.

All of the foregoing typological discussion has been designed to indicate the position of the Low Clone industry in the broad divisions of Mesolithic material suggested by recent work. The conclusion, however, must only be taken to specify that, **typologically,** this industry appears to differ in certain respects from the geometric microlithic industries of northern England and Scotland. Further documentation and a re-assessment of the Scottish traditions are in preparation.

The difficulty in assessing the **cultural** status of the original occupants of Low Clone rests in the fact that in common with all Mesolithic and Palaeolithic sites, this site represents only one of a number of camps occupied by a particular hunting group. The assemblage of artefacts from any one site is not, therefore, a proper sample of the industrial equipment but is a grab sample of the total material equipment of the group. The use of individual sites as " type sites " for a " culture " is liable to present a biased view of the material capabilities and achievements of a group who will be exploiting a range of territories and whose equipment will reflect the varying economic circumstances of each area. Hunters and gatherers, such as the Low Clone people were, practise mobile economies which cut across the boundaries of economically complementary zones. The Low Clone group would seek to find a number of seasonal situations where maximum input of food could be obtained for the minimum output of labour. Therefore it is likely that differences in assemblages, both typological and in quantity, are due not to differences in "culture" or in people, but to seasonal exploitations of varied environments. In theory it is possible that individual assemblages which differ widely in their content represent the activities of one group of people. An

example of this, close in time and space to the Low Clone material, is the relationship between the Maglemose settlement at Star Carr in Yorkshire and the microlithic industries of the upland Pennines. From shed and unshed antlers at Star Carr it appears that this site was occupied in the winter season, possibly in spring and autumn. It is unlikely that a habitat such as the Pennines would tend to be a preferred area of occupation in the winter months, and indeed it would be unlikely to lead to the survival of humans. Without going into the subdivisions of the Pennine microlithic industries in detail here (see above), it may therefore be said that it is likely that the lowland settlements represent cold weather and the upland settlements represent warm weather occupations and activities. The material equipment is likely to be different.

On this reasoning the coastal sites in Wigtownshire may represent strand-looping activities of groups who also occupied inland areas, and perhaps islands, at appropriate seasons. In the absence of absolute age determinations for a range of Mesolithic industries from southern and western Scotland, it is hard to see how it can be demonstrated that there may have been only one basic Mesolithic population in the area during pre and early Neolithic times, but the range of economically complementary territories provided by the region seems sufficiently varied to allow a sequence of economic activities to take place on a seasonal basis by hunters and gatherers united in a common desire to extract the maximum possible food and material supplies in the minimum amount of time and effort.

ACKNOWLEDGMENTS

The writers are principally indebted to Mr William Wallace of Low Clone and his son, Mr J. M. Wallace, not only for making the ground available and taking a keen interest throughout, but moving their stock when necessary to suit the convenience of the excavators. This Society provided grants to meet the cost of hired help—the latter being provided by A. Adair, D.C.M., of Port William, who was able to direct with ability his long experience as a drainer into what was for him a new field. Society members who helped from time to time were A. E. Truckell, Lionel Masters, Miss V. Denholm, R. J. Little, W. McLaren and General Scott Elliot. Mr Allard Johnson, of the West of Scotland Agricultural College, took soil samples, the report on which will be published later. Thanks are also due to Dr A. S. Clarke of the Royal Scottish Museum who examined some of the animal bone.

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Plate I.—General view from the S.-E. of the coastal mesolithic site—marked by the nearest grazing animal—at Low Clone. In the foreground is the ravine of the Clone Burn and in the background the raised beach and Luce Bay.

[Photo: J. M. Coles]

EXCAVATIONS AT MID GLENIRON FARM, WIGTOWNSHIRE, 1963-1966

(Second Interim Report)

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An interim report of the first season's excavation of a chambered cairn at Mid Gleniron in 1963 has been published in these **Transactions**[1]. During three subsequent seasons the excavation of the first cairn was completed, and a second chambered cairn and two smaller burial cairns were excavated. This paper is intended as a brief summary of the results of these excavations in advance of the definitive report, which will be published in the forthcoming volume of these **Transactions**. The chambered cairns are referred to as Mid Gleniron I and Mid Gleniron II respectively, and the two smaller cairns as Mid Gleniron A and B They are described in that order, and a brief discussion of Mid Gleniron I and II follows the description of the latter.

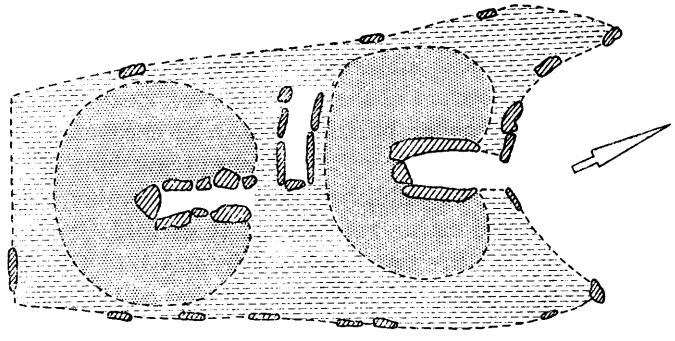
MID GLENIRON I.[2]

In 1963 excavation was concentrated on the northern chamber and the forecourt, an account of which has been published in the first interim report[3]. It was also established that a depression, which it was thought had been cut across an apparently homogenous cairn, marked a gap between closely set, but independent, structures. The southern structure was later revealed to be a very much disturbed, unchambered burial cairn (Mid Gleniron A). Part of the southern half of Mid Gleniron I was also excavated in 1963, and provided evidence which suggested that the southern chamber had originally been contained within a smaller, inner cairn[4]. This was subsequently confirmed, and suggested that Mid Gleniron I was of multi-period construction. The cairn may conveniently be described in the assumed order of construction.

Southern chamber and inner cairn

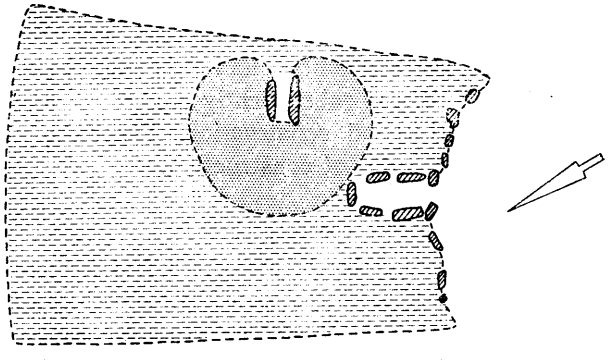
The chamber is rectangular in plan, is 9 feet long internally, and has an average width of 2 feet 3 inches. There are three orthostats in the eastern wall, and four in the western. Apart from one displaced roofing stone, lying to the west of the southern end of the chamber, there was no evidence of roofing. The position of the surviving roofing slab suggests that a number of similar flat stones would have rested comfortably and securely on the squat orthostats which formed the side walls. This would have allowed a headroom of approxi-

1 J.X.W.P. Corcoran, **Trans. Dumfriesshire and Galloway Nat. Hist. and Ant. Soc.**, XLI (1962-63), 99-110.
2 National Grid Reference NX 1870 6099.
3 op. cit. 100-103, figs. 1 and 2.
4 Ibid, 103-104.



MID GLENIRON I

0 5 10 15 20 25 feet
0 1 2 3 4 5 6 7 metres



MID GLENIRON II

mately 3 feet. The floor of the chamber was completely paved by flat slabs of varying size. Owing to recent disturbance, the only finds of prehistoric date were a few fragments of unburnt human bone, which presumably represent the remains of prehistoric burials.

The southern chamber was enclosed in an oval cairn, the overall dimensions of which were 21 feet from east to west, and 20 feet from north to south. The cairn was carefully built from rounded boulders, with a well defined outer edge which, although crude in appearance, attained in places the stability of dry-stone walling. There can be little doubt that the southern chamber and inner cairn at Mid Gleniron I together formed an independent structure, a small oval cairn enclosing a simple, rectangular chamber.

Northern chamber and inner cairn

The northern chamber is built of two long orthostats and an end-stone; it is 9 feet long and 3 feet 9 inches wide. A short dry-stone adit joins the chamber to the facade. It was assumed in 1963 that the adit and chamber were built at the one time, but subsequent excavation proved that the former was a later addition, and its construction presumably was contemporary with that of the facade.

An oval cairn encloses the northern chamber. Its construction resembles that of the southern inner cairn, and its greatest dimensions are 23 feet from east to west, and 17 feet from north to south. The edge of the cairn curves inwards to the northern end of the two side orthostats of the chamber.

Adit and forecourt

When it was decided to add a semi-circular facade to the northern chamber, it was probably found necessary to interpose a short adit of dry-stone walling between the two. It would not have been possible to erect a semi-circular facade up against the existing entrance to the northern chamber, as the latter was recessed partially by the incurve of the edge of the inner cairn. To have done so would have resulted in a more V-shaped plan, which evidently was not desired.

A summary of the structural features of the facade and the blocking of the forecourt has been given in the first interim report.[5]

The long cairn

The outer cairn presumably was built as part of a plan to provide the northern chamber with a facade, and to enclose existing cairns within a single structure. This was achieved by laying out the new outer revetment as near as possible to the inner cairns, and by the addition of extra cairn material between the latter and the revetment. As the axes of the two inner cairns are not on

5 Ibid. 100-102.

the same alignment, the resulting plan was slightly asymmetrical, although the intention may have been to produce a rectangular cairn.

The greatest length of the long cairn is 61 feet, and its greatest width 30 feet. Its revetment is composed of upright and dry-stone walling. The average height of the former is approximately 3 feet 6 inches, and that of the dry-stone walling may have been similar. On the eastern side the uprights appear to have been set in such a position that their centres were spaced between 7 feet to 8 feet apart, although in one place two uprights were set adjacent to each other. There is no evidence of extra-revetment.

Lateral chamber

A lateral chamber, 8 feet 6 inches long and 2 feet 6 inches wide, opens from the west and is set between the two inner cairns. It has been extensively disturbed to beneath original ground level, and at present each side wall is composed of two orthostats. Owing to this disturbance, which presumably accounts for the complete absence of finds, it was not possible to determine either details of the entrance, or its relationship to the outer revetment. It is assumed that the construction of the lateral chamber was contemporary with that of the outer cairn.

Secondary cremation burials

The remains of at least nine cremations in cinerary urns were found in the body of the cairn, the majority in the south-eastern quadrant, to the south-east of the southern chamber. Three inverted urns, one of which was intact, had been placed in a small pit near to the south-eastern corner of the outer revetment. A description and illustration of four of these urns may be found in Mr Morrison's **corpus** of cinerary urns from south-western Scotland, elsewhere in these Transactions (cf. **infra,** p. 80).

MID GLENIRON II.[6]

Before excavation Mid Gleniron II. was a low, grass-covered mound, orientated approximately north-south. There was evidence of a crescentic facade, but not of a terminal chamber, at the southern end, and of a small lateral chamber opening from the east. Experience gained from the excavation of Mid Gleniron I. suggested that Mid Gleniron II. may similarly have been of multi-period construction. This was confirmed subsequently, and the cairn may be described in the presumed order of construction.

Lateral chamber and inner cairn

The chamber, which was subsequently to become the lateral chamber, is small. Its side walls are each formed of a single orthostat, and the end wall

6 National Grid Reference NX 1880 6094.

appears to have been dry-stone built. The chamber is approximately 4 feet long and 1 foot 8 inches wide. It was enclosed in a small, ovate cairn, measuring 19 feet from east to west, and 15 feet from the rear of the cairn to the entrance. The cairn is carefully built, and edged by a low, rudimentary dry-stone wall, which formed a well-defined kerb. There was evidence that the chamber had been blocked independently of the later, outer revetment.

Terminal chamber

Owing to extensive disturbance, not a single orthostat of the terminal chamber survived intact. Sockets and stumps of broken orthostats, however, survived, and it was possible to determine that the chamber had been rectangular in plan, and was approximately 8 feet long and 3 feet wide. There appear to have been two orthostats in each side wall. The end-stone of the chamber was erected close to the south-western quadrant of the inner cairn.

Forecourt

A very shallow facade flanks the entrance to the terminal chamber. Although the overall plan gives the impression of a crescentic setting, the orthostats of each side of the facade are set in an almost straight line, the outermost orthostat of the eastern side alone projecting forward of the entrance. The overall width is 21 feet.

All six surviving orthostats of the facade lean forward. Of these, none would have been more that 2 feet 9 inches in height if set vertically. Roughly constructed dry-stone walling appears to have been built between each pair of adjacent orthostats, but this had mostly collapsed. The facade, indeed, appears to have become unstable during the period of use of the cairn in prehistoric times. In order to counteract the possibility of further instability, a low dry-stone wall, some 1 foot 9 inches high, was built in front of the facade. The final act in the use of the tomb involved the closing of the entrance to the terminal chamber, and the blocking of the forecourt. A semi-circular, platform-like arrangement of three or four layers of flat slabs was built up against the central part of the wall supporting the facade. This inner blocking was in turn masked by an outer blocking, also built of flat slabs laid over and against the inner, and concentric with it. The regular arrangement of the inner and outer blocking appears to have been masked by a mantle of smaller stones which extended for the full width of the facade.

The long cairn

It is assumed that the construction of the facade, but not its blocking, and the long cairn were contemporary. The limits of the outer cairn are marked by an outer dry-stone revetment, giving a plan which increases in width from 30 feet at the southern end to 39 feet at the northern. Its maximum length is 43 feet. This outer revetment appears to have been built up against an earlier,

and partially unstable, revetment, the outward splay from front to rear having been conditioned by a need to enclose some of the collapse from the northern end of the cairn.

Finds

Despite the very considerable disturbance suffered by Mid Gleniron II., several sherds of pottery and a number of flints, including a leaf-shaped arrowhead from the forecourt, had survived. The pottery includes undecorated sherds from the lateral chamber, including one very small sherd from below the end wall of the lateral chamber, and decorated pottery from the body of the long cairn and the blocking of the forecourt. These wares may be paralleled in Neolithic contexts in Scotland. Sherds of coarser, urn-like pottery were recovered from the upper disturbed levels of the terminal chamber.

DISCUSSION

A full discussion of Mid Gleniron I. and II. and their relationship to the chamber cairns of south-western Scotland will be offered in the final report. Briefly, the most significant result of the excavation is the evidence for cairns of multi-period construction. In recent years comparable evidence has emerged from counties as far apart as Caithness and Berkshire, and in Ireland. One of the difficult problems of interpretation of the study of chambered cairns has been that of origins, and more particularly of localised types, such as those found in the north of Ireland or in the Cotswold-Severn region.

The origins and development of the Clyde cairns of south-western Scotland, from simple beginnings to monumental long cairns with semi-circular facades have recently been discussed by Scott.[7] The two cairns at Mid Gleniron offer some corroboration of the manner in which such developments may have taken place.

MID GLENIRON A

Reference has been made to the position of this structure in relation to Mid Gleniron I. Before excavation it had appeared to some observers that the two cairns together formed a single structural unit, over 100 feet long. A transverse hollow, however, suggested to the writer that two distinct structures might have been linked together in a composite monument. The first season's excavation in 1963 revealed that the two structures were quite independent, and set 13 feet apart on approximately the same alignment. The builders of Mid Gleniron A presumably wished to position their cairn as near as possible to the chambered cairn. Their motives may have been similar to those which prompted the insertion of secondary cremations in the body of Mid Gleniron I.

Mid Gleniron A had been extensively disturbed, but sufficient evidence

7 J. G. Scott in T. G. E. Powell et al, **Megalithic Enquiries in the West of Britain**, Liverpool, 1968.

survived to demonstrate that it had been a burial cairn. An outer capping of smaller stones appears to have covered a basal setting of larger stones. The outer capping was rather more square than circular in plan, although this may have resulted partially from slip and disturbance, and it measured 33 feet by 30 feet. The basal setting was arranged in such a manner that the long axes of the larger stones tended to lie concentric with the circumference of the setting as a whole. Despite disturbance, it seems probably that this inner feature was penannular, rather than circular, in plan, and open to the south.

The central area was free of larger stones and it is possible that burials had been deposited here on the original ground surface, although subsequently covered by the capping of smaller stones. Several scatters of small fragments of cremated bone and very small sherds were found in this central area. It cannot be proved that the cremations had originally been placed in urns. The fabric of the sherds, however, resembles that of cinerary urns, although there is no surviving evidence of rim, collar, cordon or decoration which might allow classification.

The evidence suggests that Mid Gleniron A was a burial cairn, perhaps dating from the second millennium B.C., and built to contain cremations, possibly deposited in cinerary urns.

MID GLENIRON B

Mid Gleniron B lies a little more than 40 feet south-west of the facade of Mid Gleniron II. Before excavation it appeared to be a circular cairn, and a large vertical orthostat-like stone which projected above the surface suggested that there might be a central megalithic chamber.

Excavation revealed a very well built circular cairn, some 22 feet in diameter, which encloses a small square chamber. Disturbance, as in the case of the other three cairns described in this paper, had destroyed much of the evidence which might be supposed to have existed in the chamber.

The size and construction of the cairn resemble those of the inner cairns of Mid Gleniron I. and II., but the chamber of the former is closed, and had never been provided with an entrance passage. This might suggest a comparison with a Bronze Age cist, but the construction of the chamber differs from that of the conventional cist. On the one hand, the surviving orthostat is more massive than the wall stones normally used in such cists. Further, the construction of the chamber is such that it appears that two opposed walls were formed of single orthostats, whereas the other two were dry-stone built.

It is particularly unfortunate that the only finds of prehistoric date were one flint scraper and one small, featureless sherd of pottery. It is therefore impossible to determine whether this structure antedates or post-dates the two chambered cairns at Mid Gleniron.

CINERARY URNS AND PYGMY VESSELS IN SOUTH-WEST SCOTLAND

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The importance of the corpus as a regional and chronological study of prehistoric materials has increasingly been recognised in recent years. Major contributions to the study of the Bronze Age in Scotland have been Coles' papers on Scottish Middle and Late Bronze Age metalwork,[1] and, more recently, on Bronze Age metalwork in Dumfries and Galloway.[2] The study has been extended to Bronze Age pottery with Simpson's corpus of Food Vessels in South-West Scotland,[3] and this paper continues the study, within that region, to cover Cinerary Urns and Pygmy Vessels. The only treatment of Scottish Cinerary Urns since Abercromby[4] has been Childe's list[5] and a map by Mr J. Barber.[6] In addition, there has been a recent survey of the Bronze Age pottery from Luce Sands, Wigtownshire.[7] The present paper is an attempt to catalogue the known Cinerary Urns and Pygmy Vessels of South-West Scotland, including fragments and references to finds which seem reasonably well established. It is certainly not complete—some fragments have been omitted, and it seems certain that some urns or fragments which should have been included may yet be lying unpublished in private collections. One hundred and thirty-nine vessels, fragments and references to finds (a reference counting as one, whether it refers to one or more finds), are included in the inventory.

By far the predominant type, leaving aside the question of doubtful classification, is the Collared Urn. After this comes the Cordoned Urn, then the Bucket-shaped Urn.

Collared Urns	45
Cordoned Urns	33
Bucket-shaped Urns	25
Encrusted Urns	6
Bipartite/Biconical Urns	3
Enlarged Food Vessels	3
Fragments or uncertain	2
Pygmy Vessels	22

The predominant decoration is of string or cord impression—twisted, plaited or whipped, followed by incised lines and then stamped impressions. Combination of two methods of decoration is common, particularly string

1 PSAS, XCIII (1959-60), 16-134; XCVII (1963-4), 82-156.
2 TDGNHAS, XLII (1965), 61-98.
3 TDGNHAS XLII (1965), 25-50.
4 A Study of the Bronze Age Pottery of Great Britain and Ireland, Vol. II, 1912.
5 V. G. Childe: Scotland Before the Scots, 1946, 127.
6 Prehistoric Peoples of Scotland, 1962, edited by S. Piggott, 90.
7 PSAS, XCVII (1963-4), 40-81.

impression and incised lines, and there are occurrences of all three methods on one vessel—e.g. (119). The main designs produced are triangles, filled and unfilled, chevron and herring-bone patterns.

The occurrence of urns in groups or cemeteries greatly outnumbers instances of single finds, and many existing single urns are, in fact, survivors of groups which were dispersed and lost after discovery or which—"crumbled to dust on exposure," as at Straiton (44). Cemeteries consist of cairns or mounds of earth and stones [Ardeer (17-28), Kilwinning (29), Coylton (33), Ochiltree (36), Muirkirk (40), Straiton (44), Beoch (48), Luce Sands (63), Dally (82), Cairngill (84), Kirkbean (85), Lochrutton (86), Cauldchapel (108), Limefield (116-18), East Kilbride (129), Cairngryffe (135), Kilmacolm (138)]; enclosures or ring cairns, circular or oval, with stone and earthen banks, with or without entrances [Monkton (32), Muirkirk (41-2), New Cumnock (45-7), Luce Sands (77-8), Whitestanes Moor (105)]; flat cemeteries, apparently without boundary [Largs (2-8), Girvan (49-50), Palmerston, Dumfries (89-93), Kirkburn, Lockerbie (95-8), Dinwoodiegreen (101-104), Thankerton (111-15), Hamilton (119-21), Uddingston (126-7), Newlands, Glasgow (131-4)]; or intrusions at a later date into already-existing cemeteries, as, for example, at Mid Gleniron (70-73)—the cemetery in this case being the body of a Neolithic chambered cairn. The structures are not all imposing—the "cairn" covering the urned and unurned cremations at Luce Sands (63) being no more than a small mound of pebbles, barely covering the urn, and an "enclosed cemetery" also at Luce Sands (77-8), consisting simply of a circular band of gravel and pebbles, about 3 ft. wide, around the buried urns. This suggests not so much degeneration, as the adherence to an idea under difficult circumstances. In many cases, urns found in pits or hollows, alone or in flat cemeteries, may have at one time been surrounded by a bank or ditch or covered by a cairn, since ploughed away or used for dyke-building, etc.—the urns being discovered long after any memory or remains of the structure have disappeared. This might have been the situation at Thankerton (111-15), Hamilton (119-21), and Bishopbriggs (125), where an earlier cairn-covering is not unlikely. The association of urn burials with stone circles is suggested at Greystone Park, Dumfries (94), and at Nith Lodge, New Cumnock (45-7), in which latter case the stone circle marked the bank of an oval enclosed cemetery.

From seventy-five instances where details of the position of the urns at time of discovery are known, the following information can be derived:

Inverted—56 (23 Collared, 23 Cordoned, 5 Bucket-shaped, 3 Encrusted, 2 Pygmy Vessels).

Inverted on slab or flat stones—8 (4 Collared, 3 Cordoned, 1 Pygmy Vessel).

Inverted on pebbles or small boulders—8 (1 Collared, 6 Cordoned, 1 Encrusted).

Inverted with base protected by slab—2 (1 Collared, 1 Cordoned).
Upright—19 (14 Bucket-shaped, 3 Collared, 2 Pygmy Vessels).
Upright on slab or flat stones—3 (1 Collared, 1 Bucket-shaped, 1 Pygmy Vessel).

Other urns were discovered in cists or cist-like structures [Largs (2-5), Seamill (14), Doonfoot (34), Cumnock (38), Stranraer (55), Blairbuie (76), Limefield (118), Cairngryffe (135), Drumpellier (137)], usually singly, but in the case of Largs (2-5), in a group. The Largs (2-5) urns were Bucket-shaped and upright, Seamill (14), Collared; Doonfoot (34), Cordoned and Inverted; Cumnock (38), Collared; Stranraer (55), a reference to Inverted Urns, probably Pygmy Vessels; Blairbuie (76), Bucket-shaped; Limefield (118), Collared and Inverted; Drumpellier (137), a reference to several urns of unknown type. There are also urns protected by a packing of stones, as at Low Glengyre (52-3), Mid Gleniron (70-73), and Dinwoodiegreen (102).

A few urns had their contents sealed up by a plug of half-baked or unbaked clay—Ardeer (18), (24), (27), (28); Mid Gleniron (70); Kirkbean (85). One of the urns from Ardeer (28) and the Mid Gleniron urn had pebbles embedded in the clay plugs—perhaps as reinforcement. Other instances of urns having clay seals have been recorded,[8] one Irish urn having the mouth blocked with a sod.[9]

Allowing for the limited number of examples and the fact that some early reports of discoveries tend to give insufficient detail, the foregoing information suggests that Collared Urns, Cordoned Urns and Encrusted Urns were usually buried in an inverted position, whereas Bucket-shaped Urns tended to be buried in an upright position. In Fox's corpus of Encrusted Urns[10] (four of which are included in this paper), of a total of forty-eight urns listed, where the positions of seventeen were known, fifteen were inverted and two were upright.

Within the region, Cinerary Urns have been found associated, within a group or cemetery, with other Bronze Age pottery types. With Beakers or sherds at Cumnock (39), Beoch (48), Kirkburn, Lockerbie (95-8), and Limefield (116-18). With Food Vessels or sherds at Doonfoot (34), Muirkirk (40), Palmerston, Dumfries (89-93), Kirkburn, Lockerbie (95-8), Thankerton (111-115), Limefield (116-18), Hamilton (119-21), and Drumpellier (137). Neolithic sherds were also in association at Kirkburn, Lockerbie.

Distribution

The map shows, more than anything else, where accidental finds have been made and where excavation has taken place. There are no neat associations to be made—the sources of gold and copper ores show little relationship to

8 Barrow 187, Ford, Northumberland, in J. Thurnam, **Archæologia**, XLIII (1871), 408-10 and Abercromby, fig. 119. At Barrow 24, Calais Wold Group, E. Yorks., both urn and hole containing it had clay cover. J. R. Mortimer: **Forty Years Researches**, 1905. 156, fig. 401. A plain biconical Pygmy Vessel found under a barrow at Ringwould, Kent, had its mouth sealed with a half-baked clay plug, **Archæologia**, XLV (1877), 54. Two Bucket-shaped urns, buried upright, at Cowdenbeath, Fife, had clay plugs—one with a stone embedded in it, **PSAS.** LXV (1930-31), 261-9.
9 Ballon Hill, Co. Wicklow, in **Trans. Kilkenny Arch. Soc.**, II, 298, and Abercromby, fig. 541.
10 **Antiquaries Journal**, VII (1927), 115-33.

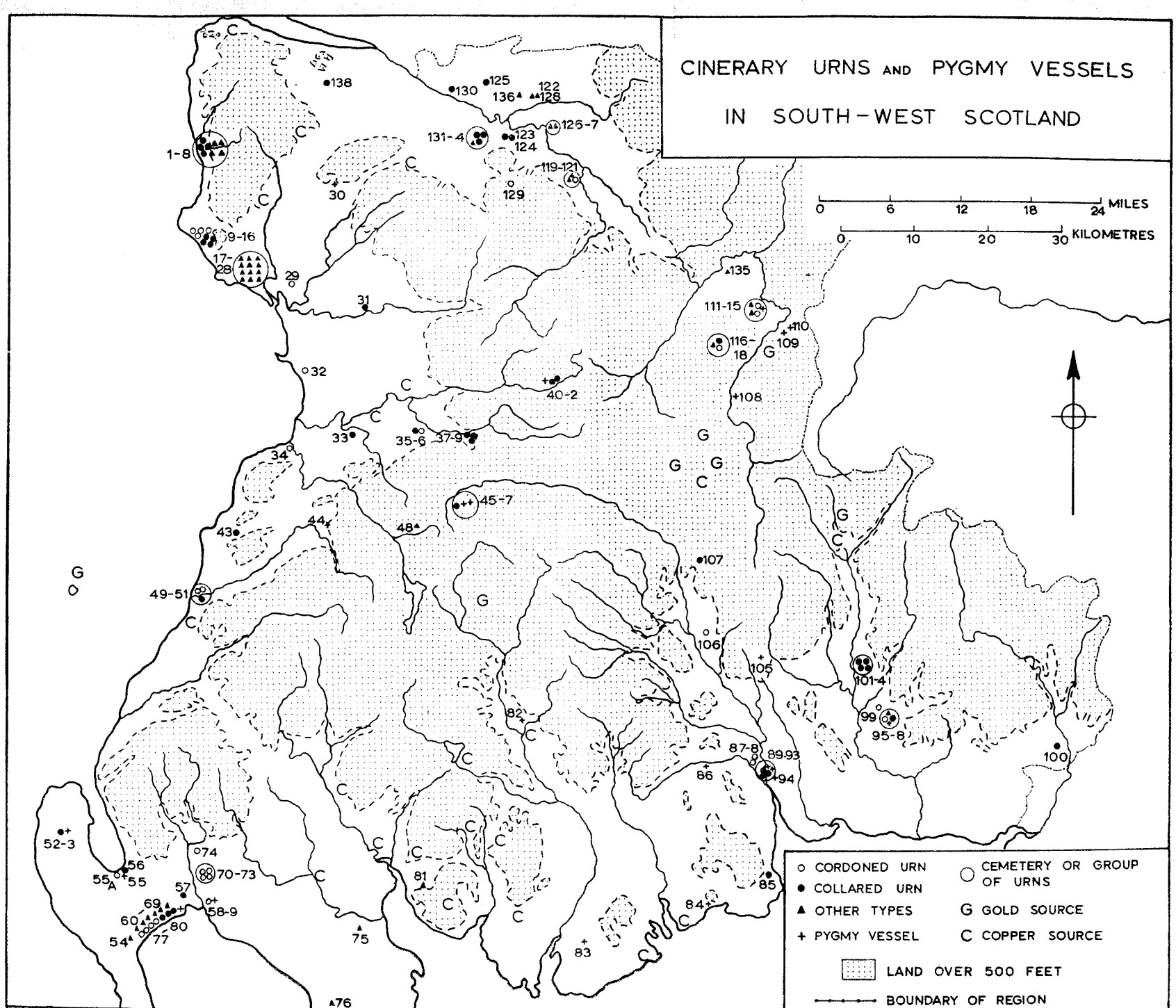

Fig. 1—Distribution Map.

Cinerary Urn sites. Little evidence for relationship with settlement sites exists in the region, except, perhaps, at Muirkirk,[11] and this might suggest a separation of domestic and funerary sites, but such a suggestion would not be altogether valid, considering the general paucity of evidence for Bronze Age settlement sites. The distribution, as far as Dumfries and Galloway are concerned, does, however, compare to a certain extent with Coles' distribution map of Middle Bronze Age metal-work.[12]

Several sites are less than a mile from the coast. There is an area of concentration in North Ayrshire (Largs—West Kilbride—Ardeer), all on the raised beach, but two-thirds of this may be accounted for by two groups or cemeteries —Nelson Street, Largs (2-8), and Ardeer Cairn (17-28). Away from the coast, gravels and river valleys are the main locations. There is another concentration in the Luce Sands of Wigtownshire—an area which has more than an average amount of Bronze Age pottery, having been the landfall, intentional or unintentional, for many migratory movements, east-west and north-south. Other pockets of density occur in lower Nithsdale and lower Annandale, but again these may be accounted for by three sites—Palmerston, Dumfries (89-93), Kirkburn, Lockerbie (95-8) and Dinwoodiegreen (101-104). The last area of concentration is on the middle and upper Clyde, a routeway and a route-crossing since earliest times, with contacts to the south by way of Annandale, to the south-east by way of the Biggar Gap, and by various routes to the Ayrshire Plain and coast. Apart from this last area, there are few occurrences of urns above the 500 ft. contour.

There seem to be more finds of Cinerary Urns than of either Beakers[13] or Food Vessels[14] in the region. Allowing for the fact that the original number of vessels must necessarily exceed the survivals, and that contemporaneity and overlap (see above) existed, could this argue for an increase in population? Some urns have been found in areas which might not have been attractive to earlier peoples, and it is not improbable that some of the poorer areas were being occupied for the first time.[15]

Bucket-shaped Urns

Twenty-five urns have been listed as "Bucket-shaped" (2, 3, 4, 5, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, 54, 61, 63, 64, 65, 76, 78, 81, 117, 138), and these fall into three main groupings—Largs (2-5), Ardeer (17-24, 26-28), and Luce Sands (61, 63, 64, 65). These are all coastal groupings, and, of the total, only two [Limefield (117) and Mount Vernon (136)] could be termed "inland." The classification "Bucket-shaped" is essentially formal and, on this basis, all the urns listed should qualify. But four of the urns (17, 18, 26, 27)—from Ardeer cairn, would seem to be of the Cordoned type. They have been included as

11 PSAS, LVIII (1923-4), 333-8; LXI (1926-7), 277-8.
12 TDGNHAS, XLII (1965), 72, fig. 5.
13 Maps of Scottish Beakers, in **Prehistoric Peoples of Scotland**, figs. 10 and 11.
14 TDGNHAS, XLII (1965), 27, fig. 1.
15 Frank Elgee: **Early Man in North-east Yorkshire**, 1930, 164-5.

Bucket-shaped, not irrefutably, for several reasons. They are of bucket shape, and, without the vestigial mouldings and decoration, there would be no doubt as to their classification under this heading. The mouldings, however, are very shallow, and the decoration, although in the Cordoned Urn tradition, is also to be seen on urns (21) and (28), which are bucket-shaped but have no suggestion of moulding or cordon. It is not impossible that the urns were all deposited in the cairn at the same time — it was not a large cairn, and re-use on several different occasions could have caused the destruction of earlier-deposited urns; this does not seem to have occurred. The grouping of the urns within the cairn shows no separation of the two types: (20), (21) and (24) were deposited at or near the centre of the cairn; (17), (19) and (22) were in another group.[16] Two of the "doubtful" urns (17), (26), were inverted—not usual with bucket-shaped urns, but the other two (18), (27), were upright.

Bucket-shaped urns, in this region, are associated with different types of cemetery—cists (Largs, Blairbuie), cairns (Ardeer, Luce Sands (63), Limefield), a rudimentary type of enclosed cemetery [Luce Sands (78)], and seemingly single flat burials (54), (61), (64), (65).

The urns are normally undecorated, the exceptions being (17), (18), (26), (27), noted above, and Stoneykirk (54), which has an unusual incised design of hatched diamond—or lozenge-shaped panels on the body, a motif which may be seen in Rinyo-Clactonian decoration,[17] and also in some Hebridean Iron Age pottery types.[18] The suggestion of continuity is here, but no conclusions may be drawn from a single fragmentary vessel. Two of the vessels (5), (81), have a row of perforations just below the rim. The Garrochar urn (81) has been compared by Stevenson[19] to two vessels from Glamorganshire and Cardiganshire, now in Cardiff Museum. The sites were both coastal, and a coastal contact between Wales and South-West Scotland is suggested. Four bucket-shaped urns from Middlesex[20] have perforations just below the rim, but in three of these the perforations are "repair-holes,"[21] and the fourth urn does not strictly belong in the category, having a slashed cordon or moulding about one-third of the way down the body.

Urns of this type have been suggested as Late Bronze Age in context. Childe[22] lists the Largs urns (2-5) and fragments with the cryptic statement: "7 O.K. urns in one cist too," referring to the urns from Old Keig, Aberdeenshire,[23] a site which, together with Loanhead of Daviot,[24] he uses for purposes of comparison in the discussion of the Garrochar urn (81), assigned to "about

16 **PSAS**, XL (1905-6), 378-402.
17 **PSAS**, LXXIII (1938-9), 6-31.
18 **PSAS**, XCVI (1962-3), 172-4; **Antiquity**, XXXIX (1965), 266-78, fig. 2.
19 **TDGNHAS**, XXIV, 3rd ser. (1945-6), 18.
20 Ashford, Middlesex, in **JBAA**, XXVII (1871), 449-52; Acton, Middlesex, in **Archæological Journal**, XL, 106; Abercromby, op. cit., Nos. 469d, 470, 470a, 470c.
21 **British Museum Guide to the Antiquities of the Bronze Age**, 2nd ed. (1920), 73, fig. 64.
22 Childe, op. cit. 127, immediately after Nos. 613-17.
23 **PSAS**, LXVII (1932-33), 48, and LXVIII (1933-4), 372-93.
24 **PSAS**, LXIX (1934-5), 200.

500-600 B.C."[25] Stevenson,[26] referring to the Glamorgan urn, states that it was—"in a cave containing a number of vessels of Bronze Age character, but probably somewhat later in date." However, a late date need not be sought for all vessels in this category. At Ardeer (17-24, 26-8), urns (20), (21) and (24) were together in one group. Urn (21) contained, as well as cremated bone, two of the ubiquitous white quartz pebbles, traces of thin gold leaf, and three beads of "grey vitreous paste"—two segmented and one of a nine-rayed star shape. The evidence of the faience beads[27] argues in favour of a Middle Bronze Age dating for these three urns, if not for the cairn as a whole. The circular, slab-covered cist-like structure which contained the Bucket-shaped urns at Largs (2-5), had separate burials of cremations in inverted Collared Urns (6-9) scattered around it. At least three of the Collared Urns belong to Longworth's Primary Series,[28] assignable to a fairly early date and, while the cist need not be absolutely contemporary, the use of what may have been an unmarked flat cemetery by groups coming in at a very much later date does not seem probable. Rynne[29] has noted the difficulty of using an unmarked cemetery over a long period of time, suggesting that burials would have to be made during one or two generations, and that differences in pottery type need not suggest great difference in time or even culture, but rather different social or family structure, cremation being the constant factor. At Doll Tor Stone Circle, Stanton Moor, Derbyshire, Bucket-shaped urns containing cremations were associated with unurned cremations accompaned by star-rayed and segmented faience beads.[30] The Limefield Bucket-shaped urn (117) was in a cairn which also had Food Vessel and Beaker pottery, as well as Collared and Cordoned urns. Other associations are a flint knife with Luce Sands (63) urn, and a jet bead in a clay covering in Luce Sands (61) urn.

Some origins in Lough Gur wares[31] have already been suggested for Cordoned Urns, and shapes not unlike Bucket-shaped Urns can be seen among the Class II. vessels from Site C, including vessels perforated below the rim, as at Largs (5) and Garrochar (81). As with other types, the Bucket-shaped urn may well have been used during the major part of the Bronze Age, contemporaneity and continuity not being too difficult to argue for a vessel which, in the main, is featureless and simple, but, as has already been stated, has cremation as a constant factor.

Pygmy Vessels

Twenty-two Pygmy Vessels (30, 42, 44, 46, 47, 53, 55, 59, 69, 82, 83, 84, 86, 89, 92, 94, 95, 105, 108, 109, 110, 111), whole or fragmentary, are listed. One

25 TDGNHAS, XXIII, 3rd ser. (1940-44), 136-43.
26 TDGNHAS, XXIV, 3rd ser. (1945-6), 18.
27 H. C. Beck and J. F. Stone, **Archæologia**, LXXXV (1935), 203-52; also J. F. S. Stone and L. C. Thomas in **PPS**, XXII (1956), 37 ff.
28 **PPS**, XXVII (1961), 267-8.
29 Etienne Rynne, in **JRSAI**, XCVI (1966), 39-46.
30 **Journal of the Derbyshire Archæological and Natural History Society**, XIII (1939), 105-25.
31 **PRIA**, LVI, C (1954), 334, fig. 16; 336, fig. 17/2; plates XXIa, XXXIIa, XLVIa.

(44) has a baked clay cover or lid, perforated near the centre. Five (44, 82, 84, 86, 108) were in cairns or mounds, four (89, 92, 95, 111) were in flat cemeteries, four (42, 46, 47, 105) were in enclosed cemeteries, and one (94) was at the base of a fallen stone of a reputed stone circle. Eleven of the Pygmy Vessels (30, 42, 44, 53, 59, 69, 83, 84, 89, 92, 111) were in, or associated with, a larger urn or fragments of a larger urn (probably cinerary). At Muirkirk, the Pygmy Vessel (42) was in a Collared urn (41), and at Glenluce, the Pygmy Vessel (59) was in a Cordoned urn (58). Similar associations have been found at Brackmont Mill, Fife,[32] where two of thirteen Collared urns were inverted over Pygmy Vessels; Harristown, Co. Waterford,[33] where an upright Cordoned urn contained an undecorated biconical Pygmy Vessel; Corkragh, Co. Tyrone,[34] where an Encrusted urn was inverted over a Pygmy Vessel in a cist; at Craigdhu, North Queensferry, Fife,[35] a Pygmy Vessel was found under a cinerary urn (probably an Enlarged Food Vessel) beside an inhumation in a cist under a cairn; at Carphin, Creich,[36] a Pygmy Vessel was found under a cinerary urn —one of at least fourteen, about three feet apart and running in a straight line east-west; at Wester Bucklyvie, Fife,[37] a Pygmy Vessel, standing upright under a large urn, contained the cremated bones of a young child, the larger urn containing the cremated bones of an adult.

Pygmy Vessels accompanied unurned cremations in pits at Nith Lodge (46, 47), Kirkburn, Lockerbie (95), and Whitestanes Moor (105), where charcoal from the pit containing the Pygmy Vessel gave a C14 dating of 1360 ± 90 B.C.

Four Pygmy Vessels contained cremated bones: Straiton (44)—probably the bones of a 5-6-year-old child; Low Glengyre (53)—possibly the bones of a child of 8-12 years; Lochrutton (86); Palmerston, Dumfries (92)—a rather doubtful mention of thin flakes of "white osseous matter" which disintegrated at a touch. Pygmy Vessels containing cremated bones have been found at Fovant, Wiltshire;[38] at Broughderg, Co. Tyrone,[39] where a Pygmy Vessel with cruciform design on the base was found containing "decayed bones" under a larger urn; at Bagenalstown, Co. Carlow,[40] a Pygmy Vessel of unusual shape and design was found under a larger urn in a cist, the smaller vessel containing the cremated bones of an infant.

Two of the Vessels contained a fine black ash—Muirkirk (42) and Glenluce (59). The Muirkirk Pygmy Vessel also contained a bronze awl, an unworked fragment of green chert, and a bone pin, 7⅜ in. long, stuck vertically into the fine ash. The Straiton Vessel (44) contained two fragments of a bronze pin. A

32 **PSAS**, LXXVI (1941-2), 84-93.
33 **JRSAI**, LXXI (1941), 141, fig. 4.
34 **UJA**, II, 3rd ser. (1939), 65-71, fig. 4D.
35 J. Anderson: **Scotland in Pagan Times**, vol. II, 1886, 45, and **TDGNHAS**, XV, 3rd ser. (1928-9), 53, fig. 2.
36 **PSAS**, II (1854-7), 11; VII (1866-8), 405; IX (1870-2), 200-201.
37 **PSAS**, IX (1870-2), 189-207, and **TDGNHAS**, XV, 3rd ser. (1928-9), 53, figs. 4 and 5.
38 Abercromby, fig. 248.
39 Abercromby, fig. 345.
40 Abercromby, fig. 354; **PRIA**, IV, 35.

Pygmy Vessel from Bulford, Wiltshire,[41] contained two bronze pins and several portions of small beads of "white coraline substance." A stone axe/hammer was associated with the Pygmy Vessels at Nith Lodge (46, 47) and probably at Low Glengyre (53). The urns at Stranraer (55) were associated with ten jet beads. These, and other associations, have already been discussed by Sir Lindsay Scott.[42]

The predominant shape of Pygmy Vessel in the region is biconical (30, 42, 44, 47, 53, 82, 83, 92, 109) and the predominant decoration is incised triangles and chevrons. Twelve of the Vessels are perforated (30, 42, 44, 46, 47, 82, 83, 86, 89, 94, 105, 109), the perforations in the Vessel from Whinnie Liggate (83) being triangular. Parallels to the Whinnie Liggate design can be seen in two Vessels from Ireland—Killucken, Co. Tyrone,[43] and one from an unknown source —probably Ulster,[44] and there are suggestions of this openwork design in Pygmy vessels from Bryn Seiont, Caernarvonshire,[45] and Bulford, Wiltshire.[46] There are similarities in design between the Vessels from Nith Lodge (46, 47), Dalry (82), Culter (109), and some Irish Pygmy Vessels—notably those from Drung, Co. Donegal,[47] and Knockboy, Co. Antrim.[48] In particular, the upright triangles on the lowest band of decoration of the Nith Lodge (46) Vessel, when viewed from below, show a sun or star-ray design, paralleled on the Drung and Knockboy Pygmy Vessels. The filled chequer design on the bases of the Dalry (82) and Culter (109) Vessels is not unlike the quartered design on the Drung and Knockboy Vessels. The Thankerton (111) Pygmy Vessel is similar in shape and design to one from Broughderg, Co. Tyrone.[49] The biconical type of Pygmy Vessel has been suggested as intrusive into the British Isles, possibly arriving via north-western France.[50]

The undecorated biconical Pygmy Vessels (30, 42, 53) have parallels at Cocked Lane, Bole Hills, Crookes, Sheffield,[51] where a small plain example with two perforations was found, along with a tanged bronze bade, under an inverted Collared urn, and at Westwood, Newport, Fife,[52] in a cremation cemetery with Collared urns. The Lochrutton Pygmy Vessel (86) is not unlike a decorated example from Gilchorn, Arbroath,[53] found under a Collared urn which also contained a whitish paste bead. Luce Sands (69) resembles a Pygmy Vessel from Glanville, Newry, Co. Down.[54]

The Palmerston, Dumfries (92) Vessel is of miniature Food Vessel type

41 Abercromby, fig. 226; **Archæological Journal, VI, 319.**
42 **PPS, XVII (1951), 16-82.**
43 **PSAS, IX (1870-72), 189-207; JBAA, I (1846), 243;** Abercromby, fig. 341.
44 Abercromby, fig. 342.
45 **Archæologia Cambrensis, XIV, 3rd Ser., 256; Archæologia, XLIII (1871), fig. 52.**
46 Abercromby, fig. 226.
47 **JRSAI, XCIII (1963), 169-79.**
48 **UJA, 27 (1964), 62-6.**
49 Abercromby, fig. 345.
50 **UJA, 27 (1964), 64 and JRSAI, XCIII (1963), 174-9.**
51 Abercromby, fig. 84a.
52 **PSAS, VI (1864-66), 388; PPS, XVII (1951), 80-81,** figs. 2/15 and 2/16; Abercromby, figs. 184f and g.
53 **PSAS, XXV (1890-91), 447;** Abercromby, fig. 185b.
54 Abercromby, fig. 557a.

and resembles, in shape if not design, one from Bagenalstown, Co. Carlow,[55] and an undecorated example from Annakeen, Co. Galway.[56] A number of examples have been found in eastern Scotland, notably at Craigdhu, North Queensferry,[57] at Carmyllie, Arbroath,[58] and at Greenhill, Balmerino, Fife.[59] Scott[60] notes the distribution of such types—closely akin to the Food Vessel in shape and decoration, but occasionally, as at Palmerston, Dumfries (92) having decoration in the Biconical Pygmy Vessel tradition.[61]

The plain, undecorated, hemispherical or flattened hemispherical Pygmy Vessel of the Kirkburn, Lockerbie (95) type, or with omphalos as at Cairngill (84), has a wide distribution. The distribution and further examples are given by Longworth[62] in his discussion of the Kirkburn, Lockerbie Vessel, and he suggests early origins, probably in domestic cups of native Neolithic cultures. There is good evidence for this—particularly in the small cups from Site C at Lough Gur.[63]

Recent discussion of Pygmy Vessel origins and distribution[64] suggests early developments in native Neolithic and early Bronze Age cultures, with perhaps some intrusive elements, particularly in the case of Biconical Vessels. In use, they contained cremations—in some instances the cremated bones of infants or young children, they accompanied unurned cremations, and they accompanied or were contained in urned cremations—predominantly those in Collared urns.

Cordoned Urns

There are thirty-three examples of the Cordoned Urn in the corpus (10, 11, 12, 16, 29, 32, 34, 36, 49, 50, 55a, 58, 62, 66, 67, 70, 71, 72, 73, 74, 79, 87, 88, 96, 99, 106, 112, 113, 114, 115, 116, 121, 129); classification in some instances is doubtful and subjectivity is inevitable, as, for example, in the case of two of the Thankerton urns (114, 115), which are described by Scott[65] as "degenerate food-vessels," but are included in Abercromby's corpus[66] as "Cordoned or hooped type." A similar urn from Ballon Hill, Co. Wicklow is included under the same heading by Abercromby.[67]

Starting with the group at Seamill, West Kilbride (10, 11, 12, 16), the map shows a scattering of finds through central Ayrshire down to Girvan. There is another concentration in the Luce Sands/Glenluce area (58, 62, 66, 67, 70, 71, 72, 73, 74, 79), and again in the Lockerbie/Dumfries area (87, 88, 96, 99). North

55 Abercromby, fig. 354 and **PRIA, IV, 35.**
56 Abercromby, fig. 355.
57 J. Anderson: **Scotland in Pagan Times,** vol. II, 1886, 45; **TDGNHAS,** XV, 3rd ser. (1928-9), 53, fig. 2; **PSAS,** II (1854-7), 533; XV (1880-81), 6; **PPS,** XVII (1951), 81-2, fig. 2/22.
58 **PSAS,** XXXII (1897-8), 239; Abercromby, fig. 330; **PPS,** XVII (1951), 81-2, fig. 2/20.
59 **PSAS,** XXXVI (1901-2), 635-53; **PPS,** XVII (1951), 80-81, fig. 2/14.
60 **PPS,** XVII (1951), 63.
61 **Bulletin of the Board of Celtic Studies,** XVIII (1958-60), 97.
62 **PSAS,** XCVI (1962-3), 129.
63 **PRIA,** LVI (1954), 332, fig. 15.
64 Sir Lindsay Scott, **PPS,** XVII (1951), 62-66, 79-82; H. N. Savory, **Bulletin of the Board of Celtic Studies,** XVIII (1958-60), 89-118; E. Rynne, **JRSAI,** XCIII (1963), 174-9; **Prehistoric and Early Wales,** 1965, ed. I. Foster and G. Daniel, **map of distribution of Biconical Pygmy Vessels,** 93, fig. 11.
65 **PPS,** XVII (1951), 82.
66 op. cit., figs. 500b and c.
67 op. cit. fig. 541a.

of this, the only group is on the upper Clyde at Thankerton (112-115). The majority of the sites are coastal or not far inland.

Of the thirty-three urns or references to urns in the corpus, twenty-three (i.e., 70%) were found in an inverted position. Some were in flat cemeteries—at Girvan (49, 50), Doonfoot (34), Kirkburn, Lockerbie (96), Thankerton (112, 113, 114, 115), and Hamilton (121). In four instances the urns were under cairns or mounds —Kilwinning (29), Ochiltree (36), Limefield (116), and, according to the description,[68] at East Kilbride (129). One, Monkton (32), was associated with a ring-cairn structure, and one, Doonfoot (34), was inverted in a cist, one side of which was the end-slab of a larger cist containing an inhumation and a food vessel. Other cemeteries where cordoned urns were associated with food vessels are—Kirkburn, Lockerbie (96), Thankerton (112-15), Limefield (116), and Hamilton (121). Beakers or beaker sherds were associated with cordoned urns at Kirkburn, Lockerbie (96), and Limefield (116). Four urns, Mid-Gleniron (70-73) were secondary intrusions in a Neolithic chambered cairn.

In form, the cordoned urns are variations on the barrel/bucket/flower-pot shape. Six are undecorated (29, 50, 66, 73, 74, 114). Six of the urns (50, 87, 88, 99, 106, 112) have only one cordon, but, of these, three (88, 106, 112) are incomplete and therefore doubtful. Eighteen urns (10, 11, 12, 29, 32, 49, 55a, 58, 62, 66, 70, 72, 74, 79, 96, 113, 116, 121), forming 55% of the total, have two cordons. The remainder have three or more cordons. Of three definitely single-cordon urns, one (50) is undecorated, one (87) has an overall decoration of circular impressions, and one (99) has a decoration of oval impressions between rim and cordon. Of the eighteen two-cordon urns, twelve (10, 12, 32, 49, 55a, 58, 62, 70, 96, 113, 116, 121) have the decoration between rim and upper cordon only, two (72, 79) have the decoration betweens rim and upper cordon and between the cordons, and one (11) has the decoration between the cordons only. In the case of the decorated urns, single horizontal lines of twisted string impressions above the cordon alone or below the cordon alone have been disregarded.

The main method of decoration is by twisted or whipped string or cord impression, followed by incised lines. The main designs are triangles, filled and unfilled, criss-crossing lines or lattice patterns and a few herring-bone or chevron designs.

The Glenluce (58) urn contained a pygmy vessel—not a regular occurrence with cordoned urns, but paralleled at Harristown, Co. Waterford,[69] where a pygmy vessel was found in an upright cordoned urn. Cordoned urns were found containing bronze objects at the following sites:

Mid Gleniron (70)—3 fragments of bronze pin/needle
Mid Gleniron (71)—shank of bronze pin
Balneil (74)—bronze flat-tanged chisel
Kirkburn, Lockerbie (96)—riveted bronze knife-blade
Shuttlefield, Lockerbie (99)—bronze razor (Class I.A.)
East Kilbride (129)—" bronze objects "

68 D. Ure: The History of Rutherglen and East Kilbride, 1793, 215-20, plates I and V.
69 JRSAI, LXXI (1941), 141.

Bone objects were found in cordoned urns at:

Balneil (74)—a crutch-headed pin (burnt)

Kirkburn, Lockerbie (96)—a " skewer-type " pin (burnt)

The Balneil (74) urn also contained a faience quoit bead (burnt) and a Cordoned urn from West Kilbride (12) contained a discoidal bead of lignite or shale. Another West Kilbride (16) urn contained a polished stone battle-axe. The Girvan (49) urn contained at least one flint scraper (burnt) and the Limefield (116) urn contained an unworked flake of flint or chert. Pebbles were contained in the urns from Monkton (32), Glenluce (58) and E. Kilbride (129). The urn from Hamilton (121) contained an archer's wrist-guard or bracer of polished felstone.

Examples of Cordoned urns with similar contents are numerous in Ireland. Urns containing bronze razors were found at the following sites:

Gortrighy, Co. Antrim.[70]
Glenaree, Co. Limerick.[71]
Pollacorragune, Co. Galway.[72]
Carrowjames, Co. Mayo.[73]
Carrowjames, Co. Mayo.[74]
Harristown, Co. Waterford. [75]
Knockast, Co. Westmeath. [76]

The Knockast urn (Cremation 36) is very similar to the urns at Mid Gleniron (70-73), both in shape and design. The urn at Harristown also contained a bone ring-headed pin and a quoit faience bead (cf. Balneil (74)). Urns containing, or associated with, stone battle-axes are known from Oban,[77] Strichen, Aberdeenshire,[78] and one from Ireland—Laheen, Co. Donegal.[79] Some of the Irish urns quoted above were associated with Food Vessels or sherds. The Cordoned(?) urn from Thankerton (114) is, as already mentioned above, not unlike the urn from Ballon Hill, Co. Wicklow; the Balneil undecorated urn (74) resembles that from Glarryford, North Antrim,[80] also undecorated, and containing " many bone pins and nineteen flint scrapers." The suggestion of Irish contact is strong, and similarity between cairns or mounds such as Ardeer (17-28) or Beoch (48), and cemetery-cairns like Knockast, Co. Westmeath, has already been noted by Piggott,[81] who includes cairns in north Yorkshire and Derbyshire in the comparison.

The question of origins of Cordoned urns, whether in Neolithic or Secondary Neolithic wares in Ireland,[82] or amongst coarse wares on Beaker sites elsewhere,[83] has been well discussed recently and need not be repeated here. Suffice to say that the evidence of faience beads, razors, Beaker and Food Vessel associations, and the archer's wrist-guard (121) strongly suggests

70 JRSAI, XX (1891), 433.
71 NMAJ, I (1936-9), 34-5.
72 JGAHS, XVII (1936-7), 49.
73 JGAHS, XVIII (1938-9), 163 (Tumulus II).
74 JGAHS, XVIII (1938-9), 164 (Tumulus III).
75 JRSAI, LXXI (1941), 141.
76 PRIA, XLI (1932-4), 232-84.
77 PSAS, XXXII (1897-8), 58-9.
78 Antiquaries Journal, VII (1927), 518.
79 JRSAI, XCVII (1967), 39-44.
80 Abercromby, fig. 543.
81 The Prehistoric Peoples of Scotland, 1962, 95-6.
82 Piggot, op. cit., 96
83 Longworth, PSAS, XCVI (1962-3), 130.

Middle Bronze Age, or even earlier, dating for the Cordoned Urns in this region.

Collared Urns

With forty-five examples listed (1, 6, 7, 8, 9, 13, 14, 15, 31, 33, 35, 37, 38, 39, 40, 41, 43, 45, 51, 52, 56, 57, 60, 68, 77, 85, 90, 91, 93, 97, 100 101, 102, 103, 104, 107, 118, 123, 124, 125, 130, 131, 132, 133, 138), Collared Urns are in the majority in this region. Most of them can be classified, on the basis of at least two traits, as belonging to Longworth's Primary Series.[84]

The map shows a grouping in the Largs (1, 6, 7, 8)—West Kilbride (9, 13, 14, 15) region, then a scattering across Central Ayrshire. There are few Collared urns in the Luce Sands area compared with Bucket-shaped and Cordoned types. Another grouping is in the lower Nithsdale/lower Annandale region (90, 91, 93, 97, 101, 102, 103, 104), and then, much farther to the north, around Glasgow (123, 124, 125, 130, 131, 132, 133, 138).

Twenty-three of the forty-five Collared urns were found inverted, three were upright, and of the others, details are not known. Collared urns were found in flat cemeteries at Largs (1, 6, 7, 8), Palmerston, Dumfries (90, 91, 93), Kirkburn, Lockerbie (97), Dinwoodiegreen, Lockerbie (101-104) and Newlands, Glasgow (131, 132, 133); under mounds or cairns at Coylton (33), Muirkirk (40), Kirkbean (85), Limefield (118), and Kilmacolm (138); in enclosed cemeteries at Muirkirk (41), and Nith Lodge (45). Collared urns were found in cists or arrangements of stones resembling cists at Seamill (14), Cumnock (38), and Limefield (118).

Cemeteries where Collared urns were associated with Food Vessels or sherds are Palmerston (90, 91, 93), Kirkburn (97), and Limefield (118); and with Beakers or sherds at Cumnock (39), Kirkburn (97), and Limefield (118). Western Neolithic pottery was also found at the Kirkburn (97) site.

With very few exceptions, the urns conform to the accepted Collared Urn shape. The method of decoration, as in general with the urns of this region, is principally by twisted string or cord impression, followed by incision and impressed oval or circular marks. The patterns are mainly triangles, upright and inverted, mainly hatched, then herring-bone and chevron designs, lattice patterns and panels of alternately upright and horizontal lines. Five urns are undecorated—(13, 14, 90, 93, 143), although (14) has a simple zig-zag decoration on the rim alone. Twelve urns (7, 15, 31, 35, 37, 45, 60, 103, 104, 130, 132, 133) are decorated externally on the collar only, nine of them (31, 35, 37, 60, 103, 104, 130, 132, 133) having a rim decoration. Five urns (52, 97, 107, 124, 138) have the same decoration on collar and neck, and eight (6, 41, 43, 85, 91, 100, 101, 138) have a row of circular or oval impressions defining the shoulder. Only two urns (57, 68) have decoration below the shoulder, and five (35, 91, 102, 103, 107) have internal decoration.

The pattern of panels of alternately vertical and horizontal lines of twisted

84 PPS, XXVII (1961), 267-8.

string impressions or incisions (7, 39, 40, 43) is a common one, with several other examples in Scotland,[85] a few in the south of England,[86] and a concentration in the north of England,[87] mainly in Yorkshire. Other designs, particularly the hatched triangle motif (15, 35, 38, 41, 51, 57, 91, 100, 102, 104, 125) are equally widely distributed in Scotland[88] and England,[89] again, in the latter case, with the emphasis on the north and Yorkshire. Ireland is not so well represented in the Collared Urn series.

The Muirkirk (41) Collared Urn contained a pygmy Vessel (42), and a Pygmy Vessel (53) was buried beside the Collared urn at Low Glengyre (52)—reminiscent of the association of Pygmy Vessel and cinerary urn at Knockboy, Co. Antrim.[90] The Stranraer (56) urn contained a bronze Class I. razor, and similar occurrences have been well discussed by Butler and Smith,[91] who suggest a close relationship between urns of the Stranraer type and Varley's Pennine series.[92] The associations of razors and urns, Collared and otherwise, in Ireland, have been more recently discussed by Binchy.[93] One urn at Dinwoodie-green (103) was found inside a larger urn there (104).

The Luce Sands (77) urn contained a riveted bronze knife-dagger, and green staining on the bones in other urns (13, 85, 90, 132) might indicate decayed bronze objects.

The Kilmarnock (31) urn contained a stone axe/hammer, as did the Stranraer (56) urn, and axe/hammers were associated with Collared urns at Largs (6), Nith Lodge (45), and possibly at Low Glengyre (52) and Victoria Park, Glasgow (130). Associations of cinerary urns and battle-axes or axe/hammers have recently been catalogued and discussed,[94] and their importance as evidence for early dating is recognised. Whetstones were contained in the Stranraer (56) and Luce Sands (77) urns, and the Stranraer urn also contained a decorated bone bead. A burnt bone pin or awl was found in the Kirkbean urn (85)—similar objects have been found in Collared urns in Derbyshire, Yorkshire and Northumberland.[95] The Kilmarnock (31) urn is said to have contained three barbed and tanged flint arrowheads, now lost. Flint arrowheads in Collared urns are also recorded from Banffshire,[96] Great Cumbrae,[97] and Derbyshire.[98] A plano-convex flint knife was contained in the Collared urn from Kirkburn, Lockerbie (97) and the Limefield (118) urn was inverted over a worked flint blade. Long worth[99] uses the evidence of the flint knife at Kirkburn to support an early dating of the urn (97), assigned to his Primary Series, and refers to six other

85 Abercromby, figs. 190, 192, 195; **PSAS,** XX (1884-5), fig. 9; XLII (1907-8), 330; LV (1920-21), 37; LXIV (1929-30), 28; LXX (1935-6), 378; LXXI (1936-7), fig. 4; LXXXII (1947-8), fig. 20.
86 Abercromby, figs. 5d, 24, 25, 69, 82, 87.
87 Abercromby, figs. 78, 107a, 107c, 111, 126, 132, 137, 148, 162, 167.
88 Abercromby, figs. 179a, 180, 180b, 181, 194, 199, 202, 205a.
89 Abercromby, figs. 67, 73, 85, 88, 94, 96, 109, 116, 143, 152, 159, 164, 169, 171, 173.
90 **UJA,** XXVII (1964), 62-6.
91 **University of London Inst. Arch. 12th Annual Report (1956), 20-52.**
92 **Antiquaries Journal,** XVIII (1938), 161-6.
93 **North Munster Studies,** 1967, 43-60.
94 Roe, **PPS,** XXXII (1966), 225, 241-43; O Ríordáin, **JRSAI, XCVII (1967), 42-4.**
95 Abercromby, figs. 79, 81, 109, 119, 124.
96 **PSAS,** XXXI (1896-7), 221.
97 Abercromby, figs. 205a-c.
98 Abercromby, fig. 81.
99 **PSAS, XCVI (1962-3), 129.**

occurrences of such knives with Collared Urns of the Primary Series[100] and their frequent association with Food Vessels in closed grave groups.

The form and decoration of the south-west Scottish Collared urns place the majority in the Primary Series, an early context which is supported by contents and associated objects. Similarities may be seen in appearance and associations, to Collared urns in other areas of Scotland, and, more particularly, to those of northern England, especially Yorkshire.

Encrusted Urns

There are six encrusted urns listed (75, 80, 120, 126, 128, 134), and the urn from Annathill (122) might well be included since, despite its very close resemblance to the Enlarged Food Vessel from Hamilton (119), it does bear the typical applied zig-zag moulding or chevron of Encrusted Urn decoration.

Two of the urns (75, 80) are from Wigtownshire, and the remainder are scattered in the middle Clyde area. Three (80, 126, 134) were found inverted and no details of the others are known. Three were in flat cemeteries—at Hamilton (120), Uddingston (126), and Newlands, Glasgow (134). The Hamilton cemetery also contained cists with inhumations and Food Vessels, and the Newlands cemetery had Collared urns (131, 132, 133) associated with the Encrusted urn. The Uddingston urn (126) was accompanied by another which has been classified as Biconical/Bipartite (127) though having a similar shape and design to (126), but without encrustation.

The applied chevron or zig-zag is common to all seven urns, outlined with stab markings on three (80, 122, 128) and with plaited string impressions on (126). All but two (75, 126) have decoration continued below the shoulder, and ignoring rim bevels, only (134) has internal decoration. Three urns (75, 80, 126) have applied blobs or bosses within the triangles formed by the chevrons. These are contained by the inverted triangles on (75) and (80), and by both upright and inverted triangles on (126). The Newlands, Glasgow (134) urn is very unusual in decoration—in particular the vertical mouldings continuing down the body below the shoulder. In this it bears comparison with an urn from South Lodge Camp, Dorset,[101] and with another from the Breselu (Prescely?) Mountains, Pembrokeshire.[102] Fox[103] compares the Newlands urn with one from Tallaght, Co. Dublin,[104] suggesting that they represent late forms. He goes on[105] to suggest a development of the Encrusted Urn in north-eastern England and eastern Scotland with a spread via the Tyne gap and Clyde gap west and south-west, eventually to the Isle of Man, Ireland, and South Wales, quoting the similarity between the Luce Sands (80) urn and one from Ballaugh, Isle of Man, as evidence of Wigtownshire being one of the jumping-off places in the population movement involved. The derivation of design from Food

100 **PPS, XXVII (1961), 263-306.**
101 **Antiquaries Journal, VII (1927), 115-133, plate XXVI; Pitt-Rivers, Excavations, IV, plate 240; Abercromby, 381-381a. Below the urn was a razor and a small bronze chisel.**
102 **Archæologia Cambrensis, IV (1853), 85; Archæologia, XLIII (1871), 352-3.**
103 **Antiquaries Journal, VII (1927), 123.**
104 **PRIA, 3rd ser. V, 340, plate XI.**
105 **Antiquaries Journal, VII (1927), 123-4.**

Vessel types in the region of development is not unlikely—the resemblance of the Annathill (122) urn to the Enlarged Food Vessel from Hamilton (119) and to Food Vessels in general can be appreciated. More recent study[106] has placed the Encrusted Urn earlier than suggested by Fox, with perhaps something of Secondary Neolithic tradition as well as Food Vessel origins in its ancestry.

Enlarged Food Vessels

Three urns (119, 122, 135) were listed in this category, but (122) has been discussed above, under Encrusted Urns. The Hamilton urn (119) was found in a cemetery with Cordoned (121) and Encrusted (120) urns, and Food Vessels with inhumations in cists. It is not unlike the Doonfoot[107] Food Vessel, and some of the sherds from that site resemble, in decoration, the channelling on the lower part of the Hamilton urn. The Cairngryffe (135) was described as having been found in a stone cist surrounded by five smaller urns. These may have been Food Vessels.

True Food Vessels have been found,[108] in this region, containing cremations —notably at Palmerston, Dumfries; Baillieston, Glasgow; East Kilbride; Kyle Park, Uddingston. The East Kilbride Food Vessel bears a strong resemblance to the Cairngryffe (135) urn, as does a Food Vessel associated with a cremation at Cadder.[109] A Food Vessel cremation site at High Banks Farm, Kirkcudbright,[110] contained two Vessels, one of which had channelling and decoration not unlike the Ferniegair urn. Both in use and appearance, these examples illustrate the close association implied in the name Enlarged Food Vessel. The Cairngryffe (135) urn, in particular, resembles closely Food Vessels of the Yorkshire Vase type.

Bipartite/Biconical Urns

Three urns (25, 98, 127) are included in this category. The urn from Ardeer (25) is unlike the other, mainly Bucket-shaped, urns from that cairn, and its inclusion in that group is not at all sure. Comparisons are difficult with urns of this type, which could be classified in various categories. However, the Ardeer urn resembles one from Matlock Bridge, Derbyshire,[111] found inside a larger urn protected by stone slabs. Such an example suggests some relationship to Pygmy Vessels—particularly the Biconical type.

The Kirkburn, Lockerbie, (98) urn was found in a flat cemetery which also contained Collared, Cordoned and Pygmy Vessel types, as well as Western Neolithic, Beaker and Food Vessel pottery. It was accompanied by a small bronze knife, and in this respect, as well as some resemblance in shape, it may be compared to the Cordoned urn from Shuttlefield, Lockerbie (99). This comparison is noted by Longworth,[112] who suggests developments from the late Necked Beaker via bipartite Food Vessel forms. The shapes of Food Vessels[113] found at Palmerston, Dumfries, and Mount Vernon, Glasgow, have something of the outline of the Kirkburn urn.

106 Butler and Smith, Univ. London Inst. Arch. 12th Ann. Report, (1956), 47.
107 TGAS, XV, pt. 4 (1967), figs. 4, 5e.
108 TDGNHAS, XLII (1965), 25-50, Nos. 18, 38, 44, 45.
109 op. cit., No. 46.
110 op. cit., No. 26.
111 Abercromby, fig. 266.
112 PSAS, XCVI (1962-3), 131.

The Uddingston urn (127) closely resembles its Encrusted companion urn (126), the plaited string zig-zag design taking the place of the applied chevron. In this, and in shape, it also resembles the Encrusted urns from Hamilton (120) and Annathill (128), even to the slight lip on the outside of the rim. A relationship to the Yorkshire Vase type of Food Vessel is also suggested.

Most of the urn types mentioned in this paper have been suggested as being of early, and at least Middle Bronze Age, date. For urns not containing, or associated with, dateable objects, this is, of course, a generalisation, and Piggot[114] has pointed out the necessity for such associations in attempting to fit pottery into a chronological sequence of any value.

In recent years, and as a reaction against earlier theories of devolution and degeneration from south to north, great effort has been expended in demonstrating earlier dating, contemporaneity, and indigenous development in Highland Britain for several classes of Cinerary Urns. As a result, the Late Bronze Age survival and use of Cinerary Urns is a subject which has been somewhat neglected, although noted.[115] Perhaps detailed study of seemingly late pottery such as the Bucket-shaped Urn, and of "mixed" sites such as Queen Mary's Cairn, Cathkin Moor, East Kilbride (129) would help to redress the balance.

The coastal location of many Cinerary urn sites, particularly Cordoned urns, in the south-west of the region, together with their associations, suggests contact with, if not movements from, Ireland. Coles[116] sees this influence strongly reflected in the Middle Bronze Age metalwork, above all in the Wigtownshire / Kirkcudbright area, and the spread of the Irish Bowl Food Vessels into the region, demonstrated by Simpson,[117] underlines the continuity of such movements, which may have begun as early as the Neolithic period. Other classes of Cinerary urn suggest contact with areas outside the region, the Collared urns and their associations having numerous parallels in the north of England, Encrusted urns and Enlarged Food Vessels suggesting developments from other pottery types to the east and south-east.

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113 TDGNHAS, XLII (1965), 25-50, Nos. 18, 56.
114 Prehistoric Peoples of Scotland, 97.
115 E. M. Jope and H. M. Jope, UJA, XV (1952), 69; A. May and A. E. P. Collins, UJA, XXII (1959), 38-9.
116 TDGNHAS, XLII (1965), 88.
117 op. cit., 37-8.

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No.	Site	Type	CONTENTS: Inverted	Upright	On Slab or Flat Stones	On Pebbles	Covered with Slab	Sealed with Clay	Cremation	Pygmy Vessel	Flint	Bone Object	Bronze	Stone Axe/Hammer	Beads: Faience	Beads: Jet	Beads: Glass	Pebbles	Other Contents	ASSOCIATED OBJECTS: Cinerary Urn	Cremation	Pygmy Vessel	Flint	Bone Object	Bronze	Stone Axe/Hammer	Beads: Faience	Beads: Jet	Beads: Glass	Pebbles	Other Finds	Present Location
1.	LARGS	Collared	★																													Hunterian
2.	LARGS	Bucket-shaped		★					★																							Glasgow
3.	LARGS	Bucket-shaped		★					★																							Glasgow
4.	LARGS	Bucket-shaped		★					★																							Glasgow
5.	LARGS	Bucket-shaped		★					★																							Glasgow
6.	LARGS	Collared	★																							★						Glasgow
7.	LARGS	Collared	★																													Glasgow
8.	LARGS	Collared	★																													Glasgow
9.	SEAMILL	Collared							★																							National Museum
10.	SEAMILL	Cordoned							★																							Glasgow
11.	SEAMILL	Cordoned																														National Museum
12.	WEST KILBRIDE	Cordoned	★			★			★							★																National Museum
13.	SEAMILL	Collared							★				?																			National Museum
14.	SEAMILL	Collared					★		★																							National Museum
16.	WEST KILBRIDE	Cordoned	★											★																		Not Known

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17.	ARDEER	Bucket-shaped	★						★																							Glasgow
18.	ARDEER	Bucket-shaped		★				★	★																							Glasgow
19.	ARDEER	Bucket-shaped		★					★																							Glasgow
20.	ARDEER	Bucket-shaped		★					★									★														Glasgow
21.	ARDEER	Bucket-shaped		★					★						★			★	★													Glasgow
22.	ARDEER	Bucket-shaped		★					★																							Glasgow
24.	ARDEER	Bucket-shaped		★				★	★									★														Glasgow
26.	ARDEER	Bucket-shaped	★																	★										★		Glasgow
27.	ARDEER	Bucket-shaped		★				★	★																							Saltcoats
28.	ARDEER	Bucket-shaped	★					★	★									★														Saltcoats
30.	BEITH	Pygmy Vessel																		★	★											National Museum
31.	KILMARNOCK	Collared							★	★			★						★													Kilmarnock
32.	MONKTON	Cordoned	★						★									★					★							★		National Museum
34.	DOONFOOT	Cordoned	★						★																							Not Known
35.	OCHILTREE	Collared							★																							Ayr

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36.	OCHILTREE	Cordoned	★						★																							Ayr
40.	MUIRKIRK	Collared (?)	★						★																						★	National Museum
41.	MUIRKIRK	Collared	★						★	★																						National Museum
42.	MUIRKIRK	Pygmy Vessel		★							★	★	★						★	★	★											National Museum
43.	KIRKOSWALD	Collared	★						★																							National Museum
44.	STRAITON	Pygmy Vessel							★				★							?												Ayr
45.	NEW CUMNOCK	Collared	★						★																	★						National Museum
46.	NEW CUMNOCK	Pygmy Vessel																			★					★						National Museum
47.	NEW CUMNOCK	Pygmy Vessel																			★					★						National Museum
49.	GIRVAN	Cordoned	★						★		★												★									Hunterian
50.	GIRVAN	Cordoned	★			★			★																							Hunterian
51.	GIRVAN	Collared							★																							Hunterian
52.	KIRKCOLM	Collared		★	★				★													★	★			?						Glasgow
53.	KIRKCOLM	Pygmy Vessel		★	★				★										★	★												Glasgow
54.	STONEYKIRK	Bucket-shaped		★												★					★		★			★						Not Known

TABLE OF CONTENTS AND ASSOCIATED OBJECTS

No.	Site	Type	CONTENTS: Inverted	Upright	On Slab or Flat Stones	On Pebbles	Covered with Slab	Sealed with Clay	Cremation	Pygmy Vessel	Flint	Bone Object	Bronze	Stone Axe/Hammer	Faience	Beads: Jet	Beads: Glass	Pebbles	Other Contents	ASSOCIATED OBJECTS: Cinerary Urn	Cremation	Pygmy Vessel	Flint	Bone Object	Bronze	Stone Axe/Hammer	Faience	Beads: Jet	Beads: Glass	Pebbles	Other Finds	Present Location
55.	STRANRAER	Pygmy Vessels	★		★											★																Not Known
56.	STRANRAER	Collared	★						★			★	★	★					★													National Museum
57.	DUNRAGIT	Collared (?)																					★									National Museum
58.	GLENLUCE	Cordoned	★		★		★		★	★								★														National Museum
59.	GLENLUCE	Pygmy Vessel	★																★	★												National Museum
60.	LUCE SANDS	Collared	★						★																							National Museum
61.	LUCE SANDS	Bucket-shaped	★						★			?				★																National Museum
62.	LUCE SANDS	Cordoned	★																													National Museum
63.	LUCE SANDS	Bucket-shaped	★						★									★			★	★										Dumfries
66.	LUCE SANDS	Cordoned	★						★																							National Museum
69.	LUCE SANDS	Pygmy Vessel																	?												★	National Museum
70.	GLENLUCE	Cordoned	★		★		★		★			★																				Dumfries
71.	GLENLUCE	Cordoned	★		★				★			★																				Dumfries
72.	GLENLUCE	Cordoned	★		★				★																							Dumfries
73.	GLENLUCE	Cordoned	★						★																							Dumfries

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74.	NEW LUCE	Cordoned	★						★			★	★		★																	National Museum
77.	LUCE SANDS	Collared	★						★				★						★													National Museum
78.	LUCE SANDS	Bucket-shaped (?)		★					★									★														National Museum
79.	LUCE SANDS	Cordoned (?)							★																							National Museum
80.	LUCE SANDS	Encrusted	★						★																							National Museum
81.	CREETOWN	Bucket-shaped		★	★				★																							Kirkcudbright
82.	DALRY	Pygmy Vessel																														Glasgow
83.	WHINNIE LIGGATE	Pygmy Vessel																		?												National Museum
84.	CAIRNGILL	Pygmy Vessel																		?	★											Dumfries
85.	KIRKBEAN	Collared	★					★	★		★	★	?																			Hunterian
86.	LOCHRUTTON	Pygmy Vessel							★																							Hunterian
89.	DUMFRIES	Pygmy Vessel																		★	★											Dumfries
90.	DUMFRIES	Collared (?)	★						★		★		?																			Dumfries
91.	DUMFRIES	Collared (?)	★		★				★																							Dumfries
92	DUMFRIES	Pygmy Vessel							?											★	★											Dumfries

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93.	DUMFRIES	Collared (?)	★						★																							Dumfries
94.	DUMFRIES	Pygmy Vessel																			★											Dumfries
95.	LOCKERBIE	Pygmy Vessel																			★											National Museum
96.	LOCKERBIE	Cordoned	★			★			★			★	★																			National Museum
97.	LOCKERBIE	Collared	★		★				★		★																					National Museum
98.	LOCKERBIE	Bipartite	★						★																★							National Museum
99.	LOCKERBIE	Cordoned	★						★				★																			National Museum
101.	DINWOODIE GREEN	Collared		★					★																							Dumfries
102.	DINWOODIE GREEN	Collared	★		★				★																							Dumfries
103.	DINWOODIE GREEN	Collared	★		★				★																							Dumfries
104.	DINWOODIE GREEN	Collared	★		★														★													Dumfries

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105.	WHITESTANES MOOR	Pygmy Vessel																			★		★								★	National Museum
111.	THANKERTON	Pygmy Vessel																		★												National Museum
112.	THANKERTON	Cordoned	★						★																							National Museum
113.	THANKERTON	Cordoned	★						★																							National Museum
114.	THANKERTON	Cordoned (?)	★						★													★										National Museum
115.	THANKERTON	Cordoned (?)							★																							National Museum
116.	LIMEFIELD	Cordoned (?)	★						★	★																						National Museum
117.	LIMEFIELD	Bucket-shaped																														National Museum
118.	LIMEFIELD	Collared (?)	★	★		★				★																						National Museum
119.	HAMILTON	Enlarged Food Vessel							★																							Glasgow
120.	HAMILTON	Encrusted																														Glasgow
121.	HAMILTON	Cordoned (?)	★	★					★										★													Glasgow
123	CAMBUSLANG	Collared							★																							National Museum

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124.	CAMBUSLANG	Collared							★																							Old Glasgow Museum
125.	BISHOPBRIGGS	Collared		★		★			★																							Glasgow
126.	UDDINGSTON	Encrusted	★						★																							National Museum
127.	UDDINGSTON	Biconical (?)	★						★																							National Museum
129.	EAST KILBRIDE	Cordoned (?)	★		★				★				★					★														Not Known
130.	GLASGOW	Collared							★																	★						Old Glasgow Museum
131.	GLASGOW	Collared	★						★																							National Museum
132.	GLASGOW	Collared	★						★				?																			National Museum
133.	GLASGOW	Collared	★						★																							National Museum
134.	GLASGOW	Encrusted	★			★			★																							National Museum
135.	CAIRNGRYFFE HILL	Enlarged Food Vessel (?)																													★	British Museum
136.	GLASGOW	Bucket-shaped							★																							Airdrie
138.	KILMACOLM	Collared							★																	?						Glasgow

INVENTORY

Abbreviations:

Ab. followed by number. Abercromby: **Bronze Age Pottery of Great Britain and Ireland,** Vol. 2, 1912, list of Cinerary Urns and Pygmy Vessels.

Ch. followed by number. Childe: **Scotland Before the Scots,** 1946. List of Cinerary Urns and Pygmy Vessels.

AHCAW. Archæological and Historical Collections of Ayrshire and Wigtownshire.

CAANHS. Collections of the Ayrshire Archæological and Natural History Society.

D. & E. Discovery and Excavation, published by the Scottish Regional Group of the Council for British Archæology.

PPS. Proceedings of the Prehistoric Society.

PSAS. Proceedings of the Society of Antiquaries of Scotland.

TDGNHAS. Transactions of the Dumfriesshire and Galloway Natural History and Antiquarian Society.

TGAS. Transactions of the Glasgow Archæological Society.

NSA. New Statistical Account.

Anderson. Joseph Anderson: **Scotland in Pagan Times. Vol. II, The Bronze and Stone Ages, 1886.**

Smith. John Smith: **Prehistoric Man in Ayrshire, 1895.**

Hunterian. Hunterian Museum of the University of Glasgow

Glasgow. Glasgow Art Gallery and Museum.

NMA. National Museum of Antiquities, Edinburgh.

Munro. R. Munro: **Prehistoric Scotland, 1899.**

AYRSHIRE

1. LARGS. Collared urn. Possibly from Nelson Street area. Ab. 205. Hunterian.
2. LARGS, NELSON STREET. Small, bucket-shaped urn. No decoration. One of seven in circular, slab-covered cist, all mouth upwards and containing calcined bones. **Archæologia,** LXII (1910), pp. 239-46. Ch. p. 127. Glasgow.
3. LARGS, NELSON STREET. Bucket-shaped urn. No decoration. From above cist. **Archæologia,** LXII (1910), pp. 239-46. Ch. p. 127. Glasgow.
4. LARGS, NELSON STREET. Small bucket-shaped urn. No decoration. From above cist. **Archæologia,** LXII (1910), pp. 239-46. Ch. p. 127. Glasgow.
5. LARGS, NELSON STREET. Tall, bucket-shaped urn. Row of perforations about 2 in. apart around urn ¼ in. below rim. No other decoration. From above cist. **Archæologia,** LXII (1910), pp. 239-46. Ch. p. 127. Glasgow.
6. LARGS, NELSON STREET. Collared urn. One of several found inverted over cremations in holes near above cist. Collar decorated with two incised parallel herring-bone patterns, neck with a succession of triangular spaces filled in with incised lines. Perforated stone (diorite) hammer found near, was probably in one of the collared urns smashed by workmen. **Archæologia,** LXII (1910), pp. 239-46. Ch. 613-17. Glasgow.
7. LARGS, NELSON STREET. Collared urn. Inverted in hole as above. Collar decorated with panels of horizontal string impressions separated by single vertical string impressions, one panel of vertical string impressions. **Archæologia,** LXII (1910), pp. 239-46. Ch. 613-17. Glasgow.
8. LARGS, NELSON STREET. Collared urn. Rim fragment. Collar decorated with criss-crossing diagonal lines of plaited string impressions. Neck has similar arrangement of incised impressions. **Archæologia,** LXII (1910), pp. 239-46. Ch. 613-17. Glasgow.
9. SEAMILL, WEST KILBRIDE. Collared urn. Collar has two horizontal lines of plaited string impressions, one just below rim and one just above base of collar, joined by vertical lines of plaited string impression about ¼ in. apart. Neck is

delimited at bottom with single horizontal line of plaited string impression and above that is covered with criss-crossing diagonal lines of plaited string impressions. **NSA, V**, 258. **PSAS,** XVII (1882-3), p. 72, fig. 5, **LXI** (1926-7), pp. 246-51, **LXII** (1927-8), p. 262. **AHCAW, I**, p. 40, fig. 2. Smith, p. 8, fig. 6. Munro, p. 319, fig. 202. NMA.

10. SEAMILL, WEST KILBRIDE. Cordoned urn. Upper cordon 3 in. below rim, lower cordon 6¼ in. below rim. Double row or horizontal twisted string impressions just below rim and just above upper cordon, area between decorated with triple diagonal lines of twisted string impressions forming zig-zag pattern. Rim has internal sloping bevel, with two horizontal lines of twisted string impressions. Anderson, Vol. II, p. 73, fig. 82. **PSAS,** LXI (1926-7), pp. 246-51, fig. 9. Glasgow.
11. SEAMILL, WEST KILBRIDE. Cordoned urn. Upper cordon 1¼ in. below rim, lower cordon 3⅞ in. below rim. Four single horizontal lines of twisted string impressions—one just below rim, one just above upper cordon, one just below upper cordon and one just above lower cordon. Area between upper and lower cordons decorated with double diagonal lines of twisted string impressions forming zig-zag pattern. Rim has internal, sloping bevel. Anderson, Vol. II, p. 73, fig. 82. **AHCAW,** VII, p. 6, fig. 2. **Ab. 508. PSAS, LXI (1926-7), pp. 246-51, fig. 82. NMA.**
12. FENCES FARM, WEST KILBRIDE. Cordoned urn. Upper cordon 4 in. below rim, lower cordon 7¼ in. below rim. Base missing. Found inverted over cremation on top of a few pebbles. Contained single discoidal bead of lignite or shale. **PSAS,** LXI (1926-7), pp. 246-51, LXII (1927-8), pp. 260-2. Ch. 612. NMA.
13. SEAMILL, WEST KILBRIDE. Collared urn. Rim has internal, sloping bevel. Undecorated. Found near urn below. Contained calcined bone, some pieces having greenish staining. **PSAS,** LXI (1926-7), pp. 246-51, fig. 6. NMA.
14. SEAMILL, WEST KILBRIDE. Collared urn. Flat rim has zig-zag pattern of twisted string impressions, otherwise undecorated. Found in a cist-like structure of small slabs set on edge and covered by thin sandstone slab. **PSAS,** LXI (1926-7), pp. 246-51, fig. 7. NMA.
15. WEST KILBRIDE. Collared urn. Only upper part survives. Collar has two horizontal incised lines, one just below rim and one just above base of collar. Between these is a design of incised upright and inverted triangles filled with incised lines. Rim has sloping internal bevel. **PSAS,** LXI (1926-7), p. 260-1. NMA.
16. CHAPELTON FARM, WEST KILBRIDE. Cordoned urn. Found inverted over polished stone battle axe—"immediately beside a larger urn containing remains of bones, etc." No other details of the urn, or its whereabouts, are known. **PSAS,** IX (1874-5), pp. 385-7. **AHCAW,** III, pp. 78-80. Ch. 593.
17. MISK KNOWES, ARDEER SANDS, STEVENSTON. Bucket-shaped urn, with incipient cordon or shallow horizontal moulding 3¼ in. below rim. Single horizontal lines of twisted string impressions, ¼ in. below rim, about ¾ in. below rim and about 3 in. below rim. Between the two lower horizontal lines the decoration consists of an inconsistent zig-zag pattern of sets of two, three and four diagonal lines of twisted string impressions. Found inverted over cremation, with at least fifteen other urns, in small oval cairn app. 15 ft. by 10 ft. and 3 ft. high in centre, composed of about 80 water-rolled boulders. Cairn revealed by drifting of sand-dune. **PSAS,** XL (1905-6), pp. 378-402, fig. 1. Ab. 535. Ch. 577-92. Glasgow.
18. MISK KNOWES, ARDEER SANDS, STEVENSTON. Bucket-shaped urn, with incipient cordon or shallow horizontal moulding about 4 in. below rim. Two single horizontal lines of twisted string impressions, ½ in. below rim and about 3½ in. below rim. The area between is decorated with diagonal lines of twisted string impressions, forming an irregular zig-zag pattern. Rim has sloping internal bevel with single horizontal line of twisted string impression. Found upright in above cairn, containing cremation, and sealed with a layer of half-baked or unbaked clay, the top surface

of which was 2½ in. below rim. **PSAS,** XL (1905-6), pp. 378-402, fig. 2. Ab. 535a. Ch. 577-92. Glasgow.

19. MISK KNOWES, ARDEER SANDS, STEVENSTON. Bucket-shaped urn. Undecorated. Found upright in above cairn, containing cremation, unsealed. **PSAS,** XL (1905-6), pp. 378-402, fig. 3. Ab. 535d. Ch. 577-92. Glasgow.
20. MISK KNOWES, ARDEER SANDS, STEVENSTON. Bucket-shaped urn. Undecorated. Fund upright in above cairn, containing cremation and fifteen white quartz pebbles, unsealed. **PSAS,** XL (1905-6), pp. 378-402, fig. 4. Ab. 535c. Ch. 577-92. Glasgow.
21. MISK KNOWES, ARDEER SANDS, STEVENSTON. Small bucket-shaped urn. Two single horizontal lines of twisted string impressions, ¼ in. below rim and 1½ in. below rim. The area between is decorated with sets of two and three diagonal lines of twisted string impressions. Rim has slightly sloping internal bevel with single horizontal line of twisted string impression. Found almost upright in above cairn, containing cremation, unsealed. Also contained two small white quartz pebbles, traces of thin gold leaf, two cylindrical notched beads and a star-shaped, nine-pointed bead, all of grey vitreous paste. Bones were of young, slender person, possibly girl. **PSAS,** XL (1905-6), pp. 378-402, fig. 5. Ab. 535e. Ch. 577-92. Glasgow.
22. MISK KNOWES, ARDEER SANDS, STEVENSTON. Bucket-shaped urn. Undecorated. Found upright in above cairn, containing cremation, unsealed. **PSAS,** XL (1905-6), pp. 378-402, fig. 7. Ab. 535b. Ch. 577-92. Glasgow.
23. MISK KNOWES, ARDEER SANDS, STEVENSTON. Bucket-shaped urn. Undecorated. Probably from above cairn. **PSAS,** XL (1905-6), pp. 378-402. Ch. 577-92. Glasgow.
24. MISK KNOWES, ARDEER SANDS, STEVENSTON. Bucket-shaped urn. Undecorated. Rim has slightly sloping internal bevel, undecorated. Found upright in above cairn, containing cremation, and sealed with layer of clay as (17). Also contained three small white quartz pebbles. **PSAS,** XL (1905-6), pp. 378-402, fig. 9. Ab. 535g. Ch. 577-92. Glasgow.
25. MISK KNOWES, ARDEER SANDS, STEVENSTON. Biconical urn, with incipient cordon or shallow horizontal moulding 2 in. below rim. Double incised horizontal line ½ in. below rim and 1/ in. below rim. Area between has zig-zag pattern of double incised diagonal lines. Rim has steeply sloping, concave internal bevel, undecorated. Probably from above cairn. Ch. 577-92. Glasgow.
26. MISK KNOWES, ARDEER SANDS, STEVENSTON. Bucket-shaped urn, with incipient cordon or shallow moulding, 3 in. below rim. Two single horizontal lines of twisted string impressions, ¼ in. below rim and 2¾ in. below rim. Area between has zig-zag pattern of double diagonal lines of twisted string impressions. Found inverted in above cairn, mass of cremated bones and quartz pebbles nearby. Dick Institute, Kilmarnock.
27. MISK KNOWES, ARDEER SANDS, STEVENSTON. Bucket-shaped urn, with incipient cordons or shallow mouldings 1½ in. and 3 in. below rim. Two incised horizontal lines, just below rim and just above upper moulding. Rim has sloping internal bevel with central incised horizontal line. Found upright in above cairn, containing cremation and sealed with cover of soft clay. **PSAS,** XL (1905-6), pp. 378-402, fig. 11. Ch. 577-92. North Ayrshire Museum, Saltcoats.
28. MISK KNOWES, ARDEER SANDS, STEVENSTON. Bucket-shaped urn, base missing. Two horizontal lines of twisted string marks, just below rim and 2¾ in. below rim. Area between has zig-zag pattern of sets of parallel lines of twisted string impressions. Found inverted in above cairn, containing cremation and sealed with a cover of soft clay in which were embedded about six small white quartz pebbles and a reddish quartz pebble about the size of a hen's egg. **PSAS,** XL (1905-6), pp. 378-402, fig. 12. Ab. 535h. Ch. 577-92. North Ayrshire Museum, Saltcoats.

NOTE.—Other urns or fragments from the above cairn, listed or illustrated in **PSAS,** XL (1905-6), pp. 378-402, appear to have been lost.

29. EGLINTON CASTLE, KILWINNING. Small cordoned urn. Two cordons, upper 2½ in. below rim, lower 4¼ in. below rim. Otherwise undecorated. Found in a tumulus with several other urns. **AHCAW,** I, p. 51. Smith, p. 59. Munro, p. 323, fig. 208. NMA.
30. TOWNEND OF THREEPWOOD, BEITH. Pygmy vessel. Biconical shape. Two perforations on keel ½ in. apart, otherwise undecorated. Contained in cinerary urn —"capable of holding six gallons." Urn subsequently lost. **NSA,** Vol. V. **PSAS,** XII (1877-8), pp. 684-5. **AHCAW,** I, pp. 42-3. Anderson, pp. 43-4, fig. 41. Smith, p. 79. **PPS,** XVII (1951), pp. 80-1, fig. 2/6. NMA.
31. HIGH GLENCAIRN STREET, KILMARNOCK. Collared urn. Rim sherds. Collar has five horizontal lines of twisted string impressions, beginning immediately under rim and ending about 2 in. below rim. Flat rim has design of parallel diagonal lines of twisted string impressions. Contained three barbed and tanged flint arrowheads, a stone axehead and a stone pounder, all subsequently lost. Smith, pp. 104-5. Dick Institute, Kilmarnock.
32. WHITESIDE, MONKTON. Cordoned urn. Upper (vestigial) cordon 3½ in. below rim, lower cordon 6¼ in. below rim. Double horizontal incised line just below rim, single line just above upper cordon. Area between decorated with zig-zag of double and triple parallel incised lines. Raised moulding inside 2 in. below rim. Between this and rim, incised zig-zag pattern. This urn and the rim sherds of another are all that remain of a group of at least seven urns—probably all inverted—buried near a ring-cairn structure 15 ft. wide and about 150 ft. in diamater. The urn contained cremated bone, earth and quartz-pebbles. **PSAS,** LXXVIII (1943-4), pp. 131-5, pl. X. NMA.
33. CARLIN HILL, COYLTON. Collared urn. Rim sherds. Collar decorated with three horizontal lines of stamped triangular impressions, neck with two lines. Found in a mound with another urn which disintegrated on exposure. MS Catalogue of Old Thornhill Museum, no. 552 (Courtesy of Dumfries Burgh Museum). Glasgow.
34. DOONFOOT, AYR. Cordoned urn. Two cordons. Inverted in small cist, adjacent to larger inhumation cist of Food Vessel burial. Sherds of at least one other Cinerary Urn in same cemetery. Urn subsequently lost. **TGAS,** XV, Pt. IV (1967), pp. 159-70.
35. MOATHILL, OCHILTREE. Collared urn. Collar decorated with panels of horizontal lines and triangular panels of chevrons of twisted string impressions. Flat rim slopes very slightly inwards and is decorated with a zig-zag of twisted string impressions. The interior has deep diagonal oval impressions down to about 5 in. below rim. **AHCAW,** I, pp. 38-9. **NSA,** V, p. 109. Smith, p. 142. Munro, p. 319, fig. 201. Carnegie Library, Ayr.
36. OCHILTREE. Cordoned urn—squat, barrel-shaped. Four small cordons or hoops ½ in., 1½ in., 3 in. and 5 in. below rim. Single horizontal line of twisted string impression above and below uppermost cordon. Area between upper pair of cordons decorated with hatched triangles and herring-bone pattern of twisted string impressions. Rim has sloping internal bevel. Found in small mound inverted over cremation. **D. & E.,** 1955, pp. 11-12. **CAANHS,** IV, 2nd ser. (1955-7), pp. 228-30. Carnegie Library, Ayr.
37. CUMNOCK. Collared urn. Reconstructed from sherds. Collar has pattern of six horizontal lines of twisted string impressions. Rim has sloping internal bevel with two horizontal lines of twisted string impressions. MS Catalogue of Old Thornhill Museum (Courtesy of Dumfries Burgh Museum). Glasgow.
38. CUMNOCK. Collared urn. Collar has pattern of triangles filled with diagonal lines, all of twisted string impressions. The neck has a lattice design of criss-crossing lines of twisted string impressions. Rim has sloping internal bevel with parallel diagonal lines of twisted string impressions. Found in cist. Glasgow.

39. BORLAND CASTLE HILL, CUMNOCK. Collared urn, reconstructed. Collar has design of alternating panels of vertical and horizontal lines of twisted string impressions. For about 2½ in. below this there is a lattice design of criss-crossing incised lines and, immediately beneath, a horizontal line of fingernail impressions. In pit above gravel layer covering several large boulders. Beaker sherd nearby. **PSAS,** LXXIV (1939-40), pp. 136-7. **PPS,** XVII (1951), p. 74. Glasgow.
40. WETHERHILL, MUIRKIRK. Collared (?) urn. Rim sherds only. "Collar" has design of alternating panels of short vertical and long horizontal lines of twisted string impressions. Below this, the body is decorated with at least three horizontal rows of short diagonal lines of twisted string impressions. Rim has internal bevel with parallel diagonal lines of twisted string impressions. Found inverted in cairn (30 ft. by 25 ft.). **PSAS,** LI (1916-17), pp. 24-5. Ch. 541. NMA.
41. MARCHHOUSE, MUIRKIRK. Collared urn. Collar decorated with pattern of triangles, upright and reversed, hatched with parallel lines—all of whipped cord impressions. Double line of horizontal whipped cord impressions at top and single line at bottom of collar. Neck has circular impressions made by blunt end of wood or bone implement. Below this is a row of twisted cord loop impressions, and below this again, a row of impressions as on neck. Rim has steeply sloping internal bevel with a design of double interlocking zig-zag lines of whipped cord impressions. Inverted over cremation and pygmy vessel (42), near centre of banked cremation enclosure, 47 ft. in diameter, which contained at least one other urned and one unurned cremation. **PSAS,** LVIII (1923-4), pp. 333-38, fig. 2, LXI (1926-7), pp. 277-8, fig. 10. Ch. 543. NMA.
42. MARCHHOUSE, MUIRKIRK. Pygmy vessel. Biconical. Double incised line just below rim. Line of 13 perforations along keel, some out of line. Mouth upwards under collared urn (41). The pygmy vessel was filled with fine ash and also contained **a bone pin, 7⅛ in. long, stuck vertically into the ash,** a bronze awl and an unworked fragment of green chert. **PSAS,** LVIII (1923-4), pp. 333-38, fig. 3, LXI (1926-7), pp. 277-8. Ch. 298. **PPS,** XVII (1951), pp. 80-1, fig. 2/5. NMA.
43. KIRKLANDS FARM, KIRKOSWALD. Collared urn. Collar has design of alternate panels of horizontal and vertical lines of twisted string impressions. Line of circular impressions on slightly raised area just below neck. Rim has sloping internal bevel ornamented with two parallel lines of twisted string impressions. Inverted over cremation of adult male. **PSAS,** LXX (1935-6), pp. 378-80. NMA.
44. GENNOCH, STRAITON. Pygmy vessel. Biconical. Two perforations on keel 1¾ ins. apart. Four incised lines around mouth, six around middle, four around base. Accompanied by round baked clay "lid," 3¼ in. diameter, perforated near centre. The vessel was nearly full of burnt bones and ashes—probably of a 5-6-year-old child—and also contained two fragments of a bronze pin. Probably inside larger cinerary urn, now lost. In mound with about twelve lost urns containing several pygmy vessels, of which only this one has survived. **AHCAW,** I (1878), pp. 43-4. Anderson, Vol. II, pp. 45-6, fig. 44. Smith, p. 185. **PPS,** XVII (1951), p. 80. Carnegie Library, Ayr.
45. RIG HILL, NITH LODGE, NEW CUMNOCK. Collared urn. Collar decorated with parallel diagonal lines of twisted string impressions. Rim has sloping internal bevel. Inverted over cremation at base of pillar-stone in stone circle marking bank of oval enclosure. Stone axe hammer associated. **PSAS,** LXXII (1937-8), pp. 235-47.
46. RIG HILL, NITH LODGE, NEW CUMNOCK. Pygmy vessel. Globular, with omphalos. Three bands of incised decoration, hatched and unhatched triangles. Omphalos surrounded by incised five-pointed star, the points filled with incised diagonal lines. Rim has sloping internal bevel with incised diagonal lines. Two perforations, 2 in. apart, below centre moulding. Accompanied one of seven unurned cremations in above enclosure. **PSAS,** LXXII (1937-8), pp. 235-47. **PPS,** XVII (1951), pp. 63, 80-1, fig. 2/3. NMA.

47. RIG HILL, NITH LODGE, NEW CUMNOCK. Pygmy vessel. Biconical, with two lines of incised hatched triangles between rim and keel. Two perforations on keel. Rim has sloping internal bevel with groups of two and three incised horizontal lines, each group separated by single vertical line. Accompanied one of seven unurned cremations in above enclosure. **PSAS,** LXXII (1937-8), pp. 235-47. **PPS,** XVII (1951), pp. 63, 80-1, fig. 2/4. NMA.
48. BEOCH, DALMELLINGTON. Fragments of three cinerary urns (not illustrated). Found, with some crernated bone fragments, in cairn surrounded by stone circle. Cairn also had cists, Beaker pottery and ring-marked stone. **TGAS,** LXXII (1937-8), pp. 235-47. Ch. 556-8. NMA.
49. COALPOTS ROAD, GIRVAN. NX 190971. Large cordoned urn. Upper cordon about 4¼ in. below rim, lower cordon 7½ in. below rim. Two horizontal lines of twisted string impressions just below rim and two just above upper cordon. Area between decorated with a design of triangles, alternately upright and inverted, filled with parallel lines, all of twisted string impressions. Third cordon inside urn, about 1½ in. below rim. Two horizontal lines of twisted string impressions inside, one just below rim, one just above cordon. Area between has diagonal lines of twisted string impressions. Base fragmented. Inverted in pit. Contained cremated remains of a female 20-22 years old, accompanied by those of an infant in about its 7th month of intra-uterine life. Also contained burnt flint scraper. Second burnt flint scraper in bottom of pit. **CAANHS,** VII, 2nd ser. (1961-6), pp. 9-27. **D. & E.,** 1961, pp. 25-6. Hunterian.
50. COALPOTS ROAD, GIRVAN. NX190971. Cordoned urn. Single cordon about 2¾ in. below rim. Otherwise undecorated. Base fragmented. Inverted in pit on layer of small stones. Contained cremated remains of an adolescent, probably 14-16 year old. **CAANHS,** VII, 2nd ser. (1961-6), pp. 9-27. **D. & E.,** 1961, pp. 25-6. Hunterian.
51. GIRVAN. Collared urn. Collar has a design of alternately upright and inverted triangles, filled with parallel lines, all of thin whipped cord impressions. The neck has zones of vertical rows of small horseshoes alternating with panels of vertical lines separating herring-bone patterns, all of thin whipped cord impressions. The bottom of the neck is marked by a single horizontal line of small horseshoes. The rim has a sloping internal bevel with a double interlocking zig-zag of thin whipped cord impressions. Found in 1861. Exact location not known, but possibly near Coalpots site. **AHCAW,** I, p. 38. **PSAS,** XLI (1906-7), pp. 185-274, fig. 39. **CAANHS,** VII, 2nd ser. (1961-6), pp. 9-27. Hunterian.

WIGTOWNSHIRE

52. LOW GLENGYRE, KIRKCOLM. Collared urn, rim reconstructed. Collar and neck decorated with punctulated impressions. Found upright in hollow in field, protected by stones. Urn nearly full of burnt bone and charcoal. Bone and charcoal scattered among soil in hollow. Pygmy vessel (53) beside urn, also fire-damaged thumb-nail scraper of flint and two small chips of flint among soil in hollow. **PSAS,** LVII (1922-3), pp. 98-107, fig. 1. **PPS,** XVII (1951), p. 79. Glasgow.
53. LOW GLENGYRE, KIRKCOLM. Pygmy vessel. Biconical, undecorated. Found on base beside collared urn (52) containing small quantity of cremated bone (possibly child of 8-12 years) and charcoal. **PSAS,** LVII (1922-3), pp. 98-107, fig. 1. **PPS,** XVII (1951), p. 79. Glasgow.
54. STONEYKIRK. Bucket-shaped urn. Fragmentary. Outside of rim, down to "shoulder," is decorated with incised zig-zag lines, each of the upright triangles so formed containing a number of short indented strokes varying in number from two to six. Below this is a row of diamond-shaped panels filled with criss-cross hatching, all incised. According to the report of the find, from which the illustration has been drawn, there was a second row of smaller diamond-shaped panels below the first,

but these are not shown in the illustration which accompanied the report. The urn was found upright and it contained 187 small, thin perforated jet or lignite discs and a triangular central pendant piece. Nearby was found some burnt bone, flint chips and part of a stone axe-hammer. Untraced. **PSAS, XXXVI** (1901-02), pp. 584-9, fig. 1.

55. STRANRAER. Pygmy vessels? A reference only to several clay urns "the size of Coffee cups" with herring-bone design below rims, found mouth downwards on slab in cist. One contained 10 jet beads. Untraced. **PSAS, XII** (1876), p. 625.
56. SAND MILL FARM, STRANRAER. Collared urn. Base missing. Collar has stab or fingernail impressions over surface. Neck has lattice design of criss-crossing incised lines. Rim steeply bevelled internally with double line of stab or fingernail impressions. Inverted over cremation, stone battle axe, tanged razor, decorated bone bead and three whetstones, 1½ ft. deep in shingle. **PSAS,** LXXVI (1941-2), pp. 79-80, pl. XX. LXXXI (1946-7), p. 171. **PPS,** XII (1946), pp. 121-41. **University of London Inst. Arch., 12th Annual Report** (1956), pp. 20-52. Ch. 628. NMA.
57. DROUGHDOOL FARM, DUNRAGIT. Collared (?) urn. Fragmentary. Collar has incised design of alternately upright and inverted triangles filled with oblique parallel lines. The neck has a similar design—at least two rows, one above the other, separated by a horizontal incised line, but the incisions are rather deeper and wider than on the collar. At the base of the neck, and just above the shoulder, is an applied moulding or fillet, bearing a design of stab impressions. The shoulder has a single line of stab or fingernail impressions. The body, down to about 2 in. above the base, has a lattice design of criss-crossing incised lines. The flat rim has an irregular incised criss-cross design. Flint scraper found nearby. **PSAS,** LXXIX (1944-5), pp. 168-70. **PPS,** XXVII (1961), pp. 263-306. NMA.
58. BANKFIELD FARM, GLENLUCE. Cordoned urn. Upper cordon 2¼ in. below rim, lower cordon 5½ in. below rim. Two horizontal lines of twisted string impressions just below rim and one just above upper cordon. Area between these lines decorated with criss-crossing lines of twisted string impressions. Rim has sloping internal bevel. Found in hole inverted on flat stone and containing cremated bone (probably young man), three small pebbles (two quartz) and pygmy vessel (59). Base of urn covered by stone supported at either end by two other stones. **PSAS,** XXI (1886-7), p. 186, fig. 5. XLI (1906-7), pp. 185-274, fig. 171. **AHCAW,** VI (1889), pp. 91-2, fig. 4. Ab. 507. NMA.
59. BANKFIELD FARM, GLENLUCE. Pygmy vessel. Small—"like saucer for a flower-pot." Surface smooth and without ornament. Found inverted under cordoned urn (58), containing fine black ash. **PSAS,** XXI (1886-7), p. 187, fig. 4. **AHCAW,** VI (1889), pp. 92-3. Ab. 507 a. **PPS,** XVII (1951), p. 79, fig. 2/2. NMA.
60. LUCE SANDS, GLENLUCE. Collared urn. Collar ornamented with oval indentations arranged in five encircling rows and slanted alternately, giving a chevron effect. Rim has sloping internal bevel with one line of oval indentations. Found buried in sand, inverted, covering a mass of cremated bone and black ashes. **PSAS,** XXI (1886-7), pp. 182-3, fig. 1. XLI (1906-7), pp. 185-274, fig. 61. XCVII (1963-64), pp. 40-81, No. 199. **AHCAW,** VI (1889), p. 87, fig. 1. Ab. 196. NMA.
61. LUCE SANDS, GLENLUCE. Bucket-shaped urn. Undecorated. Found buried in sand, inverted, containing cremated bone (some with green, blue and reddish staining), charcoal (possibly oak wood), and a jet bead encased in a clay covering. Bones were those of a child of about 4 years of age. About 2 dozen white quartz pebbles strewn nearby. **PSAS,** LXXXVI (1951-2), pp. 46-9, fig. 2. NMA.
62. LUCE SANDS, GLENLUCE. Cordoned urn. Upper cordon 3¾ in. below rim, lower cordon 7¼ in. below rim. Two horizontal lines of twisted string impressions just below rim and two just above upper cordon. Area between has a design of criss-crossing oblique lines of twisted string impressions. The rim has a sloping internal

bevel with two horizontal lines of twisted string impressions with parallel slanting lines between. Buried in sand in inverted position. **PSAS,** XXII (1887-8), pp. 69-70. XCVII (1963-4), pp. 40-81, No. 196. **AHCAW,** VI (1889), pp. 98-9, fig. 7. NMA.

63. LUCE SANDS, GLENLUCE. NX 129546. Bucket-shaped urn. Base missing. Undecorated. Urn inverted over cremated bone, pebbles (several quartz) and probably flint knife, which was found among stones beneath urn. Knife unburnt. This deposit was accompanied by an unurned cremation, both burials were covered by a small cairn of round stones and quartz pebbles. **D. & E.,** 1964, p. 53. **Royal Aircraft Establishment News,** Vol. 17, No. 9, p. 22. Dumfries.
NOTE: See report on this urn elsewhere in this volume (infra p. 240).
64. LUCE SANDS, GLENLUCE. Bucket-shaped urn. Undecorated. Rim has slightly sloping internal bevel. Glasgow.
65. LUCE SANDS, GLENLUCE. Bucket-shaped urn. Base missing. Undecorated. Flat rim. **PSAS,** XCVII (1963-4), pp. 40-81, No. 200. Glasgow.
66. LUCE SANDS, GLENLUCE. Cordoned urn. Base missing. Upper cordon 3½ in. below rim, lower cordon 6½ in. below rim. Undecorated. Rim has sloping internal bevel. Found buried in sand inverted over cremated bones, black ash and charcoal. **PSAS,** XXI (1886-7), pp. 183-4. XCVII (1963-4), pp. 40-81, No. 193. **AHCAW,** VI (1889), pp. 87-8. NMA.
67. LUCE SANDS, GLENLUCE. Cordoned (?) urn. Rim fragment. Three horizontal lines of twisted string impressions just under rim. Beneath this is a row of upright triangles each containing concentric triangles of diminishing size, all of twisted string impressions. **PSAS,** XCVII (1963-4), pp. 40-81, No. 197. NMA.
68. LUCE SANDS, GLENLUCE. Collared (?) urn. Base only. Decorated to base with oblique lines of possibly fingernail impressions. **PSAS,** XCVII (1963-4), pp. 40-81, No. 203. NMA.
69. LUCE SANDS, GLENLUCE. Pygmy vessel. Biconical. Double zig-zag line below rim, otherwise undecorated. "Found lying on the sand beside two fragments of the common 'drinking-cup' type of urn (Beaker?) and a fragment of a large urn of coarse clay and stones, black on the inside. Perhaps all belonging to one interment." **PSAS,** XXI (1886-7), pp. 185-6, fig. 3. **AHCAW** VI (1889), p. 93. **PPS,** XVII (1951), p. 79, Fig. 2/1. NMA.
70. MID GLENIRON, GLENLUCE. Cordoned urn. Upper cordon 2¾ in. below rim, lower cordon 6¾ in. below rim. Between rim and upper cordon is a design of double parallel incised lines forming a criss-cross pattern which disintegrates in places and elsewhere is replaced by an incised herring-bone pattern. The rim has a sloping internal bevel. Secondary intrusion in body of Neolithic chambered cairn (Mid Gleniron I). Urn inverted in recess in cairn material, surrounded by a packing of water-rolled pebbles. Recess partially covered by stone slab. Urn sealed with plug of clay reinforced with small stones. Contained cremated bones and three fragments of a bronze pin (?)/needle (?). Initial examination suggests that the cremated remains are those of a woman and a child—the child possibly at an intra-uterine stage of development. Traces of burning in the interior suggest that the cremated remains were still hot when placed in the urn. Dumfries.
71. MID GLENIRON, GLENLUCE. Cordoned urn. Base missing. Two sets of double cordons, upper set 2½ in. below rim, lower 5½ in. below rim. Deeply channelled horizontal incised line ⅜ in below rim, second line just above upper set of cordons. Area between has a herring-bone design of wide, deeply incised lines. Rim has sloping internal bevel. Inverted beside (70) in above cairn. Unsealed. Contained cremated bone and the shank of a bronze pin. Dumfries.
72. MID GLENIRON, GLENLUCE. Cordoned urn. Upper cordon ½ in. below rim, lower cordon 3 in. below rim. Area between has an incised design of oblique groups of parallel lines forming a broad zig-zag pattern which disintegrates in

places. Below rim and above upper cordon is a row of incised oblique lines, changing to a double zig-zag design. Rim has sloping internal bevel. Urn inverted beside (70) and (71) in above cairn. Unsealed. Contained cremated bone. Dumfries.

73. MID GLENIRON, GLENLUCE. Cordoned urn. Four cordons or mouldings beginning ¼ in. below rim down to 2¼ in. below rim. Otherwise undecorated. Rim has sloping internal bevel. Urn inverted in slipped cairn material from above cairn, near recess containing (70), (71) and (72). Contained cremated bone. Dumfries.
NOTE: Remains of at least four other urns were discovered in above cairn. See interim report of Mid Gleniron excavations, p. 73 of this issue.

74. BALNEIL FARM, NEW LUCE. Cordoned urn. Upper cordon 3⅛ in. below rim, lower cordon 6⅛ in. below rim. Rim has sloping internal bevel. Otherwise undecorated. Urn inverted over partially cremated remains of two persons. Also contained a bone object resembling a crutch-headed pin (burnt), a faience quoit bead (burnt) and a bronze flat-tanged chisel. **PSAS,** L (1915-16), pp. 302-5. LVII (1922-3), pp. 123-66. LXIV (1929-30), p. 33. LXVII (1932-3), p. 29. **Archæologia,** 85 (1935), pp. 203-52. **University of London Inst. Arch. 12th Annual Report** (1956), pp. 20-52. Ch. 632. NMA.

75. TORHOUSKIE. Encrusted urn. Fragment only. From rim down to 3 in. below rim is a "collar" bearing a zig-zag moulding forming alternately upright and inverted triangles. The upright triangles are filled with incised oblique parallel lines, the inverted triangles have each a single central rounded boss or moulding. Just under the "collar" is a row of deep V-shaped impressions. **PSAS, XXI** (1886-7), p. 188. **AHCAW,** VI (1889), p. 90, fig. 3. Ab. 534. NMA.

76. BLAIRBUIE (?), GLASSERTON. Bucket-shaped urn. Slight constriction under rim. Body decorated with maggot impressions. Rim is flat with a design of whipped cord impression. Although whole, the urn is very much twisted out of shape. Found in stone cist. Flint fragment nearby. NMA.

77. LUCE SANDS, GLENLUCE. Collared urn. Fragments only. Not illustrated. Inverted within ring of gravel and water-worn pebbles, 3 ft. broad and 27 ft. diameter. Contained cremated bone, whetstone and riveted bronze knife/dagger. **PSAS,** XXII (1887-8), pp. 66-7. **AHCAW,** VI (1889), pp. 93-5. VII (1894), p. 30, fig. 17. Ch. 634. NMA.

78. LUCE SANDS, GLENLUCE. Bucket-shaped (?) urn. Fragments only. Not illustrated. Found upright, near (77), within ring of gravel and water-worn pebbles 3 ft. broad and 27 ft. diameter. Contained "unctuous black ashes," cremated bone and some water-worn pebbles of white quartz. **PSAS,** XXII (1887-8), pp. 67-8. NMA.

79. LUCE SANDS, GLENLUCE. Cordoned (?) urn. Reconstructed from fragments. Strongly bucket-shaped. Slight cordons, upper 3½ in. below rim, lower 6 in. below rim. Space between rim and upper cordon filled with alternating panels of vertical and horizontal lines of twisted string impressions. Space between upper and lower cordons filled with irregular rows of fingernail-shaped indentations slanting downwards from right to left. Contained cremated bone, charcoal and black ash. **PSAS,** XXII (1887-8), pp. 67-8. XCVII (1963-4), pp. 40-81, No. 195. **AHCAW,** VI (1889), p. 99. Ch. 636. NMA.

80. LUCE SANDS, GLENLUCE. Encrusted urn. Reconstructed. Row of oblique incised lines ffiust outside rim. Below this is a zig-zag moulding forming alternately upright and inverted triangles. The moulding bears a chevron design of incised lines and each of the inverted triangles contains a large rounded boss or moulding with incised lines radiating from the centre of each. Below this is a second row of oblique incised lines, and the area between this and the shoulder has a double

chevron design of incised lines. Below the shoulder, the body of the urn is decorated with vertical incised lines which may have reached to the base. Rim has sloping internal bevel with incised double chevron design. Inverted in sand over black ash and cremated bone. **PSAS,** XIII (1878-9), p. 8. XXI (1886-7), pp. 182-4, fig. 1. XLI (1906-7), p. 185-274, fig. 188. XCVII (1963-4), p. 40-81, No. 198. **AHCAW,** VI (1889), pp. 89-90, fig. 2. Ab. 533. NMA.

KIRKCUDBRIGHT

81. GARROCHAR, CREETOWN. Bucket-shaped urn. Undecorated except for a row of perforations about ¾ in. apart running right round urn ¾ in. below rim. Found upright, containing cremated bones of an adult, standing on stone below which was a layer of charcoal (hazel) about 5 in. thick. **TDGNHAS,** 23, 3rd ser. (1940-44), pp 136-43. 24, 3rd ser. (1945-6), p. 18. Kirkcudbright.
82. KNOCKMAN, DALRY. Pygmy vessel. Four bands of incised decoration separated by undecorated bands. Upper band has alternately upright and inverted triangles, the upright triangles being filled with oblique parallel lines. The two central bands of decoration are of lozenges filled with oblique parallel lines sloping in alternate directions. The lowest band has an incised chevron design. The base has a chequer design, alternate squares being filled with parallel lines. Rim has sloping internal bevel with incised chevron design. 2 pairs of perforations on keel—incised hollow above one perforation, as if for cord passing through hole and carried over mouth. Found in gravel under removed cairn. **PSAS, XXII** (1887-8), pp. 68-9. **PPS,** XVII (1951), p. 80. Glasgow.
83. WHINNIE LIGGATE. Pygmy vessel. Biconical. Two horizontal incised lines just below rim and two just above keel. Area between has 14 triangular perforations, the triangles being alternately upright and inverted. Line of dots along keel. Found in ploughing, fragments of larger urn associated. **PSAS,** XXVIII (1893-4), pp. 204-5. **PPS,** XVII (1951), p. 79. Ab. 331. NMA.
84. CAIRNGILL, SANDYHILLS BAY. Pygmy vessel. Undecorated, omphalos base. Found in cairn or mound at no great depth below surface. Accompanied by fragments of probable cinerary urn and some cremated bone. **PSAS,** LXII (1927-8), pp. 148-50. **TDGNHAS,** 15, 3rd ser. (1928-9), pp. 50-54. 17, 3rd ser. (1930-31), pp. 82, 92. **PPS,** XVII (1951), p. 80. Dumfries.
85. KIRKBEAN. Collared urn. Horizontal line of twisted string impressions just below rim. Remainder of collar has a shallow double chevron design of twisted string impressions. Neck has a criss-crossing lattice design of incised lines. Row of punched circular impressions at base of neck. Rim has sloping internal bevel with three horizontal lines of twisted string impressions. Urn inverted and sealed with clay plug. Contained cremated bone, flint scraper (burnt), and bone pin (?)/ awl (?) (burnt). Some of the cremated bone had green staining. Found—not centrally situated—under a mound of mainly earth and a few stones. Mound 25 ft. long, about 14 ft. across, and about 4 ft. high. Orientated roughly N-S. **TDGNHAS,** 5, 3rd ser. (1918-19), pp. 44-8. Hunterian.
86. BOGRIE FARM, LOCHRUTTON. Pygmy vessel. Undecorated. Four perforations, 2½-3 in. apart, on keel. Found, full of burnt bones, in a mound. **TDGNHAS,** 5, 3rd ser. (1918-19), pp. 46-7. 15, 3rd ser. (1928-9), p. 54, fig. 7. Hunterian.

DUMFRIESSHIRE

87. MAXWELLTOWN PARK, DUMFRIES. Cordoned urn. Single ridge or cordon 1½ in. below rim. Body above and below cordon decorated with rows of punched circular impressions. Found with fragments of larger cordoned urn (88). **TDGNHAS,** 17, 2nd ser. (1904-5), pp. 377-8. 17, 3rd ser. (1930-31), p. 92. Dumfries.
88. MAXWELLTOWN PARK, DUMFRIES. Cordoned urn. Fragments only. Single

cordon 3 in. below rim. Two horizontal lines of twisted string impressions, one just below rim and one just above cordon. Rim has sloping internal bevel with two horizontal lines between which runs a zig-zag—all of twisted string impressions. Found with smaller cordoned urn (87). **TDGNHAS,** 17, 2nd ser. (1904-5), pp. 377-8. 17, 3rd ser. (1930-31), p. 92. Dumfries.

89. PALMERSTON, DUMFRIES. Pygmy vessel. From rim to base, exterior bears five zones or belts of incised decoration, separated by horizontal incised lines. Immediately below rim is an encircling chevron design. Beneath this, the largest zone has a design of laterally elongated filled lozenges surrounded, above and below, with short vertical lines. The next zone down has a design of alternately upright and inverted triangles, filled with oblique parallel lines. Below this again is a simple incised zig-zag design, and the lowermost zone repeats the upright and inverted filled triangles design on a smaller scale. The omphalos base has a design of three parallel lines cutting two parallel lines at right angles, but not centrally. The rim has a flat top and a sloping internal bevel, both bearing an incised chevron design. Two perforations, about 2 in. below rim, 1⅛ in. apart. In flat urnfield with pits and at least 9 other urns (including a Food Vessel) in roughly circular layout. A stone near the centre of the layout may have had an urn, now gone, placed on it. This Pygmy Vessel was found 15 in. below the surface—"hanging amid the fragments of another urn and incinerated bone fragments." Was probably inside the larger urn. Suggested by H. N. Savory as—"a miniature Food-vase of Type 3, decorated with Bipartite Pygmy Cup incised patterns and provided with a pair of perforations." **TDGNHAS,** 17, 3rd ser. (1930-31), pp. 79-94. **PPS,** XVII (1951), p. 80. **Bulletin of the Board of Celtic Studies,** XVIII (1958-60), p. 97. Ch. 649-58. Dumfries.

90. PALMERSTON, DUMFRIES. Collared (?) urn. The urn has a tripartite division suggesting collar, neck and body. Undecorated. Urn inverted 20 in. below surface in above urn cemetery. Contained cremated bone (some with greenish staining), soil, charcoal, and flint scraper (burnt). The top 3 in. of the contents were packed together, but under this the contents were compacted around the sides of the urn leaving a central cylindrical empty space. **TDGNHAS,** 17, 3rd ser. (1930-31), pp. 79-94. Ch. 649-58. Dumfries.

91. PALMERSTON, DUMFRIES. Collared urn. The collar has a design of chevrons and vertical lines of twisted string impressions. The neck has a zig-zag line forming alternately upright and inverted triangles filled with oblique/parallel lines, all of twisted string impressions. The base of the neck has a row of circular indentations. The rim is flat with three rows of impressed oval and circular indentations, the two outer rows overlapping on to the outside and inside surface of the urn. Just below the rim on the inside, is a row of square hook impressions. Inverted on flat stone in pit in above urn cemetery. Contained cremated bone and, as in (90), the contents were compacted round the inside of the urn, leaving a central cylindrical empty space. **TDGNHAS,** 17, 3rd ser. (1930-31), pp. 79-94. Ch. 649-58. Dumfries.

92. PALMERSTON, DUMFRIES. Pygmy vessel. Biconical (?). Three zones of decoration, incised. Two upper zones have design of alternately upright and inverted triangles, the inverted triangles being filled with parallel oblique lines. Lowest zone has unfilled triangles. Omphalos base. In hole 2 ft. deep in above urn cemetery. Contained fine soil, a few small stones and thin flakes of "white osseous matter" which disintegroted at a touch. Accompanied by a quantity of cremated bone and fragments of a larger urn in which it may have been contained. **TDGNHAS,** 17, 3rd ser. (1930-31), pp. 79-94. **PPS,** XVII (1951), p. 80. Ch. 649-58. Dumfries.

93. PALMERSTON, DUMFRIES. Collared (?) urn. Tripartite division. Flat rim. Undecorated. Base destroyed. Inverted 18 in. below surface in above urn cemetery.

Contained cremated bone. **TDGNHAS,** 17, 3rd ser. (1930-31), pp. 79-94. Ch. 649-58. Dumfries.

NOTE: A Food Vessel, containing a cremation, was also found in a pit in the above urn cemetery. **TDGNHAS,** 17, 3rd ser. (1930-31), pp. 79-94. 42, 3rd ser. (1965), p. 39 and No. 18. Dumfries.

94. GREYSTONE PARK, DUMFRIES. Pygmy vessel. Double incised line about 1 in. below rim, enclosing line of dots and two perforations, about ½ in. apart. Single incised line just below rim. Faint, incised lattice design on upper part of cup. found with fragments of bone, buried at foot of fallen stone on site of reputed stone circle. **TDGNHAS,** No. 5 (1886-7), pp. 38-41. 15, 3rd ser. (1928-9, p. 54. **PSAS,** XII (1887-8), p. 417. **PPS,** XVII (1951), p. 80. Dumfries.
95. KIRKBURN, LOCKERBIE. Pygmy vessel. Undecorated. Much of surface has flaked away under heat. Found in flat cemetery containing cremations, inhumations, pits, cists, and a wide variety of pottery including Western Neolithic, Beaker, Food Vessel and Cinerary Urn. The Pygmy vessel was in a pit 13 in. deep and accompanied a "dirty" cremation. In all, there were the cremated remains of 16 persons, all adults, on this site. Four of the cremations were in three cinerary urns (96), (97) and (98), two cremations were in a small cist. The rest of the cremations were in pits without any trace of containers. The urns were all accompanied by grave goods and one unurned cremation was accompanied by a bone pin and a bone bead. **TDGNHAS,** 40, 3rd ser. (1963), pp. 53-9. **PSAS,** XCVI (1962-3), pp. 107-35. NMA.
96. KIRKBURN, LOCKERBIE. Cordoned urn. Two cordons, the upper about 3 in. below rim, the lower about 5¾ in. below rim. Two pairs of horizontal lines of twisted string impressions, one pair just below rim, second pair just above upper cordon, enclosing an irregular design of criss-crossing lines and broken lines of twisted string impressions. Rim has sloping internal bevel with zig-zag line of twisted string impressions. Urn inverted on a spread of stones in circular pit 1 ft. deep in above cemetery. Base ploughed away. Contained the cremated remains of two young adult persons, a bone pin of the "skewer" type (burnt), and a bronze riveted knife-blade (unburnt). **TDGNHAS,** 40, 3rd ser. (1963), pp. 53-9. **PSAS,** XCVI (1962-3), pp. 107-35. NMA.
97. KIRKBURN, LOCKERBIE. Collared urn. The collar has an incised design of alternate panels of horizontal and vertical herring-bone patterns. The neck has an incised design of horizontal herring-bone patterns. The rim is flat. Urn inverted on three flattish stones in pit 22 in. deep in above cemetery. Several flat stones placed around urn. Contained the cremated remains of a young adult person and a flint knife (unburnt). **TDGNHAS,** 40, 3rd ser. (1963), pp. 53-9. **PSAS,** XCVI (1962-3), pp. 107-35. NMA.
98. KIRKBURN, LOCKERBIE. Bipartite urn. Undecorated. Base ploughed away. Urn inverted in irregular hole in subsoil in above cemetery. Contained "clean" cremation. Just outside urn was a bronze tanged and riveted blade (unburnt). **TDGNHAS,** 40, 3rd ser. (1963), pp. 53-9. **PSAS,** XCVI (1962-3), pp. 107-35. NMA.
99. SHUTTLEFIELD, LOCKERBIE. Cordoned urn. Single cordon 5 in. below rim. Area between rim and cordon decorated irregularly with shallow oval impressions. Rim has steeply sloping internal bevel. Found inverted over cremation and bronze blade. **PSAS,** XIV, (1879-80), pp. 280-2. Anderson, p. 21, fig. 15-16. Ab. 519. Childe: **Prehistory of Scotland** 1935, p. 137. **University of London Inst. Arch. 12th Annual Report** (1956), pp. 20-52. Ch. 664. NMA.
100. ORCHARD FARM, CANONBIE. Collared urn. Base missing. Collar has two horizontal lines of twisted string impressions, one just below rim, the other at base of collar. The area between has a design of alternately upright and inverted triangles, filled with oblique parallel lines, all of twisted string impressions. The

neck has a row of lozenge shapes formed of criss-crossing lines of twisted string impressions. At base of neck is a horizontal line of circular indentations. The rim has a sloping bevel with a zig-zag line of twisted string impressions. **D. & E.**, 1966, p. 23. Dumfries.

101. DINWOODIEGREEN FARM, ANNANDALE. NY 107 884. Collared urn. Collar has two horizontal lines of twisted string impressions just above base. Above this is an encircling design of lozenge shapes formed of criss-crossing lines of twisted string impressions. The neck has four rows of slanting oval-shaped indentations. Rim has sloping bevel. Found upright and touching urn (104). **PPS**, XXV (1959), p. 279. Dumfries.
102. DINWOODIEGREEN FARM, ANNANDALE. NY 107 884. Collared urn. Collar has two horizontal lines of twisted string impressions, just below rim and just above base. Between is a lattice design of twisted string impressions. The neck has a design of alternately upright and inverted triangles filled with oblique parallel lines, all of twisted string impressions. The base of the neck is delimited by a single horizontal twisted string line. The rim has a flat top with a single line of twisted string impressions, and a sloping internal bevel with two lines. Found inverted on a flat stone in a pit, the latter being lined with stones forming a beehive-shaped chamber. **PPS**, XXV (1959), p. 279. Dumfries.
103. DINWOODIEGREEN FARM, ANNANDALE. NY 107 884. Collared urn. Two horizontal lines of twisted string impressions, one just below rim, one just above base of collar. Between are almost vertical parallel lines of twisted string impressions. Rim has a flat top with zig-zag design of twisted string impressions, and a steeply sloping internal bevel with six horizontal lines of twisted string impressions. Found inverted inside urn (104), and containing a cremation burial. **PPS**, XXV (1959), p. 279. Dumfries.
104. DINWOODIEGREEN FARM, ANNANDALE. NY 107 884. Collared urn. Line of twisted string impressions just under rim. Between this and base of collar is a design of alternately upright and inverted triangles filled with oblique parallel lines—all of twisted string impressions. Rim has sloping internal bevel with two horizontal lines of twisted string impressions. Found inverted on a flat stone and containing urn (103) which itself contained a cremation burial. Base missing. **PPS**, XXV (1959), p. 279. Dumfries.
105. WHITESTANES MOOR. NX 967882. Pygmy vessel. Undecorated. Has two pairs of perforations about half-way down body. Accompanied cremation in pit which also contained black ash, charcoal (C 14 dating of 1360 B.C. ± 90), small flint scraper (burnt), flint chip, some pieces of leather or skin. One of 8 cremation pits within stone banked circular structure ("Enclosed Cremation Cemetery") which had an entrance on S.-W. side. Bank 9-10 ft. wide and 2 ft. high, overall diameter of enclosure about 48 ft. **TDGNHAS**, 42, 3rd ser. (1965), pp. 51-60. **D. & E.**, 1964, p. 29. Dumfries.
106. CLOSEBURN. Cordoned urn. Fragments only. Cordon 2 in. below rim. Area between rim and cordon has a design of inverted triangles filled with oblique parallel lines—all of twisted string impressions. Below the cordon, at least six horizontal lines of twisted string impressions. Rim has sloping internal bevel with single horizontal twisted string line. **NMA.**
107. GATESLACK, DURISDEER. Collared urn. Collar has a horizontal herring-bone design of twisted string impressions, continued on the neck. Just below base of neck is a zig-zag line of twisted string impressions. The interior is decorated to about 3 in. below rim, the design being similar to that on the collar. Glasgow.

LANARKSHIRE

108. CAULDCHAPEL, ABINGTON. Pygmy vessel. Fragment only, not illustrated. Base

missing. Open pattern of incised lozenges alternately dot-filled. Found under tumulus. **Journal of British Arch. Ass.**, X (1855), pp. 8-9. **PSAS**, XVI (1881-2), p. 148. **PPS**, XVII (1951), p. 82, fig. 2/33. NMA.

109. CULTER. Pygmy vessel. Top missing. Biconical. Pair of perforations on keel. Just below keel—incised zig-zag line. Just above base is a design of incised upright triangles outlined with dots. On the base is an incised chequer design with fillings of parallel lines. **PSAS**, XVI (1881-2), p. 147. **PPS**, XVII (1951), p. 82, fig. 2/31. NMA.
110. CULTER. Pygmy vessel. Globular. Design of double incised horizontal, vertical and oblique lines, dot-filled. Flat rim with incised line and dots. **PSAS**, XVI (1881-2), p. 148. **PPS**, XVII (1951), p. 82, fig. 2/32. NMA
111. THANKERTON. Pygmy vessel. Three sets of double horizontal incised lines—just below rim, around middle, and just above base. Between these—design of oblique incised lines, upper sloping down from right to left, lower from left to right. Rim has sloping internal bevel with oblique incised lines. Found in flat cemetery on gravelly knoll, under heap of cremated bone and urn (114). Cemetery also contained a Food Vessel in cist and at least 4 other urns. **PSAS**, XIII (1878-9), pp. 113-124, fig. 8. Ab. 500d. **PPS**, XVII (1951), p. 82, fig. 2/30. NMA.
112. THANKERTON. Cordoned urn. Top missing. Single cordon. Area above cordon has a design of double and triple criss-crossing parallel lines of twisted string impressions. Inverted over cremated bones in above cemetery. **PSAS**, XIII (1878-9), pp. 113-24, fig. 4. NMA.
113. THANKERTON. Cordoned urn. Two cordons—upper 3½ in. below rim, lower 6 in. below rim. Area between rim and upper cordon has a design of criss-crossing lines of twisted string impressions, bounded above and below by double horizontal twisted string lines. Rim has steeply sloping bevel with oblique incised lines. Urn inverted over cremated bones in above cemetery. **PSAS**, XIII (1878-9), pp. 113-24, fig. 3. Ab. 500. NMA.
114. THANKERTON. Cordoned (?) urn. Five cordons or bulges from rim to 2¾ in. below rim, otherwise undecorated. Rim has sloping internal bevel. Has been described as a "degenerate Food Vessel." Found on, and partly containing, heap of cremated bones under which was a Pygmy vessel (111), in above cemetery. **PSAS**, XIII (1878-9), pp. 113-24, fig. 7. Ab. 500b. NMA.
115. THANKERTON. Cordoned (?) urn. Three cordons or bulges from rim to 1¾ in. below rim. Irregular lattice design of criss-crossing grooves stretching from just below rim to about 1¼ in. above base. Rim has sloping internal bevel. Has been described as a "degenerate Food Vessel." Found broken among cremated bones in above cemetery. **PSAS**, XIII (1878-9), pp. 113-24, fig. 6. Ab. 500c. NMA.

NOTE: Other unaccompanied deposits of cremated bone were scattered around this flat cemetery, on the average about 1½ ft. below the present surface. In one case, a heap of cremated bone had been placed within an imperfect cist of flat stones, which had one side missing and no bottom or cover.

116. LIMEFIELD. NS 924315. Cordoned urn. Broken. Two cordons—upper 1¾ in. below rim, lower (only vestigial), 3½ in. below rim. Five lines of horizontal twisted string impressions—two just below rim and one just above upper cordon, the area between having a zig-zag twisted string line forming alternately upright and inverted triangles. Fourth line just under upper cordon and fifth just above lower cordon. Inverted over cremation and unworked flake of flint/chert near perimeter of kerbed cairn, 35 ft. in diameter and 2 ft. greatest height. Cairn contained at least 13 burials—8 cremations, the rest probably inhumations. Sherds of at least 11 vessels—Beaker, Food Vessel and Cinerary Urn. **D. & E.**, 1967, p. 59. NMA.
117. LIMEFIELD. NS 924315. Bucket-shaped urn. Fragment only. Undecorated. Rim

has slightly sloping internal bevel. Lying smashed among material of above cairn. No cremation found. **D. & E.**, 1967, p. 59. NMA.

118. LIMEFIELD. NS 924315. Collared (?) urn. Fragments only. Not illustrated. Neck has overall design of punctulated impressions. Body below shoulder has a design of broad, shallow, vertical scratches about 1½ in. apart, with similar short, horizontal scratches running between, forming a series of "ladders." Urn inverted over cremation on flat stone in above cairn. Surrounded by protective setting of four stones with another stone resting on top of the other stones (not a true cist). Also contained a worked flint blade (burnt). **D. & E.**, 1967, p. 59. NMA.

NOTE: The report of the Limefield excavations will appear in a forthcoming issue of **PSAS.**

119. FERNIEGAIR, HAMILTON. Enlarged Food Vessel. The area between the rim and the shoulder has a design of alternating lines of stamped triangular impressions and twisted string impressions. The body below the shoulder has a design of increasing channelled chevrons, reaching to within 2 in. of the base. Rim has a sloping internal bevel with a mixture of stamped triangular and maggot impressions. Found, containing cremated bones, on sandy knoll which may at one time have been covered with cairn. Also on this site—cists containing inhumations and Food Vessels. **TGAS**, 11 (1947), pp. 17-21. Glasgow.
120. FERNIEGAIR, HAMILTON. Encrusted urn. Small "collar" about ¾ in. broad with a row of obliquely sloping maggot impressions. Area between this and shoulder has a zig-zag moulding of roughly triangular section. Imprinted across this are lines of plaited string impressions. Below the shoulder, and stretching about half-way down the body, is a herring-bone design of twisted string impressions. The rim has a steeply sloping internal bevel with three horizontal lines of twisted string impressions. Found in above cemetery. No cremation associated. **TGAS**, 11 (1947), pp. 17-21. Glasgow.
121. FERNIEGAIR, HAMILTON. Cordoned (?) urn. Fragments only. Two cordons or bulges—upper 2¾ in. below rim, lower 6¼ in. below rim. Two horizontal lines of twisted string impressions just below rim and two just above upper cordon, area between has double parallel zig-zag line of twisted string impressions. Rim has sloping internal bevel with two horizontal lines of twisted string impression joined by short oblique lines. Inverted over cremation on stone slab in above cemetery. Also in the urn was a polished, perforated, rectangular archer's wrist-guard of felstone, with slightly incurved sides. **TGAS**, 11 (1947), pp. 17-21. Glasgow.
122. ANNATHILL, COATBRIDGE. Encrusted urn (?). Row of small, oblique incised lines just outside rim. Below this is a zig-zag moulding, forming alternately upright and inverted triangles filled with fingernail impressions. Between this and the shoulder are two lines of stamped triangular impressions. Below the shoulder, and reaching almost to the base, is a lattice design of criss-crossing incised lines. Rim has a sloping internal bevel with a row of fingernail and a row of stamped triangular impressions. Glasgow.
123. DRUMSHARGARD, CAMBUSLANG. Collared urn. Undecorated. Rim has sloping internal bevel. Contains cremated bone and very large pieces of skull. **PSAS**, XVII (1882-3), p. 381. NMA.
124. CAMBUSLANG. Collared urn. Collar and neck have a design of irregular lines of circular impressions. Rim has steep internal bevel with same design. Found containing cremated bones. **PSAS**, XLI (1906-7), pp. 185-274, fig. 71. Old Glasgow Museum.
125. CAWDER ESTATE, BISHOPBRIGGS. Collared urn. Fragments. Incised line just below rim. Collar has two bands of similar decoration, consisting of alternately upright and inverted triangles, outlined with twisted string impressions and filled with oblique parallel incised lines. The two bands are separated by horizontal in-

cised lines. The neck has also two bands of incised decoration—each between two horizontal incised lines—consisting of oblique incised lines, the upper row sloping from right to left, the lower from left to right. The rim has a sloping internal bevel with incised zig-zag line. Found upright containing cremation, on layer of stones in pit, which may have been under a mound of earth and stones. **PSAS, LXI** (1926-7), pp. 266-8. Glasgow.

126. UDDINGSTON. Encrusted urn. Horizontal line of plaited string impressions just below rim and just above shoulder. The area between has a zig-zag moulding forming alternately upright and inverted triangles, each containing a rounded boss or moulding. The inner and outer edges of the zig-zag moulding are outlined with plaited string impressions. The inside of the rim has two rows of circular indentations. Buried in gravel, about 1 ft. below surface, inverted over cremated bones. **PSAS, XIX** (1884-5), pp. 337-40. **XLI** (1906-7), pp. 185-274, fig. 181. **Ab 528. Antiquaries Journal, VII** (1927), pp. 115-33. **NMA.**

127. UDDINGSTON. Biconical (?) urn. Horizontal plaited string line impression just below rim-lip, second just above shoulder. Area between has zig-zag plaited string line forming alternately upright and inverted triangles. Third horizontal line of plaited string impression just below cordon. Rim has steeply sloping internal bevel with two horizontal lines of plaited string impressions. Buried, beside (126), in gravel, about 1 ft. below the surface, inverted over cremated bones. **PSAS, XIX** (1884-5), pp. 337-40. **XLI** (1906-7), pp. 185-274, fig. 182. **Ab. 528a. Antiquaries Journal, VII** (1927), pp. 115-33. **NMA.**

128. ANNATHILL, COATBRIDGE. Encrusted urn. Fragments only. Line of short oblique incisions just outside rim. Between this and shoulder a zig-zag moulding forms alternately upright and inverted triangles filled with short, sharp-pointed incised marks or stabs. Below the shoulder are at least five horizontal rows of sharp-pointed incisions or stab-markings. Rim has steeply sloping internal bevel. Probably associated with (122). Glasgow.

129. "QUEEN MARY'S CAIRN," EAST KILBRIDE. Cordoned (?) urns. Reference only. 25 urns, mostly about 12 in. high and 6 in. wide at mouth. All inverted on flat stones. Each contained cremation and white quartz pebble. Two contained bronze objects. All found in 1792 in cairn, 120 ft. diameter and 18 feet high, surrounded by ditch and small earthen dyke. Other finds in cairn suggest secondary, possibly Iron Age, intrusions. Untraced. D. Ure: **The History of Rutherglen and East Kilbride**, 1793, pp. 215-20, plates I and V. V. G. Childe: **Scotland Before the Scots**, 1946, pp. 130-2.

130. VICTORIA PARK, GLASGOW. Collared urn. Base missing. Collar has two horizontal lines of twisted string impressions, one just below rim and one just above base of collar. The space between is filled with vertical parallel lines of twisted string impressions about ¼ in. apart. Rim has sloping internal bevel with three horizontal lines of twisted string impressions. Found in sand-pit, containing cremated bones. Stone axe/hammer associated. **PSAS, LVII** (1922-3), p. 105. **PPS, XXXII** (1966), p. 242. Old Glasgow Museum.

131. NEWLANDS, GLASGOW. NS 577608. Large collared urn. Collar is decorated with a series of very open Z-shape lines of twisted string impressions. Neck decorated with vertical lines of twisted string impressions, about ¾ in. apart. Rim has sloping internal bevel decorated with a twisted string zig-zag line. Inverted over large mass of cremated bones in flat cemetery containing at least three other cinerary urns and several pits with cremated bone, but without pottery. The pits contained much smaller osseous remains than were contained in the urns, and may, therefore, represent not separate interments, but only the finer debris from the enurned cremations. The exception is (131) where most of the remains (probably an adult female) appear to have been collected in the urn. **PSAS, XXXIX** (1904-05),

pp. 528-52, fig. 7. **Antiquaries Journal,** VII (1927), pp. 115-133. Ch. 363-5. NMA.

132. NEWLANDS, GLASGOW. NS 577608. Collared urn. Fragments. Single horizontal twisted string line just below rim. Below this, collar decorated with criss-crossing lines of twisted string impressions. Rim has sloping internal bevel with twisted zig-zag line. Inverted in hollow on layer of sand, artifically placed. In above cemetery. Contained cremated bones of an individual of about 25 years of age, some showing green staining. **PSAS, XXXIX** (1904-05), pp. 528-52, fig. 4, 5, 6. **Antiquaries Journal,** VII (1927), pp. 115-33. Ch. 363-5. NMA.
133. NEWLANDS, GLASGOW. NS 577608. Collared urn. Broken. Collar decorated with criss-crossing incised lines. Rim has sloping internal bevel with short, incised criss-crossing lines. Inverted in hollow on layer of sand, artificially placed. In above cemetery. Contained cremated bone. **PSAS, XXXIX** (1904-05), pp. 528-52, fig. 3. **Antiquaries Journal,** VII (1927), pp. 115-33. Ch. 363-5. NMA.
134. NEWLANDS, GLASGOW. NS 577608. Encrusted urn. Lower half missing. Just above where the urn broadens out to the shoulder is a horizontal moulding running right round the urn. Between this and the rim is a zig-zag moulding, forming alternately upright and inverted triangles which are filled with a hatching of parallel incised lines. Below the horizontal moulding, the body is decorated with vertical strips of moulding about 4 in. apart each aligned below the apex of one of the inverted triangles. The spaces between these vertical strips have an incised herring-bone decoration. The rim is flat on top with criss-crossing incised lines. Inside the urn to about 2¾ in. below rim, is an incised herring-bone decoration. The report of the find describes a second horizontal moulding farther down the body, but this no longer exists. Inverted on 8 water-worn pebbles at bottom of hollow, in above cemetery. Contained cremated bone and charcoal. **PSAS, XXXIX** (1904-5), pp. 528-52, fig. 8. **Antiquaries Journal,** VII (1927), pp. 115-33. Ch. 366. NMA.
135. CAIRNGRYFFE HILL, HYNDFORD BRIDGE. Enlarged Food Vessel (?). Row of circular indentations on outside edge of rim. Second row about 3 in. below rim. Between is an incised design of open reversed Z-shapes. Third row of circular indentations about 4 in. below rim. Between this and second row is an incised herring-bone design. Rim has sloping internal bevel. Drawn from Abercromby's photograph. Found on or near Cairngryffe Hill possibly at the site of "Hero's Cairn" described as a large tumulus in which,—"when it was taken down, a large urn, surrounded by five smaller ones, was discovered, the whole being included in a stone cist." **Journal British Archæological Association, X** (1855), p. 26. **PSAS,** XXIV (1889-90), pp. 326-7. Ab. 517. British Museum.
136. MOUNT VERNON, GLASGOW. Small bucket-shaped urn. No decoration. Found in West Sand Quarry. Contains cremated bones. Airdrie Public Library.
137. DRUMPELLIER ESTATE, COATBRIDGE. Cinerary urns (?) and Food Vessels. Reference only. 9 stone cists excavated in 1852, in a circle of about 15 yds. diameter. Cists 5 yds. apart. Outside the circle to the west was a small cist, and to the south-east a large cist. At the head of each cist—"a peculiarly-shaped urn was found, about 9 in. in height, narrow at the bottom, bulging out in the centre, then narrow at the neck and spreading out wider at the top. Several of the urns were taken to Drumpellier House where, we understand, they are still preserved." Miller. Location not now known. Three Food Vessels in Airdrie Public Library. Andrew Miller: **Coatbridge, its Rise and Progress, 1864. D. and E., 1961, p. 39.**

RENFREWSHIRE

138. LAWFIELD FARM, KILMACOLM. Collared urn. Collar has very open Z-shape design of incised lines. Neck has two rows of oblique incised lines sloping in opposite directions. Row of oval-shaped impressions on shoulder. Rim has sloping internal bevel with oblique incised lines. Found, containing cremation, on site of

cairn. Stone axe/hammer found in vicinity at later date. **PSAS,** LVII (1922-3), p. 104. Glasgow.

ADDENDUM

WIGTOWNSHIRE

55a. STRANRAER. Cordoned urn. Two cordons—4 in. below rim and 8 in. below rim. Above upper cordon is a design of criss-crossing lines of twisted string impressions with two horizontal lines above and below. Drawn from a photograph in Dumfries Burgh Museum. Ashmolean Museum.

ABBREVIATIONS USED IN FOOTNOTES

JBAA—Journal of the British Archæological Association
JGAHS — Journal of the Galway Archæological and Historical Society
JRSAI — Journal of the Royal Society of Antiquaries of Ireland
NMAJ — North Munster Antiquarian Journal
PPS — Proceedings of the Prehistoric Society
PRIA — Proceedings of the Royal Irish Academy
PSAS — Proceedings of the Society of Antiquaries of Scotland
TDGNHAS — Transactions of the Dumfriesshire and Galloway Natural History and Antiquarian Society
TGAS — Transactions of the Glasgow Archæological Society
UJA — Ulster Journal of Archæology

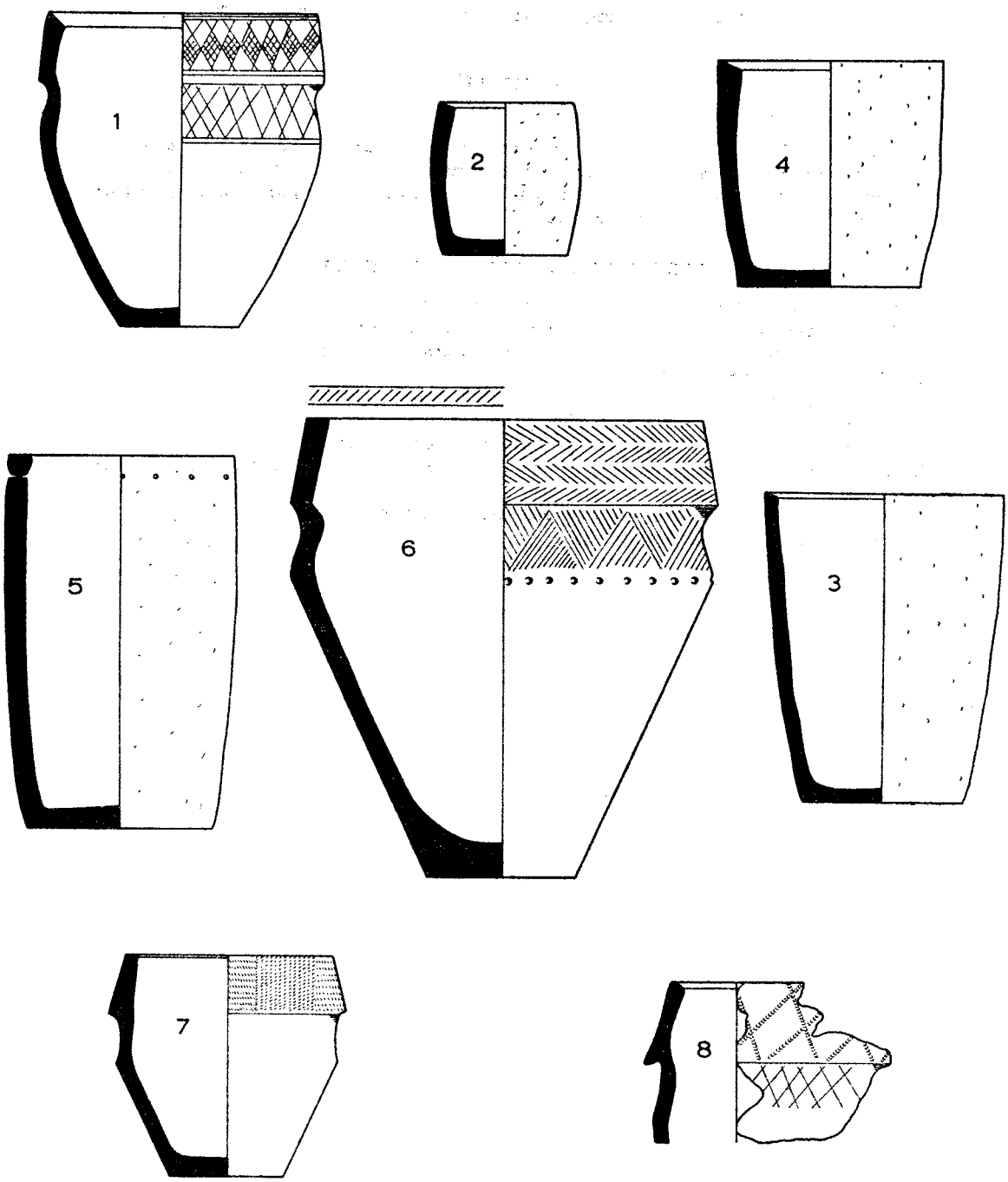


Fig. 2—all $\frac{1}{6}$ nat. size

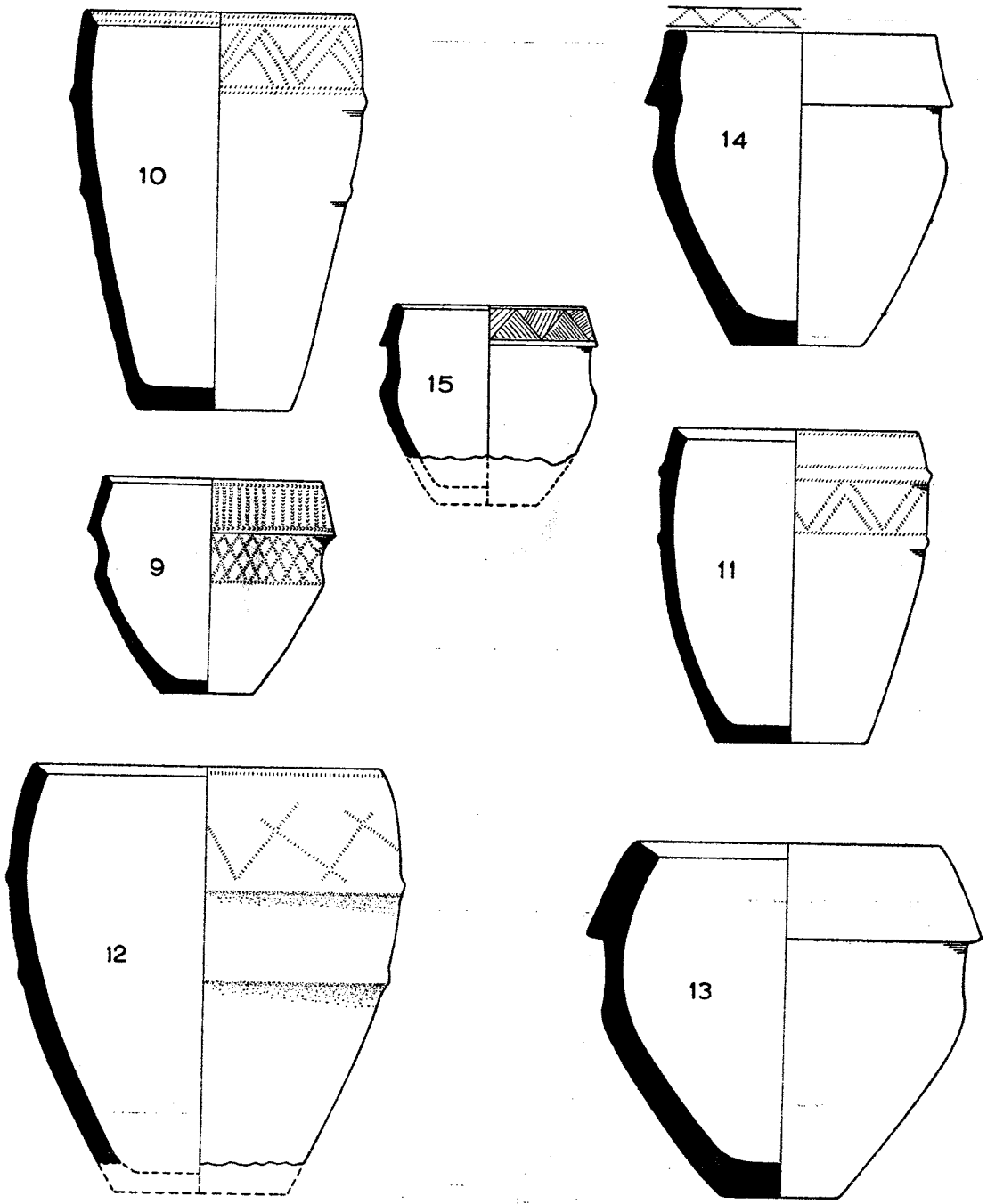


Fig. 3—all $\frac{1}{6}$ nat. size

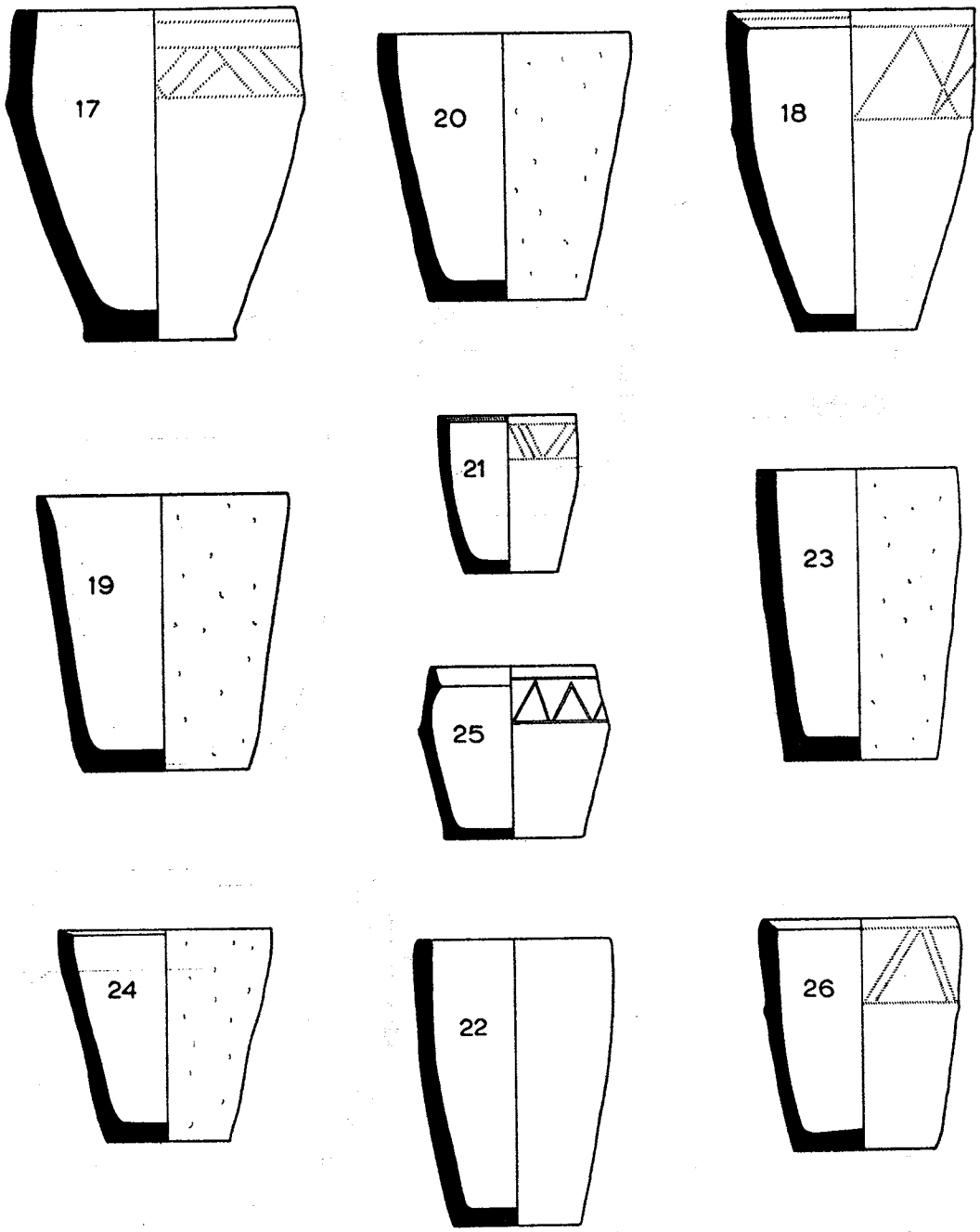
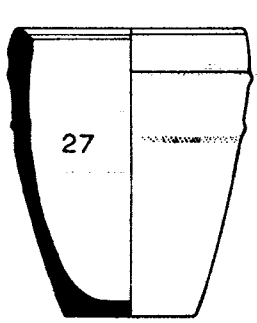
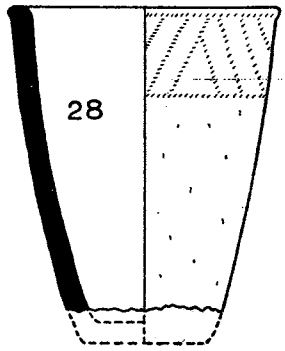
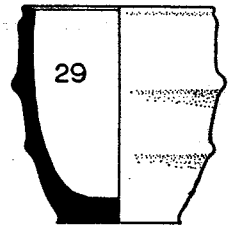
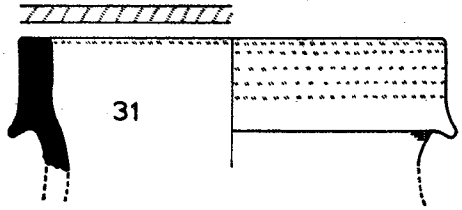


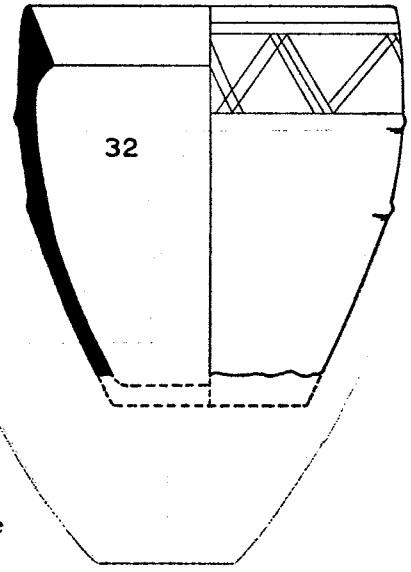
Fig. 4—all $\frac{1}{6}$ nat. size











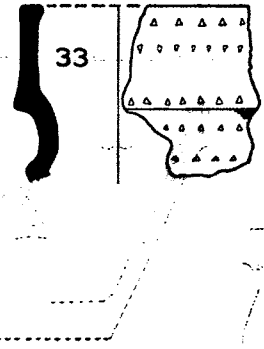


Fig. 5—all ¼ nat. size

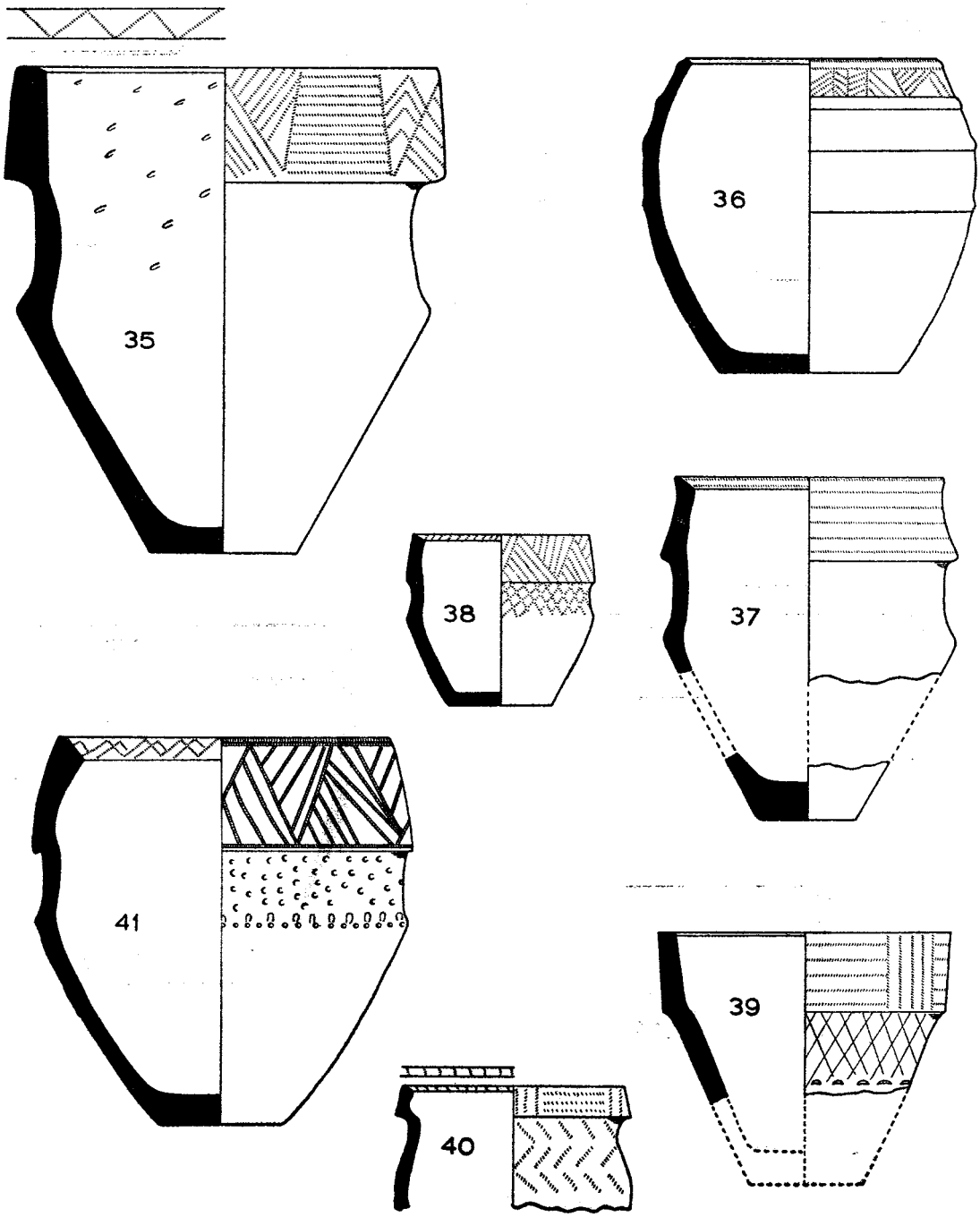


Fig. 6—all ¼ nat. size

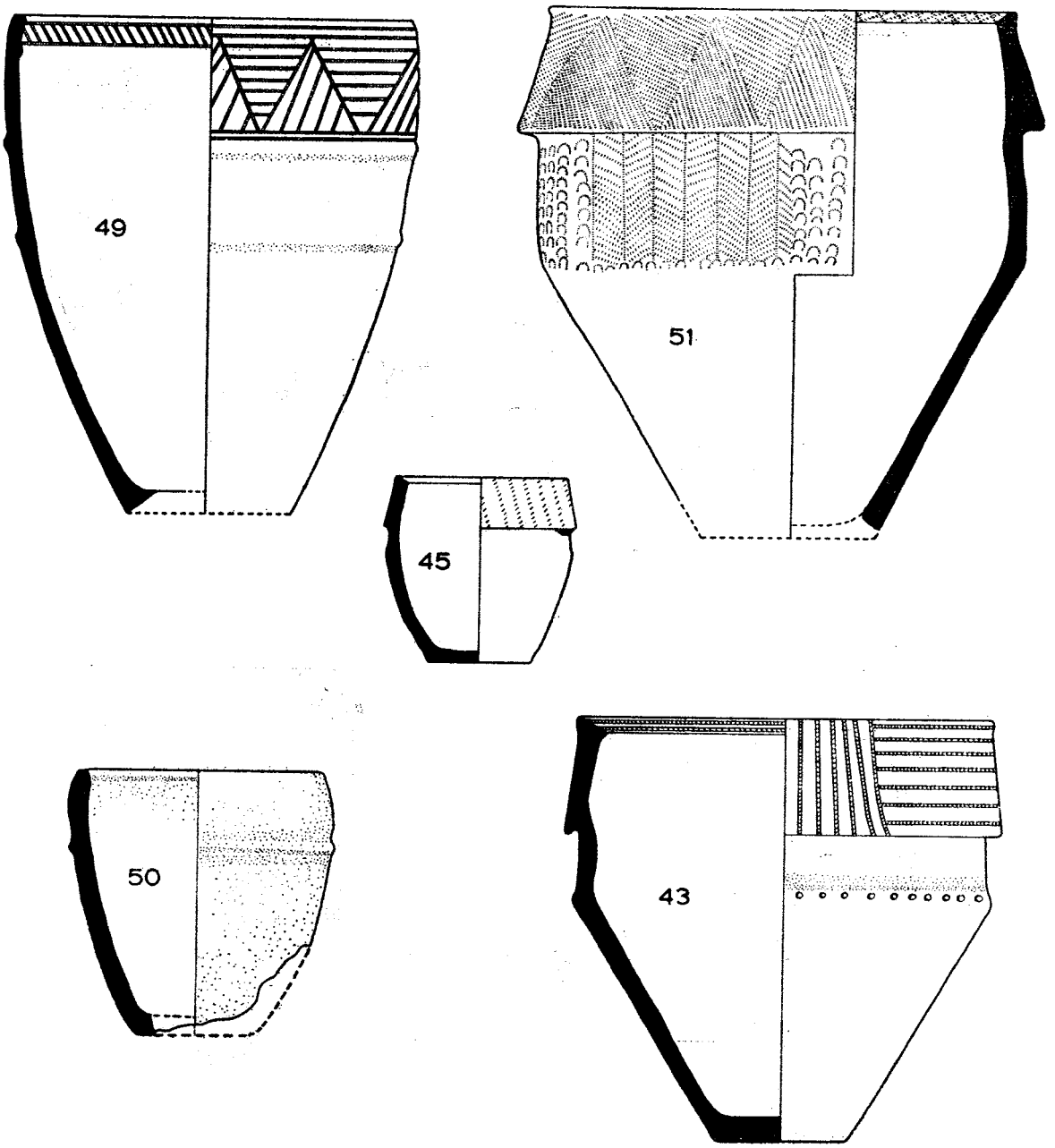


Fig. 7—all ⅛ nat. size

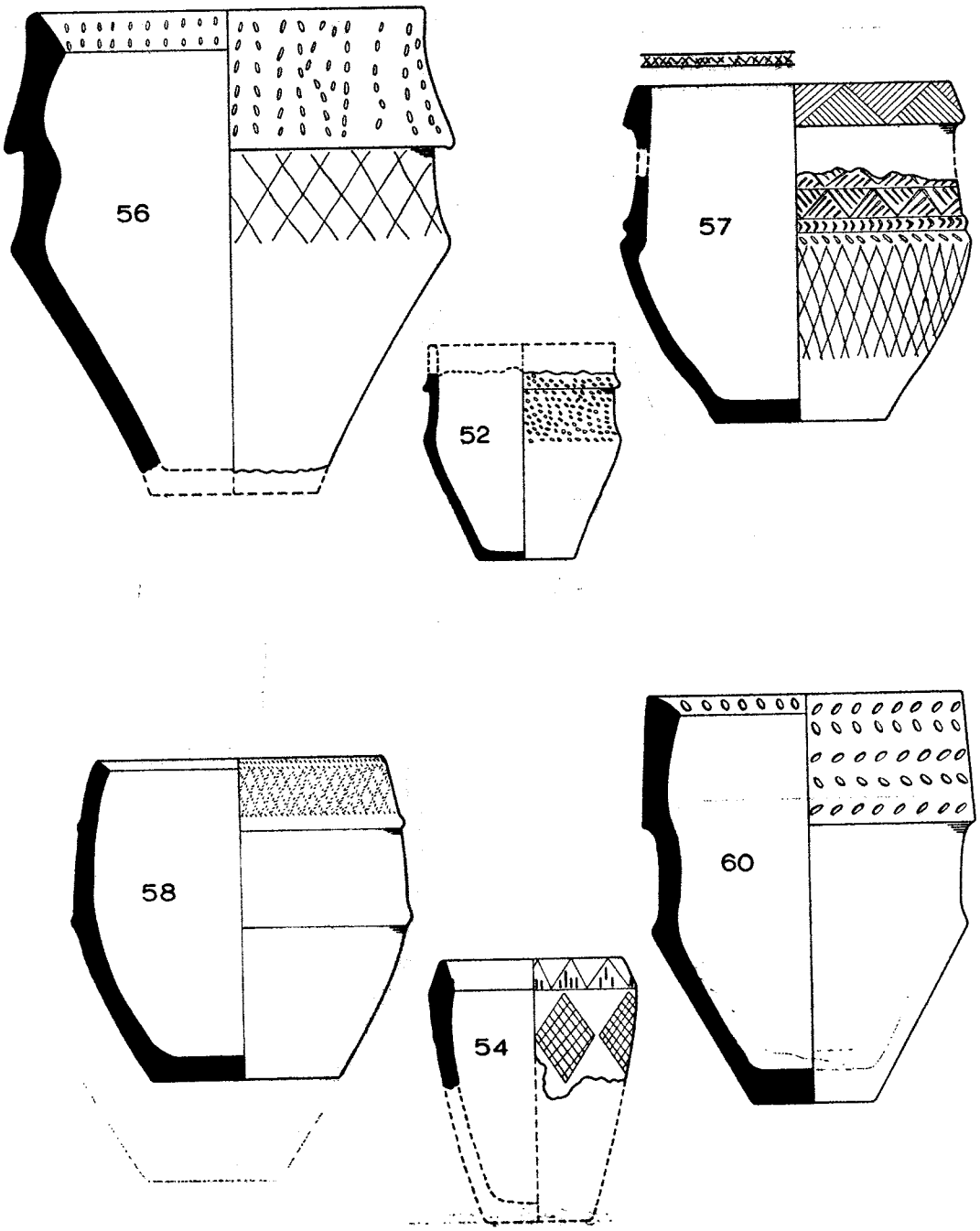


Fig. 8—all ⅛ nat. size

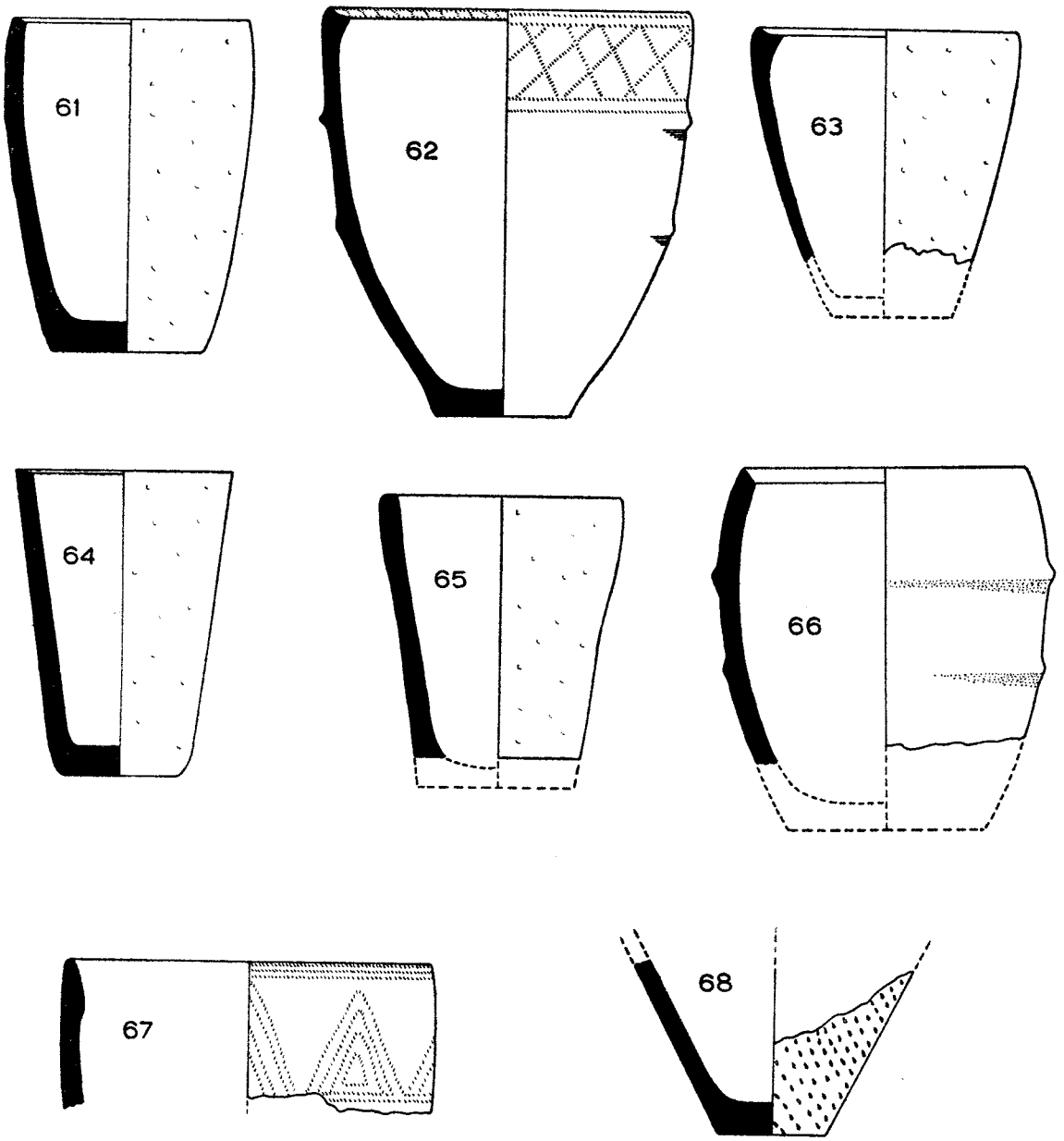


Fig. 9—all ⅛ nat. size.

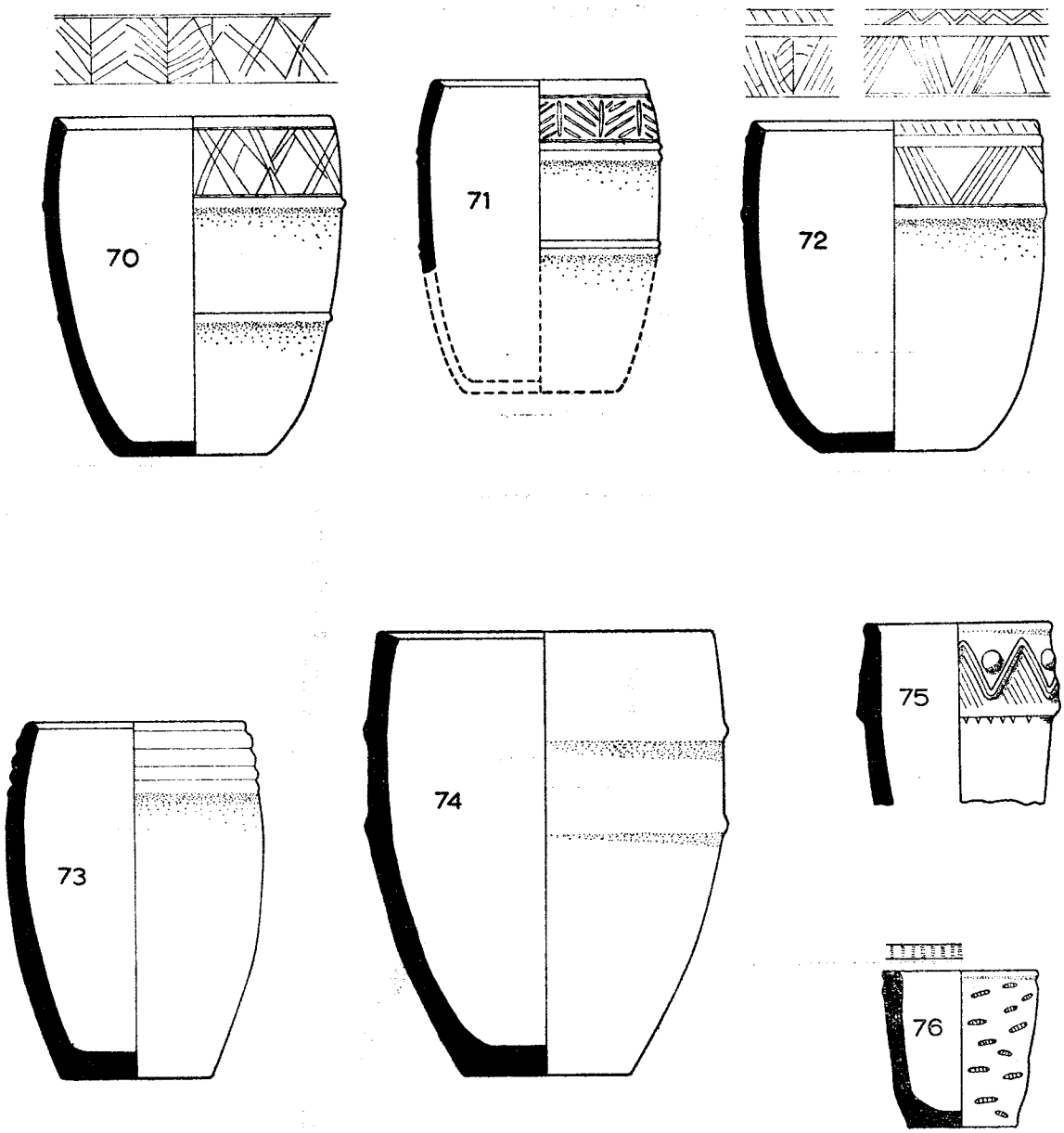


Fig. 10—all ⅛ nat. size

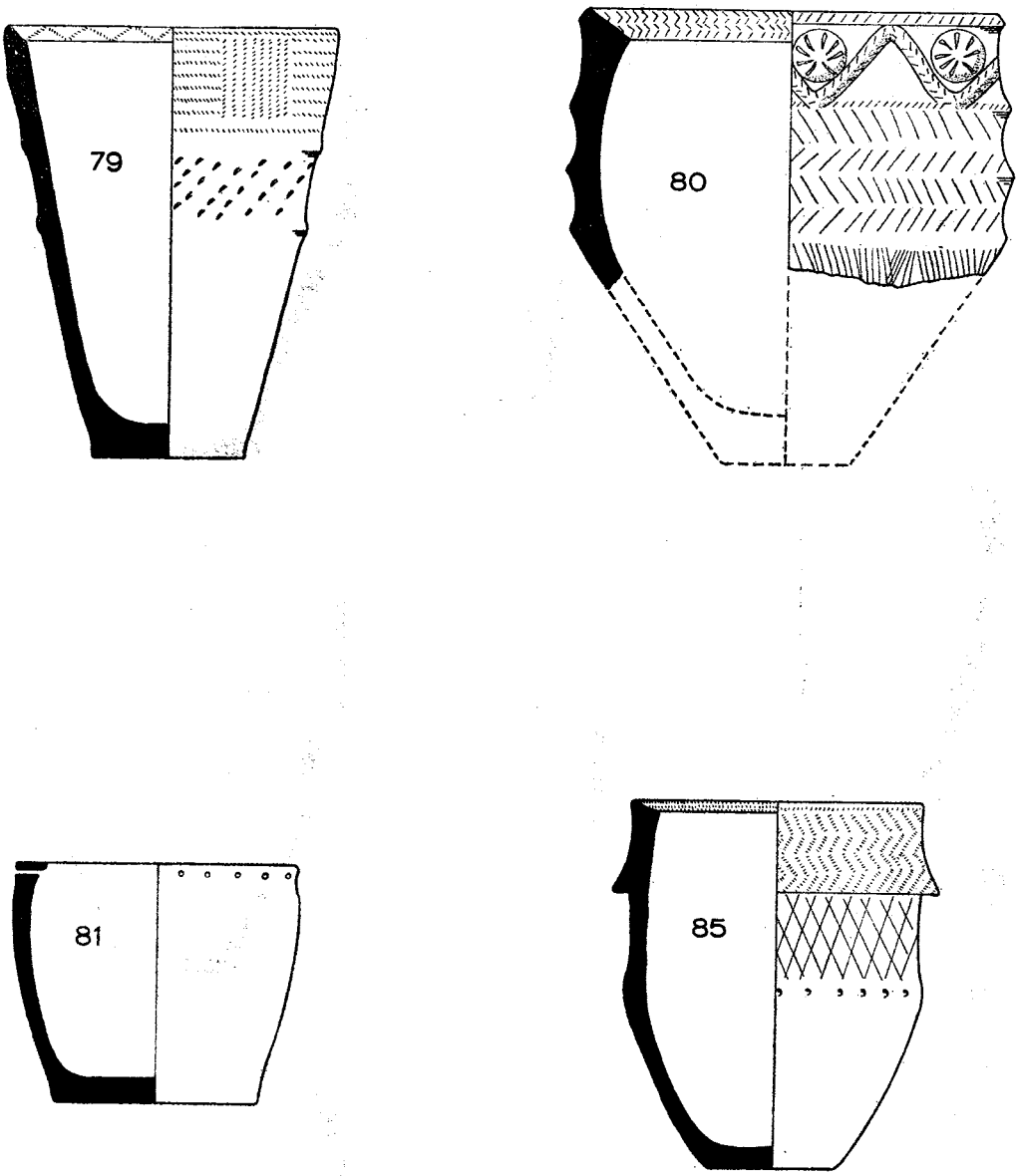


Fig. 11—all ½ nat. size

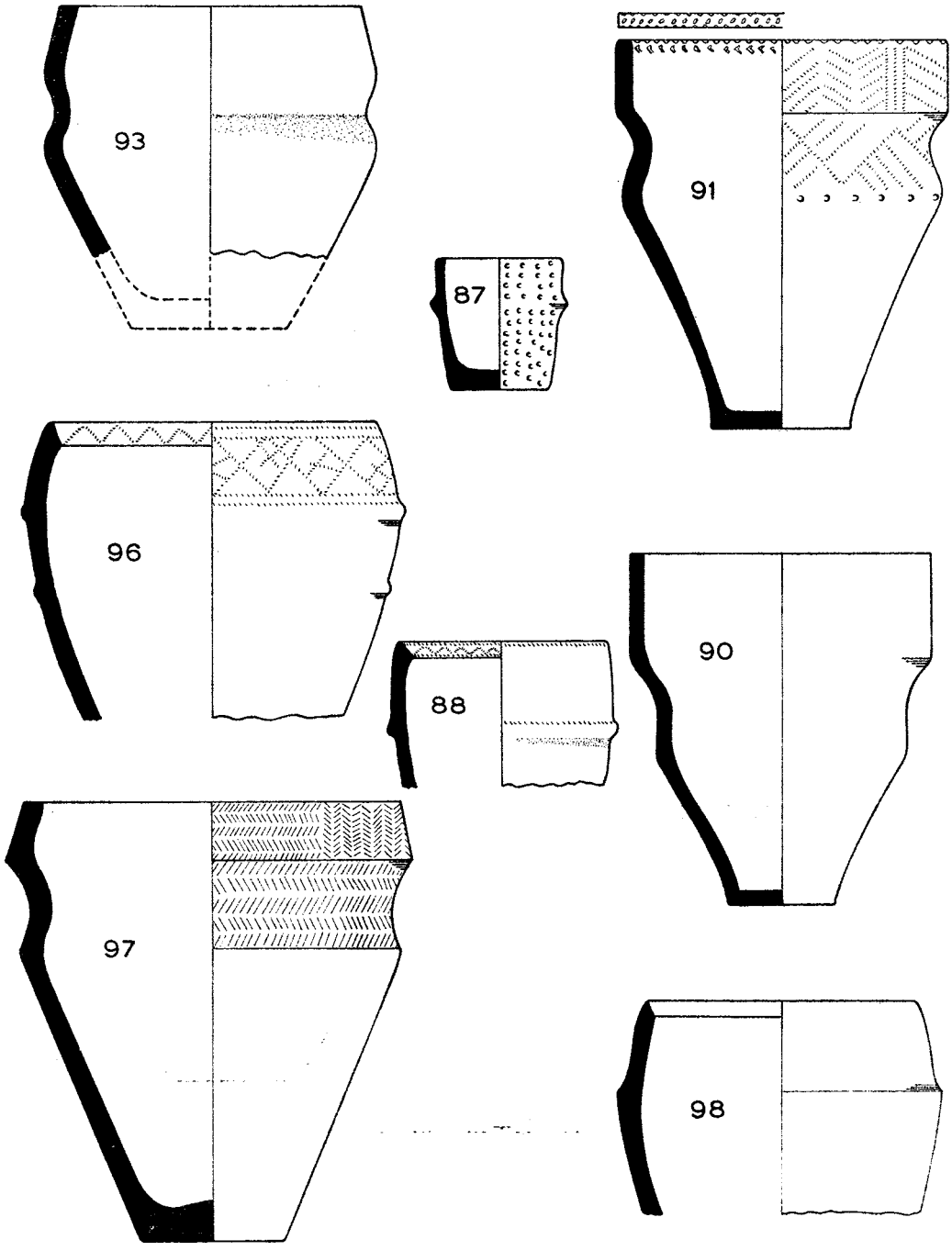


Fig. 12—all ⅛ nat. size

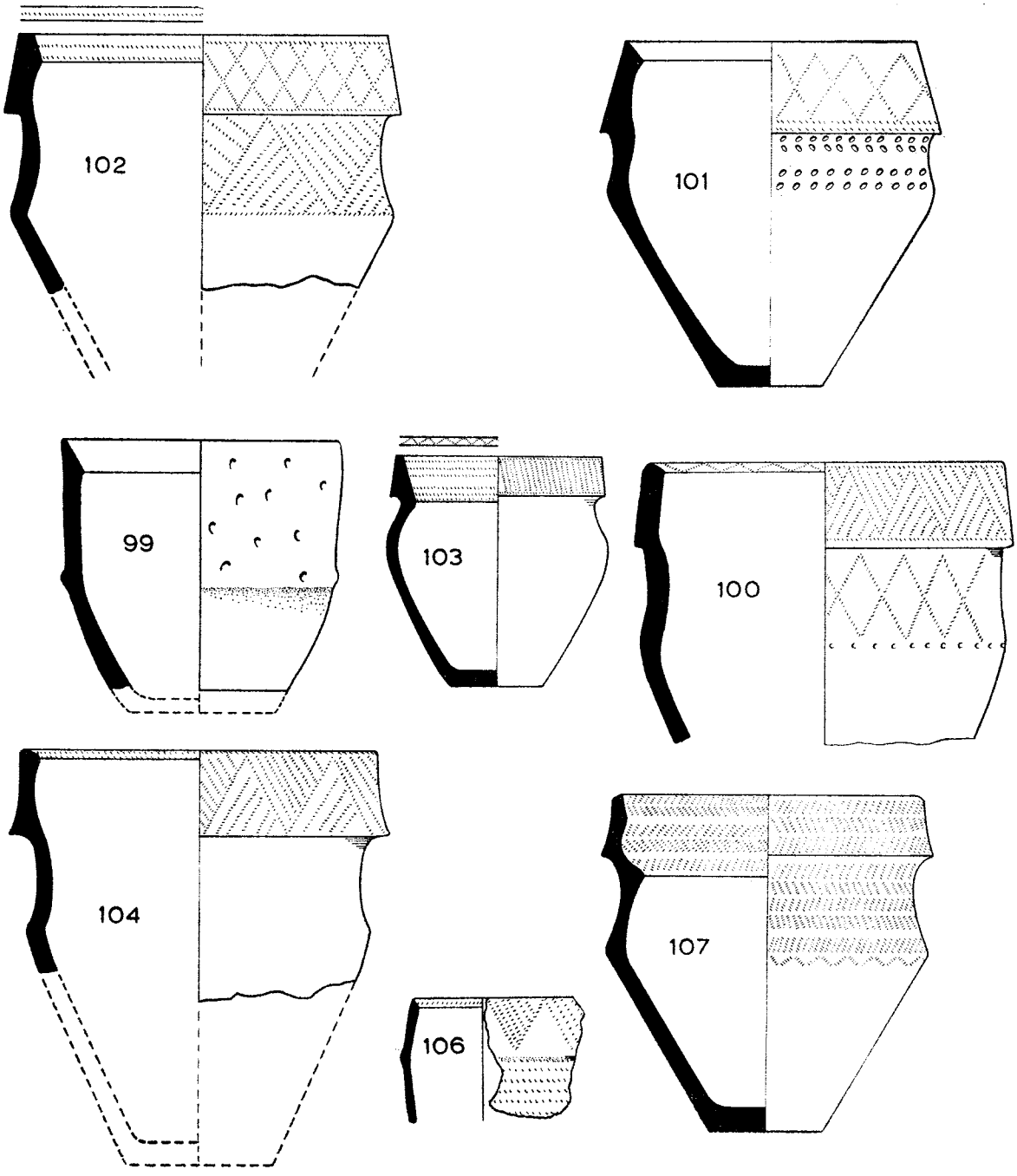


Fig. 13—all $\frac{1}{6}$ nat. size

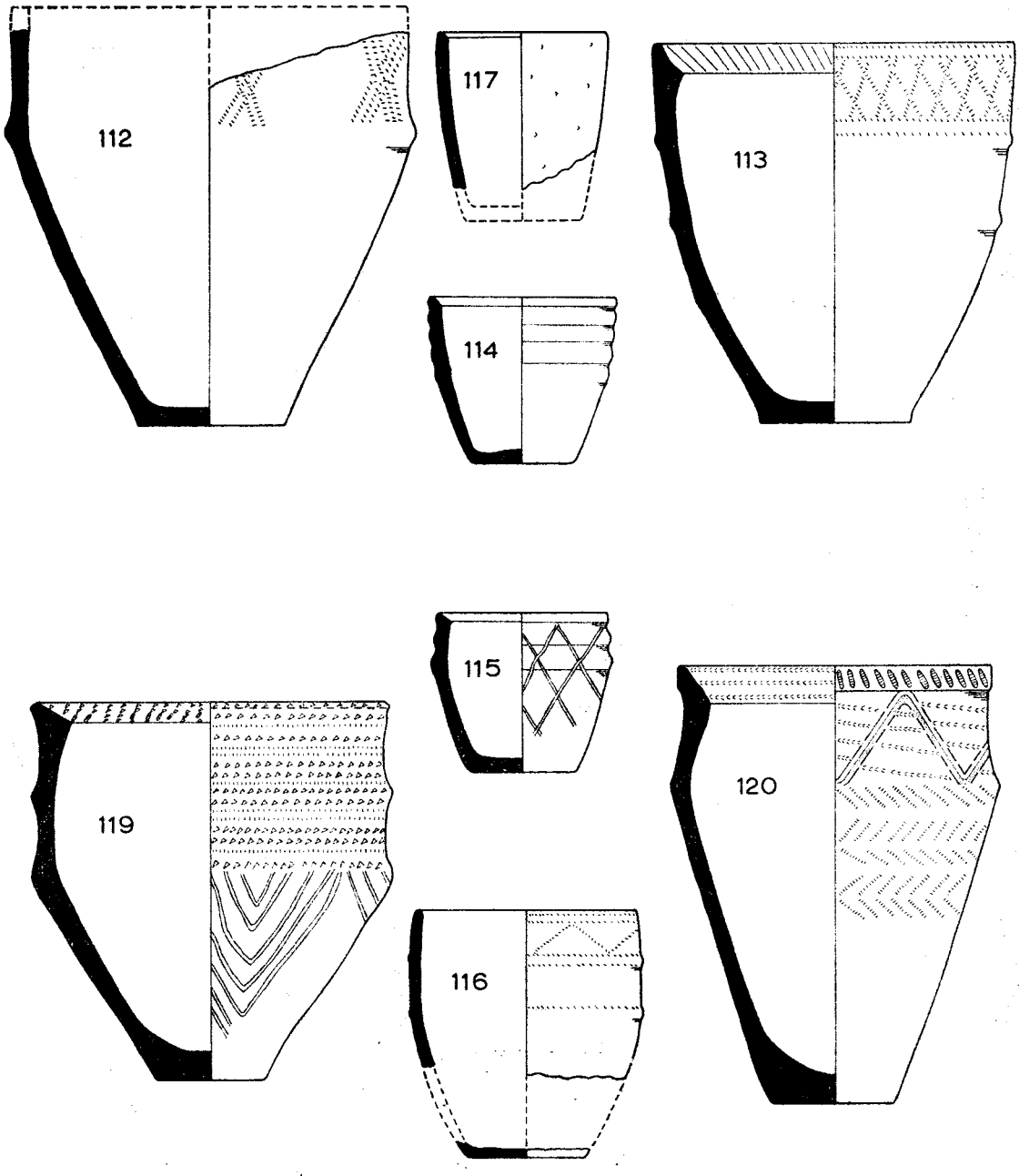


Fig. 14—all ⅛ nat. size

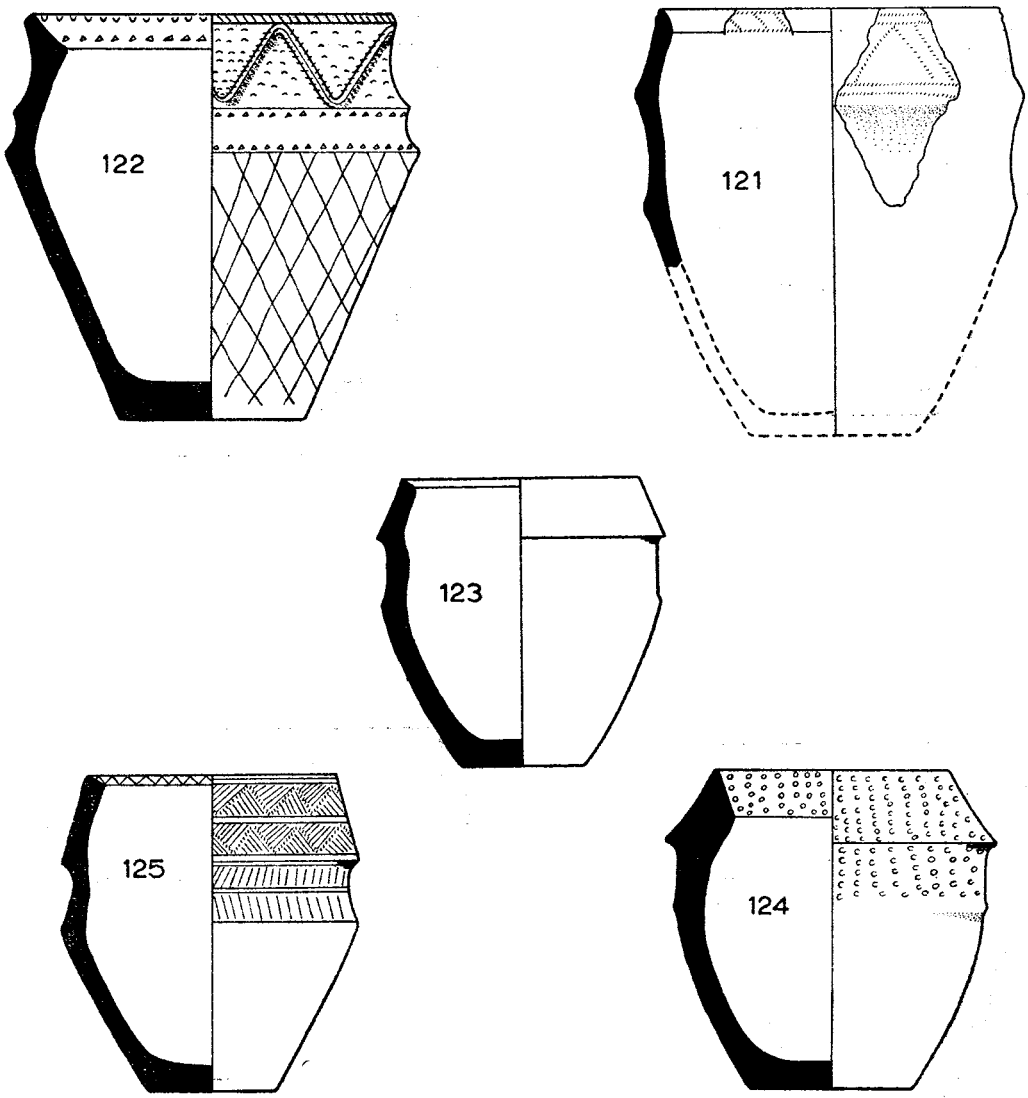


Fig. 15—all $\frac{1}{6}$ nat. size

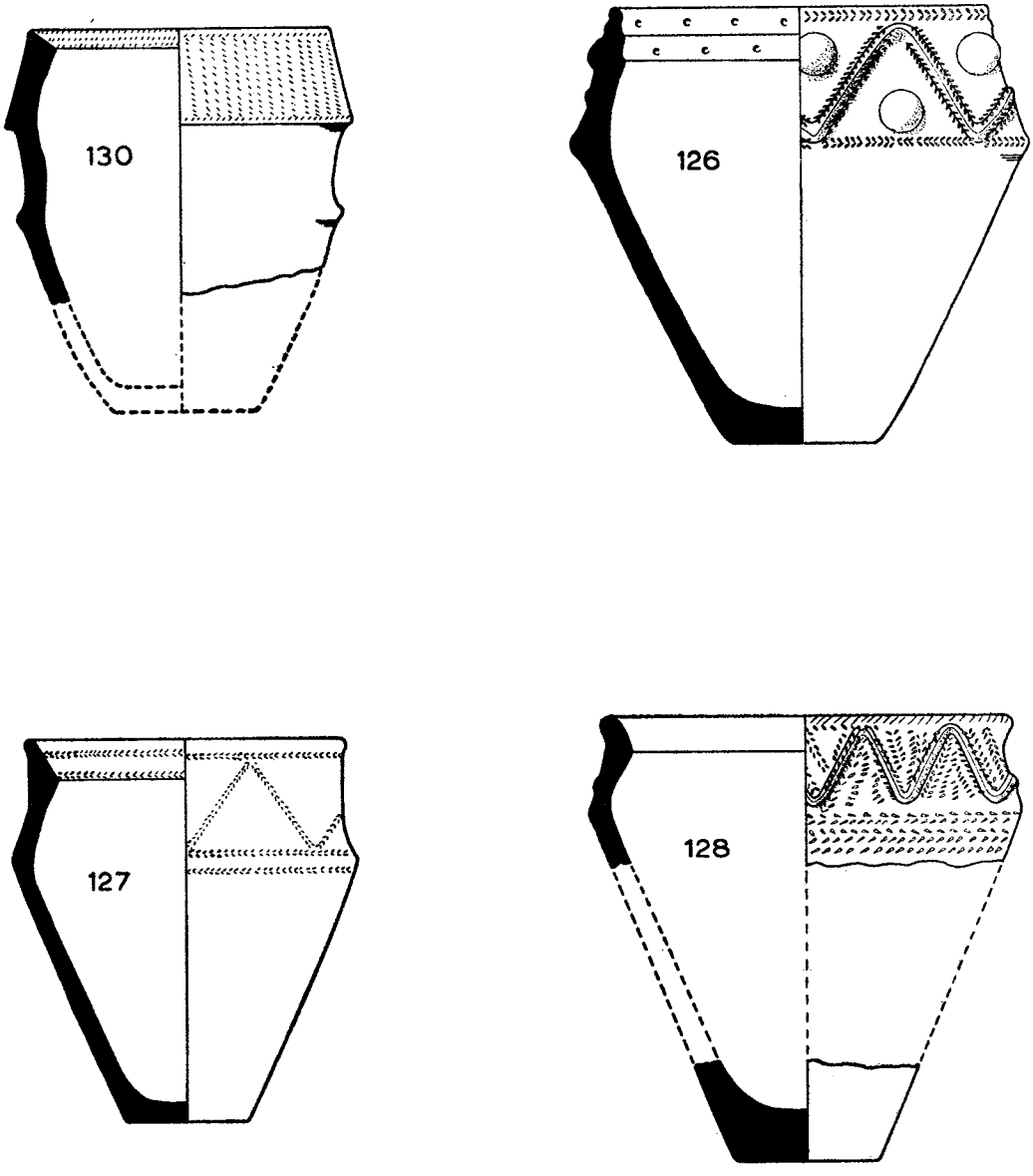


Fig. 16—all $\frac{1}{6}$ nat. size

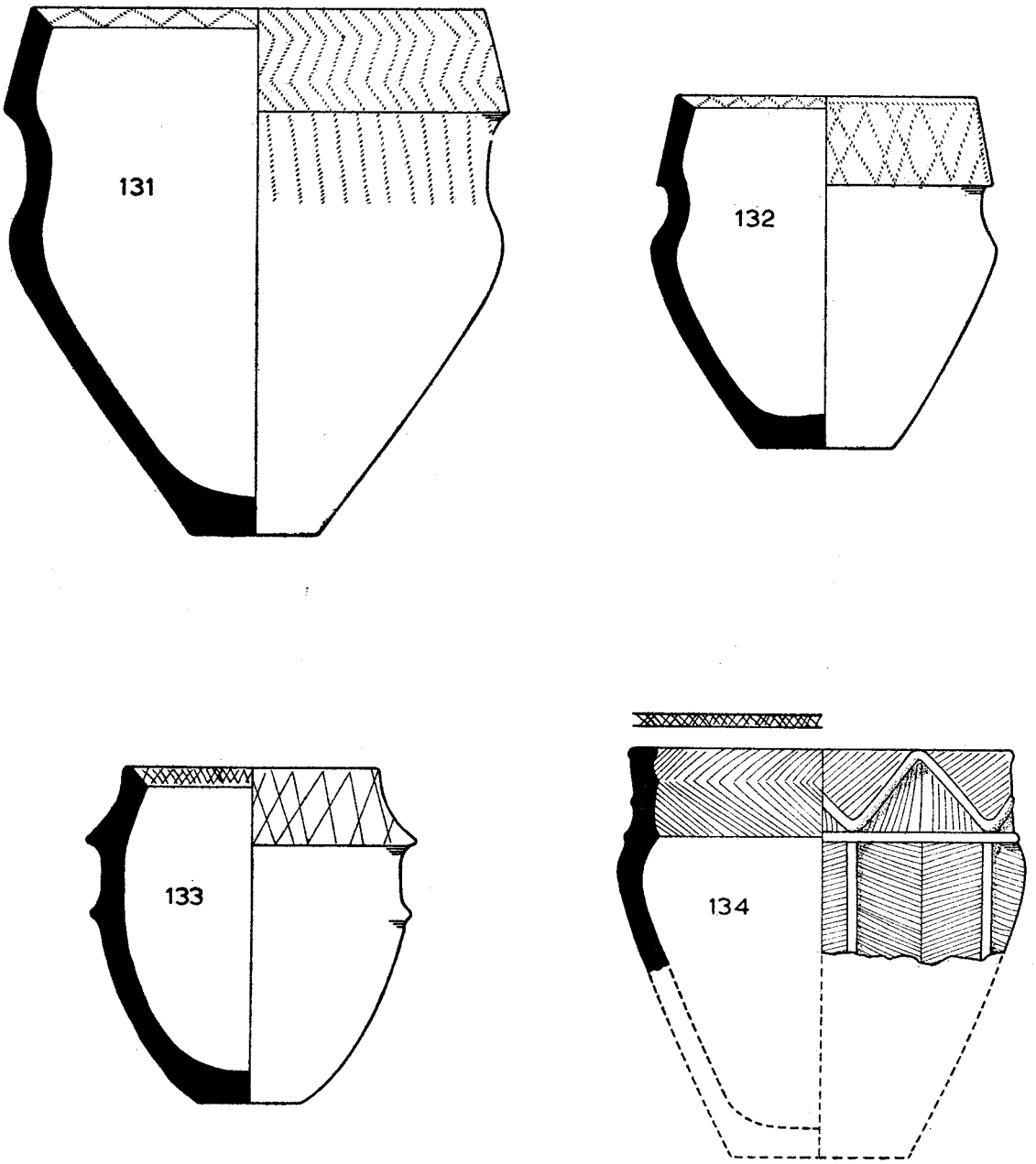


Fig. 17—all ⅛ nat. size

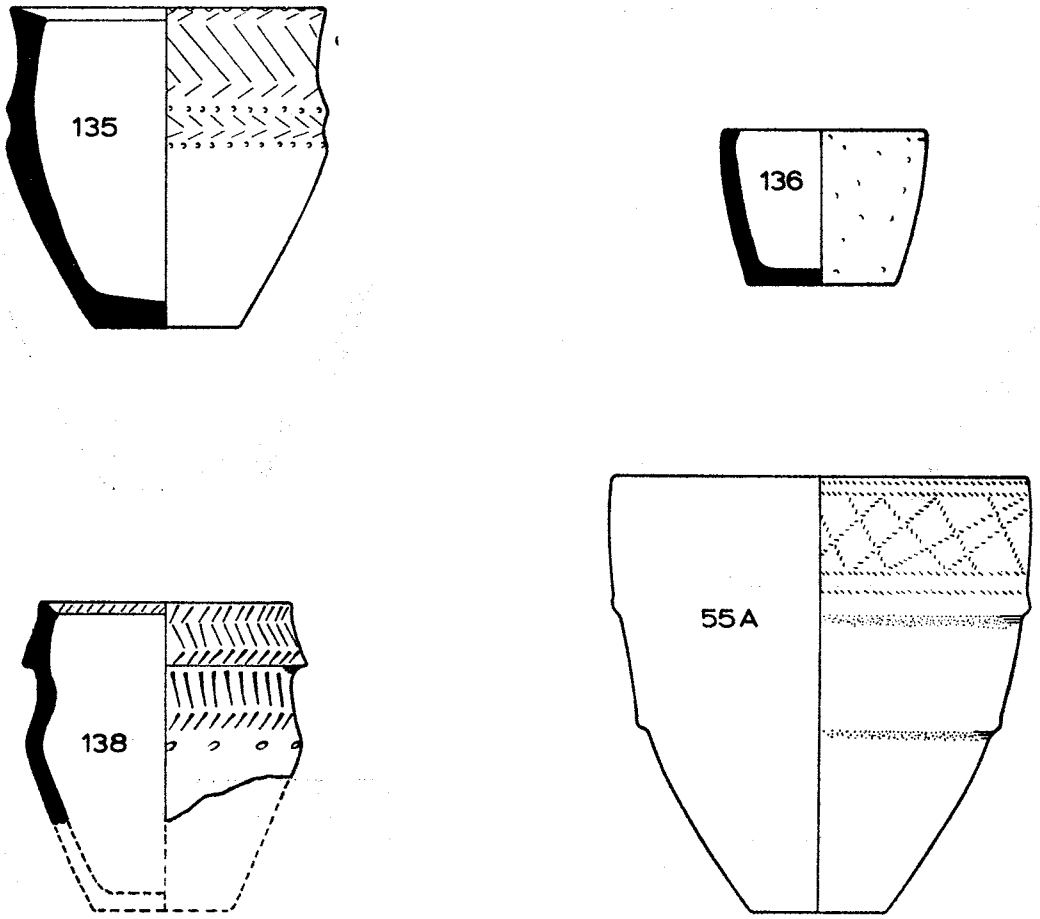


Fig. 18—All $\frac{1}{6}$ nat. size

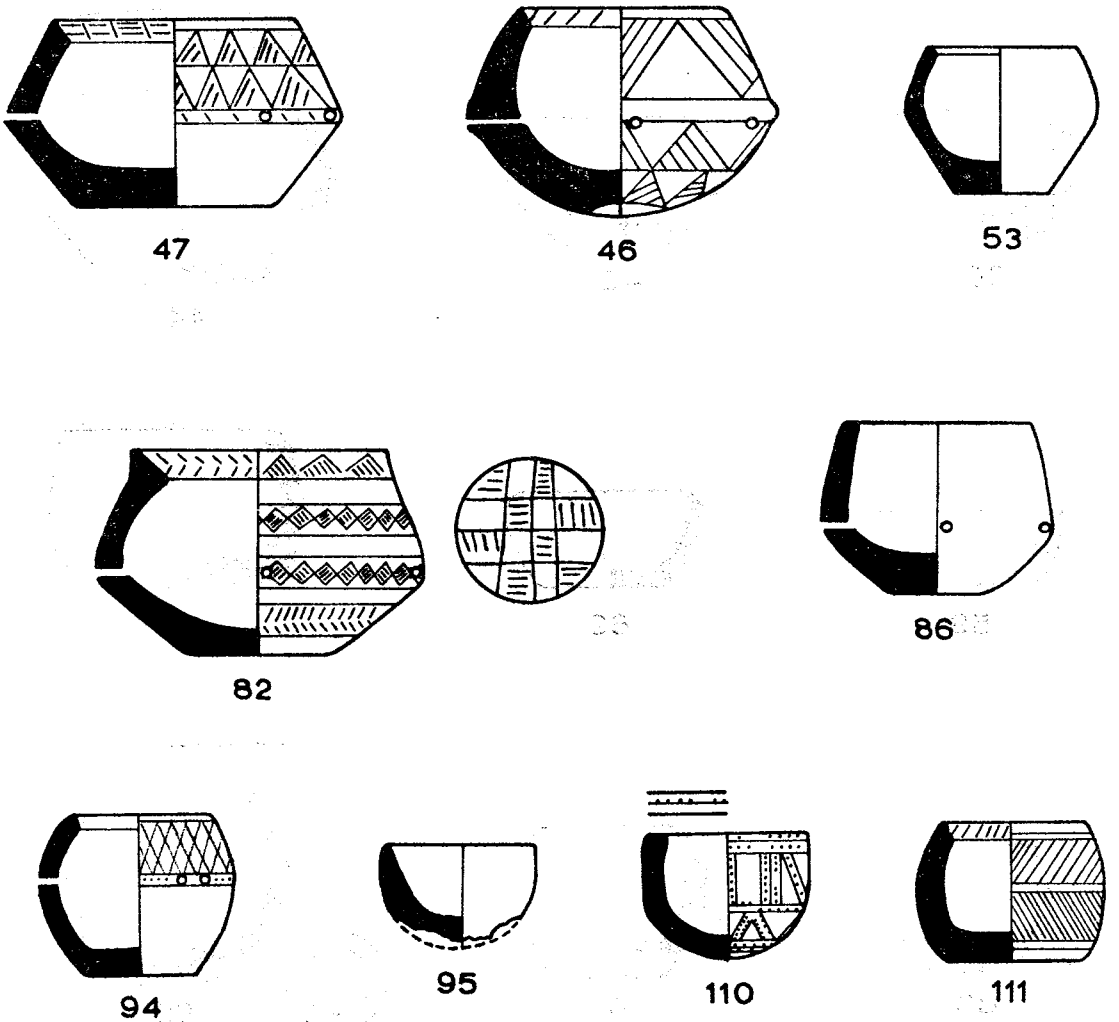


Fig. 19—Pygmy Vessels, all ½ nat. size

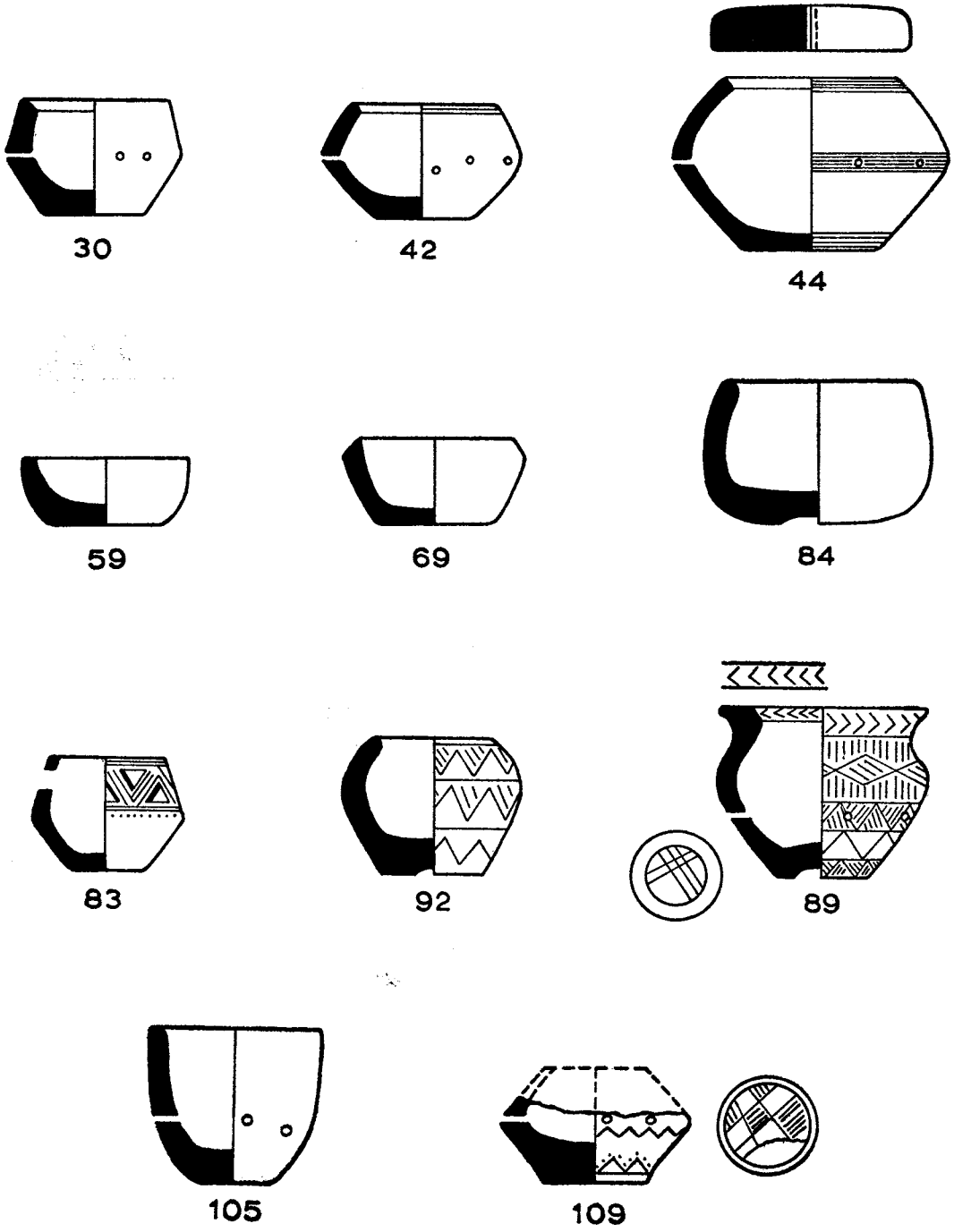


Fig. 20—Pygmy Vessels, all ¼ nat. size

DECORATIVE RING-HEADED PINS IN SCOTLAND

By D. D. A. and M. SIMPSON

The Glasgow Art Gallery and Museum has been fortunate enough to acquire on semi-permanent loan an Iron Age pin of considerable interest. To this, our attention was kindly drawn by Mr J. G. Scott who has provided the accompanying photograph (Pl. II.) and information concerning the circumstances of discovery and state of preservation.

The pin was found at Sasaig, in Sleat parish on the island of Skye; it occurred in a deep peat cutting and was apparently unaccompanied. The bronze, of which it is cast, is in an unusually good state of preservation, its deep golden colour interrupted only by a sporadic blackish surface deposit, some of which has been removed—presumably in modern times. The tip is slightly burred over.

Description can be brief. Overall length is 5.5 in. The circular-sectioned, tapering shank is intentionally bent below the ring head, both these features being executed in the same plane. A graded convex moulding separates shank from ring head proper, and this last itself displays a pleasing sophistication of modelling; the attenuated segment of the ring would be well suited to the attachment of a cord for security fastening (Fig. 1a).

An immediate distinction must be drawn between true ring-headed pins and that "projecting ring headed" form, more popular in Iron Age Scotland; this latter, clumsy name is used to identify pins, the plane of whose ring head is not only at right angles to the axis of the shank but is also projected in front of that shank. These constitute a separate, albeit related, topic and will not be dealt with here.[1]

Of the true ring-headed series, at least twelve examples have been found in Scotland, with a geographic range extending from Roxburgh in the south to Inverness in the north and from both west and east coasts. List P. 146). While there is little real evidence as yet to support a chronological differentiation between those of iron and bronze, or within the latter category, those of bent wire or solid cast manufacture, removal of the irrelevant types leaves us with a mere seven cast bronze specimens from Scotland; two from Bute and single examples from East Lothian, Forfar, Ayrshire, Skye and the island of Coll. The first-mentioned finds were made within the vitrified fort of Dunagoil; the next within the native oppidum of Traprain. In the case of the remaining representatives, no archæological context is recorded. In view of their scanty numbers, scattered distribution and relatively uninformative associations,[2]

1 See PPS, XXI (1955), 282-4.

2 Dunagoil's occupation is thought by Miss Leechman to cover at least the first centuries, B.C. and A.D., although recent radio-carbon dates from vitrified forts suggest a beginning for the type in the fourth and fifth centuries, B.C.

Stratification of the Traprain pin led its excavators to postulate a loss (though not necessarily manufacture) in the first century A.D.

an origin outside Scotland must be sought to provide, one hopes, a closer estimate of the range of their adoption and use within that country.

Dunning's work of 1934 remains basic to any study of English ring-headed pins.[3] This scholar was inclined to view the type as an insular development in south Britain from the "swan's neck" pin of ultimately Hallstatt ancestry.

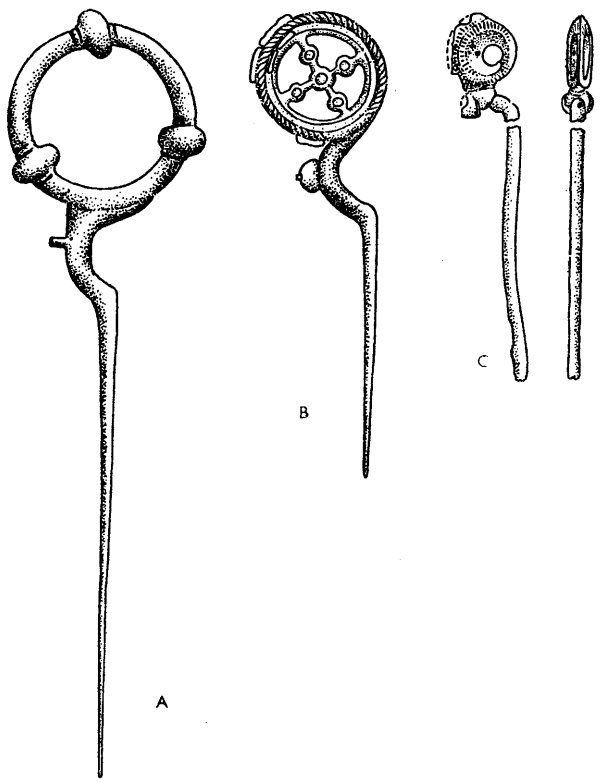


Fig. 1—Ring-headed pins from (a) Sasaig, Skye, (b) Carsphairn, Ayrshire, and (c) Traprain, E. Lothian—all ½ nat. size

Hawkes would attribute the latter perhaps to his First A phase, and the former to his Second A phase when, after the initial period of small scale invasion and unrest, a uniquely British culture was in process of development.[4] Hodson includes the ring-headed pin within his Woodbury Culture, of basically Bronze Age and Iron Age A stock with some La Tène elements.[5] Such an ancestry is probable for the wire form of ring-headed pin (irrespective of the metal used) and perhaps also for the more massive cast versions of this completely plain type, such as that from the Thames at Hammersmith[6] or from Hagbourn Hill,

3 ARCH.J. XCI (1934), 269-95.
4 FRERE ED. Problems of the Iron Age in southern Britain (1958), 9-14.
5 PPS, XXX (1964), 102-7.
6 ARCH.J. XCI (1934), 277, fig. 4, 8.

Berks.[7] There is reason, however, to suspect a more complex derivation for those rare examples where decoration is applied by means of plastic modelling and/or coloured inlay, not only to the front and back but also to one side plane of the head[8] (e.g. fig. 2b). Stead has pointed out that similar, though not strictly comparable elaborations are to be found on pins from Pont-Faverger (this

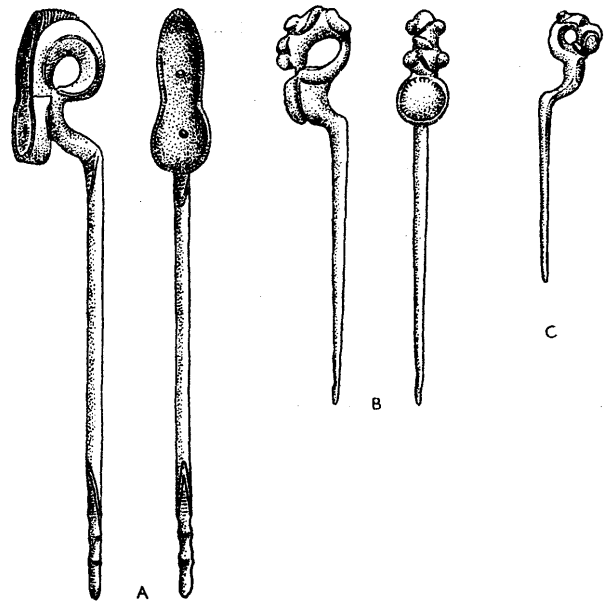


Fig. 2—Ring-headed pins from (a) Sawdon, Yorks., (b) Danes Graves, Yorks., and (c) Alnham, Northumb.—all ½ nat. size

accompanied by a La Tène Ic brooch) and possibly Mairy, both in the Marne district.[9] The Yorkshire pins come from that East Second B phase which Hawkes would envisage as covering the last half of the third and the first half of the second centuries B.C.[10] Stead's conclusions are somewhat at variance with this, as the relevant graves belong to his Second (Arras-Danes Graves-Eastburn) phase, which he considers unlikely to be earlier than the second century B.C. and perhaps in the main to be contained within the succeeding century.[11]

Yet another group of ring-headed pins is Irish (figs. 3a, b). To this, attention has recently been drawn by Seaby[12] whose list may be augmented by

7 **ARCH. XVI** (1812), 348-9 and **PL.L.**
8 EG. From Danes Graves and Sawdon, Yorks. (FOX. **Pattern and Purpose** (1958) pp9B and **ARCH.J. XCI** (1934) 277 fig. 4, 10); also from Holt, Worcs. (**IBID** 277 fig. 4, 9). This small group has recently been augmented by Mr Jobey's exciting find at Alnham, Northumb. (**ARCH. AEL** 4th series XLIV (1966), 30, fig. 11); however, the pin's location in an otherwise unproductive cairn demands rather than provides chronological illumination.
9 **The La Tène Cultures of Eastern Yorkshire** (1965), 57-9 and fig. 32, 2.
10 Frere ED. **Op. Cit.** 13-14.
11 Stead **Op. Cit.** 82.
12 **U.J.A. 27** (1964), 67-72.

reference to Dunning[13] and Crawford,[14] as well as to early volumes of the Ulster Journal of Archæology. Distribution is exclusively northern, and the finds spots where recorded at all, provide no solution to the chronological range. On stylistic grounds, Seaby would allocate the most characteristic pins to the first and even second centuries A.D. It is a purely personal opinion that he may be one, perhaps two, centuries short of the mark. The colourful knobbiness of head adornment seems to us more suitable interpreted as a development of East Second B flamboyance,[15] rather than the summit of a late and purely insular extravagance. Then again, a comparison of modelling upon the McAleer pin's tip (see fig. 3a) to that of certain Roman probes is both unconvincing and unnecessary, as an early looking English variant of the ring-headed pin is provided with just such a moulded point.[16] Most damaging of all to Seaby's theory is the following negative argument; the recently discovered pin from Alnham, Northumberland[17] (fig. 2c) is a direct and close relative (probably ancestor) of the Irish series; should this latter group be as late as Seaby recommends, why then has no English equivalent occurred in a Roman context? Whatever the duration of this fashion in Ireland, its arrival must surely be attributed to the first century B.C. at least. The question of Anglo-Irish contact during the Iron Age has received considerable attention.[18] The ring-headed pin, loaded with plastic detail must rank as incontrovertible evidence for its early existence.

Where do our rare Scottish representatives fit into this scheme of events? Are they an offshoot of the English prototype, parallel with a more flourishing Irish development, or could they conceivably be a second-hand contribution from the last mentioned country? As already hinted, all are unhelpful; however, a re-appraisal of some, from the stylistic point of view, will not be entirely fruitless. Plainest of all are the two fragmentary specimens from Dunagoil, Bute. Their total simplicity and small head size suggests a cast interpretation of that wire form more typical of Iron Age A contexts in the south and especially south-west.[19]

The stray pin from Carsphairn, Ayrshire (fig. 1b), is less easily explained; although plain, its large elegant head is more comparable with the Danes Graves and Sawdon pieces (figs. 2b, a), while acting as a geographic bridge between these latter and the all important specimen from Skye. At first glance, the head moulding of this last is distinctly reminiscent of the Irish series; but the complete absence of inlay, even upon the neck band, may be better interpreted as a local Scottish development, parallel with that in Ireland rather than deriving from it. There remain two Scottish pins worthy of discussion. That from

13 **Op. Cit.** 284-7 and 295.
14 **J.R.S.A.I.** LII (1922), 178-9.
15 Displayed to perfection by the brooches from Arras, Yorks. (**STEAD Op. Cit.** 46, fig. 25, 2), Harborough Cave, Derby (**FOX Op. Cit.** pp 8C), Newnham Croft, Cambs. (**IBID**, 10, fig. 6b), etc.
16 Cold Kitchen Hill, Wilts. (**IBID.** 18, fig. 14, 2).
17 See Footnote 8.
18 **PPS.** XVI (1950), 16; **U.J.A.** XVIII (1955), 37-45; **Bericht Uber Den V Internationalen Kongres für Vor-und Frühgeschichte. Hamburg** (1961), 705-9.
19 For a summary of the picture see Gardner & Savory. **Dinorben, a Hill-fort occupied in early Iron Age and Roman times** (1964), 131-2.

Traprain (fig. 1c) is a massive casting with superficial "Dunagoil" connexions; however, its knurled detail and the possible allowance for coral or enamel inlay within the imperforate head could be offered as hints of a distant East Second B ancestry. Its attribution to the first century A.D. is dubious, for the reasons set out by Miss Burley.

The final pin from Scotland to warrant mention is a now lost specimen from the island of Coll (fig. 3c). Its elaborate head detail, almost simulating inlay, plus an allowance upon the neck section for an actual knob of coral or enamel are so reminiscent of Ireland, that one is forced to view it as an import, falling into a small category of objects which include the Group IIIa scabbard from

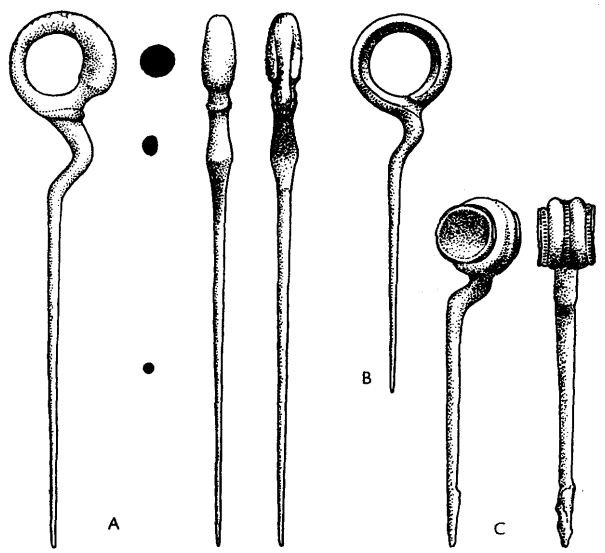


Fig. 3—Ring-headed pins from (a) Co. Tyrone, unlocated, (b) O'Connor's Island, Sligo Bay, Co. Sligo, and (c) Island of Coll, Argyll—all ½ nat. size

Bargany House,[20] perhaps also a leaf brooch from Lochlee, Ayrshire;[21] a carved comb from Langbank, Dunbartonshire;[22] and, at an unspecified later date, the enigmatic sphere from Walston, Lanarkshire.[23]

The multiple ancestry of ring-headed pins in Scotland suggested above may be thought to verge on the tortuous, stressing as it does contacts with A communities of south Britain, Second B communities of the east, and Irish craftsmen from the west; but there is nothing novel here. All have been foreshadowed by the work of Professor Piggott,[24] Mr Stevenson[25] and Mr

20 **Arch. Colln. of Ayr and Galloway** VII (1894), 48-52.
21 MUNRO. **Ancient Scottish Lake-dwellings** (1882), 129, fig. 141.
22 **PSAS.** LXIII (1928-9), 320.
23 **PSAS.** XVI (1881-2), 149 and fig.
24 RIVET ED. **The Iron Age in North Britain** (1966), 1-15.
25 **IBID.** 17-37.

MacKie,[26] while the first has received detailed treatment from Mrs Piggott[27] and the second from Miss Henshall[28] and Professor Thomas.[29] The real disappointment lies in our inability to impose upon the Scottish material a close time range. We can only hope for further finds from archæologically valid contexts.

LIST OF SCOTTISH DECORATIVE RING-HEADED PINS

Abernethy, Perthshire—PSAS, XXXIII (1898-9), 13-33.
Bonchester, Roxburgh—PSAS, LXXXIV (1949-50), 122, fig. 6, 1.
Carsphairn, Ayrshire—PSAS, XLVI (1911-12), 179-80.
Clairinch, Loch Lomond, Dumbarton—PSAS, LXXXIV (1949-50), 130.
Coll, Inverness-shire—PSAS, XV (1880-1), 81.
Dunagoil, Bute—3 examples. PSAS, LXXXIV (1949-50), 130, fig. 11.
Eignag, Lochmoidart, Inverness-shire—Arch.J., XCI (1934), 283, fig. 7, 4.
Forfar, Angus—Arch.J., XCI (1934), 283, fig. 7, 7.
Sasaig, Sleat, Skye—Present Paper.
Traprain, East Lothian—PSAS, LXXXIX (1955-6), 167, no. 95.

26 **PPS**, XXXI (1965), 116-21, etc.
27 **PSAS**, LXXXIV (1949-50), 113-29.
28 **PPS**, XVI (1950), 146-7.
29 **ARCH.J.**, CXVIII (1963), 16-7.

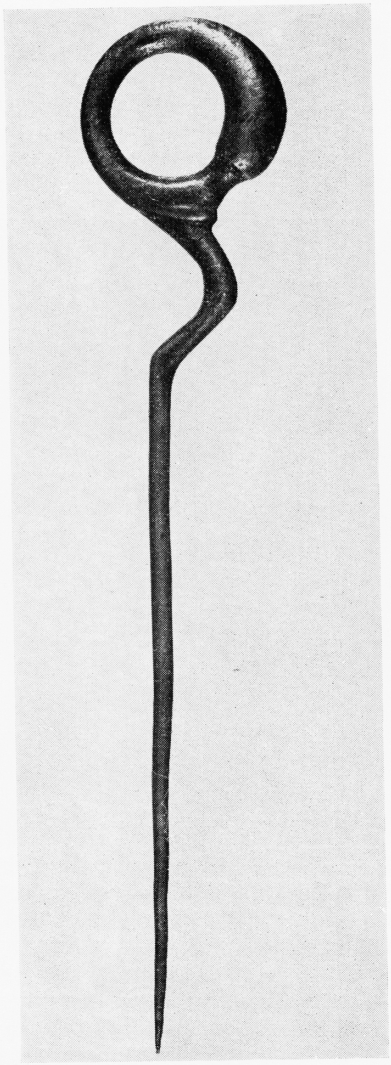


Plate II.—Ring-headed pin from Sasaig, Skye—nat. size

Photo: Glasgow Museum and Art Gallery

CORRIGENDA

FOR VOLUME XLV, 1968

p. 142 Fig. 1a and p. 145 Fig. 3a—these illustrations should be transposed.

PLOUGH AND SPADE IN DUMFRIES AND GALLOWAY

By A. FENTON,
National Museum of Antiquities of Scotland

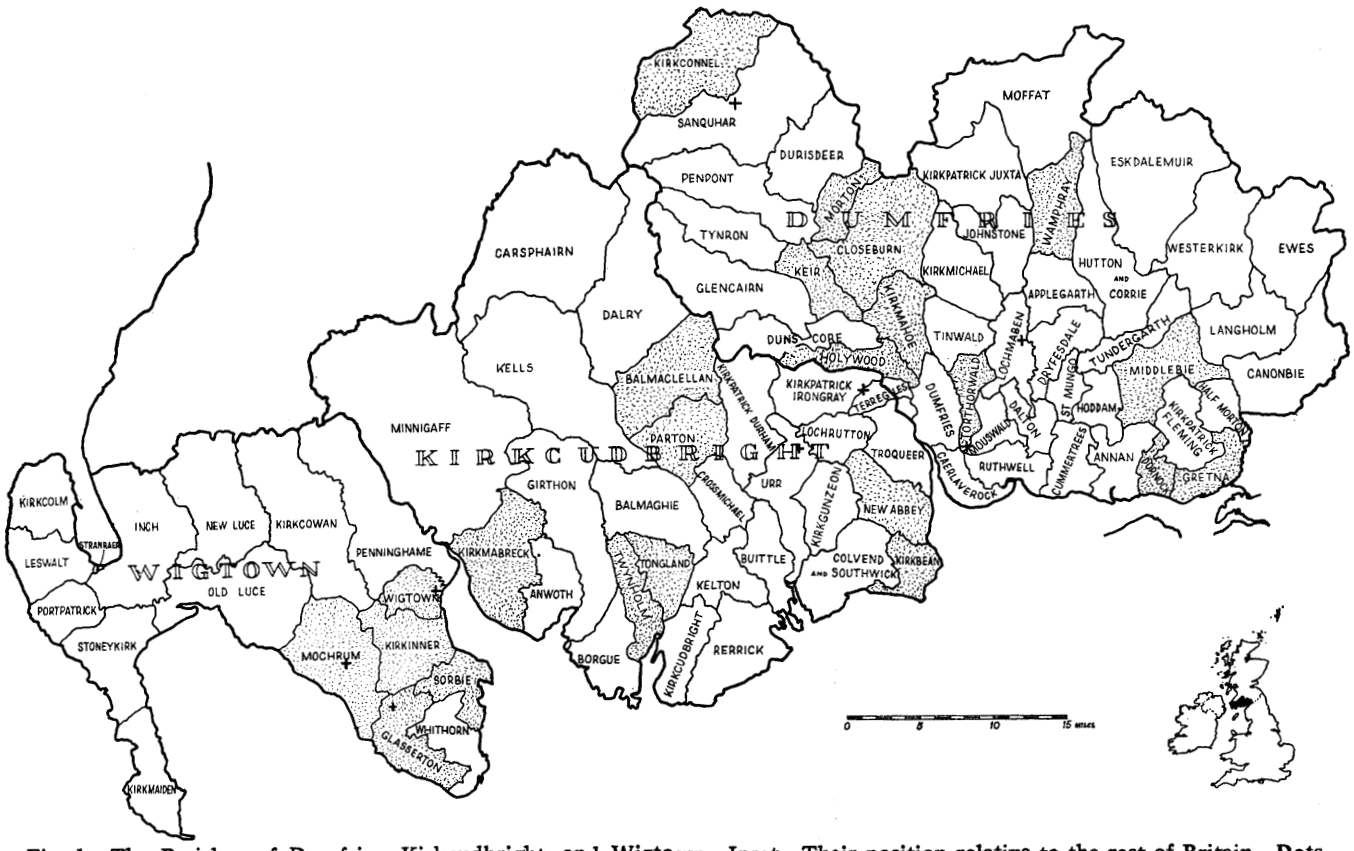
In the notes that follow, a number of scattered pieces of information are brought together, partly to outline the historical development of implements of cultivation in Dumfries and Galloway, and partly as an exercise in the study of innovation and change. Situated as it is in the angle between England, Ireland, and the rest of Scotland (Fig. 1, inset), the South-West has a potentially high degree of interest for those who study the reasons for and relationships between geographic, cultural, linguistic, and national boundaries. The subject under review is most relevant in this respect to the late eighteenth and early nineteenth centuries, and accordingly the emphasis will lie here. Such evidence as has come to hand for other periods, though scanty, is also presented as a basis upon which subsequent research may build.

The Prehistoric Evidence.—An examination of the carbonised remains of cereal grains and weeds associated with cultivation, and the impressions left by them on prehistoric pottery, makes it possible to get some idea of what crops were being grown in prehistoric times. The evidence was brought together by two Danish scholars in 1944,[1] and can be summarised from their work as follows:—

1 K. Jessen and H. Helbaek, **Cereals in Great Britain and Ireland in Prehistoric and Early Historic Times** (Kongelige Danske Videnskabernes Selskab), Copenhagen, 1944.

TABLE I.

Date	County	District	Remains
Middle Bronze Age	Wigtown	Baskfield, Glenluce	Hulled barley, one flower (i.e. grain plus flowering glume and palea).
Late Bronze Age	„	Torrs, Luce	Triticum monococcum or dicoccum, one spikelet; naked barley, 24 grains.
Bronze Age	„	Glenluce Sands	Naked barley, 1 grain.
	„	Glenluce	Emmer, 1 grain.
	„	Glenluce Sands	Emmer, 4 spikelets.
	„	Glenluce Sands	White goosefoot, 6 spikelets; black bindweed, 1 fruit; pale persicaria, 2 fruits.
Roman	Dumfries	Birrens	Wheats, various kinds, 7 grains; barley, 150 flowers and grains.
	„	„	Pale persicaria, 1 fruit.
Early Christian	Wigtown	Barhapple Loch	Emmer, 30 spikelets; barley, 50 flowers and grains plus fragments.



Fir. 1—The Parishes of Dumfries, Kirkcudbright, and Wigtown. Inset—Their position relative to the rest of Britain. **Dots** indicate areas where the two-horse team controlled by the ploughman himself, using reins, was operating in the 1790s. **Crosses** in parishes indicate sites as follows: Lochmaben—plough beam; Urr—Milton Loch and head and stilt; Sanquhar —James Rigg and Sons, Spade Works; Terregles—Inglestoun Lodge; Mochrum—Chilcarroch; Torthorwald/Mouswald—Lochar Moss; Wigtown—Baldoon; Mochrum—Lochhead of Elrig; Glasserton—Drummoddie Moss.

Further evidence for cropping in the 2nd-3rd centuries A.D. comes from the analysis of the peat from the crannog in Milton Loch, excavated in 1953. The samples contained pollen of various kinds, including that of the weeds of cultivation, so that crop growing in this area is established by inference. Evidence from this kind of source is likely to contribute increasingly to knowledge of prehistoric cultivation as more pollen analysis is carried out of samples from excavated sites.

Table I. indicates that the Luce area of Wigtownshire was particularly

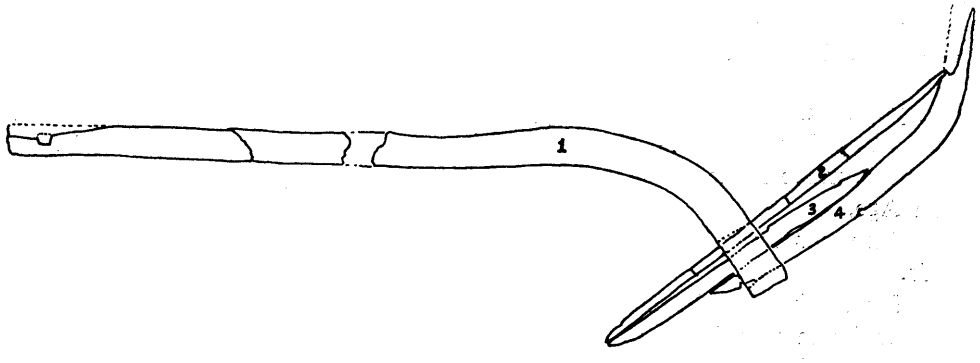


Fig. 2—A Danish bow ard, and its parts: 1, beam; 2, foreshare; 3, share; 4, ard-head and stilt. After Glob.

favoured in Bronze Age times, and that the predominant crop was barley. One may speculate on the possibility that the barley growing tradition continued uninterrupted at least until the eighteenth century A.D., since a 1684 description of Galloway recorded that the oats were very bad in comparison with those of many other shires, with long awns that had to be removed by barefoot treading (a process known as **lomeing,** a word of Gaelic origin), whereas the barley or bere received all the attention and all the season's dung, providing in return both food and drink. Oats were in general grown on the outfield, here called **oatland,** and bere on the much better quality infield or **beir-fay,** around the houses.[2]

In addition to actual traces of crops, parts of two prehistoric wooden ards[3] have been found in the South-West, one in a crannog in Milton Loch. Kirkcudbrightshire, the other in a peat bog at Lochmaben in Annandale, Dumfriesshire. To understand the significance of these, it is necessary to look first of all at a number of finds from continental sources, and especially the peat bogs of Denmark. These include complete examples of ards, of which the type relevant to the present enquiry is called a **bow ard,** from the bow or curvature of the beam. A complete bow ard, such as that from Dϕstrup or Donneruplund in Jutland, consists of four main pieces, the beam, a foreshare, a main share,

2 A. Symson **A Large Description of Galloway ,1684,** Edinburgh, 1823. 73-4, 76-7; A. Fenton, Skene of Hallyard's Manuscript of Husbandrie in **The Agricultural History Review,** 1963. XI. 73-5.

3 The Scandinavian term **ard** is used for a cultivating implement drawn by animals, but lacking a mouldboard.

and a combined head and stilt (fig. 2). The beam is straight at the front, with an opening near the point in which a wooden tie hook for the share is sometimes found inserted. The rear end curves downwards to form an angle of approximately 120° with the front of the beam. Near the base of the rear end is a mortice set at an angle, and the three other parts of the ard are inserted into this as indicated in fig. 2. The foreshare helps to protect the main share from excessive wear. The main share is gripped more firmly to the head by interlocking grooves and ridges, or by wooden studs on one piece fitting into corresponding holes in the other.[4]

Ploughing scenes from Swedish rock carvings show that such ards were commonly pulled by two animals, the long beam running up between them and linked at its front end to the yoke across the necks of the two animals. This is a yoking arrangement that may still be seen for ards in the Mediterranean area, Israel, Vietnam,[5] and elsewhere. The rock engravings, and the finds from the bogs, make it clear that bow ards were operating by the Late Bronze-Early Iron Age.

With this background in mind, we can now go on to examine the Scottish finds.

The Lochmaben beam (in Dumfries Burgh Museum): In the year 1870, a wooden beam was found in a peat bog near Lochmaben. It is a substantial piece of wood, not, however, too heavy to be easily lifted by one man (Plate III.), measuring 8 ft. 1½ in. (248.05 cm.) in length. The forepart of the beam, now twisted through about 45° in the process of drying, contains a roughly rectangular opening, 2.3 in. by 0.9 in. (5.84 cm. x 2.29 cm.). The lower part of the rear end, with a downwards curvature of circa 120°, contains an angled mortise, 4.25 in. by 1.6 in. (10.8 cm. x 3.06 cm.). It is a well-made piece, with the front side of the rear end neatly chamfered to present a wedge-shaped face, like the breast or sheath of later ploughs. The details tally so closely with those of the bow-ards described above that the Lochmaben beam must be from the same stable, and as such is the first ard beam to have been found in Britain.

The Milton Loch ard-head and stilt (in the National Museum of Antiquities): In 1953, a crannog, or artificially constructed island built on a foundation of logs of alder, was excavated by Mrs C. M. Piggott.[6] Under the floor of the building erected on the crannog was found a wooden object, broken in antiquity, resembling a one-piece wooden spade with a triangular blade (fig. 3a). The upper surface of the head has two raised ridges with a groove between, and the upper end of the handle has been shaped to form a backwards curving hand grip, broadly resembling the wood or horn handles of the present-day Galloway peat spade.

Again, there can be no doubt that this is an ard head and stilt comparable

4 P.V. Glob, **Ard and Plough in Prehistoric Scandinavia** Aarhus 1951. 29-53, and 113-118 (English Summary).

5 Cf. S. Avitsur, **The Native Ard of Eretz-Israel** Tel Aviv 1965; A. G. Haudricourt et M. J.-B. Delamarre, **L'Homme et la Charrue** Paris 1955, Plate XII., 43, etc.

6 C. M. Piggott, Milton Loch Crannog I, in **Proceedings of the Society of Antiquaries of Scotland**, 1952-3. LXXXVII. 143-4.

to those from continental finds, and of the type that would have fitted into the mortise in the rear end of a beam like that from Lochmaben.

Whereas the Lochmaben beam had no context by which it could be dated, the ard-head and stilt must antedate the building of the crannog, which contained objects of the second century A.D. It was used and broken when deposited, probably as filling to help to level up the area below the floor. It can, therefore, be dated to about or before the second century A.D., and the Lochmaben beam may be tentatively ascribed to a similar period.[7]

The number of ard heads and stilts has lately been increased by a remarkable discovery in a peat bog at Virdifield in Shetland. Here, at a depth of six feet (182.88 cm.), two examples were found, one on each side of a straight bar of wood, 7 ft. 10½ ins. long (240 cm.). The dimensions of the heads, set out in Table II below, agree fairly closely with those of the Milton Loch and Irish ards. The chief difference lies in the lack of ridges and grooves on the upper surfaces of the Shetland heads, which have instead a hollowing on the top (Fig. 3, b-c). Experiment has shown that certain stone implements, possibly stone shares, [8] of which numbers have been found in Shetland and to a lesser extent in Orkney, fit reasonably well into these hollows. It may therefore be that we have here the parts of two ards formerly furnished with stone shares.[9]

In Table II, the dimensions of these and of similar wooden objects from Ireland[10] are brought together for comparison. It will be seen that all fall within the extreme limits of the Dϕstrup and Donneruplund ard-heads and stilts, except for the slightly larger one from Mayo (no. 9) which was found at a depth of 14 ft. (426.72 cm.) in a bog and is catalogued as a spade. Of the Irish specimens, those from Mayo (no. 6) and Clare (no. 5) are particularly close in appearance to the Shetland finds, with deeply chamfered edges on the under surface of the head.

A full discussion is not appropriate here, since the intention is merely to set the evidence from Galloway in its wider context.[11] At the same time it must be said that some care in interpretation is necessary since wooden spade blades, or the wooden core onto which an iron shoe was fitted, can also be arrow shaped. Caution is doubly necessary since the Irish and Scottish implements listed above all have straight handles, making them more spade like, whereas the Danish examples have curved stilts. Furthermore, spades are known to go back as far as the Bronze Age in Britain, since spade (or shovel) marks, of a kind that could have been made by a heart-shaped blade, have been uncovered in Bronze Age fields at Gwithian in Cornwall.[12] The chief diagnostic feature is

7 A. Fenton, Early and Traditional Cultivating Implements in Scotland, in **Proceedings of the Society of Antiquaries of Scotland** 1963-4 XCVI. 264 ff. Now radio-carbon dated in Copenhagen to 400 B.C. + or − 100.

8 For a discussion of the evidence, see A. Fenton, op. cit. 265-269.

9 Details and diagrams have been supplied by T. Henderson, Curator of the Shetland County Museum, where they are now on display.

10 I am indebted to Dr A. T. Lucas, Director of the National Museum of Ireland, and his colleague Dr J. Rafferty, for supplying photographs and details.

11 It is important that any finds of wooden objects in peat bogs should be notified immediately to the appropriate museum or authority, so that find spots can be recorded and preservative treatment given to prevent disintegraion or shrinkage and warping.

12 Megaw, J. V. S., Thomas, A. C., and Wailes, B., The Bronze Age Settlement at Gwithian, Cornwall, in **Proceedings of the West Cornwall Field Club,** 1960-1, II, 200-215.

TABLE II.

Dimensions of Ard Heads and Stilts from Scotland and Ireland

Area	Total Length	Blade Length	Blade Width
Scotland—			
1. Shetland	4 ft. 0.8 in. (124 cm.)	8.05 in. (20.45 cm.)	4.9 in. (12.5 cm.)
2. Shetland	4 ft. 1.4 in. (125.5 cm.)	8.5 in. (21.59 cm.)	4.1 in. (10.5 cm.)
3. Kirkcudbright	4 ft. 2½ in. (124.03 cm.)	11.6 in. (29.5 cm.)	5.25 in. (13.34 cm.)
Ireland—			
4. Armagh	3 ft. 11.6 in. (121 cm.)	9.03 in. (25.5 cm.)	6 in. (15.5 cm.)
5. Clare	3 ft. 2.2 in. (97 cm.)	10.86 in. (27.6 cm.)	6.4 in. (16.3 cm.)
6. Mayo	4 ft. 2.69 in. (128 cm.)	7.38 in. (18 cm.)	3.93 in. (10 cm.)
7. Sligo	3 ft. 0.2 in. (92 cm.)	8.85 in. (22.5 cm.)	6 in. (15.5 cm.)
8. Dublin	2 ft. 11¼ in. (89.5 cm.)		5¾ in. (14.5 cm.)
9. Mayo	4 ft. 9 in. (144.78 cm.)		
10. Tipperary	c. 4 ft. (122 cm.)		
Denmark—			
1. Donneruplund	94.5 cm. (3 ft. 1.2 in.)	8.5 cm. (3.35 in.)	c. 9.5 cm. (3.74 in). (broken)
2. Dostrup	146.5 cm. (4 ft. 7.6 in.)	33.5 cm. (13.3 in.)	13.5 cm. (5.32 in.)

the groove and ridges or stud marks on an ard-head, and on this basis the Milton Loch crannog find can be accepted as a genuine ard part.

The Pre-Eighteenth Century. In South-West Scotland, as in most other parts of the country, there are few material remains to fill the gap between prehistoric times and the eighteenth century. No spade or plough remains have been identified, but ploughshares and coulters are represented on two grave slabs from Lower Annandale in Dumfries.

One comes from Pennersaughs Graveyard in the parish of Middlebie. It is of Mid-Annandale gritstone, and measures 6 ft. 3 in. (190.5 cm.) long by 1 ft. 6 in. (45.72 cm.) broad by 9 ins. (22.86 cm.) thick. Incised in it is a double armed cross, below which is a deeply cut plough-share and tanged coulter (Plate IV (a)). The other came originally from the Hospice of the Knights of St. John, Kirkstyle, Cummertrees, and was built into the wall of Mount Kedar Free Church, Ruthwell. It is of red sandstone, measuring about 5 ft. 10 in. (177.8 cm.) long by 1 ft. 7 in. (48.26 cm.) wide by 4 in. (10.16 cm.) thick tapering a little towards the bottom. It bears a relief carving of a cross on a calvary of

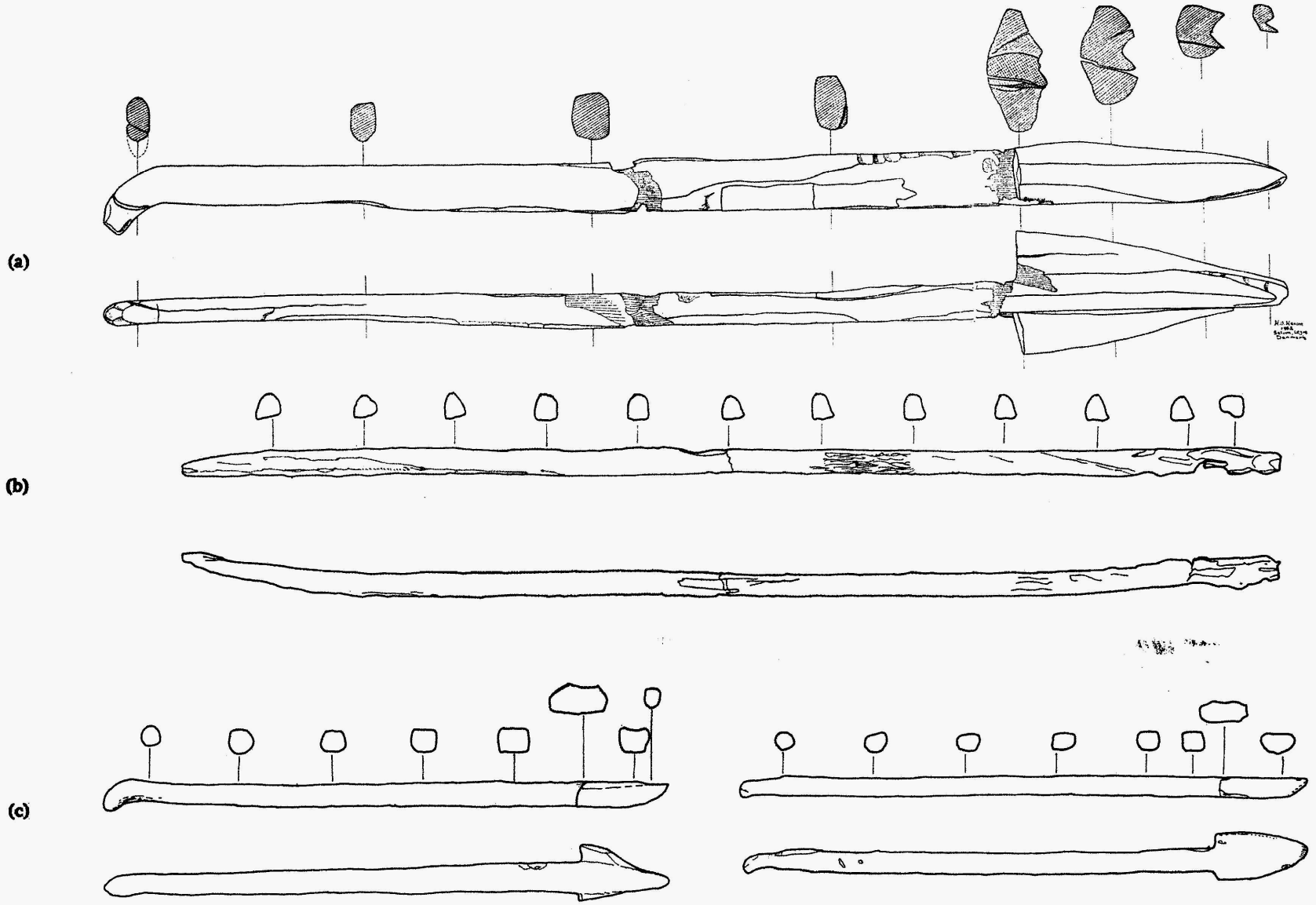


Fig. 3—(a) The Milton Loch ard-head and stilt. Arrangements for drawing the diagram were made by Professor A. Steensberg. Block lent by Society of Antiquaries of Scotland. (b, c) The finds from Virdfield, Shetland. Drawn by T. Henderson.

two steps (Plate IV (b)). The arms of the cross expand at the ends into lozenges, the intersection of the arms is surmounted by a square with indented corners, and four circles lie under the corners of the square within the angles of the arms. At one side of the cross is a sword with conventionally represented quillons and a lozenge-shaped pommel, at the other side is a tanged coulter and a ploughshare. The grouping of the objects and the character of the cross suggests a pre-Reformation date, possibly as far back as the mid-fourteenth century.[13] They are, therefore, the earliest recorded illustrations of plough parts in Scotland.

Both coulters have a blade and tang. The shares are symmetrical, in the form

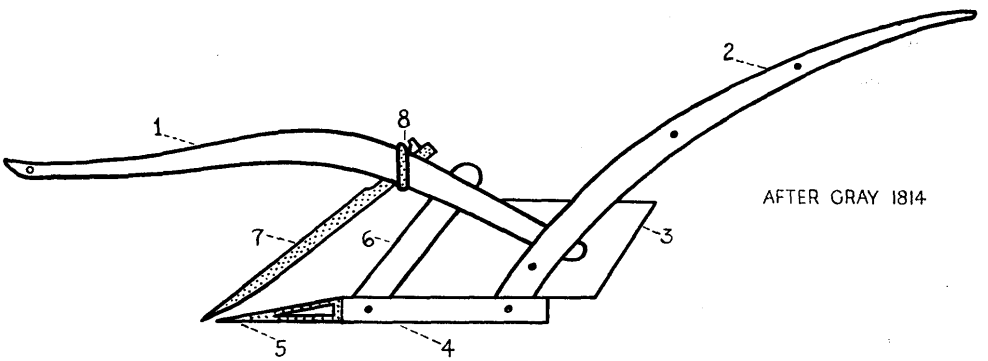


Fig. 4—The land side of the old Scotch plough, with its parts: 1, beam; 2, handle or stilt; 3, mould board; 4, sole; 5, share or sock; 6, sheath; 7, coulter; 8, band strengthening coulter mortice. After Gray, 1814.

of an isosceles triangle, the one from Pennersaughs having a socket on the short side. They appear solid, with no indication of the gridded construction of some surviving shares of the eighteenth-nineteenth centuries (fig. 6), though matching them in their pointed, symmetrical form. Their cognates appear on gravestones of the late seventeenth-eighteenth centuries in Perthshire, for example, where the tanged coulter and symmetrical share motif occurs on gravestones at Dunblane, Aberuthven and Forteviot.[14] This is to say that there is nothing about the medieval Dumfriesshire implements to suggest that they belonged to a type of plough other than the one that has come to be known, from documentary sources, as "the old Scotch plough."

The documentary evidence, though fuller, is still regrettably scanty, though research in sources like the inventories of goods in the Commissariat Records of Wigtown, from 1700-1800, and of Dumfries, from 1624-1800, will ultimately add to the present picture. From the sources to hand, the following extracts have been made:—

[13] I am indebted to A. E. Truckell, Dumfries Burgh Museum, for details additional to those given in **The Royal Commission on Ancient and Historical Monuments of Scotland, 7th Report, Dumfries,** Edinburgh 1920. 168, no. 469, and 181, no. 518.

1524-5. Amongst the goods belonging to Glenluce Abbey, looted by James Gordoun of Lochinvar, there were:

ix franche schod schulis, price of the pece xvid.

vi franche speddis, price of the pece ivd.[15]

The adjective suggests import from France, and the cost of the shod shovels, four times that of ordinary wooden spades, is probably due to the relative value of iron at that period.

1563. An inventory of goods sold in the market at Dumfries in the presence of the provost and two bailies included a spade at 10d., a shovel at 4d., and a plough with its irons at 25/3.

1563. The craftsmen and smiths of Dumfries agreed on the following prices for their work:

"The making of a pair of new plew Irnis the price iij ss. vjd. A feddir the price viij.d Ane nodding of ane (deleted) to ane coulter & ane sok the price vjd. The making of four new schone & nalies of ane manis awn Irne the price viij.d The making of ane flauch[t]ir spaid the price xxx.d The making of fwte spaid viij.d the making of ane peit spaid the price viij.d ane schule heid the price vj.d the graything of an ?Yok the price viij.d The making of ane plewche band the price vj.d the making of ane mussale & the pane the price vj.d . . ."

This unusually informative statement lists the essential metalwork of a wooden plough—the share (which could have a wing or feather), the coulter, the band round the beam strengthening the mortice into which the coulter tang fitted, and the muzzle by which the yoke was linked to the plough—as well as peat and turf cutting and general purpose spades and shovels.

1563. An inventory includes "the best yard spaid & peit spaid xiiij.d . . . the best schole fork & barrow comprysit to xij.d . . . the best plew Irnis & culter comprysit to xv ss . . . the best sok to iiij ss."

1575-6. Another inventory includes "ane pair of sokis & spurris . . . xxvij.d . . . the best harrowe the best barrow the best spaid and the best schule the best graip and fork the best cardis the best flauchter spaid the best pair of creills . . ., a greipe, price ij ss.—ane fut spaid price xviij.d—ane schule price viij. ane pleucht price iiij ss."[16]

16—Reference is made in the Customs Accounts to a boat that brought in timber of various kinds, including 12 spades and 12 plough beams,[17] surely a reflection on the scarcity of substantial home-grown timber in the area.

Such sources are tantalising for their brevity and lack of descriptive and background information. Quite otherwise, however, are the notes written by the Rev. A. Symson in 1684, under the stimulus of Sir Robert Sibbald, who already

14 D. Christison, Carvings . . . . on Kirkyard Monuments, in **Proceedings of the Society of Antiquaries of Scotland**, 190–2, XXXVI, 409.

15 R. C. Reid, **Wigtownshire Charters** (Scottish History Society), 1960, 63.

16 Extracted from the typescript **Early Dumfries Lists of Personal Belongings—16th and 17th Centuries**, transcribed from original documents and compiled by A. E. Truckell.

17 A. Murray, Customs Accounts, in **Transactions of the Dumfries and Galloway Natural History and Antiquarian Society, 1965, XLII., 132.**

at this date was attempting to accumulate topographical information about Scotland by means of a questionnaire. Symson was amongst his best informants, and on the question of cultivation, he described how in several parts of the Stewartry tilling was carried out by a team of four horses yoked abreast, " bound together to a small tree before, which a boy, or sometimes a woman leads, going backwards." Another man with a strong stick, about four feet long, " with an

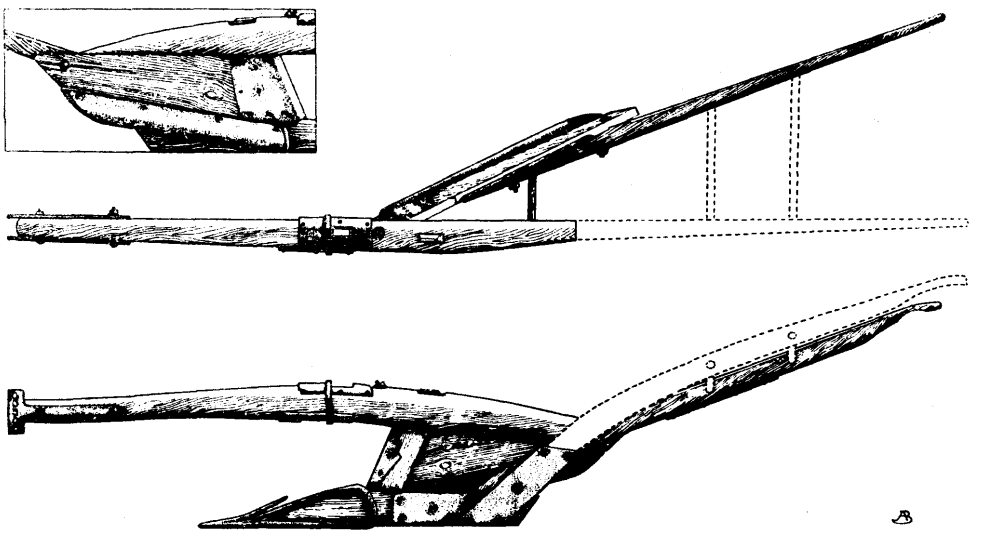


Fig. 5—The Chilcarroch Plough: (a) The land side, showing the rectangular framing; (b) Details of mould board and ground-wrest; (c) The marked angle between the line of the beam and the line of the share and land side.

iron-hook at the lowest end thereof, with which, being put into another iron, fastened to the end of the plough-beame, and leaning upon the upper end of the stick, and guiding it with his hands, he holds the plough-beam up or down, according as he finds the ground deep or shallow; the land, where they use this sort of tilling, being far more rocky and stonier than in the Shire,"[18] where ploughing was carried out by teams of eight or more usually ten oxen.

For the plough historian, interested in questions of draught and depth control, this is an important description. The team of four animals yoked abreast, often called the " broad plough," with a driver walking backwards in front of the animals, has been recorded in a number of parts of Scotland, on and to the West of the Highland Line, and in Caithness, Orkney, and Shetland.[19] By the late eighteenth century, with the development of improved plough types, this method of yoking had become a survival of a formerly more widespread practice, confined

18 A. Symson, op. cit., 75.
19 The First Statistical Account, of the 1790's, specifies teams of four animals abreast in parts of Aberdeenshire, Angus, Argyll, Caithness, Inverness, Kirkcudbright, Orkney, Perth, Ross, Shetland, Stirling and Sutherland.

to the upland areas. The team of four abreast was gradually replaced by teams of two by two, and in vignettes on a Caithness estate plan of 1772 teams of both kinds are shown at work, one of four oxen side by side, the other of four horses two by two.[20] Here, the change was under way but had not been fully completed.

Although the heavy type of old Scotch plough, discussed below, was drawn in most parts of the Scottish lowlands by teams of six to ten oxen, and occasionally twelve (in North-East Scotland only), or of horses and oxen mixed (with the horses preceding the oxen), the lighter upland plough was invariably drawn by four horses, described as light, and of the Highland breed, except in the flatter lands of Caithness, Orkney and Shetland where oxen were also used. It is not known how far back in time this type of team, and the light plough that it drew, can be traced, though the plough described by Symson in 1684 was presumably the light type of Scotch plough. The existence of the light version has not been generally realised by students of Scottish agrarian history. The use of a pole for pressing on the beam to adjust the ploughing depth, referred to by Symson, is not a unique phenomenon. It can be paralleled in, for example, Ayrshire[21] and Orkney. Until well into the eighteenth century, therefore, ploughing in South-West Scotland involved four draught horses and three people, one to control the horses, one to steer the plough, and one to assist in depth control.[22] Such a large force ceased to be economically or socially viable as the old joint-farming system with its associated run-rig broke up into individual units with enclosed fields.

This is, of course, equally true of the heavy eight to ten ox plough that Symson mentions with particular reference to the Stewartry, though without giving any physical details. For these, we have to wait until the eighteenth century.

The Old Scotch Plough. (Figs. 4-5). By the end of the eighteenth century the processes of change had gone far in many parts of Scotland. Nevertheless, some elements of the farming practice of an earlier period survived into the nineteenth century, and amongst the most persistent of these was the old Scotch plough in both its light and heavy forms. In the course of the eighteenth century it began to be complemented rather than replaced by ploughs of English make, notably the Rotherham plough, with curved, pot-metal mouldboards, imported in part via Carlisle, by chain ploughs of the type patented by James Small, and by hybrids such as the Scotch plough with an English mould-board. At first the pressure of innovation reached the improving lairds, the trend-setters of their communities, from across the English Border and from the Lothians. Later, the influence of types like that made to the North by Mr Wilkie in Lanarkshire became stronger.

Nevertheless, even after these new types had been well established, some farmers in certain areas still maintained a pair of Scotch ploughs, a heavy one

20 R. S. Megaw, Farming and Fishing Scenes on a Caithness Plan, 1772, in Scottish Studies, 1962, VI., 218-223, and Plates X-XI.
21 Old Statistical Account, 1793, IX., 536.
22 See A. Fenton, op. cit., Plate XLVII., 1, for a 19th century illustration.

for breaking in ley and tilling stiff or strong ground, and a lighter one for stubble and previously cultivated fields.[23] This use of a pair was noted just over a decade earlier by Andrew Wight, who said that James Rome, tenant of the farm of Inglestone-lodge, on the property of Mr Heron of Heron, had

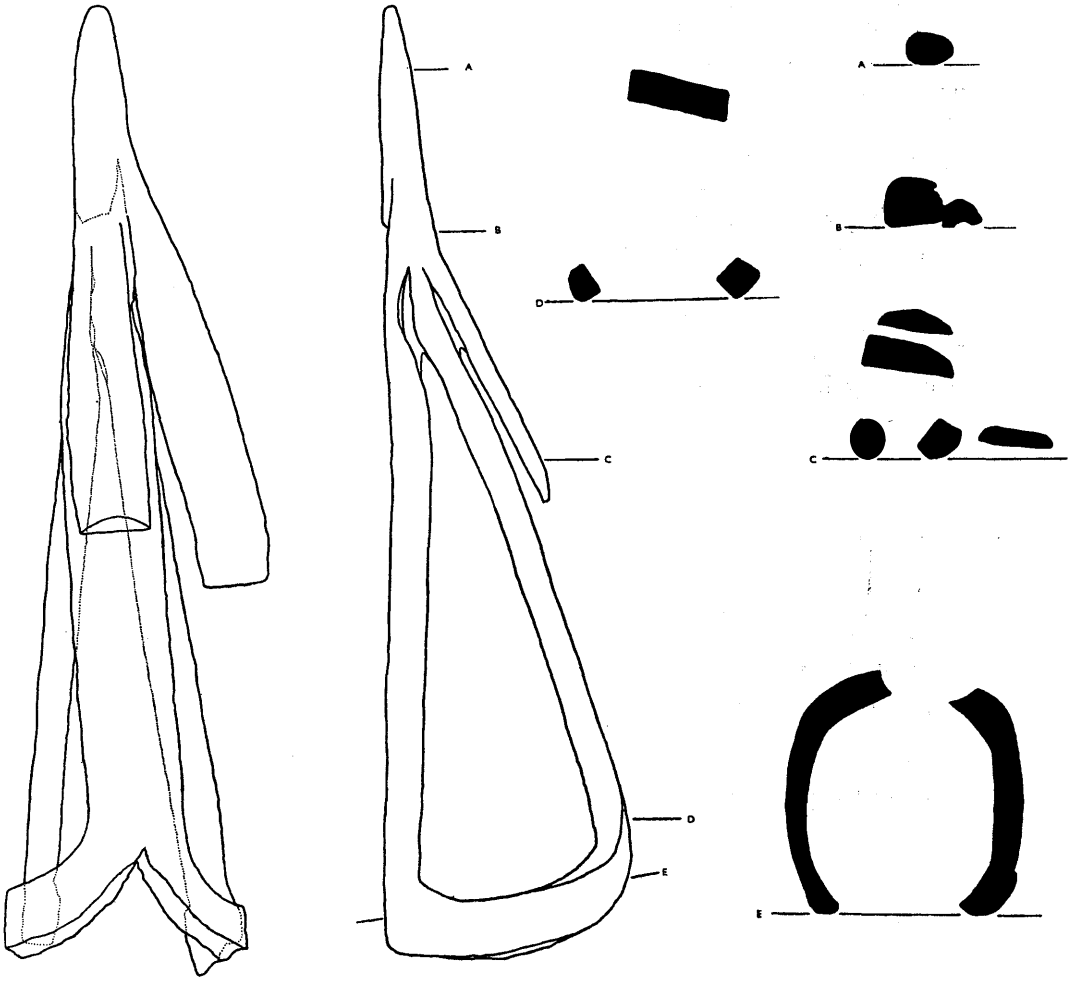


Fig. 6—(a) The grid share from the Chilcarroch plough.

broken in a steep lying area by first opening it into ridges with a heavy plough drawn by six large oxen accompanied by three men, and then completing the raising of the ridges by a lighter four-horse plough.[24]

A consequence of the improvements was the reduction in size of plough teams, and the giving up of the traditional use of oxen in the heavy plough. In 1745 the Earl of Stair maintained seventeen plough oxen, worth £4 each, at

23 Old Statistical Account, 1793, IV., 220-1.
24 A. Wight, Present State of Husbandry in Scotland, Edinburgh, 1784, III., Pl. I., 61-2.

Culhorn.[25] About the same period, the parishes of Twynholm and Kirkbean had used teams of four oxen and two horses, and in Tongland, six oxen and two horses or eight oxen and two horses.[26] By the 1790's, a team of two horses, or three in stiff land, had become fairly standard. On the other hand, a school of thought amongst the improvers of the period, in England as in Scotland, advocated oxen in preference to horses, some, like Lord Kames, speaking in quite impassioned terms:

"There is not in agriculture any other improvement that equals the using oxen instead of horses: they are equally tractable; and they are purchased and maintained at much less expense. As this improvement is obvious to the meanest capacity, one might expect to see every farmer greedily embracing it, as he would a feast after being famished. Yet few stir. How is this to be accounted for? Men are led by custom in chains; and in instances without number are fettered against their interest. 'And why should we pretend to be wiser than our fathers?' they will say modestly, or rather obstinately."[27]

There is, of course, plenty of evidence for the use of oxen in various parts of the country by "our fathers," but Lord Kames was no doubt carried away by the spirit of his declamation. His book was widely read and his advice taken by some improvers, and this may explain why at the end of the eighteenth century Lord Daer revived the use of oxen in Twynholm parish, and why the farm of Raehills in Johnston parish had six labouring oxen in the 1790's, and why Admiral Keith Stewart of Glasserton "zealously adopted" them for drawing the cart and plough in the 1780's.[28] Stewart's practice was to select the stoutest and largest boned oxen from amongst those imported from Ireland on their way to England. At the age of four, they were yoked in the draught and worked for four years. In the ninth year they were fattened for the butcher. According to Wight, they were harnessed to the plough in the same manner as horses, an innovation that spread rapidly throughout Scotland and England in the period c. 1770-1800. The collar was open at the bottom, so that it could be dropped over the neck of the ox instead of being put on, as for a horse, upside down over the head and then turned. Stewart found that if the oxen were fed well with hay, straw, or occasionally potatoes, with a small weekly allowance of corn, they had nearly the same strength as a draught of horses. Their pace was much slower, however, so that three ploughs drawn by oxen did not usually carry out more work than two ploughs drawn by horses. This was partly balanced by the fact that the expense of feeding a working bullock was half that of a working horse, but in the event, the revival of the use of the ox in the plough barely survived the turn of the century.

The big teams of horses and oxen mixed, like the teams of four horses abreast, required a man to control the animals (sometimes known as the gadsman, from his use of a sharp-pointed ox-goad), and another man between

25 A. Agnew, **The Hereditary Sheriffs of Galloway**, Edinburgh, 1873, II., 326.
26 **Old Statistical Account**, IX., 1793, 326-7; XV., 1795, 83, 125.
27 Henry Home, Lord Kames, **The Gentleman Farmer**, Edinburgh, 1776, 26-27.
28 A. Wight, op. cit., 133; **Old Statistical Account**, 1796, XVII., 591-2; Ib. IV., 1793, 221.

the plough-stilts. One of the great innovations consequent on the widespread adoption of improved ploughs, the increase in use of light versions of the old Scotch plough, and the reduction in size of the plough team to two, was the arrangement whereby the ploughman between the stilts himself controlled the

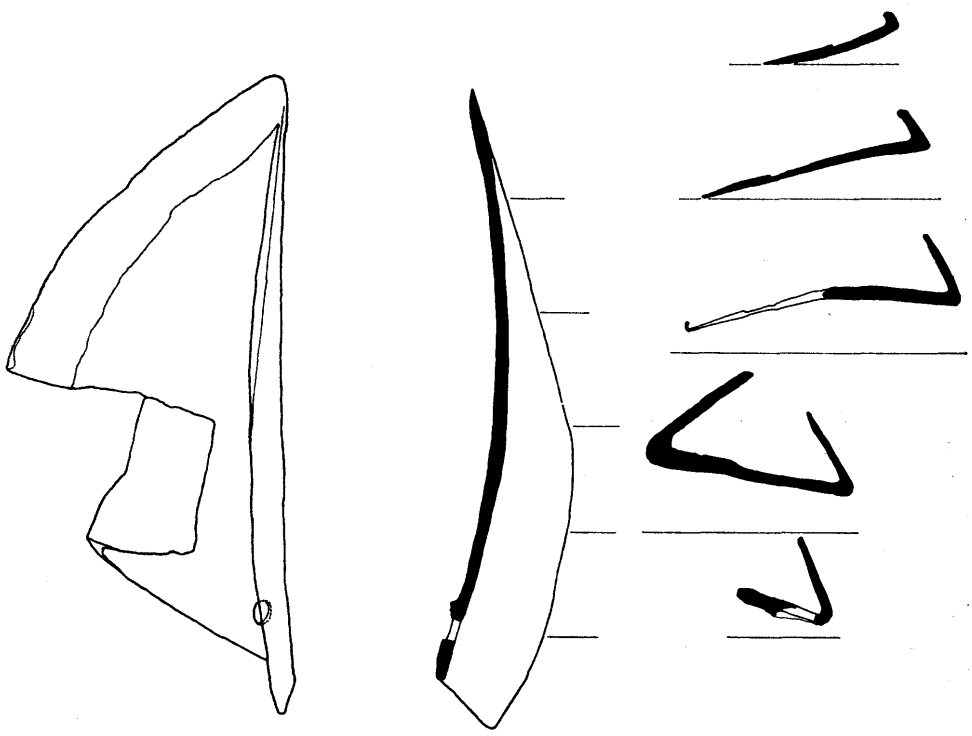


Fig 6—(b) The wing share from the Chilcarroch plough.

horses with reins. In this way, a farmer required only one man and two horses where formerly he had had to maintain two men and anything up to ten animals. The economic gain to the farmer is self-evident.

Galloway is the only part of Scotland where an example of the heavy form of the old Scotch plough survives. It is now preserved in the Stranraer County Museum, and a full-scale replica is being made at the time of writing for the National Museum. The plough is known to have come from the farm of Chilcarroch, where it probably started its life. It then went to the farm of Culbae, Whauphill, and later to High Elrig, where it lay on the rafters for eighty years before going to the Museum. It is thought locally that it may have come to Chilcarroch about 1793.[29] It is therefore possible to get an accurate idea of the old Scotch plough, instead of depending on documentary sources of information.

29 For a preliminary note, see A. Fenton, The Chilcarroch Plough, in **Scottish Studies**, 1964, VIII., 80-84.

The Chilcarroch plough (fig. 5) is built entirely of wood, except for the iron bridle to which the yoke was attached, the pair of iron shares, the iron band and top and bottom plates strengthening the mortise in the beam that held the coulter (now missing), the iron plates protecting the land side, the front of the sheath, the ground wrest, and under part of the sole from excessive wear, the bolts by which the mouldboard is attached to the right hand stilt, and the long bolt running from the beam, through the sheath, and into the sole. The beam is tongued into a mortise in the left hand stilt, which has, unfortunately, been broken off at this point and is missing. The upper two of the three wooden rungs that linked the stilts are also missing. The beam, the sheath, the lower part of the left hand stilt, and the sole, are tongued and mortised together to make a sturdy rectangular frame. The sheath slopes back slightly as it rises from sole to beam.

The flat wooden mould-board, 1½ in. (3.8 cm.) thick, is fixed to the sheath at the front end (the joint being covered with metal), and to the right hand stilt by an iron bolt and a wooden dowel peg at the back. It overlies a sturdy ground wrest, 4 in. (10.2 cm.) deep by 3 in. (7.6 cm.) wide. Ground wrest and mould-board together measure 12.5 in. (31.8 cm.) deep at the front, 10 in. (25.4 cm.) deep at the back (taking each of these measurements vertically), 3 ft. (91.4 cm.) long at the top, and 28 ins. (71.1 cm.) long at the bottom. They are upswept so that the ground wrest is 7 in. (17.8 cm.) higher above the base of the sole at its rear end than at the front (Fig. 5b).

The length and upward sweep are functionally well adapted for ploughing soil into ridges, where the furrow has to be cut and raised up so as to add to the depth of soil on the ridge. The sweep of the mouldboard, combined with the width of the plough body, and almost certainly also the angle at which the plough was held, were designed to achieve this effect.

The sole is 2 ft. 9 in. (83.82 cm.) long by 4 in. (10.16 cm.) square and its head tapers to fit the sockets of the shares. One share is pointed and of an open, gridded construction (grid share), suitable for use in stiff, stony soil. It is almost, but not entirely, symmetrical, since the land side has a slight flattening (fig. 6a) and the furrow side has a small feather. The top bar is protected by an additional piece, springing from the point. The addition of a feather to a grid share was sometimes done when it was intended to open up old ley ground,[30] a purpose for which the old Scotch plough was frequently retained alongside its improved brethren to complement their feebler efforts. Grid shares with feathers also occur on gravestones of 1784 and 1794 at Thornton in Fife.[31] The grid share is 2 ft. 1 in. (63.5 cm.) long by 7½ in. (19.05 cm.) wide at the back, easily the longest so far found in Scotland. Even so, the point has been worn down by use. The extreme length is due to the fact that Mr Milhench, the blacksmith at Mochrum Smiddy who dressed this share, put on an extra long point so that it would not need re-doing at a busy period. The second share (fig. 6b) has a feather or wing (wing share) suitable for cutting

30 Dr Singer, **General View of the Agriculture of Dumfries,** Edinburgh, 1812, 127.
31 D. Christison, op. cit., 409.

through roots in weed infested soils, allowing the furrow slice to rise cleanly, and destroying root weeds by cutting them low down. It is much smaller than the other, measuring 1 ft. 3 in. by 7.1 in (38.1 x 18.03 cm.) across the wing.

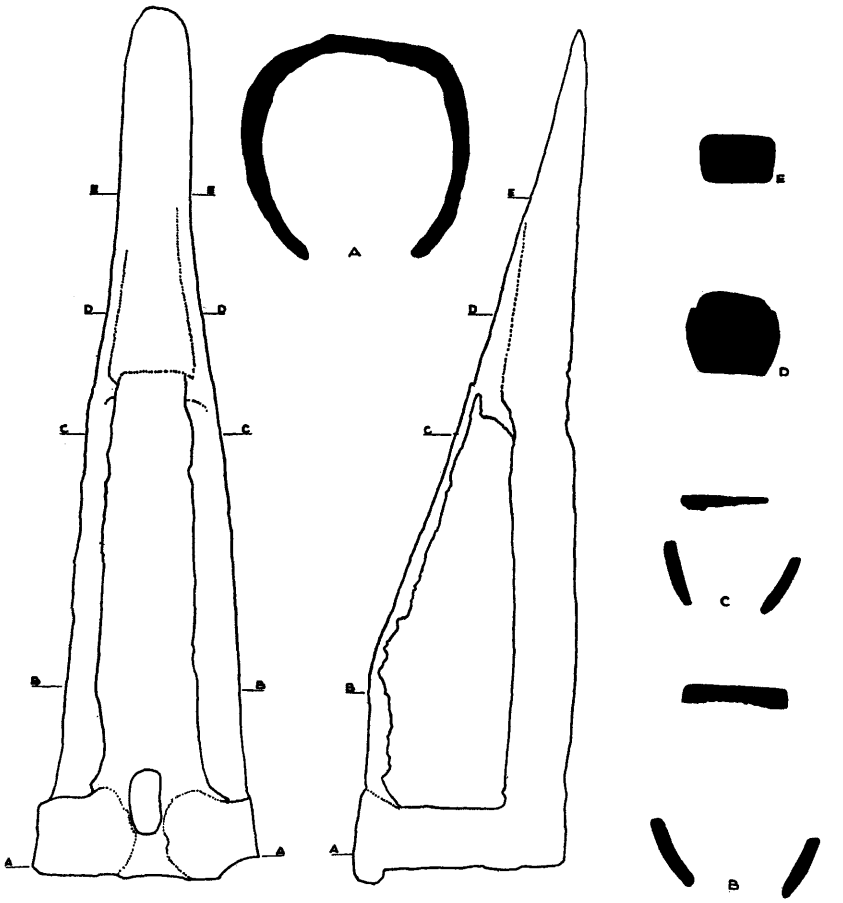


Fig. 6—(c) The Thornhill share.

Though the coulter is now missing, it is very likely to have been similar to that described by A. Dickson in his discussion of the old Scotch plough, i.e., about 2 ft. 10 in. (86.36 cm.) long by 2½ in. (6.35 cm.) broad, sharp in front where it cut into the soil, and "thick on the back, like a knife." It was fixed in position in the coulter mortise in the beam by wedges, by which it could be adjusted so that the coulter point was level with or a little in front of that of the share, and in a line with the land side of the plough. It sloped forward from the beam to the point, the slant improving its cutting action, and helping to prevent the plough from being thrown out when an obstacle was encountered.[32] (Fig. 7).

32 A. Dickson, **Treatise of Agriculture**, Edinburgh, 1770, 188-191.

The sole of the Chilcarroch plough, at 2 ft. 9 in. (83.82 cm.) is well above the average of 1 ft. 10 in. (55.88 cm.) referred to by Dickson and indeed with the grid share in position it goes up to 3 ft. 8½ in. (112.93 cm.) Though giving rise to increased friction, this would have made for steadiness. Dickson also said that the share should be set with the point turned a little to the land,[33] and this is a marked feature of the Chilcarroch plough when the grid share is mounted on the sole (fig. 5c). The length of this share would also make the plough go deeper, so that these three features, the length of the sole with the share in position, the length of the share point, and its angle to the land, would combine with the long, flat mouldboard to make considerable friction, hence the need for a large team. The plough was undoubtedly intended for making a strong, deep furrow, for which a team of six or more animals would have been appropriate.

Another piece of concrete evidence of the old Scotch plough takes the form of a grid share (fig. 6c and Plate Va), found in the grounds of Thornhill Museum when its collection was being dispersed in 1965. It measures 1 ft 6 in. by 4.6 in. (44.76 cm. x 11.8 cm.) across, and has an oval opening 1.4 x 0.6 in. (3.56 cm. x 1.5 cm.) in the topmost bar near the socket end. It has clearly been subjected to a good deal of use. The wooden plough of which it formed part, presumably of the old Scotch type, was also in the grounds, but no trace of it can now be found.

Stranraer Museum contains another iron share (fig. 6d and Plate Vb) from Chilcarroch, but of a later vintage than those described above. It is a wing share, with an elongated point, 1 ft. 8.5 in. (62.07 cm.) long by 5.8 in. (14.73 cm.) across the rather narrow wing. Like the grid shares, it is intended for work in stiff, stony soil, such as there is in the fields of Chilcarroch farm. It is socketed, however, for attachment to the head of an iron sole, and was therefore used on a plough of a later type.

In the area under discussion, there is little indication of the general use of plough types other than the heavy and light versions of the old Scotch plough, until well through the eighteenth century. One reference to a one-way or reversible plough suggests that this was a completely unfamiliar implement. The farmer at Inglestone-lodge said that for breaking in a steep area:

"Though I made shifting mould ploughs, we got very little use of them; for, when the men came to lay the furrows to the left hand, it came as awkward to them as writing with the left hand to a clerk; therefore they drove the horses up the easiest way empty, and came downhill with a furrow; in this way they did it surprisingly soon."[34]

Partly because a light version had been developed possibly as early as the seventeenth century, and partly because of its suitability for stiff, stony soil, the old Scotch plough was not readily given up in some areas, such as the parish of Glasserton, where it was actually preferred to Small's chain plough,[35]

33 A. Dickson, op. cit., 162-3, 182-7.
34 A. Wight, op. cit., 61-2.
35 Old Statistical Account, 1795, XVII., 584-5.

By the end of the first decade of the nineteenth century it had more or less gone completely out of regular use, and its epitaph written as follows in 1814:

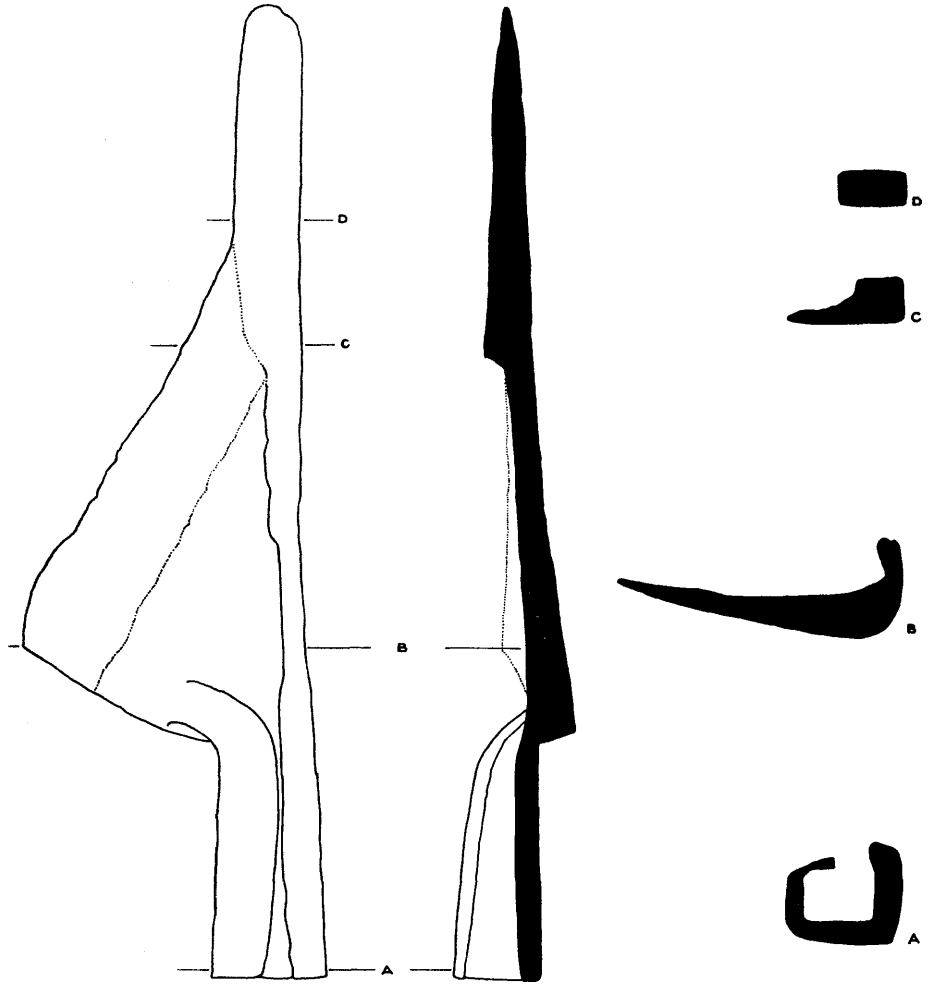


Fig. 6—(d) The Chilcarroch share for a plough with an iron sole.

"The old Scotch plough, but with some improvements, and of neater workmanship, long maintained its reputation from the idea that the broken stony lands of Galloway were not adapted for any other. But it is now found that ploughs on the model of Small's, with the latest improvements made upon it, answer much better on almost every species of soil; and that the additional expense is more than compensated by durability arising from superior workmanship."[36]

The strength of the old tradition, reinforced by the nature of the soil, led

36 S. Smith, **General View of the Agriculture of Galloway**, London, 1814, 99-100.

to the continued use of a grid share on improved plough types, as part of a set of up to three shares, including two wing shares, of which one had a broader wing for leys, and in the smithies were to be seen moulds in which the smiths could shape new shares, or re-lay old ones when worn.[37]

The situation towards the end of the eighteenth century, then, was mixed, with old and new types in use in different areas, and sometimes in the same area, depending on soil conditions, on the improving or traditional nature of the farmer or landlord, the stimulating effect of Agricultural Societies like the one in Dumfries that encouraged the use of the "English" plough, and on the position of the district in relation to lines of influence from Northern England, South-East Scotland, and a little later from the Glasgow area. Soil type was one of the strongest conditioning factors, leading to the use of the "English" plough, or those of Small's type, on soils free of stones, the old Scotch plough in stony land, and the Scotch plough with the curved mouldboard of the English plough on soils of intermediate type.[38]

The Improved Ploughs:

1. The Rotherham Plough (fig. 8): This was one of the earliest of the improved plough designs in Britain to have a wide influence outside the immediate area of their appearance. It was patented by Joseph Foljambe, of Eastwood in the West Riding of Yorkshire, and Mr Stanyforth, of Firbeck, in 1730, and registered in the Patents for Inventions as a swing plough, made of wood except for the bridle and irons, with a curved mouldboard plated with iron. Its great novelty lay in the way in which the left hand stilt was brought down to meet the base of the sheath. This meant that the sole was almost non-existent, and a wooden wedge was fixed under the lower part of the main stilt to act as a heel to give the plough manoeuvrability.[39]

According to a survey of the West Riding of Yorkshire by three East Lothian farmers in 1793, the Rotherham plough was "commonly called the Dutch plough,"[40] suggesting the influence of the Low Countries. On some examples, the upper half of the mouldboard was of wood and the lower half of cast iron, to resist wear.[41] The share was rather broader in the point than those they were accustomed to use at home.

By this date, 1793, the Rotherham plough was used all over the West Riding, and had indeed spread widely in Northern and Eastern England, and was beginning to displace ploughs with wheeled forecarriages in the more southerly areas. In Scotland, it can be seen from the Old Statistical Account that "English" ploughs, drawn by two horses, were known in Aberdeenshire, Angus, Argyll, Ayr, Banff, Berwick, Dumfries, East Lothian, Fife, Inverness, Kincardine, Kirkcudbright, Moray, Nairn, Peebles, Perth, Renfrew, Ross, Rox-

37 Dr Singer, op. cit., 128.
38 B. Johnston, **General View of the Agriculture of Dumfries, 1794**, 41; J. Webster, **General View of the Agriculture of of Galloway**, Edinburgh, 1794, 14; et al. (especially the **Old Statistical Account**).
39 T. B. Passmore, **The English Plough**, London, 1939, 14.
40 R. Brown, **General View of the Agriculture of the West Riding of Yorkshire**, Edinburgh, 1799, 53.
41 Messrs Rennie, Broun and Sheriff, **General View of the Agriculture of the West Riding of Yorkshire**, London, 1794, 34 (R. Brown's edition of 1799 is an extended version).

burgh, and Wigtown. A number of English ploughs, some of them old, are listed in an inventory of 1747 for the Earl of Galloway's estate in Orkney.[42] There can therefore be little doubt of its widespread popularity.

An interesting feature of the Rotherham plough was the way in which the

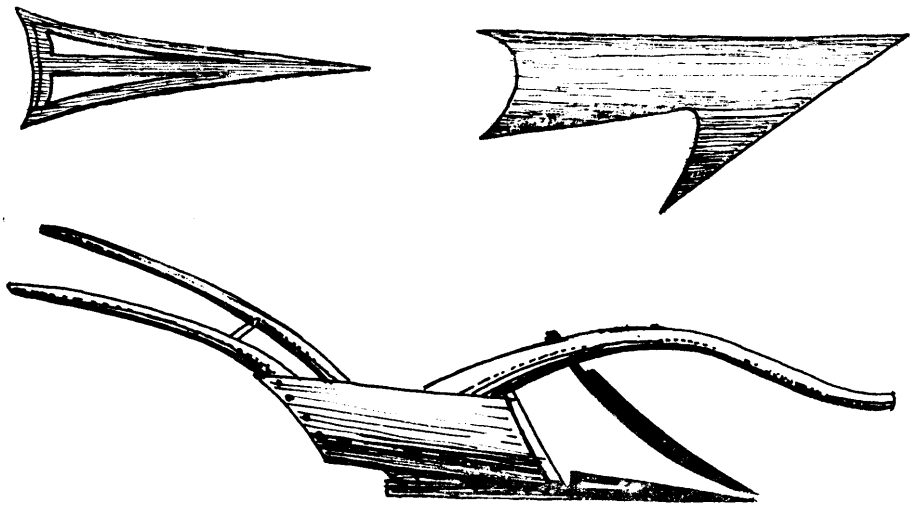


Fig. 7—The furrow side of the old Scotch plough, and its pair of shares. After Dickson, 1770.

beam was turned considerably to the furrow, in order to give the plough more land, i.e., to make it cut a wider slice of earth. This meant that the share and coulter were at an angle to the line of draught, pushing in to the land, with a consequent increase in friction. The reason was said to be because of the prevalent custom of yoking the horses in line ahead, one by one, a method no doubt intended to prevent the ploughed land from being trodden down and hardened into clods as might happen in wet conditions, which must have been frequent before the development of underground field drainage. The same custom was observed, however, even when horses were yoked abreast.[43] Since this is exactly paralleled on the Chilcarroch plough, the possibility arises that as it survives in the Rotherham plough, it is a relict feature, carried over from earlier ploughs, that crept back into the form of the new plough as individuals adapted it to their own traditional ideas.

A curious point is that the illustration (fig. 8) in the 1799 edition of the General View of the Agriculture of the West Riding shows a left-handed plough, with the mouldboard on the left instead of the right side, as is more usual. The surveyors make no specific reference to this, and since it does not appear in other known illustrations of the Rotherham plough, and is unusual on British swing ploughs of any kind, it is better to treat the diagram with some care. It

42 H. Marwick, Inventory of House or Place of Burray, 1747, in **Proceedings of the Orkney Antiquarian Society**, 1934, XII., 48 ff.
43 R. Brown, op. cit., 53.

is not, of course, an impossibility, and occurs in parts of Europe where ploughing has to be done in steep terrain.

2. James Small's Plough (fig. 9). James Small, the son of a Berwickshire farmer, served an apprenticeship as a ploughmaker to a country carpenter at Hutton. Between about 1758-63 he lived and worked at Doncaster, where he saw and studied the Rotherham plough. On his return to Scotland he settled at Blackadder Mount, Berwickshire, set up a manufactory of ploughs and other agricultural equipment, and began carrying out experiments on the construction of ploughs. It appears that he started with the old Scotch plough and gradually improved it by combining with it the main features of the Rotherham plough.

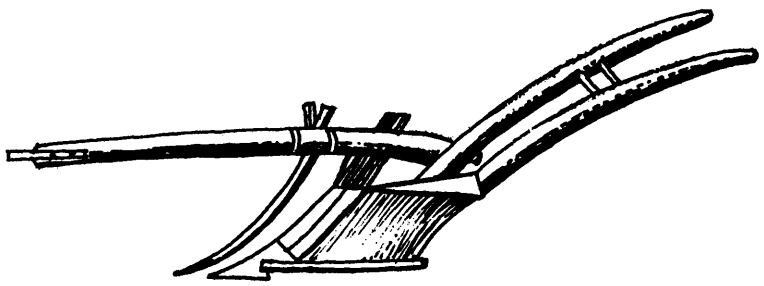


Fig. 8—The Rotherham plough in a left-sided form. After Brown, 1799.

Whatever the exact details of the origin of the plough that Small patented about 1767—and there are undoubtedly some obscurities in the story[44]—the fact remains that he produced an instrument that had a profound effect on farming in Scotland and beyond, having found its way to the Isle of Man by the 1790's,[45] for example, and to Sweden in 1803, where a factory for making it, at first largely staffed by Scottish smiths, was established.[46]

The two main features of Small's plough are the same as those of the Rotherham, i.e., a curved mouldboard and a triangular body form, resulting in a short sole. In addition, Small at first fixed a chain from the bridle to a hook on the underside of the beam, whence the name chain-plough, and paid a great deal of attention to the position of the share, and of the coulter in relation to the land side of the plough, both of which he aimed at making perpendicular, flat, and in line with the draught. He shaped the beam so that the coulter mortise could be brought over to the correct position for this. Without going further into the technical details[47] it may be said that Small's outstanding contribution to plough history and to agricultural progress was the shaping, to some extent by experiment, of a plough on modern principles, in which the defects of the old Scotch plough, and of the Rotherham plough as Rennie,

44 J. Sinclair, **Appendix to The General Report of the Agricultural State of Scotland,** Edinburgh, 1814, I., 352-359.
45 B. Quayle, **General View of the Agriculture of the Isle of Man,** London, 1794, 19. 27 ff., and 81.
46 N.-A. Bringéus, **Järnplogen som innovation** (the iron plough as an innovation), Lund, 1962.
47 A full description appears in J. Small, **A Treatise on Ploughs and Wheel Carriages,** Edinburgh, 1784.

Brown, and Sherriff saw it, were eradicated. It achieved lightness and grace, and was versatile enough to work in a variety of soil types, especially where the land had been previously broken in for cultivation. It also brought the all iron plough a step nearer, since in 1779 or 1780, Small took a wooden pattern for his curved mouldboard to the Carron Company (established 1759) in

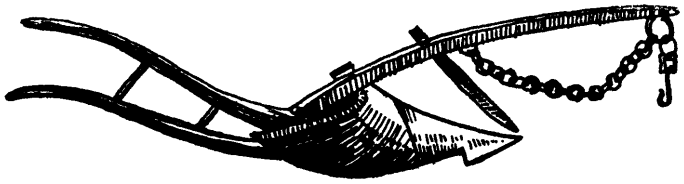


Fig. 9—James Small's chain plough. After Lord Kames, 1776.

Falkirk, where he had it cast in iron. A few years later, he also had the sheath and plough head cast in iron.[48] The firm of Gray of Uddingston, Glasgow, was probably the first in Scotland to make a plough entirely of iron, about 1803-4, though iron ploughs had been in use in parts of England for some years before this.

3. James Wilkie's Plough (Fig. 10). James Wilkie's plough began to play its part in the agriculture of South-West Scotland in the first decade of the nineteenth century. It was made at "Uddieston" (Uddingston), near Hamilton, in Lanarkshire, essentially as a version of Small's plough, adapted to suit local conditions. It was quite flat and perpendicular on the land side, the stilts were arranged to allow the ploughman to walk comfortably in the bottom of the furrow, and the twist of the mouldboard was changed slightly and made less hollow, to help to lay the furrow slice more neatly on edge. Like Small's, Wilkie's plough was originally of wood. A cast-iron sheath then replaced the wooden one, and ultimately it was made entirely in iron. Between about 1801-12 Wilkie constructed about 2500 of them. They were popular in Ayrshire, whence they spread to Annandale, where one farmer was said to have "run a plough of Wilkie's construction for nine years, without finding a loose pin in it." Wilkie's alterations made it rather more suitable for stony land, and less easily choked in rough stubble. In the area of Lanarkshire and Ayrshire it was more popular than Small's plough, and indeed Dr Singer said of it that it was "considered, by men of eminent observation, as the best plough ever invented."[49]

Ploughing Matches. In the dissemination of new plough types, an important part was played by the ploughing matches organised by local Agricultural Societies, often with the encouragement of the Highland and Agricultural Society. One was instituted at Dumfries in 1776,[50] two in Wigtownshire about 1800, one in Castle-Douglas in 1809.[51] At some of these matches, it is said that "ploughs

48 J. Sincair, op. cit., 356.
49 Dr Singer, op. cit., 129, 645-6.
50 The medal collection in the National Museum includes two presented by the Dumfries Agricultural Society, one of them to "Robert Riddell of Glenriddell." See R. W. Cochran-Patrick, **Catalogue of the Medals of Scotland,** Edinburgh, 1884, 181, No. 19.
51 S. Smith, op. cit., 356-9.

were brought from Roxburghshire, Berwickshire, Northumberland, and other counties, the most celebrated for agriculture. Their respective merits being

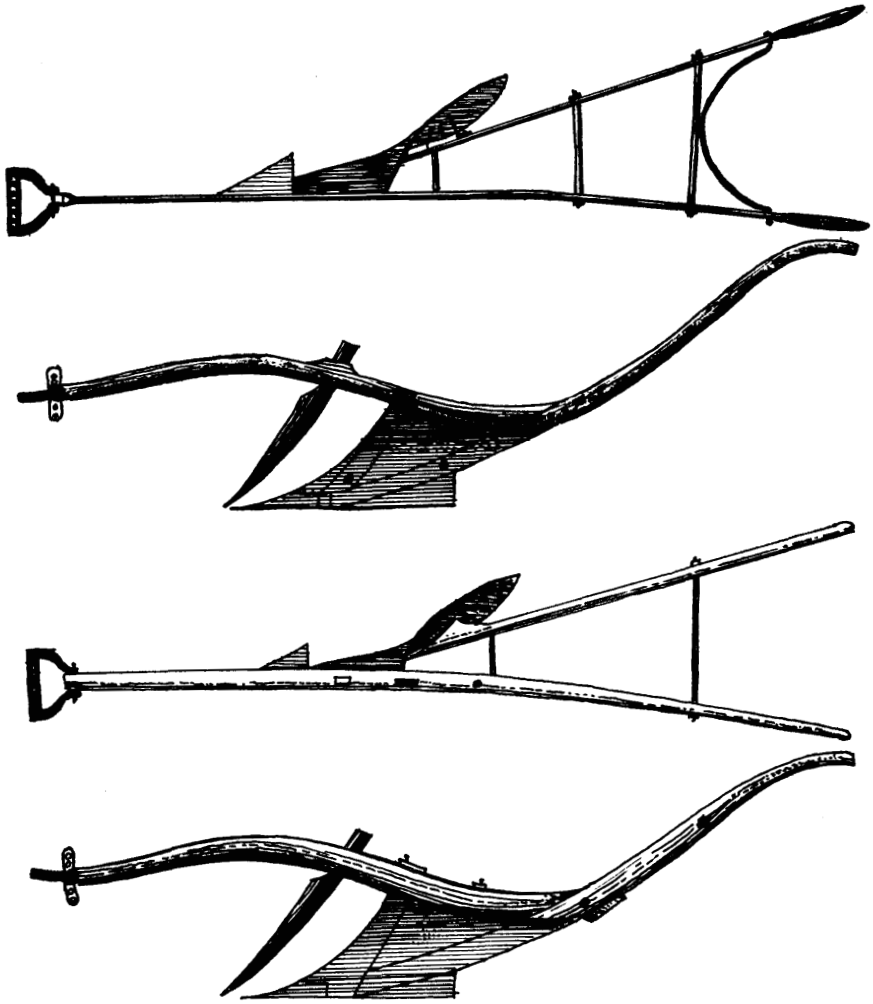


Fig. 10—James Wilkie's plough: (a) in its wooden form; (b) in its iron form. After Singer, 1812.

accurately ascertained; the tradesmen in the county afterwards copied from the most approved models among them, and soon equalled the originals."[52]

The result of this activity was that by the middle of the nineteenth century, iron ploughs were almost universal, all in some degree descended from Small's and Wilkie's ploughs which by this time had developed recognisable regional forms geographically located in East Lothian, Midlothian, and Lanarkshire. The

52 S. Smith, op. cit., 100.

Second Statistical Account, of 1845, shows that in Dumfries the iron plough, costing £3-£3.10, had almost, but still not entirely, supplanted the old Scotch plough. In the parish of Applegarth and Sibbaldbie the "Lothian" plough, complete, cost £2.12.6, whereas the old Scotch plough cost £1.11.6. In Wigtown an iron plough varied between £3.10 to £4, with iron drill ploughs at £3, and in

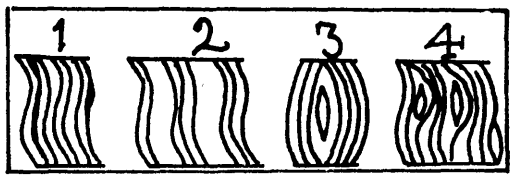


Fig. 11—Curved plough ridges: 1, The most general form, of fairly even breadth; 2, Of unequal breadths; 3, Noted in Lincolnshire; 4, Noted in Ayrshire in the 1820s. After Robertson, 1829.

Kirkcudbright they were most expensive of all, at £4.10 to £5. Thirty iron ploughs took part in the Agricultural Society's ploughing match at Carsphairn in 1838.

From about the middle of the nineteenth century a number of firms were pushing their wares. English makes by Ransome and by Howard, American makes like the Oliver (from about 1870), ploughs of good Scottish descent like those of Sellars of Huntly (after about 1900), Gray of Uddingston, and so on, all appeared on the scene, and began to be disseminated by the familiar method of display and temptation at ploughing matches and agricultural shows, and by general advertisement. These must often have failed to compete, however, with ploughs of more indigenous types made by local smiths, but the details of the spread of these incoming types is as yet unknown, and remains to be picked out from any surviving account books of the firms involved.

The Steam Plough. Steam ploughing has played little part in the agricultural advancement of Dumfries and Galloway, though the Lochar Moss in Dumfries has the honour of being the site where the earliest steam plough appears to have disappeared. In 1832, a lace-maker, John Heathcoat, M.P. for Tiverton in Devon, and Josiah Parks, a drainage engineer, patented a steam plough with a power unit on tracks and a plough hauled by a flexible iron plated belt (wire rope not having been invented) wound on to a revolving drum. Five years later, the Highland and Agricultural Society of Scotland offered a prize of £500 for a successful system of cultivation by steam power, and awarded Heathcoat £100 towards the cost of transporting his equipment, mainly by sea, to Dumfriesshire, to coincide with the time of the Highland Show there. The tackle was set up on the Lochar Moss and astonished the good people of the countryside by ploughing eight acres of bog in twelve hours. The judges thought the plough also had possibilities for dealing with ordinary land.

A report in the Transactions of the Highland and Agricultural Society for

1838/9 gives a brief description of the machine and its method of working. The engine itself was mounted on a platform between two large skeleton drums, giving an over-all length of 26 ft. (792.48 cm.) and a width of 21 ft. (640.08 cm.). Endless bands of lengths of wood joined by flexible iron bands formed the track (an early experiment in the series that led to the caterpillar track), and distributed the

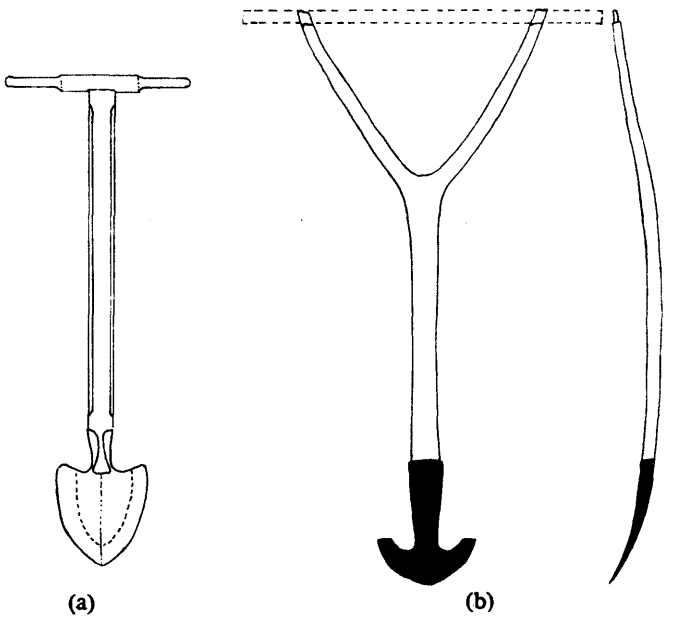


Fig. 12—(a) A flaughter or paring spade made by Rigg and Sons; (b) Another with a Y-shaped handle (cross bar missing at top), from Craigcaffie, Wigtownshire. Drawn by S. Pilling, County Museum, Stranraer.

total weight of 30 tons (including 6 tons of coal) so adequately that pressure on the ground amounted to only 1 lb. per square inch, enabling it to work on soft ground.

The ploughs, weighing 12½ cwt. and cutting a furrow 2 ft. (60.96 cm.) wide, were drawn at 2 m.p.h. by iron bands, presumably of links, measuring 2½ in. (6.35 cm.) broad by 1/16 in. (0.16 cm.) thick, and 660 yds. (597.4 m.) long. The strain was taken at one side of the field by the engine, and at the other by "auxiliary carriages" serving as anchors.

The exact story of what happened after the trial is not clear. It is said that the machine toppled and sank below the surface of the bog, never to be seen again. Interested visitors still look over the site in the hope of solving the mystery, and amongst those has been Mr Michael Salmon, archivist for the Road Locomotive Society, where a Portfolio of information on the subject is maintained. He found from the "Dumfries Times" of 1837 that the story of the sinking of the plough is not acceptable. The week-by-week newspaper accounts show that after the machinery landed at Glencaple Quay it was set

up on the Lochar Moss and actually completed the three days of the trials in spite of bad weather. When Parkes wrote to the "Dumfries Times" a week after the trial, saying he expected to be able to overcome the problems and make the plough workable, there was no indication of its sinking. The truth

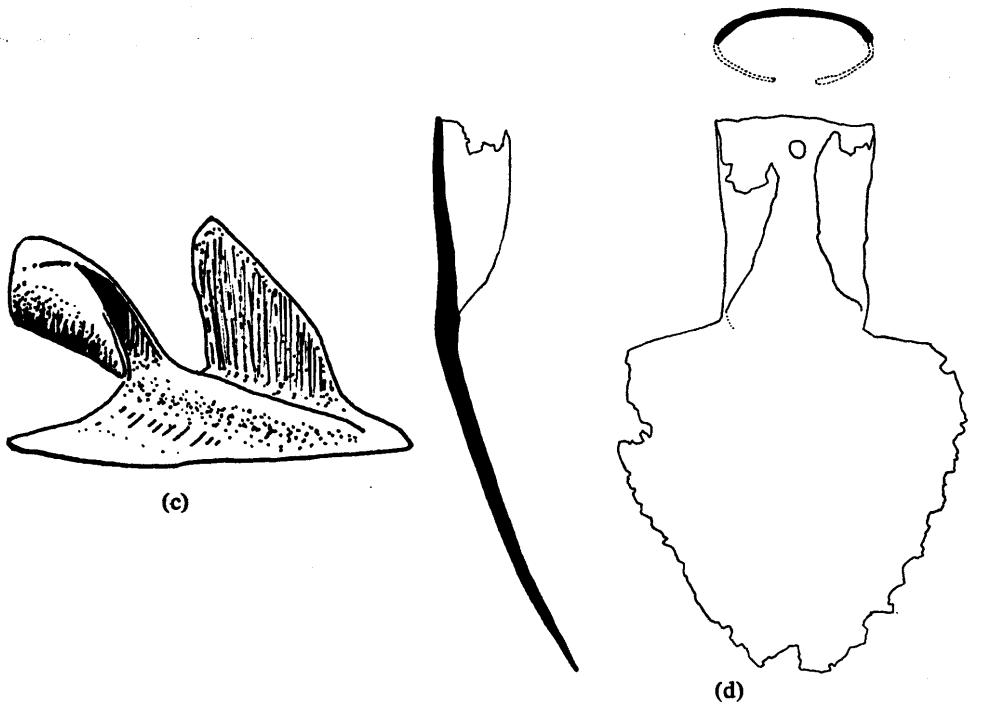


Fig. 12—(c) A paring spade blade from the North of England. After Cowper, 1895; (d) A blade found in Walker's Moss, Eskdalemuir, 1889.

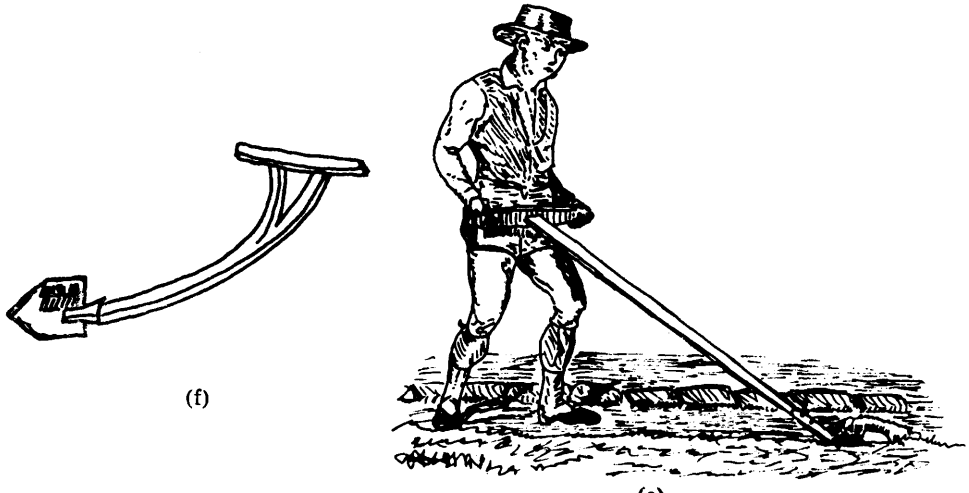
of the matter appears to be that, since the machine did not win the prize (the Highland Society withdrew their offer in 1843, no reward having been made), Heathcoat probably did not want to go to the considerable expense of removing it, and simply left it there. The local value of iron and firewood would then have led to its piece-meal disappearance. At any rate, Forestry Commission ploughing for tree planting in recent times has brought no trace of it to light.[53]

Cultivating Techniques: 1. Ridges. On the lower slopes of hill areas there can still be seen, especially in low sunlight or under a light covering of snow, the traces of fields ploughed into ridges of corrugated appearance, often with a head dyke of turf, worn down by time, separating the cultivated land from the hill pasture. Though out of cultivation for a century or more, they survive as an enduring memorial to the activities of the old Scotch plough.

53 Details condensed from G. E. Fussell. **The Farmer's Tools,** London, 1952, 76-7; H. Bonnett, **Saga of the Steam Plough,** London, 1965, 21-23, 201, illus. facing 32; **Scottish Traction Engines** (Scottish Traction Engine Society, c/o 8 Traquair Park East, Edinburgh, 12), Vol. 4, No. 4, 59-60, and Vol. 5, No. 1, 10-11.

Many were broken in under the stimulus of the improving spirit of the second half of the eighteenth century, and continued in use until the adoption of systematic underground field drainage from the second quarter of the nineteenth century, gave greatly increased cropping potential to the lower lying and more sheltered parts, making the hill fields redundant except for grazing.

Ridges were formed by repeated ploughings on the same strip so that a



(f) (e)

Fig 12—(e) The flaughter spade at work. After Stephens, 1855; (f) A winged paring spade from the Lincolnshire Fens. After Mortimer, 1708.

field ultimately appeared as a series of corrugations, containing ridges with crowns ploughed up high above the original ground surface, separated by furrows serving as surface drainage channels. In particularly wet areas, the theory was that " the land must be laid up in high and narrow ridges; for the greater number that there are of furrows, there are the greater number of drains; and the higher that the ridges are, the more easily the water finds its way to the furrows."[54] Like most theories, this one would work if conditions were right, but in level terrain it must often have happened that the ridges overtopped the quagmire of the furrows in the manner of lazy beds, serving to keep the crop above the level of the water table and little more. Nevertheless, until systematic underground drainage was developed, ridge ploughing was an essential technique of cultivation.

Since improved plough types were being adopted from about 1750, and since underground drainage came a century later, it is obvious that the technique of ridge ploughing had to be carried on by the new ploughs as well as the old. Some differences can be detected, however. The older ridges, as they survive, tend to be broad, 18 to 36 feet (549—1097.3 cm.) or more, and often have a curved form, generally that of an elongated, reversed letter S.

54 A. Dickson, op. cit., 265.

Their layout was irregular, and little, short ridges sometimes appeared amongst the big ones (fig. 11).[55] The reasons for such curvature have been much discussed and have even been accorded supernatural status as "elf furrows," intended to "wander the fairies."[56] It has been suggested that the curve meant that some part of the ridge was always presented to the sun,[57] that it prevented erosion from an unimpeded and too rapid running off of water, and so on. The real reasons are likely to lie in questions of function and technique,

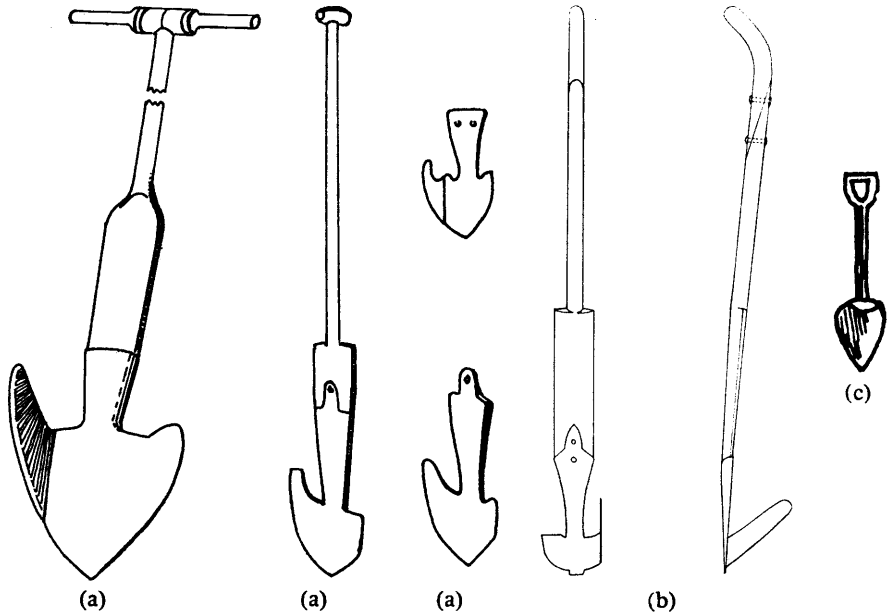


Fig. 13—(a) Galloway peat spades, with and without cutting wings, made by Rigg and Sons; (b) A peat spade from Markdhu, Glenwhilly, New Luce. Drawn by S. Pilling, County Museum, Stranraer; (c) A pointed spade from the Lincolnshire fens. After Mortimer, 1708.

and two points appear to have particular significance in this context. The first is the size and length of the team in relation to the width of the headland and the need to keep the mouldboard pressing firmly against the furrow slice right up to the end of the furrow. With a team of eight to ten animals yoked in pairs, it was not normally possible to drive straight ahead on to the headland, and the animals had to start turning before the plough came out of the soil. It has been assumed that a team ploughing down the left side of a strip would turn right at the end preparatory to coming back up the right side, but this is not necessarily correct. At the end of the strip, the animals would have to turn left along the headland to ensure continued pressure by the mouldboard

55 G. Robertson, **Rural Recollections,** Irvine, 1829; A. Birnie, Ridge Cultivation in Scotland, in **The Scottish Historical Review,** 1927, XXV., 195.
56 J. M. Davidson, Bow'd Rigs, in **Proceedings of the Scottish Anthropological and Folklore Society,** 1948, III., 75; J. Smith, **Prehistoric Man in Ayrshire,** London, 1895.
57 H. Stephens, **The Book of the Farm,** Edinburgh, 1844, I., 464.

and coulter on the furrow slice, and would not start turning back until the plough had come out. Sometimes the ploughmen overdid this turning to the left.[58] The inevitable long-term result was a tendency for each end of the

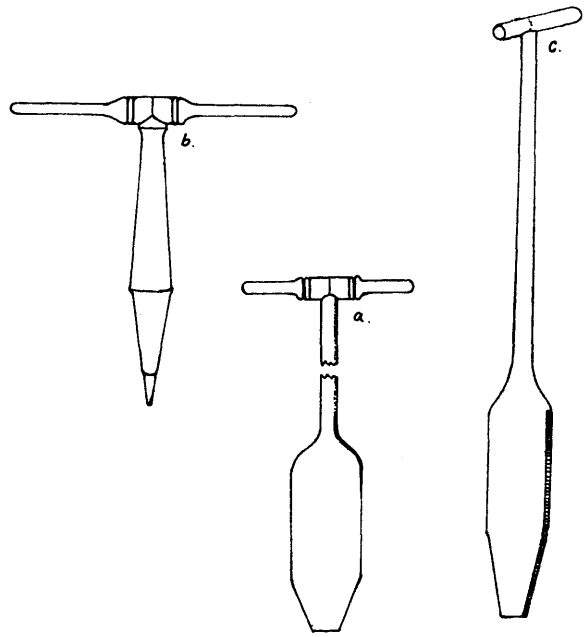


Fig. 14—Handles made by Rigg and Sons: (a) "Cross Peat Spade Handles. Rigg's pattern (35")"; (b) "Long Peat Spade Handles. Galloway pattern (3' 9"); (c) "Moss, Rutting and Raising Spade Handles."

furrow, and of the whole strip, to curve gradually to the left, so producing the reversed S shape.

A second factor could be the apparently widespread custom of offsetting the plough-beam of the old Scotch plough (Fig. 5c), so that the point of the share pressed hard in on the land. It is likely that the plough body would not have dug in quite so hard at the beginning of a furrow strip as it would a little further on, and that there would be a cumulative tendency towards arcing of the furrow. These two factors, working together, would have gone far towards producing the curvature in ridges worked by the old Scotch plough drawn by a large team.

Concurrently with the introduction of improved ploughs, ridges began to be straightened out and their height reduced in the more progressive estates and farms. This was often a matter of real difficulty since incautious levelling by simply filling the furrows with the deep earth from the ridge crowns would produce strips of barren subsoil where the crowns had been. A graphic account,

58 G. Robertson, op. cit., 200; S. R. Eyre, The Curving Plough-strip and its Historical Implications, in **The Agricultural History Review**, 1955, III., 87-88 (including a diagram).

emphasising the difficulties of the operation, comes from the farm of Mr Jaffray, at Baldoon in Galloway. There, in 1760, the ridges were broad, high, crooked and unequal, some terminating in narrow points at mid land, with unploughed baulks between covered with rushes and small dwarf willows. When Mr Jaffray started his improvements, he first ploughed the land as the ridges lay, aiming at lowering them as much as possible. To avoid robbing the crowns, he set the plough to work between pairs of ridges, and continue to work, turning the earth from the sides of the ridges towards the furrow until it reached medium height, about halfway between the old furrow and crown—i.e., the presumed original ground level. This in effect created a ridge where the furrow had been. It was then well harrowed, and the ploughs began in the old furrow, so repeating the ploughing up again to the medium height of the ridge. For this, a plough of larger size was used, with a wider mouldboard than the one that began the operation. It went much deeper, operating like trench-ploughing, and the last round of it, at the medium height, was really two furrows deep. Now the smaller plough went round once again and turned a slice from the top into the trench. The big plough followed and brought up the trench furrow that had been turned over by the small plough. So the two ploughs went round in succession, until all the furrows were ploughed up to medium height. Since the big plough went last, it laid the trench furrow of the "under staple" (subsoil) up on top of the surface furrow turned by the small plough, and this was thrown down into the old original furrow by a number of men working with spades. The small plough came round in the meantime and turned a surface furrow into the bottom of the trench, which was allowed to lie there. The big plough came again and brought up the subsoil which was again thrown down by spades, and so on till the crown of the ridge had been reached. The net result was to reverse the positions of the former ridges and furrows, and the whole field had, in effect, a trench ploughing. The average cost was 26 shillings sterling per acre, said to be little more than the expense of a good summer fallow of four ploughings and harrowings.

The ground was then treated with sea-shells, 25 tons to the acre, and sown in spring with beans and peas, with harrowing only. In the following year, it was ploughed again along the lines of the old ridges, the crowns being deepened as much as possible, and oats and barley sown. The next year the field went into a summer fallow, getting the first ploughing along the line of the old ridges, and afterwards two cross ploughings reversing one another. Once this was harrowed, the field lay perfectly level, and sea-shells and dung applied to the lines of the old crowns. Only in the sixth year after the work began, were the new, straight ridges laid out. 10 feet or 12 feet (304—365.7 cm.) broad according to the field, and gathered up into a rounded ridge, but not high. Wheat was then sown. Mr Jaffray treated nearly 300 acres in this way.[59]

This account has been given at length because it demonstrates the conjoint use of a light and a heavy plough, and because the time and effort involved

59 A. Wight, op. cit., 94-100.

emphasise the difficulties faced and overcome by the improving farmers of the time. This is a picture that could have been seen to a greater or lesser extent in many parts of Dumfries and Galloway, and indeed throughout Lowland Scotland. This period of reclaiming and improving activity coincided with the break up of the old system of run-rig and multiple-tenancy farms, and the appearance of individual farms standing on their own enclosed land, with subdivided fields.

After about 1770, therefore, the curved ridges that marked the work of the old Scotch plough and a more communal system of farming, began to be replaced by straight, level ridges, of varying width according to soil type and purpose, but averaging 15 to 18 feet (457.2—548.6 cm.) on most Dumfries farms.[60] For a special purpose like growing carrots they could be as narrow as 5 feet (152.4 cm.).[61]

2. Paring and burning (Fig. 12a-f). A technique associated with the breaking in of moorland, areas of coarse, tussocky grass, and sometimes old ley, is known as paring and burning. This involved cutting the top sod by paring it fairly thinly, usually 1½ to 2 inches (3.81—5.08 cm.) deep, allowing the sods to dry by setting them against each other, and then piling them into heaps and burning them, with as slow combustion as possible. Henry Stephens recommended in his **Book of the Farm** that heaps should be made large enough to contain 10-15 cart loads of ashes. The land so cleared was then ploughed, the ashes spread as a fertiliser, and a first crop taken, usually of turnips according to the best late 18th century practice.

This technique has been recorded in most parts of Britain in areas of fen and moorland and tussocky grass. In Hampshire and some other parts of Southern England, paring and burning formed part of a regular scheme, whereby old ley was broken in for a fresh course of cultivation every twelve years or so.[62] This systematic method implies a reasonably long established tradition, which is supported by the fact that dialect names applied to the process, such as **burn beating, burnbaking, and denshiring** (the latter recorded from 1607) belong to the south and especially the south-west of England and parts of Wales, though the evidence suggests that in the latter areas the older practice employed mattocks for hacking the turf rather than paring spades for cutting it smoothly into sods.[63]

Although Professor David Low, holder of the Chair in Agriculture at Edinburgh University, said in 1834 that paring and burning was unknown in the North of England and in Scotland,[64] this was far from being true, and numerous records can be found of the technique as carried out in the late eighteenth century to bring rough land under cultivation. Nothing has come to hand, however, to suggest that it was much older than this in Scotland.

60 Dr Singer, op. cit., 161.
61 A. Wight, op. cit., 112.
62 A. and W. Driver, **General View of the Agriculture of Hampshire,** London, 1794, 68 (note by Arthur Young).
63 Cf. G. E. Fussell, The Breast Plough, in **Man.** 1933, XXXIII., 109-114.
64 D. Low, **Elements of Practical Agriculture,** Edinburgh, 1834, 178.

In the South-West, a number of improvers made use of it as a first stage in reclamation. Sir William Maxwell of Springkell in Dumfries, for instance, improved his 450-acre farm by draining, paring and burning, and liming, shortly

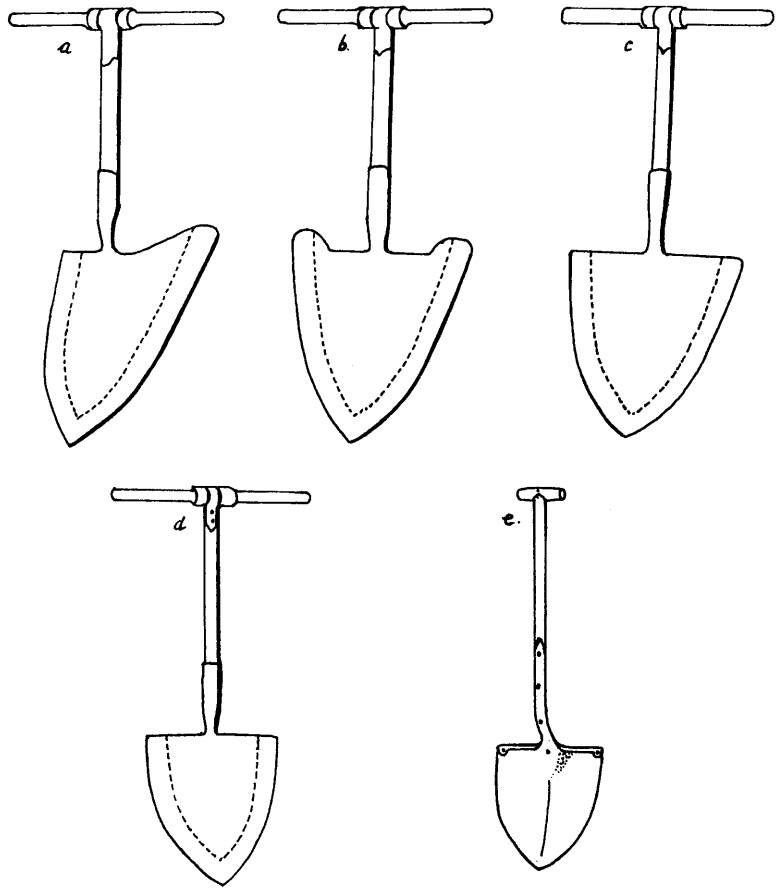


Fig. 15—Spades made by Rigg and Sons: (a) Solid steel rutting spade, right footed, in four sizes, No. 1, 10 lbs., 19 x 15 ins. No. 2, 11 lbs., 20 x 15 ins. No. 3, 12 lbs. 20 x 60 ins. No. 4, 13 lbs., 21 x 17 ins. (b) Double lugged raising spade, in four sizes, No. 1, 13 lbs., 19 x 19 ins. No. 2, 14 lbs., 20 x 19 ins. No. 3, 15 lbs., 20 x 20 ins. No. 4, 16 lbs., 21 x 21 ins. (c) Solid steel plain rutting spade, in four sizes, No. 1, 17 x 15 ins. No. 2, 18 x 16 ins. No. 3, 19 x 17 ins. No. 4, 20 x 18 ins. (d) Solid steel moss rutting spade. (e) Solid steel sharp pointed spade, in three sizes, No. 1, 13 x 10¼ ins. No. 2, 13½ x 11 ins. No. 3, 13¾ x 11¾ ins.

after 1761.[65] It was also practised by the Earl of Stair in the parish of Inch.[66] In Leswalt, successful cultivation followed ripping and burning the sod, seven or

65 A. Wight, op. cit., Edinburgh, 1778, II., 433.
66 Old Statistical Account, 1792, III., 135.

eight successive crops having been obtained. Some farms had carried out the process three times on the same piece of ground, though afterwards the grass degenerated and became very coarse, like bent. Craik of Arbigland also experimented disastrously, and for such reasons, according to the minister of Whithorn, it was now "everywhere reprobated in Galloway," and in Twynholm was regarded as the worst kind of husbandry, except on deep, mossy ground with a clay bottom.[67]

Although mattocks and paring ploughs with special shares were sometimes used for cutting the sods, the commonest implement was the paring or **breast** spade. It had a steel blade, not much thicker than the blade of the common scythe, about 8 or 9 in. (20.3-22.9 cm.) broad by 3 or 4 in. (7.6-10.2 cm.) wide. The socket for the shaft was 2 to 4 in. (7.08-10.2 cm.) broad, bent a little upwards, and of sufficient strength to stand the pressure of raising the turf. The shaft varied from about four to six or seven feet (121.9-213.4 cm.) long. The long shafts required a slighter bend at the neck of the blade, to allow it to run parallel to the surface of the ground. There was a cross bar handle, about 3 feet (91.4 cm.) long, at the end of the shaft. One side of the blade was turned up at right angles to form a wing. To begin the work of paring, a line was cut in the turf with the wing, the spade being held upside down, and then the point was inserted and pushed till the turf covered the length of the spade, the wing meantime cutting the turf free at the opposite side from the original slit. The sod was turned by jerking over the winged side of the spade. Since pressure was applied by holding the cross bar handle against the lower part of the chest, the user wore pads fitted with wooden guards, hung round his neck, to give himself protection and to ease the rather heavy work. At the usual depth of 1½ to 2 inches (3.8-5.1 cm.), a man could pare an acre of ground in a week.[68]

An example of a paring spade blade (Fig. 12d), found at a depth of 4 ft. 6 in. (137.2 cm.) in Walker's Moss, Westside, Eskdalemuir, in 1889, is now in the Dumfries Burgh Museum. It exhibits the upward bend of the socket, but differs from the paring spades described above in lacking a wing. In this respect it resembles the short handled **flaughter** spade with heart or crescent-shaped wingless blades that were used in most parts of Scotland and Ireland[69] into the present century. The longer handled paring spade with a winged blade, sometimes known as a "push plough," was known in many parts of England in the late eighteenth century, and may have crossed the border from there into the southern parts of Scotland, and into Ireland as well (Fig. 12c, e). Smith's study of the agriculture of Galloway in 1814 shows that both types were then in use.

The long handled paring spade with a winged blade may have come into the South-West as a result of the activities of improving lairds like Sir Alexander Gordon, who banked a farm from the River Dee, and then reclaimed it by paring

67 Ib. 1792, III., 318-9; 1795, XV., 83; 1795, XVI., 281; S. Smith, op. cit., 227.
68 S. Smith, op. cit., 224-5; Dr Singer, op. cit., 323; H. Stephens, op. cit., I., 647; H. S. Cowper, On Some Obsolete . . . . Appliances, in **Transactions of the Cumberland and Westmorland Antiquarian and Archæological Society, 1895 XIII., 95-6.**
69 Cf. E. E. Evans, **Irish Heritage, Dundalk, 1944, 134-5 (with illustrations).**

and burning, following the method he had observed in Berkshire where "burn-baking" was common on the Downs.[70]

This type of paring spade, therefore seems to appear as an innovation in Scotland in the late eighteenth century under the influence of Southern English

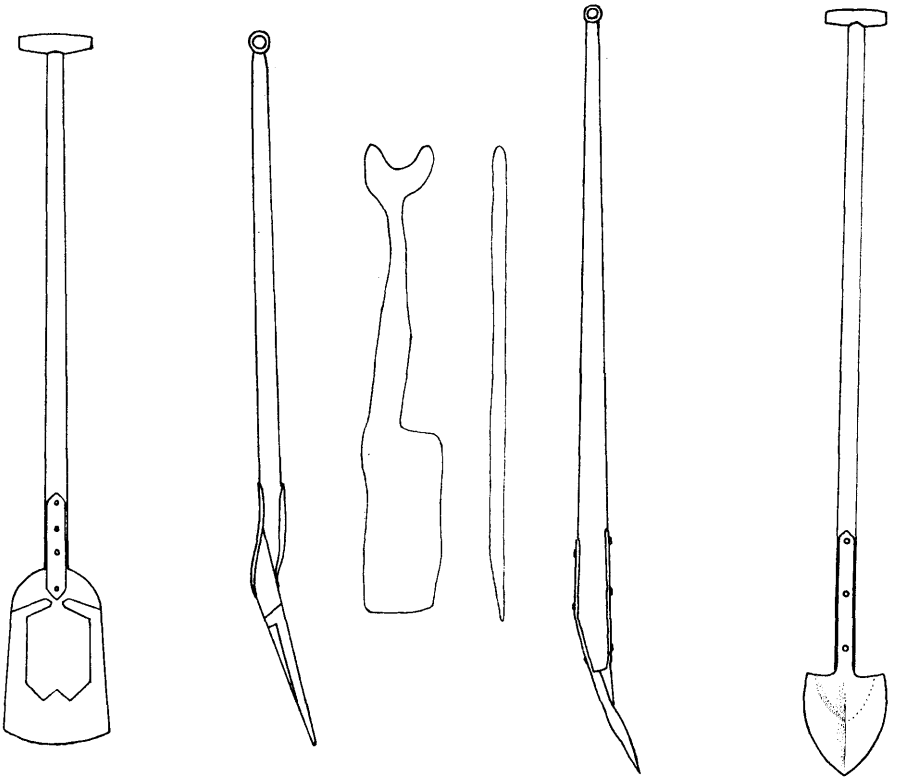


Fig. 16 (left)—An iron shod wooden spade from Bine Farm, Kirkcolm, said to have been used for digging clay. Drawn by S. Pilling, County Museum, Stranraer.
Fig. 17 centre)—A one-sided wooden spade from a moss in Wigtown, crudely cut from a solid plank. There are no marks to suggest that it has ever been shod with iron.
Fig. 18 (right)—A spade for digging holes in sand for the stakes of salmon nets, from Colvend, Dalbeattie.

practice, transmitted partly by the personal observations of travellers like Sir Alexander Gordon, and partly by the printed word.[71]

Peat Spades. 1. Peat cutting. Towards the end of the eighteenth century it is clear that the cumulative effect of centuries of use, and the increasing

71 For the influence of the English practice on Swedish agriculture, and for the general European context of paring and burning, see A. Steensberg, Med Bragende Flammer (with crackling flames) in **Kuml**, 1955, 65-130; N.-A. Bringéus, **Brännodling** (cultivation by burning), Lund, 1963, especially Chapter 2.

70 S. Smith, op. cit., 226; W. Pearce, **General View of the Agriculture of Berkshire**, London, 1794, 24.

amount of reclamation, had led to the abandonment of some peat mosses as a source of fuel. Conversion of peat bogs and moors into arable is specified for a number of areas in the Old Statistical Account, for example Kirkmaiden, around New Galloway in Kells parish, Parton, Tongland, Twynholm, and so on. Coal was coming into increased use there, though the people on the coast had been importing it from Cumberland at least from the 17th century.[72] A typical social situation was that in towns like Wigtown, and on the bigger farms, the "better sort" were burning peats in their kitchens and coal in their best rooms. The "poorer sort," on the other hand, as peat grew scarcer, were obliged to hunt as best they could for furze, broom, and brushwood to provide fuel for cooking, if not heating. In some settlement areas where peat had become scarce early on, a special type of hand-made peat was used. Around Whithorn in the 1680's, there was "a fewell, which they call baked peits, which they take out of a stiff black marish ground in the summer time; work them with their hands, and making them like very thick round cakes, they expose them to the sun, and after they be thoroughly dry, they yeald a hot and durable fire,"[73] and similarly in Borgue and other parts of Galloway where the peat soil was of a very loose, crumbly texture.[74] A parallel method was employed in parts of Ireland, like Meath and Cavan.[75]

As a general rule, however, peats were cut and shaped by a type of spade that appears to be peculiar to the South-West of Scotland (Fig. 13),[76] with a heart-shaped blade of which the right or left side may be turned up at right angles to form an upward sloping wing. The socket is wide and flat, as is the lower part of the shaft. The handle frequently consists of a cow's horn fixed to the upper end of the shaft, or is of wood turned back almost at right angles to the shaft (Plate VIa). Short chossbar handles also occur. The shaft is only slightly angled in relation to the blade, which can vary in width according to the use to which the spade is put. For example, Mr T. Thomson, late blacksmith at Lochhead of Elrig, made a rather broader peat spade, about $9\frac{1}{2}$ in. (24.13 cm.) across, for cutting shallow hill peats, which he called "minnock flappers," and set up to dry in pairs in the form of an inverted V. For deep peat, spades may be as little as $3\frac{3}{4}$ in. (9.53 cm.) across.

The type was not only made by local blacksmiths like Mr Thomson, but was also commercially produced by the firm of James Rigg and Sons, Crawick Forge, Sanquhar, established 1772. Though the immediate reason for the forge was the demand for shovels in connection with the coal workings, spades and shovels for agricultural and other purposes were also made, and the Galloway peat spade is illustrated in one of the firm's catalogues, dating from the early 20th century.[77] The Queensferry Forge, built in 1874 by William Cotts, who had

72 A. Symson, op. cit., 72.
73 Ib. 72.
74 Old Statistical Account, 1794, XI., 39-40; S. Smith, op. cit., 308.
76 Dr A. Gailey of the Ulster Folk Museum confirms that this type of blade with a pointed face and upward sloping wing is unknown in Ireland.
75 E. E. Evans, op. cit. 140-1; Irish Folk Ways, London, 1957, 194-5.
77 Illustrated Catalogue of Solid Spades and Shovels, Hill Drain and Tile Tools, manufactured by James Rigg & Sons, Crawick Forge, Sanquhar, Dumfriesshire, Scotland. (copy in library of National Museum of Antiquities).

previously had a similar forge at Shinnel, and at Penpont from 1843-49, produced a similar range of equipment, and also plough beams and heads, and moulds for plough-shares.[78] These sources would have supplied much of the popular demand.

Since the Galloway peat spade is a breast spade, no foot rest for pressing it down is required. It is worked by the arms alone, the user standing in the trench in front of the bank, and pressing his tool horizontally into it. The horn or back turned wooden handle is well suited to this technique. If the weather or the area being worked is very wet, the work could be done **underfoot** by digging down vertically, or at a slight angle, from the top of the bank. In this case an assistant was required in the trench to take the peats as they were cut. In the Elrig Loch area, the peats measured approximately 18 in. (45.8 cm.) long by 3-4 in. (7.6—10.2 cm.) wide by 1½-2 in. (3.8—5.1 cm.) thick.

After cutting, the peats were **fitted** (footed) or set up in small heaps **(fittin's)** of three or four on end with their tops leaning together, and sometimes one at an angle across them to shed the rain. In wet weather these would have to be turned, a process called **turn-fittin'**. Sometimes there was a further stage when a number of **fittins** were heaped or **rickled** together, though as often as not the peats were taken home after the **fittin** or **turn-fittin** stage.

In some mosses a fair amount of the top turf had to be cleared to get at the good burning peat below. This could be done by making a cutting with a flat, sharp bladed spade a peat's width back from the edge of the bank, and paring off the resultant strip with a flaughter spade like the one made by T. Thomson (Plate VIb). In one part of Drummoddie Moss, a few miles inland from Port William, where peat was still being cut in 1963, it was necessary to cut through a depth of nearly two feet before reaching the good peat below, since the moss at this point had been drained and reclaimed some time in the first half of the nineteenth century (Plate VIIb). Saddle back or mug draining tiles, in the shape of a horseshoe, set on tile sole plates, protruded at regular intervals of about 9-10 ft. (274.3—304.8 cm.) from the face of the bank, 20 in. (50.8 cm.) down, as mute testimony to the endeavour of an earlier generation. The fact that the top two feet was of little use for fuel showed that the system had been effective. To clear this, a heavy, flat-bladed rutting spade (Plate VIa) was used, with a stout horn (in the same plane as the blade) rising at one side. The horn served to cut the opening slit. This type is locally called a lurgan spade.[79]

The origin and age of the form of the Galloway peat spade as it now exists is not clear. The most noteworthy feature is the pointed form of the blade face, making it closer to the heart-shaped flaughter spade than most other members of the peat spade family. The form would facilitate cutting through tough, fibrous roots, and resembles a type of spade (Fig. 12f, 13c) used in the Lincolnshire fens about the year 1700, " the Edges of which are as sharp as a Knife, which

78 J. Brown, **The History of Sanquhar**, Dumfries, 1891.
79 Oral information on peat cutting obtained in 1963 from Mrs J. Kelly, Elrig Village; Mr T. Thomson, blacksmith, Lochhead of Elrig; D. Gordon, Bowbrig Farm; R. Chalmers, Balcraig Moor; and R. Donaldson, Barwinnock.

makes it easier to cut Flag-roots, and the Roots of other Weeds, and indeed is very useful in any Lands that have not Stones in them; some of these Spades are made with one side turned up like the Breast plough, by which means they with once jobbing of it into the Ground, can cut an exact Turf, so that one Man with one of these Spades in fenny soft Ground, will do as much in a day as two Men with a common Spade."[80] This duality seems to be a parallel type of development on the analogy of which it may be suggested that the Galloway spade owes a good deal to the form of the flaughter spade, and to the nature of the peat in which it was used. It may also be relevant to note that James Rigg & Sons produced planting, hedging, and digging spades with pointed blades and that the Holm Forge Co., in Glasgow, produced spades of similar shape, described in their Catalogue as " Solid Steel Dumfries Spades."[81]

Fishing:

Another spade type that seems to have been localised at Colvend and Annan for about a century was also manufactured by James Rigg and Sons, though not illustrated in the Catalogue referred to above. It is characterised by a comparatively small, pointed blade, 8½ in. (21.6 cm.) by 6½ in. (16.5 cm.), angled forward on the end of a long, very sturdy shaft, 5 ft. 2¾ in. (158.8 cm.) long, with a short cross bar handle (fig. 18). They were used by salmon fishers to dig holes in the sand for the stakes of their nets, about four or five feet (121.9—152.4 cm.) deep by a foot (30.48 cm.) wide at the top, tapering gradually to the bottom. Squads of six men worked together when nets were being erected, each digging a hole and completing it in four or five minutes. The nets each had a pocket hung on twelve poles, with a leader of ninety to a hundred yards long to direct the salmon into the pocket. Since the leader had a pole every three yards (274.3 cm.), each net required about forty-five poles, all of which had to be taken out again at the beginning of winter. The operation has lately been speeded up by the introduction of motor driven augers by which a four-foot hole can be made in fifteen seconds.

The type is so closely localised that the family who now have the Salmon Fishing at Colvend (from 1942) found it quite new to them when they moved there, after having been salmon fishing on the Solway for eighty or ninety years. They found eight or nine such spades at Colvend, all made by James Rigg, and after getting a demonstration of their use from an old fisherman, they were soon able to see how efficient they were.[82]

APPENDIX

Museum inventory of ploughs, plough parts, and spades from S.-W. Scotland.

County Museum, Stranraer[83]

1. Old Scotch Plough, from Chilcarroch, with two shares (Fig. 5 and 6), 1955-65.
2. Pointed wing share for an iron soled plough, from Chilcarroch (Fig. 6d and Plate Vb). 1955-69.
3. Late 19th-early 20th century iron plough, with coulter box in beam, from Blackquarter, 1965-37.

80 J. Mortimer, **The Whole Art of Husbandry**, second edition, London, 1708, 286-7.
81 Holm Forge Co., Bellshill (Glasgow), **Catalogue of Spades and Shovels**, Glasgow, no date
82 Information from A. Davidson, proprietor of the Salmon Fishing at Colvend.

4. Iron shod wooden clay spade, from Bine Farm, Kirkcolm (Fig. 16), 1956-37.
5. A draining shovel, Sheffield make, 1956-36.
6. A peat spade from Markdhu, Glenwhilly, New Luce (Fig. 13b), 1963-7.
7. A flaughter spade from Craigcaffie, Stranraer, cross bar handle missing (Fig. 12b), 1966-54.

Stewartry Museum, Kirkcudbright[84]

1. Galloway peat spade, back turned wooden handle, blade 5½ in. (14 cm.) wide, wing 5 in. (12.7 cm.) long.
2. Idem, handle broken, blade 6½ in. (16 cm.) wide, wing 6 in. (14.8 cm.) long.
3. - 4. Two model iron ploughs, 19th century, each 22 in. (55.9 cm.) long, made by Joseph Heughan, blacksmith and poet, Auchencairn.

Burgh Museum, Dumfries[85]

1. The Lochmaben plough beam (Plate III.).
2. Old Scotch plough share, originally from Thornhill Museum (Fig. 6c, Plate Va.).
3. Paring spade blade from Walker's Moss, Eskdalemuir, 1889 (Fig. 12d).
4. Wooden blade and lower 18 in. of handle of a peat spade "found with a . . . . in the north . . . . on the bank of the Nith at . . . . in Closeburn, 1862"—Ex Grierson Collection, Thornhill.
5. Wooden blade and handle of peat spade, sharply triangular blade, "found four feet under the surface at Merkland, Dunscore"—Ex Grierson Collection, upper end of handle appears to have been curved.
6. Peat spade, iron-shod—Ex Grierson Collection—blade 3 in. (9 cm.) wide; perpendicular length of upswept wing 4 in. (11 cm.).
7. Complete wooden spade dug up from 2½ feet in a peat moss on Whitcastles lower dairy farm; nails of metal foot-rest surviving at one side of top of blade, nail-holes and moulding of edge show where iron "shoe" has been attached. Still bears modern-type handle.

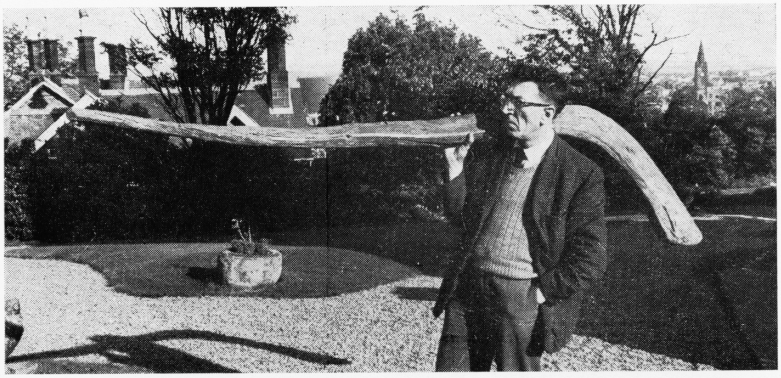
National Museum of Antiquities of Scotland

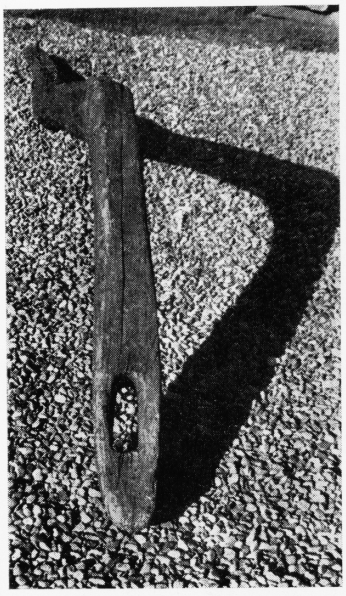
1. The ard-head and stilt from Milton Loch crannog (Fig. 3a).
2. A one-sided wooden spade, from a Wigtown moss. Presented by the Earl of Stair, 1882. (Fig. 17).
3. A Galloway peat spade with a cross bar handle, total length 3 ft. 10½ in. (118.1 cm.), width of blade 5.2 in. (13.2 cm.), perpendicular length of upswept wing 3½ in. (8.9 cm.).
4. A Galloway peat spade with a backwards curving handle, total length 3 ft. 7 in. (109.2 cm.), width of blade 5¾ in. (14.5 cm.), perpendicular length of upswept wing 3½ in. (8.9 cm.).
5. A Galloway peat spade with a cross bar handle, total length 3 ft. 7 in. (109.2 cm.), width of blade 5.25 in. (13.3 cm.), length of wing 4.5 in. (11.4 cm.). The blade is not socketed, but grips the side of the broad part of the shaft by two iron straps.
6. As for 5, total length 4 ft. 0.75 in. (123.8 cm.), width of blade 5.5 in. (14 cm.), length of wing 6.5 in. (17 cm.).
7. A Galloway peat spade blade, socketed, width 5.8 in. (14.7 cm.), length of wing 4.75 in. (11.7 cm.).
8. A peat or flaughter spade with a horn handle and a half round blade, one side of the crescent being cut off straight across (cf. fig. 13a). Blade fixed as for 5 and 6. Total length 3 ft. 11 in. (119.5 cm.), width of blade 5.1 in. (12.9 cm.).
9. A spade by Rigg & Sons, for digging holes in sand for the stakes of salmon nets, from Colvend, Dalbeattie (Fig. 18).

Royal Scottish Museum

1. A miner's pointed steel shovel, from Canonbie, 1856.

83 Information from S. Pilling.
84 Information from W. M. Kirkpatrick.
85 Information from A. E. Truckell.





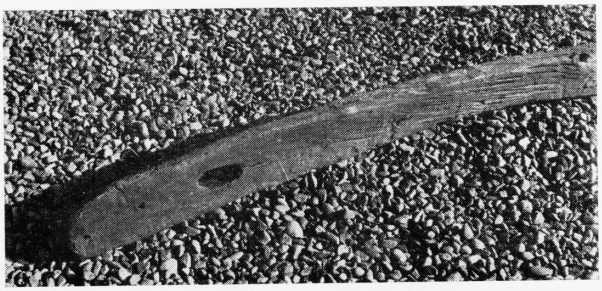
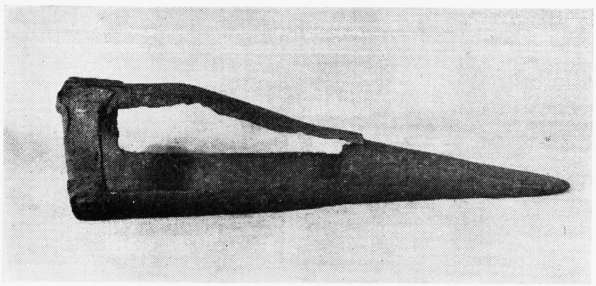


Plate III.—The Lochmaben plough beam (now in Dumfries Burgh Museum).

(a) Top—Showing how easily it can be carried by one man. (b) Centre—The mortice in the fore-end of the beam. (c) Left—The mortice in the rear-end of the beam.

Plate IV (a) (right)—From a grave slab from Pennersaughs, Annandale, c1300-c1350.

Plate IV (b) A grave slab from the Hospice of the Knights of St. John, Kirkstyle, Cummertrees, c1400.



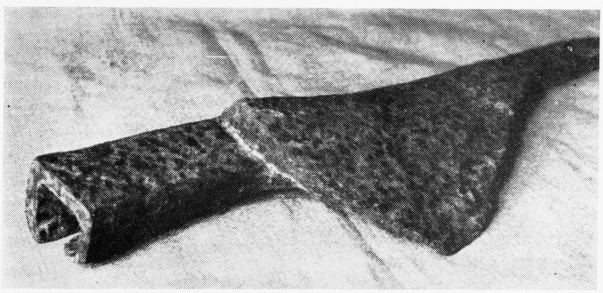


Plate V.—(a) Top—The Thornhill share. (b) Bottom—The Chilcarroch share for an iron-soled plough.

Plate VI.—(a) Above—T. Thomson, late blacksmith, Lochhead of Elrig, Wigtownshire, with a group of spades of his own making. From left to right, a rutting spade, a hill draining spade, a flaughter (paring) spade, a Galloway peat spade with a broad blade for shallow hill peat, an ordinary Galloway peat spade. (b) Right—The flaughter (paring) spade in the working position.

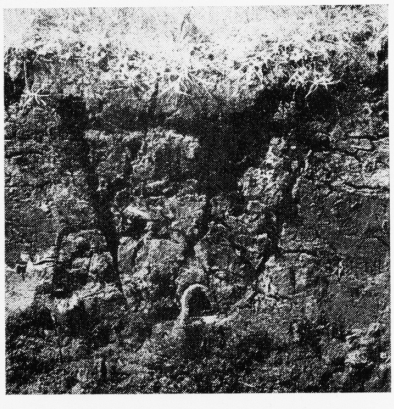


Plate VII. (a)—Left—D. Gordon, Bowbrig Farm, with his peat-cutting equipment in Drummoddie Moss. (b) Right—The dried-out top of D. Gordon's peat bank, showing the cuts made by the draining spade, and the mug tile in position on its sole. The softer peat starts immediately below the level of the tile.

LOCHWOOD CASTLE—A PRELIMINARY SITE SURVEY

By ALASTAIR M. T. MAXWELL-IRVING
B.Sc., F.S.A.Scot.

THE IMPORTANCE OF THE LOCHWOOD CASTLE SITE

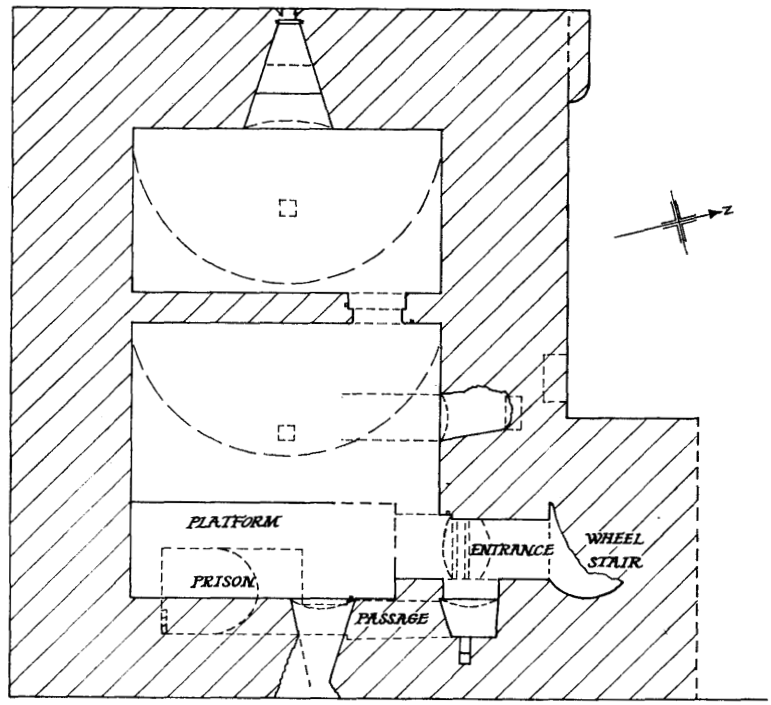
A brief first visit to the site of Lochwood Castle is not impressive, even to an antiquarian, whilst a casual observer could be excused for dismissing it. Yet here lies history and a wealth of archæological material awaiting detailed examination. In summer the camouflage provided by nature in the luxuriant growth of trees, scrub and undergrowth, obscures almost all that remains of this once great stronghold, except for occasional glimpses of walling or rubble, the mote hill just within the ancient wood at the north end of the site, and at the south end of the site a solitary pillar of masonry that stands sentinel on behalf of the tower of which it once formed a corner; whilst other features further afield are rarely given a second thought; in winter, nature is a little more co-operative, and some very vague idea of the castle's layout can be traced among the almost totally collapsed walling that is all that remains of most of the castle's once extensive buildings. It is because of this chronic state of decay that this site has been almost totally neglected in archæological research in the past, aided by the general neglect given to all mediæval site research in Scotland for so long.

The classic work on "The Castellated and Domestic Architecture of Scotland" by MacGibbon and Ross dismisses Lochwood in a few lines; the Report of the Royal Commission on the Ancient and Historical Monuments of Scotland (R.C.A.M.) in 1912, based solely on what was clearly visible, was disappointingly brief, incomplete, in some parts inaccurate, and in others seemingly "inspired" guesswork; and the best paper on Lochwood so far,[1] by the late Dr R. C. Reid — an unequalled general authority on local mediæval history—, whilst presenting a valuable contribution to the important periods of Annandale history with a personal analysis on certain aspects of the Johnstons' origin and early history in relation to this, is all too brief because it was only intended as a sketchy supplement to a visit made to the site by our Society at that time. It is hoped to supplement and correct by archæological investigation over the next few years this existing knowledge of the site, and this paper is intended as the first step towards this end. At the same time, this introduction and preliminary survey of the work would be incomplete if it was not related to both the importance of Lochwood in relation to the history of the castellated architecture of Dumfriesshire itself and Scotland in general, and the relationship of Lochwood to the status of its lairds in local history — the latter being an aspect with which both Sir William Fraser and, to a lesser extent, Dr Reid were well acquainted.

1. D. & G. Trans., 1925-26—"Lochwood Castle."

ACKNOWLEDGMENTS AND INITIAL SURVEYS

Before passing on to the detailed survey of the castle complex, the writer first wants to pay tribute to those persons whose assistance and advice have made this account so much the richer. Firstly, he owes an immense debt of gratitude to Major Percy W. Hope-Johnstone, of Annandale, 27th of Lochwood, for his interest and encouragement, and for permission to carry out a full-scale



LOCHWOOD TOWER — PLAN OF BASEMENT (1967)

work at Lochwood at all. Then, he has been very fortunate and grateful for visits to the site by four authorities in their respective spheres within this field. Mr Truckell, curator of the Dumfries Museum, assisted by Mr Williams, paid a visit to the site, during which they made a survey of all that could be seen. A week later, Mr Dunbar and Mr Wallace, mediæval specialists of the R.C.A.M., made a thorough examination of the visible remains. To these four gentlemen the writer is immensely grateful for their time and trouble, and for their comments and opinions, all of which have added immeasurably to the value of the following preliminary report. It has already been possible to draw up a much more accurate and comprehensive plan of the whole site complex.

LOCHWOOD AS A STRATEGIC SITE

None can say for certain when Lochwood was first occupied as a fortified site. Its potential in this capacity is obvious. Stretching away to the South and West is the vast expanse of Lochwood Moss, still virtually undrained, and no doubt originally more of a loch—hence the name—and almost impenetrable; whilst lesser mosses and marshes beyond the wooded ridge immediately to the North and East of the site almost completed the protective enclosure provided by nature. On this island of high ground one may still see the considerable remains of the wood of ancient "Royal Oaks," part of which has now encroached upon the Motte hill itself. Many of these regal trees may well have seen the entire chronicle of the castle's history unfolded before them, for the "Loch Wood" was here before any part of the present castle remains was built.

GRANT OF LOCHWOOD TO THE FIRST JOHNSTON

Soon after the Norman conquest of England in the 11th century, the Norman family of "de Brus" (whose lineage is reputedly traceable back to the 8th century in Denmark) settled in Yorkshire, in the person of Adam de Brus (d. 1094). Adam's son, Robert de Brus (d. 1141), came across the Border to Dumfriesshire, was granted Annandale by David I. in 1124, and married Agnes, daughter and heiress of the former Lord of Annandale. They made their home at Lochmaben, where the Bruce family continued to live for several centuries. It was the eldest son and heir of Robert and Agnes, Robert "Le Meschin" de Brus (d.c. 1190), 2nd of Annandale, who started the present history of "The Lochwood" when he granted this part of his Annandale estate to a certain "John," the original Johnston, whose origin remains to this day a complete mystery — family tradition relates that he was a Norman, which is widely accepted and not improbable, but the belief appears to be based on no more factual evidence than that the family were among the Bruces' many friends who were granted parcels of their lands, and by the time of John's son, Sir Gilbert de Johnstoun, they were frequently witnessing Norman charters. The famous historian and archivist, Sir William Fraser,[2] accepted this grant and origin in Annandale for the Johnstons; and, in spite of Dr Reid's qualified doubts, they are still accepted today, perhaps with even more conviction.

LOCHWOOD MOTTE

Thus John came to Lochwood and settled there. It was undoubtedly he who built the Motte hill, a largely artificial mound of earth on a natural eminence, upon which he built his timber pele tower, and the various ramparts and ditches thrown up round about in an elaborate and strategically logical pattern—referred to by Dr Reid. Motte hills were especially common in S.W. Scotland during this period. The four within the Burgh of Dumfries itself formed a combined defensive network and date from around 1150. Motes date back at least a century before this on the Continent, as shown on the

2. **"The Annandale Family Book of the Johnstones," 1894.**

Bayeaux Tapestry. The Lochwood Mote, however, has the very unusual feature of a distinct middle terrace. This is so rare anywhere in Britain that it has been attributed to landscaping in the 17th or 18th century, but there are two other such cases in Scotland, both also in Dumfriesshire (one further north at Garpol Water, and the other at Lincluden, one of the four Dumfries motes)[3]; We also learn that the Lochwood terrace clearly had a parapet—a point worth investigating further.

OUTER SENTRY POSTS

A defensive feature of which few are aware at Lochwood, but which may well date from this earliest period of occupation, are the "Watch Posts," some of which are natural vantage points whilst others appear as artificial mounds right on the edge of the mosses. These would have surrounded the site as sentry posts, especially on the south side from whence trouble was most likely to come; and as history would indicate that they were not in use in the early 16th century, it is reasonable to suppose that they belonged to the earthwork era. The "Watch Knowes" marked south of the site on the Ordnance Survey Map can be reasonably assumed to have been such a post, with the name handed down by word of mouth, whilst the very small, artificial mote type mounds noted by Mr Truckell just south of where the public road leaves the west side of the wood could well have been another such post—a likely situation indeed, just outside the cover of the wood.

JOHNSTON PARISH

Whether the first Johnston of Lochwood gave his name to the parish of Johnston,[4] or took his name from the parish of that name already in existence, is a debatable point, but the writer favours the former alternative.

CONTINUOUS JOHNSTON POSSESSION

We now know that there has been an unbroken succession of Johnston Lairds of Lochwood from our first John to the present day, even though there have been many periods of unrest, first during periods of English domination or occupation of Annandale, and later during the shorter, but bloodier, Border Clan wars. Some of the lairds may have been temporarily in exile from Lochwood. This we accept, but we must not allow ourselves to be corrupted or confused by such suggestions as Carlyle occupation because of some 15th century dispute between the Carlyles and Johnstons over the ownership of "Locherwoode," unquestionably the Locharwood property near the Solway, between Cockpool and Caerlaverock, a known Carlyle property, and not the Lochwood in Annandale with which we are here concerned. But more of these periods of history later.

3. Cruden "The Scottish Castle."
4. The writer uses the old spelling of the parish name and surname here.

SEQUENCE OF EARLY BUILDINGS

Dr Reid gives us a lucid description of the motte castle and a documented account of the typical construction of such a contemporary keep in Picardy where the laird and his family lived in the tower itself, while the retainers would have dwelt outside the mote within a bailey, all trace of the latter having gone long ago at Lochwood. But he then implies that the mote was occupied for about three centuries until the present stone tower was built, without any mention of an intermediate building period. This would appear to be at variance with all probability. Around the start of the 14th century a great period of fortified rebuilding took place when the mote hill castles of the great families were superseded on the existing or new sites by fine new stone castles (of well cut ashlar). This was true at Dumfries, Lochmaben, and elsewhere in the Western Marches. That this was also the position at Lochwood can now be demonstrated for the following reasons.

THE 13th/14th CENTURY CASTLE

The R.C.A.M. inspectors noted that the two surviving door lintels in the basement did not belong to their doorways; their clear cut section neither matched the door stiles nor had any meaning in their present situation. They came from somewhere else, either during the original building or as replacements for broken lintels at a later date. The writer does not believe in the latter possibility for two reasons: one is that the local sandstone is very soft, and it would, therefore, be safer to replace a broken lintel with a newly cut one to fit —anyway from where could **two** convenient replacements have come; the second is more feasible, and as well as being supported by the tangible evidence wanted by that evidence itself helps to confound the first possibility of a lintel having broken—and the local sandstone used in the tower is only very soft when wet, which it obviously was not when the tower was inhabited.

The prison itself is the lowest chamber in the tower, and together with the mural passage leading down to it from ground floor (or basement) level, was of necessity, the first part to be constructed. One could not, therefore, find stonework incorporated here that had been intended for use elsewhere in the same tower, as ashlar was cut as and when required. The roof of the mural passage is, not surprisingly, "sprung" to bear the weight of the main tower wall above it; but beneath this vaulting is a flat roof constructed of ashlar slabs, which is unquestionably an integral part of the original construction. As much as one would like to examine all these slabs individually, that would necessitate the complete demolition of the tower ruins; but three of them can be studied in detail, and two seem to the writer to provide the required proof for which we have been looking. And this theory has apparently been upheld by the experts, and Mr Dunbar of the R.C.A.M., whilst at the site, also considered this evidence as the most likely explanation for the origin of the misfitting door lintels. The first slab noticed, at the entrance of the passage, has a carefully carved lip

along the edge that is meaningless in its present position. The other two slabs are identical, whilst the carving on them is only visible because they have been fitted **upside down**: one is at the prison end of the passage, but this one has been badly chipped; the other is situated above the prison doorway near the middle of the passage, and it is perfectly preserved. This last stone is a perfect example of an elaborate 13th/14th century pattern of drainage gully in a parapet-type slab, very precisely and clearly cut in ashlar.

We have, therefore, at Lochwood proven 13th/14th century stonework incorporated in the first part of the 15th century tower. It could only have come from the earlier castle which one expects to have existed on the same site. No Lord of Lochwood would have carted such stonework, for a secondary use, across miles of rough country from some far-off site like Lochmaben or Auchen Castle—neither of which was theirs for the taking anyway—when they could cut fresh stones on their doorstep.

BAILEYS AND COURTYARDS

On the subjects of baileys and courtyards, the writer is very wary, not least because so often there is nothing even among tangible ruins that gives any clue to their date. Lochwood is no exception. The Mote had outer earthworks, which are still visible. These may have been the total extent of the bailey around it; we cannot now tell. Attached to the 15th century tower we have the remains of a barmkin enclosing the 15th century courtyard, and presumably contemporary with it. This had only one entrance possibly incorporating a gatehouse or double gateway, on the south side; and beyond the south-west corner of this barmkin is an extension of clearly later date. To the west, nothing earlier is detectable; but as the area was cleared for the 17th/18th century garden, there could have been some early structures here—just as the outer works were ruthlessly swept away from Bonshaw and other old sites during those centuries to make way for landscape gardening. The only area not mentioned so far is the east side of the site, and this presents plenty of opportunity for speculation. Unfortunately the public road (of unknown date) drives through the middle of it. The ground is lower than the rest of the site, and falling away from it, due to the natural lie of the terrain. Between the ruins and the road there is sufficient fallen rubble heaped to exaggerate the steepness of the slope; but across the road is an almost level platform, very roughly rectangular in shape (130 ft. x 50 ft., beyond the road), that is artificially built up above the marsh there on a solid bank of stones. Originally it probably was level, having had centuries since to sink into the soft ground. Neither the R.C.A.M. nor anyone else had, or has, any doubt that this was a courtyard —but when? Mr Dunbar was of the opinion that the castle could in fact once have been encircled by an outer wall and bailey. Or does the drawing in Sir William Fraser's book show a suggestion of the remnants of a wall running from the south-east corner of the tower towards the road opposite the south

end of the platform ? If the latter is the case, then it implies a separate eastern courtyard, still of uncertain date. Mr Truckell suggested the possibility of a gun terrace which would have been a 16th century feature, later than the tower. The matter could perhaps be resolved by excavation.

THE 15TH CENTURY CASTLE

The 13th/14th century castle was either small, never completed, or more likely, badly damaged in the Border wars, otherwise it would not have been dismantled and utilised in the new 15th century castle, the ruins of which form the basis of all the ruins visible today.

The new castle was almost certainly built by John Johnston of that Ilk, 10th of Lochwood, who was laird from 1454 until he granted the titles to his eldest grandson and heir in 1484; he himself lived on until c.1493. The castle is probably not later in date, and unlikely to be earlier.

The principal feature was the L-plan tower,—which will be noted in detail later. To the north and west of this lay the principal (or only contemporary) courtyard, enclosed within a barmkin wall. This wall ran west from, and square to, the north-west corner of the tower, with the main gateway adjacent to the tower. The R.C.A.M. plan of 1912 shows a ragged outline of rubble enclosing a small area immediately west of the tower, and the beginnings of another larger enclosure south of the tower; but without large-scale excavation and clearance, it is impossible to tell how much of this is fallen tower walling or to state whether there was in fact a double gateway, or gatehouse — as at the 15th century Lag Tower — whilst no details are readily discernible now of the enclosure shown by them south of the tower. It is fair to say, though, that their plan is not very accurate and omits some of the most distinctive features. There was only one gateway into the courtyard, though there could well have been posterns on any of the other sides. The gateway, whilst distinctly situated, has not yet been opened up. The south-west corner of the barmkin, however, has been cleared considerably, showing the wall to vary in thickness from 4 ft. 4 in. on the south side to 4 ft. on the west side, with a distinctly rounded outside corner (3 ft. 4 in. radius). On the west side the barmkin wall has fallen largely outwards throughout its length, because the courtyard level is about 2 ft. 6 in. higher than the outside ground; but there is so much hard-core rubble along the inside base of the wall that there may also have been a slightly built-up " walk " here. Presumably because of the lie of the land, the west wall tapers inwards towards the north end; and following the old earthworks at the base of the Mote, the north wall is particularly oblique to the roughly rectangular shape of the courtyard. The enclosure's average size is 150 ft. from north to south by 95 ft. from east to west. A lot of this area, however, is taken up by original, and later, outbuildings and accommodation blocks. Running along the road at the north-east corner of the courtyard was a building range, 93 ft. by 23 ft. 6 in., at least some of which (it is agreed) is the oldest building in the yard, probably contemporary with

the tower. The south-east corner of this building is also rounded off on the outside (3 ft. radius), matching the south-west corner of the courtyard. The outer wall between this building and the tower cannot be said with any certainty to be as old as the original buildings, as it is not keyed into the walling north of it but abuts it instead (the south end is still buried in rubble). The barmkin may, therefore, have originally included part, or all, of the courtyard already noted on the east side of the site.

THE TOWER

Like the fabric elsewhere on the site, the tower is built of the local, rough whinstone rubble, with cleanly cut ashlar mouldings of the local red sandstone, some of which—as already proven—came from the earlier castle. The present decadent state of the buildings is due in part to rough treatment during the Johnston-Maxwell clan wars, in part to the last fire that swept through the castle and the subsequent assumed salvage operations, but primarily to the hopelessly poor quality of the mortar used, which has almost all crumbled into powder, even where walling still stands. The surviving structure is, in fact, very dangerous, both inside and out, and becomes less secure every year. Any exploratory work within the tower is, therefore, both difficult and very dangerous. Not only has tons of masonry crashed down the stair well smashing all the steps beneath it—it is still very insecure—but the basement vault supports some four to six feet of fallen masonry, and masonry is falling at the entrance to the prison tunnel, from the tunnel wall, and even from the wall in the prison itself.

Outside, the main part of the tower measures 43 ft. 4 in. from east to west by 34 ft. from north to south, with a stair wing barely distinguishable at the north-east corner. The latter runs along the tower's north wall for 17 ft. 8 in. and appears to be about 8 ft. 3 in. deep (though the wall here is still lost in a heap of rubble). The south-east corner of the tower stands to about second floor level, its life prolonged by fairly recent, and in itself meaningless, masonry reinforcement on the inside; even so, it is considerably decayed now, and much smaller than shown in the illustration in Fraser's book. Being the only remaining original corner visible, it is of interest in showing ashlar corner stones. The only other corner still standing to a fair height is the north-east corner: at some period in history—possibly after the Maxwell seige of 1585—this corner was badly damaged, necessitating a strong repair with the unusually shaped buttress of small rubble still to be seen propping it up (but in itself now crumbling). All the other corners have collapsed badly and are obscured by rubble. The wheel stair wing has fallen to a solid heap of rubble on the outside, though the R.C.A.M. experts detected two ashlar stones just visible that could be the doorway between the stair and first floor. The latter is now quite open to the elements, with the floor hidden under up to 5 ft. of fallen masonry. There is, however, just detectable, immediately above the basement

partition wall, what looks like the line of a similar partition wall across the main hall—although this would certainly be unusual and unexpected. Another feature just discernible at this floor level, which the R.C.A.M. also noticed, was a quite distinct splayed jamb of ashlar on the north side of some aperture immediately above the basement's badly damaged east window. It is too low for a window, and a virtually impossible position for an outside door at that level—had there in fact ever been one—indeed there is no evidence that it ever extended to the outside wall, so one is left with the belief that it was one side of the hall fireplace.

Moving in to the middle of the surviving ruins, at ground level there is a vaulted basement. This is still complete on the inside, although it is badly filled up with rubble that has fallen inwards, and liberally covered with a layer of sand that drips freely with water from the steadily decaying ashlar vault for long after every fall of rain. This floor is divided into two unequal chambers, the west one 19 ft. 4 in. wide by 10 ft. 3½ in. long, and the east one 19 ft. 4 in. by 17 ft. 4 in. long, divided by a partition wall 1 ft. 10 in. thick. The doorway near the north end of this wall was found, on excavation, to be only 5 ft. 7¾ in. high between the threshold slab and the lintel—less than expected. The vault is about 8 ft. 6 in. above the present floor level. The window in the west wall is complete except for the last lintel on the outside. Clearly built before the age of the 16th century gunloops (found at Bonshaw—built c.1545), it has a small outside window, 9½ in. wide by 2 ft. 8 in. high, with moulded frames, and is splayed to open out on the inside (to 5 ft. 6 in. wide by 5 ft. 8 in. high). It is also splayed downwards to within 2 ft. 3 in. of the inside wall where there is a 6 in. step down to a level shelf, 2 ft. 7 in. above the present floor level. The top of the opening is vaulted for 4 ft. and then continued, as the window narrows, with three flat lintel slabs. A solitary pair of holes across the middle of the window presumably held a single iron bar. The wall at this end is 7 ft. 7½ in. thick, whilst that on the east side is only 6 ft. 3 in. thick. Both basement chambers have hatches to the floor above in the middle of the vault, each being 1 ft. sq. The eastern chamber is more complicated, as it was both the means of access and also has a platform covering the roof of the prison vault at the east end. This platform is 15 ft. 9 in. long, extends 6 ft. into the chamber, and is about 2 ft. 6 in. high. Because of this intrusion into the chamber, the window above the platform—which is completely destroyed on the outside, affording the only means of access to the basement since the stairs collapsed — has been raised to the maximum height possible, so that its vault is in fact a few inches higher at its apex than the basement vault. The reason for the intrusion of the prison must remain a mystery: it may have been a hard rock foundation, an intentional feature of the design, or just bad initial planning of the levels; we do not know. In the north wall is a narrow window opening (only 2 ft. 10 in. wide at the inner end) slightly angled to emerge clear of the stair wing. Its top is vaulted, except at the outer end, where displaced lintels have been

unearthed both inside and outside the tower: otherwise it is completely engulfed in rubble, inside and out. The absence of any basement window on the south side—an obvious choice for maximum illumination — strongly implies weak outer defences and no barmkin on that side, as already suggested.

Tucked into the north-east corner of the basement, beyond the end of the platform and flush with the base of the vault, is the doorway that led via the vaulted passage (3 ft. 8 in. wide by 5 ft. long) to the stair wing. The roof of this passage—7½ inches higher on the stair side than the basement side—rises very slightly towards the wing; but as all the ground here is deep in rubble it is impossible (and dangerous) at present to explore the floor levels and locations of steps. Leading immediately off this passage to the east under an uncomfortably low lintel—now collapsed, because the wall has crumbled beneath its north end—with a headroom of no more than 3 ft. 4 in. above the only step now visible, is a low vaulted vestibule entirely within the thickness of the wall. A feature in the top of the vestibule's east wall, with no known parallel—first noticed by the writer, and unexplainable even by the experts—is a large ventilation flue, 8 inches square, which extends 1 ft. into the wall before turning vertically upwards within the wall (where it is blocked with rubble), only 1 ft. 7 in. from the outside wall of the tower.

Doubling back southwards from this vestibule, and still within the wall's thickness, is the 9 ft. long passage (or tunnel) leading to the prison. It has a vaulted roof above the ashlar slabs already referred to, which is level throughout its length, while the rubble covered floor slopes down to a headroom of over 5 ft. (at present) at the prison entrance. Two thirds of the way down this passage is the prison doorway with ashlar jambs. Above the doorway the passage is 2 ft. 7 in. wide, and as the door opened outwards, the stairs down to it that are shown on the R.C.A.M.'s 1912 plan (and no longer visible) must have ended at the lower floor level clear of the doorway. Above the doorway is the finely cut 13th/14th century gully stone already referred to. The channelled slab at the tunnel's outer end is very low, being only 15 inches above the stone step on its west side. On the prison side of the doorway the tunnel narrows to 2 ft. wide, before opening into the east side of the prison itself.

The prison is a gloomy, but not cramped, chamber 5 ft. 4 in. wide x 8 ft. 9 in. long, and the present height to the top of the barrel vault is 5 ft. 7 in. There is no illumination, but at the extreme south end on the east side, is a ventilation flue (7 in. x 4 in.) that turns to rise vertically up inside the wall for 7 ft. before being blocked by rubble. This flue is of an unusual design: it has, however, been copied exactly at Bonshaw, where the dungeon is of a similar design and shape (except that the vaulting runs lengthwise for structural reasons, and the prison is built above ground level—also partly within the wall's thickness—because the tower is built on solid rock). As the very first chamber in the tower to be built, it is interesting to note that the masonry is a mixture of whinstone rubble with a few pieces of sandstone ashlar irregularly, and

irrationally, interspersed among it—surely also from the earlier castle. Even the barrel vault is constructed of rubble except for three rows of ashlar key-stones at the top. It is the height of this vault on the west side that projects into the basement beneath the platform there.

The stair end of the basement entrance passage is almost totally blocked by rubble, as also shown on the R.C.A.M.'s 1912 plan. There is, however, a partial cavity some 5 ft. high between the lower rubble and a masonry blockage at first floor level. In this cavity, the wall of the stair well can be seen curving around to the right, also the broken-off stairs descending in an anti-clockwise direction. Much more important is the little piece of walling that can be seen on the left: instead of following the stair well, as would be expected if the entrance had really been at first floor level, it runs off into the rubble at right angles. In fact, I do not think that anyone today really believes that the tower's original, or main entrance was at first floor level, as speculated **without proof** by the R.C.A.M. in 1912 and echoed by Dr Reid over 20 years later. We feel sure it was at ground level, at the base of the wheel stair in the re-entrant angle, and the little visible masonry tends to substantiate this. Excavations to prove this point were started, but have been abandoned for the present because of the danger without organised shoring up of the masonry above—whose instability has been worsened by the roots of an adjacent tree.

Nothing more should be said of the tower at present.

15th—16th CENTURY HISTORY

As far as we know, the history of Lochwood itself after the erection of the new 15th century castle was quiet enough to pass unnoticed before the middle of the 16th century;—whilst its lairds continued to be Chiefs of the Clan Johnston, and to hold high public office. In any case, records were still few and far between among the local clans and families—in most cases they were non-existent, or have not survived—before 1500: later they gradually increased in frequency, and came to be accepted, though mostly only in the form of land titles. For details of the everyday country life in Dumfriesshire, we owe our knowledge almost exclusively to the very detailed, but sometimes deliberately exaggerated (probably for personal political credit) reports sent back by English officials on the spot to their sovereign or superiors in London

At the time of Albany's rebellion of 1484, the laird of Lochwood and his brother Adam were among the king's most active supporters, and were largely instrumental in the suppression of the rebels.

Mention has already been made of the extensive lands acquired by Johnston of Lochwood in 1516 after the forfeiture of the Corries of that Ilk. This greatly increased their territorial importance as feudal superiors throughout most of Annandale. Of more importance to us here, however, are two years that were landmarks in Lochwood's history, 1547 and 1585.

THE ENGLISH OCCUPATION OF LOCHWOOD, 1547-50

After the disgraceful Rout of the Scottish army at Solway Moss in 1542, the English made repeated raids across the Border, and wrought great havoc, before peace was finally concluded in 1551. These raids were particularly severe in 1547 and 1548, when most Chiefs at first submitted. Before long, however, a strong resistance built up under the leadership of Douglas of Drumlanrig, who was joined by Lord Maxwell, Lord Crichton, Irving of Bonshaw, Johnston of Lochwood, Carlyle of Brydekirk, and gradually other local Chiefs. But Johnston's personal support was to be short lived, for by the 17th May, 1547, we find him a prisoner of the English, with an official letter on its way to King Henry VIII beseeching his release after being " taken on his own ground for defence of his lands and goods." The request had no effect, and Johnston was not finally released until 1550. The English also had designs on Lochwood itself, as an ideally situated stronghold for their centre of operations in Upper Annandale.[4a] Their capture of the virtually undefended Lochwood Castle by guile, not strength, soon after its owner was taken prisoner has often been quoted, and, because of its detail, no apology is made for repeating it:—

" We came there about an hour before day; and the greater part of us lay close without the barmkin. But about a dozen of the men got over the barmkin wall, and stole close into the house within its barmkin, and took the wenches and kept them secure within the house till daylight. And at sunrise two men and a woman being in the tower, one of the men rising in his shirt, and going to the tower-head, and seeing nothing stir about, he called to his wench that lay in the tower, and bade her rise and open the tower door and call them up that lay beneath. She so doing and opening the iron door, and a wooden door without it, our men within the barmkin broke a little too soon to the door. for the wench, perceiving him, leapt back into the tower, and had gotten almost the wooden door to. But we got hold of it (so) that she could not get it close to. So the skirmish arose, and we over the barmkin and broke open the wooden door. And she being troubled with the wood door left the iron door open: and so we entered and won Lochwood! "[5]

This one contemporary account alone tells us of a tower with an outer door reinforced with the usual iron yett, both almost unquestionably at **ground** level. Also within the barmkin was a separate dwelling, which was almost certainly the building at the north-east corner of the courtyard. It is fairly clear that there were no outer sentries posted at that time. From Dr Reid's paper and other extracts from the original reports, we learn in addition that the tower was considered fairly large, that there were separate stables, and possibly also a separate hall and kitchen (though this is not clear), and that the tower was well stocked with salted beef, malt, barley, oatmeal, butter and cheese.

Having captured Lochwood, the English remained in occupation there until they released the laird from prison in 1550 and returned his castle. When, two

4a. See D. & G. Trans., 1967—" The Platte of Castlemilk," 1547.
5. " The Stones of Scotland," by W. Douglas Simpson.

years later, a treaty was drawn up concerning "the Debateable Land," one of the Scottish signatories was the same John Johnston of that ilk.

In 1570 the English again made a number of invasions into Dumfriesshire, spurred on by the civil unrest following a fervent, but unsuccessful, uprising in favour of the cause of the imprisoned Queen Mary. They wrought great havoc along the Solway Coast and up Nithsdale, but on this occasion do not appear to have driven north up Annandale.

THE CAPTURE AND BURNING OF LOCHWOOD, 1585

For a long time inter-clan rivalry between the Johnstons and Maxwells had been steadily growing over the powerful political posts of Warden of the Western Marches, held at various times by the Chiefs of both clans, and the Stewardship of Annandale. When national issues were at stake, the clans were usually united in a common cause; but at other times the ill-feeling steadily grew. By the middle of the 16th century, the situation was serious; by 1564, when marriage was contemplated between the powerful clans of Irving and Johnston (the eldest son of the former Chief to a daughter of the latter Chief), the unrest was considered so serious that the Privy Council took the unprecedented step of issuing an edict forbidding it, because of the even greater "blood bond" strength that it would create within the long established Irving-Johnston Alliance: in 1585 the explosion came.

In 1578 the office of Warden of the Western Marches was taken away from the 7th Lord Maxwell and given to Johnston, making the former even more angry and rebellious. In an attempt to quieten him, Sir John Johnston of that Ilk, 15th of Lochwood, as Warden and Justice of the Western Marches finally marched against him in 1584, without achieving his object. The following spring, on the 6th April, Robert Maxwell (brother of John 7th Lord Maxwell, Earl of Morton),[6] with a force of some 400 English and Scottish rebels made a night raid upon the Johnston lands of Annandale. This was to become full-scale inter-clan war, in which most of the local clans soon became engaged on one side or the other. The Maxwells' main objective was Lochwood, which they besieged, captured, and burned, killing several Johnstons and taking many others prisoner. The charter chest with all the family muniments was destroyed. Sir John Johnston, himself, effected his escape, and fled more than 20 miles to the security of Bonshaw Castle, the seat of his chief ally, Edward Irving of Bonshaw, whither Morton followed him with siege artillery. Here he was as safe as he could be anywhere, in what the shrewd English Warden, Lord Scrope, described at the time as "one of the strongest houses of that Border." Through Scrope's mediation, a truce was agreed to; but it did not last long. Apart from three further unsuccessful sieges of Bonshaw by the Maxwells—which do not concern us here—the Johnstons were continually under pressure; and no amount of anger by the king or his government at the treatment meted out to his Warden had any effect upon the Maxwells' campaign. Before the

6. He was only Earl of Morton from 1581-85.

end of April Robert Maxwell again raided the Johnston lands of Annandale and burned about 80 homes. After retaliation by the Johnstons, the (now forfeited) Earl of Morton raided one part of the Johnston lands, whilst Robert Maxwell, assisted by four other clans, harried Dryfesdale and burned part of Lockerbie. The war continued, while Johnston first sought government help without success, and then turned to Lord Scrope for English help, but with equal lack of success as Scrope had not received the appropriate authority from his Queen. Late in May, Lord Maxwell himself, with a force of 1700 men, raided all the Johnston lands around Moffat and down Annandale, carrying off 1000 cattle, 2000 sheep, 100 horses, and other goods. Scrope's reports on the war cover the Irving-Johnston losses rather than retaliations made upon the Maxwells, as the former territory was nearer his country and news there more readily available. Perhaps it is for the same reason that we hear less of Johnston losses in Upper Annandale, although that area was also more remote from the Maxwell's home ground.

The fire continued to smoulder, or flare up, for a further eight years, before the two sides met in the famous open battle of Dryfesands (fought 1½ miles north-west of Lockerbie), the last inter-clan battle ever fought on Scottish soil, in which the Maxwells were resoundingly defeated and their Chief, the 7th Lord Maxwell, killed. Even so, the Maxwells had to try and win a last round in this personal vendetta. On the 6th April, 1608, at a personal meeting arranged to settle their differences, John 8th Lord Maxwell treacherously murdered Johnston, and then fled the country. On his return in 1613, he was tried and executed.

LATER HISTORY

Thereafter, life for the Johnstons of Lochwood, and all other Border clans, became more peaceful. The Union of the Crowns in 1603 brought both sides of the Border under the same sovereign control, and made the enforcement of law at last effective.

The Johnstons of Lochwood continued in their loyal service to the crown and high public office. James Johnstone of that Ilk, 17th of Lochwood, son of the murdered Chief, was in 1633 created 1st Lord Johnstone of Lochwood; and in 1643 his dignity was raised to that of 1st Earl of Hartfell, Lord Johnstone of Lochwood, Moffatdale and Evandale. His son James, 2nd Earl of Hartfell, was in 1661 made 1st Earl of Annandale and Hartfell, Viscount of Annand, Lord Johnston of Lochwood, Lochmaben, Moffatdale and Evandale. And his son William was in 1701 created Marquess of Annandale, etc. (with remainder to the heirs male of his body, whom failing, to the heirs female of his body). On the death of the 1st Marquess's second son, the 3rd Marquess, the titles—for reasons better known to lawyers than to reason and fact—became "Dormant."

THE LOST CHARTERS

Although it has always been accepted that all the Johnston charters were destroyed when Lochwood was burned in 1585, Dr Reid points out that some of

their titles are intact back to the year 1509. A quite reasonable explanation of this could be that the surviving charters were not in fact at Lochwood at the time—as the disastrous conflagration is too well documented to be questioned. Being legally in the category of contemporary titles, earlier charters were probably at Lochhouse (or some other lesser residence) at that time, bearing in mind that the famous marriage contract of 1566, which included the granting of certain important lands, was not drawn up at Lochwood (as one might expect), but at the Johnstons' second tower, Lochhouse.

LATER ADDITIONS TO LOCHWOOD CASTLE

It is well known that the 15th century castle had a number of additions and modifications built during subsequent centuries, and the determination of the extent of these is one of the objects of the present excavation works. For instance, in 1547 we know that the tower was separate from the other dwelling on the site, and also that there were stables of some sort. Today we can trace the ruins of a not-altogether elementary building range connecting the old dwelling to the tower. We also strongly suspect an extension of the width of this range to encroach upon the courtyard. In addition, the whole of the north side of the yard is occupied by another range of buildings, and on the west side, near the middle, are the foundations of another small building or outhouse. Beyond the barmkin, and stretching out across the adjacent field to the south and west, are more foundations of later building work, with walls 2 ft. 9 in. thick, that, surrounded—amongst other things, not yet traceable—a building or enclosure to the south of the south-west corner of the barmkin. And last, but by no means least, is the large levelled area, 240 ft. x 180 ft., with its miniature, purely decorative, "mote hill," which formed the major part of the 17th —or possibly very early 18th—century landscape garden.

Lochwood was finally abandoned soon after the turn of the 18th century. The usual, and generally accepted, story is that it was accidentally burned down in 1710 and never restored, though one account refers to the year 1725 without mentioning a fire. It was, therefore, probably burned in the time of the 1st Marquess (1664-1721), but could have been burned in the time of the 2nd Marquess (d. unmarried 1730). What contents survived were salvaged and are now presumed to be mostly at Raehills—though the later connection with the Earls of Hopetoun, Hopetoun House, and Moffat House, should not be forgotten. The only certain recovery from the castle site was a glass decanter (with a small hole in it): this was found on the site c.1890 and is now in Raehills House; its style has been dated to the late 17th century.[7] Of the castle remains, part may have been dismantled, some rubble is said to have been used long ago at nearby farms, and the rest lies today in forlorn heaps where this extensive castle once proudly predominated the surrounding area.

Right up to the time of its abandonment Lochwood was the principal

7. Further items of this period have now been recovered during excavations.

residence of the Johnston Chiefs, as well as being their "Seat," and this fact is borne out by letters addressed from there.[8] Dr Reid mentions one at Raehills that was written from Lochwood in 1693, in which William, 2nd Earl of Annandale, says he had been in residence for two months. Earlier, in 1628 Sarah Countess of Wigtown made her will here, and in 1640 the 1st Lord Johnstone also made his will here. Even earlier, according to the Royal Commission, King James VI. graced Lochwood with a royal visit, possibly during the time of the Johnston-Maxwell troubles.

Today there are only ruins. Yet, nostalgically, Lochwood will always remain the Foundation and Seat of the Johnston Clan the world over.

8. Even though Sir William Bruce built them a fine new mansion in 1699 at Craigiehall in West Lothian.

DUMCRIEFF AND ITS OWNERS

By W. A. J. PREVOST

Of all the country houses in Upper Annandale it would be true to say that Dumcrieff has by far the most interesting history. The name "Duncreth" is mentioned as far back as 1357 and the lands and house of Dumcrieff have been owned or occupied from time to time by people of some distinction. The house as it stands today is an impressive specimen of a Scottish Border mansion, a relic of what was once a large landed estate in the two parishes of Moffat and Wamphray. It stands on the western bank of the Moffat Water, a mile and a quarter below the neighbouring lands of Craigieburn which at one time formed part of the Dumcrieff estate. It is with the house and lands of Dumcrieff and its owners that this paper is chiefly concerned.

In 1482 Alexander, Duke of Albany and Lord of Annandale, granted a charter of Dumcrieff to Sir Adam Murray, second son of Sir Charles Murray of Cockpool. Sir Adam has been described as a typical Border leader and he figures with the Johnstones of that Ilk in the early history of Upper Annandale. He took an active part in the feud between the Maxwells and the Murrays in the years 1480 to 1487,[1] he was an active participator in the warfare then prevalent on the Borders and for his misdeeds was imprisoned in the Castle of Blackness.[2] Sir Adam was involved in a minor incident in 1496 when he raided the place of the Glendinnings in the parish of Westerkirk, an escapade which led to an action by the King's Advocate, for the Murrays had uplifted horses, oxen and cattle, together with "beddis, napre, silver spunyis, pottis, pannis" and other "insicht gudis." This justified some form of reprisal and Glendinning of that Ilk returned the compliment, descending on Dumcrieff at midnight and attacked Sir Adam Murray and "did that was in thame til haf slane him." Glendinning recovered eight silver spoons, seized "al uther insicht gudis that thai micht turse" and burnt the remainder.[3]

Sir Adam died in 1512 and was succeeded by his son Cuthbert[4] who doubtless followed his father's example, for he met a violent end at the hand of one James Johnstone in Corrie in 1545,[5] It was probably Cuthbert who was responsible for building the peel tower of Dumcrieff, for during his lifetime the Scottish Parliament passed an act in 1535 which ordained that every man of a certain standing was to build a barmkyn upon his lands, and also a tower should he think a tower expedient. Moreover, his neighbour, Carruthers of Mouswald, had only a few years previously built a tower on Cornal,[6] and it would seem that the need for a house of strength on Dumcrieff was no whit less pressing.

Cuthbert Murray's descendants who followed him in succession in the

1 **Scots Peerage**, i, 219.
2 **Acts of Council**, ii, 453.
3 **Ibid:**, 291.
4 **Reg. Privy Seal of Scotland**, i, 370.
5 P. W. L. Adams, **A History of the Douglas Family of Morton**, 270.
6 **R. C. Reid, Records of the Carruthers Family**, 65.

lands and Mains of Dumcrieff are shown in the following pedigree. Their story has been chronicled by Dr R. C. Reid in his "Notes on the Family of Murray of Dumcrieff."[7] The succession is clear but concerning the lands which they possessed at different times during their long reign of over 240 years there is some doubt. The Mains of Dumcrieff with its peel tower was the Murray stronghold but they also laid claim to what was known as the £10 land of Dumcrieff, land which was for long occupied by Johnstones. In 1607 their interest in this land is certain, for in that year Adam Murray (4) was found heir to his father in that same land,[8] and six years later Adam contested the right of John Johnstone of Craigieburn to certain lands in the submission which were "a part of the said Adam's £10 land of Drumcreiche." The matter was put to arbitration when the two arbiters were unable to agree, but the oversman decided in Adam's favour, ruling that all writs concerning the said lands were to be delivered to Adam,[9] and when he died in 1630 his will shows that he was firmly established in Craigieburn which was part of the £10 land.[10] Henceforth the extent of the lands possessed by the Murrays is clear enough[11] and this is confirmed by the parishioners roll of Moffat parish which shows Murrays being in both Craigieburn and Dumcrieff in 1684. (See Appendix A.)

Dr Reid writes that the fortunes of the Murrays suffered severely in the Covenanting period, but at the end of the century they still had some influence, for Archibald Murray (6) was a Commissioner of Supply between the years 1689 and 1702. He died in about 1702, apparently without issue, for Robert, his brother, had sasine of the lands of Dumcrieff in that year, and when Robert died eleven years later the lands were all divided up, in pursuance of a contract of marriage between Adam Murray (5) and his wife Christine Douglas. One half of the £10 land went to the Tods of Craigbeck, the other half to the Johnstones of Girthhead, and Adam Murray (8) inherited the lands and Mains of Dumcrieff. Adam (8) died the following year and his son John (9) succeeded him.[12]

John was not a wealthy man and his will shows that he was not blessed with many wordly goods. The dozen items listed after his death included a a horse worth £5 and the remainder were all household furnishings, amongst which were "ane jugg and six silver spoons."[13] He sold the Mains of Dumcrieff to Lord George Douglas, brother of the Duke of Queensberry, in 1724.[14] The Duke, as heir to his brother, succeeded to the estate in 1726 which he then sold to Sir John Clerk of Penicuik (1676-1755) who was one of his "commissioners."[15] Subsequent owners of Dumcrieff are as shown in Appendix B.

7 Adams **op. cit:, 269 et seq.**
8 **Retours,** Dumfries No. 42.
9 Scottish Record Office, Register of Deeds, Vol. 223. See also Adams **op. cit.,** 270, 271.
10 Adams **op. cit.,** Appendix B, No. 48.
11 Inventory of the writs and progress of the £10 land of Dumcrieff.
12 The Murray-Jardines, who farmed Granton in the 1870's and 80's, are said to have been descended from the Murrays of Dumcrieff.
13 Dumfries Testaments, 17th September, 1730.
14 **Memoirs of Sir John Clerk** (Scot. Hist. Soc.), 249.
15 **Ibid.,** Sir John Clerk in his memoirs writes that he bought Dumcrieff in the summer of 1727. For his biography see **DNB.**

The extent of the £10 land then held by the Murrays is clearly indicated in a contract of division made in 1733.[16] The eastern half contained the lands of Craigieburn, Connel Beck and Craigmyre, and was bounded on the west by the Craigie Burn, on the south and south-west by the Moffat Water, and on the north and east by the marches of the said lands of Craigieburn as they now march with the farms of Alton and Roundstonefoot. The western half was bounded on the south by the Mains of Dumcrieff, on the south and south-east by the Moffat Water, and the circle was completed by the Craigieburn and Frenchland burns. Of the several sub-divisions of land named in the contract the name Baldshaw still survives in the Belshaw Plantation, Craigiehill is now called Hunterheck Hill and Ellerbeckcrooks is derived from the Ellerbeck which flows through the farm of Rogermoor.

The Mains of Dumcrieff were advertised for sale in 1777 and they amounted to 277 Scots acres which were then mostly enclosed and under short leases.[17] When purchased by Mr MacDonnell in 1920 the policies and fields amounted to about 160 acres.

The house of Dumcrieff which John Murray had occupied was not very pretentious, though of sufficient importance to have been included by Garioch in his list of "gentlemen's seats" in 1723.[18] The "little manor or manor house" has been described as being then only two low stories in height and of a "quadrangular form." The only timber near it were some old ash trees to the north and a large Scotch fir[19] and not far from the house a wauk mill and a corn mill were operating.[20] Dumcrieff was a poor little estate which Sir John Clerk and his son George were to take a great interest in improving.

Sir John was an old habitué of Moffat and before his purchase of the property had frequented Moffat "every year." He at once planned to enlarge the house, for he had "little accommodation" there and he wished to "live there once a year for a month, for the benefite of Moffat water, and for the diversions of shooting and fishing, which were there in greater perfection than any other place" he knew. The year following his entry into Dumcrieff he bought the lands of Craigieburn from Mr Johnstone of Girthhead, the eastern half of the £10 land, and he had a great desire to buy the western half as well but could never make a bargain with Mr Thomas Tod, though they made an exchange and Sir John's half was laid contiguous to his lands of Dumcrieff.[21]

The baronet was a most progressive landlord and a pioneer of fencing. Letters with reports of work done at Dumcrieff between 1728 and 1734 record

16 Craigieburn writs. See also Scottish Record Office, Clerk of Penicuik Muniments (GD 18) Nos. 2576/1 to 4. Action and Cause raised by John Murray of Dumcrieff concerning marches of Craigieburn and Adam Murray's occupation in 1715. Also No. 2583, Inventory of Diligences, 1727.

17 **Dumfries Courier.**

18 W. Garioch, "Description of Annandale," **The MacFarlane Geographical Collection** (Scot. Hist. Soc.), i, 365.

19 **Moffat Register,** 10th September, 1859.

20 The Craigieburn writs record that John Murray leased a wauk mill at Dumcrieff to Patrick Hastie, dyer in Breckonside, tack 12 Ap 1717. Also a corn mill to William Gibson, portioner in Crawford, tack 14th May, 1719. George Halliday, dyer and waukmiller, left Dumcrieff for Berryscaur in 1746, and a family of Proudfoots were there till at least 1801 when John Proudfoot "in Dumcrieff Mill" died aged 77.

21 **Memoirs of Sir John Clerk,** 130, 133, 135.

the building of dykes or fences. A "park dyke" seems to have been a ditch and a bank faced with stones, though in 1740 Sir John refers to the park with the stone walls. Other ditches were excavated and the banks planted with quick-set or thorn. Some of these fences are perhaps the same as those shown by Roy in his map of Dumfriesshire, surveyed some twenty years later. A new dam for the mill was constructed and "there is a new sit house[21a] built for the millar near the mill and at this time we are reparing the kitchen."[21b] Lady Clerk was also helping to make the house habitable and on 8th August, 1731[22] she wrote to Sir John at Dumcrieff, informing him that "you will receive a leam[23] chamber pot and a peuther one, a besom and a hard ruber and a frying pan. For you two ells stuf. There was none like the swatche,[24] and Gill would not venture to bring any other, but I advise you to make a slit in the bed curtains at the head stoups and so you may bring the head curtain to cover the dails[25] . . . You would make the slits no longer than the dails go up. The contrivance will also keep the curtains from the lime wall . . ."

In 1737 Sir John made over the property to his son George who had married his cousin Dorothea Clerk, the daughter of Agnes Maxwell and the heiress of Middlebie, and George assumed the name of Clerk-Maxwell, but the baronet still retained a very lively interest in Dumcrieff. A memorandum[26] in Sir John's own writing records how he went there from Penicuik on 8th August, 1740, in a coach with six horses, accompanied by his wife and his daughters Ann and Joanna. Sir James Holburn[27] was also of the party. "Our equipage consisted of a coachman, a postilion, one servant on horseback, and one with a baggage horse." He also noted that the best room, which he and his wife occupied, was ill provided with furniture and that the "dining-room belou stairs is not in order. Painted paper wou'd be best to hang round it. It wou'd likeways take about 40 elles square with some fine prints in frams. The brae on the front of the house wou'd require about 50 beeches at 15 or 20 feet wide." This reference to the proposed planting of trees is noteworthy, for in 1963 a large Scotch pine in the avenue at Dumcrieff was cut down and was estimated to be about 233 years old.

It would seem that Dumcrieff has always produced some fine timber and this is confirmed by a letter 19th August, 1739, written by Sir John Clerk to his friend Rager Gale, recorded by John Nichols in his **Bibliotheca . . .** "In a moss of small extent (the Moss of Dumcrieff) I saw the finest oak my eyes

21a Sit-house, dwelling-house, a "seat" especially of a farm house.
21b Clerk of Penicuik, Nos. 5697 and 5720. An estimate for the building of 300 roods of a stone dyke to enclose the muir at Dumcrieff is dated 17th November, 1763. This was to cost 7/6 a rood, "Mr George Clark Maxwel to furnish Quarry, Tools and proper grass for the Cart Horses while employed in leading the stones." Clerk of Penicuik, No. 2607.
22 Ibid, No. 5289/14.
23 Leam, leem, earthenware.
24 Swatche, swatch, sample or pattern.
25 Dail, a deal-board.
26 Clerk of Penicuik, No. 2332.
27 Sir James Holburn, Bart., of Menstrie. Succeeded to the baronetcy January, 1736-37. Died 26th July, 1758, at Penicuik. G.E.C. **Baronetage**, iv, 438.

ever beheld. It lay six feet under the surface, straight and above seventy feet in length, all fresh from the root to the top, though no doubt it had lain there fifteen hundred years; near to it were a great many other oaks, and above, near the surface, a whole wood of birch trees, which have grown up after the catastrophe of the oaks. The main question here is, what power overturned these first and last, for the roots are as conspicuous as the bodies and branches . . ."

Extensive alterations to the house were carried out in 1742 and George Clerk-Maxwell, who was then living in Dumfries where he was managing his linen manufactory, reported to his father in a letter 29th March that the foundations of "the new building" were to be laid the following day, and again on 14th April that the masons had been obliged to pull down the middle part of the house.[28]

George (1715-1784), who succeeded his brother James in the baronetcy in 1782, deserves to be better known for his public work in Dumfriesshire. Joseph Irving includes him in **The Book of Eminent Scotsmen,**[29] and in the **New Statistical Account** for Moffat the Rev. Alexander Johnstone refers to "the influence he possessed, his residence at Dumcrieff in this parish, and his eminent public spirit and talents, altogether were very highly beneficial to this part of the country." Like his father, he was a keen antiquary and assisted General Roy in his search for Roman remains in Annandale.[30] He did much in promoting the formation of turnpike roads, building bridges and other improvements first introduced in his time.[31] Confirmation of his interest in roads is found in references in the Clerk Muniments. Firstly, a letter from George to his father in 1749 which refers to a regiment working on an unnamed road;[32] secondly, a statement of accounts which shows money spent on the road to the Well between 1759 and 1762;[33] and, thirdly, an estimate for making the new "Turnpickrood" up Annan Water, together with a covering letter 29 Nov 1763 from another contractor enclosing his account for two bridges which he had built over the Annan.[34]

Clerk's interest in forestry is also evident. In about 1774 he established extensive plantations on Aikrig,[35] and when Mr Brown wrote the **Old Statistical Account** in 1792 he noted that the young plantations were in a flourishing condition. He also planted trees in the policies and near the house, which was added to from time to time, for Clerk paid window tax on 21 windows in 1748 but on 35 in 1757. Dr Currie, who purchased Dumcrieff in 1792 describes the house as it then was. "The house is an old house, with walls cannon proof; there is one modern room, a very fine one; another tolerable, and nine bedrooms. . . . . Before the door there is a lawn about the size of a large bowling

28 Clerk of Penicuik, Nos. 5396/43 and 49
29 Also by William Anderson in **The Scottish Nation.** There is an uncomplimentary reference to George's business failures in Lewis Campbell and William Garnett, **The Life of James Clerk Maxwell** (1882), Chap. i.
30 **TDGAS.** (Third Series), viii, 90.
31 Forrest's **Illustrated Guide to Moffat** (1900) 33 and (1910) 31.
32 Clerk of Penicuik, No. 5396/74.
33 Ibid., No. 2607.
34 Ibid., No. 2607.
35 **New Statistical Account, Moffat,** 110.

green, and used as such in Sir George Clerk's time, surrounded by trees of perhaps 200 years old. On one of these hangs a bell to ring the family to dinner, and perhaps to prayers, on which I saw "1612" with a cross above it, marking a Catholic origin."[36]

It was in this house that the poet Allan Ramsay was entertained by the Clerks in 1743, 1748 and 1754, and doubtless on other occasions, for Ramsay was on intimate terms with both Sir John and his son George. The occasion of his visit in 1743 was celebrated by a rather vulgar poem, "Let Lairds of Lockerby take tent," which is in the same style but in no way equal to his classic **Gentle Shepherd.**[37]

George Clerk did not reside permanently in Dumcrieff which became a summer retreat for all the Clerk family, and in 1748 he removed to Edinburgh, having been appointed to act in the affairs relating to the Forfeited Estates.[38] He had been forced to close down his linen factory in Dumfries and he seemed to be continually in financial difficulties. In due course he was forced to sell Middlebie and finally Dumcrieff which he conveyed to his creditors in 1782.

Dr Currie (1756-1805), whose purchase of Dumcrieff has been mentioned above, was enchanted with his little estate but was fated not to enjoy it for long. He had practised in Liverpool for 12 years where he had prospered exceedingly but in 1784 he became very ill and was eventually persuaded to seek a cure at Moffat Well. This he did in June, July and August and the treatment apparently saved his life. He returned to England to continue his work but his health continued to fail and he sold Dumcrieff to Dr Rogerson in 1805.[39]

The career of Dr Rogerson is legendary. Born in Johnstone parish in 1741, he was educated first in Moffat and afterwards studied medicine in Edinburgh where he took his diploma. He was then a young man of superior intelligence and agreeable manners and made many friends with some of the more prominent men of the period. He was on terms of intimacy with George Clerk of Dumcrieff "who was distinguished for his love of scientific pursuits." In 1766 Rogerson was persuaded by his relative Dr Mounsey, also a native of Dumfriesshire and for many years physician to the Russian court, to go out to St. Petersburg[40] where he remained for fifty years.[41]

His career there was a remarkable one, for not only did he become first physician to the Empress Catherine and to the two Emperors Paul and Alexander, but he also enjoyed the friendship of the Imperial families and was in familiar intercourse with celebrated statesmen and generals of the day. In 1762, not long before Dr Rogerson's arrival in Russia, Peter III.'s succession to the throne precipitated a revolution. The Czar was put to death and his wife Catherine II. became Empress. It was to her court in 1769 that Rogerson

36 William Wallace Currie, **Memoir of the life . . . of James Currie** (1831), 1, 154-159.
37 Clerk of Penicuik, Nos. 4346, 4371/1 and 2.
38 Ibid., No. 5396/71.
39 R. D. Thornton, **James Currie** (1963), 131.
40 Ewart Library, Dumfries. Carruthers-Thompson MSS (Carruthers MSS). Letter 10th December, 1767, Samuel Rogerson of Fingland to Dr John Rogerson, St. Petersburg.
41 W. Johnstone, **The Bard and the Belted Knight** (1867), 173-181.

was appointed doctor,[42] and that Dr Rogerson was all his days a confidant and prime favourite of the Empress is unquestionable.[43] He was advanced in 1776 to a Body Physician from the rank of a Counsellor of State and on the occasion of the famous journey to the Crimea made by the Empress in 1787 she was attended by Princess Dashkoff, the Emperor Joseph, Stanislaus King of Poland, the Prince de Ligne, Mr Fitzherbert, the British minister, and Dr Rogerson.[44]

Rogerson's career in Russia was not unprofitable. Being a whole time paid servant of the sovereign it was contrary to the etiquette of the Imperial Court for him to take payments other than his salary, but it was quite in order to accept a gift in kind from any courtier whom he attended professionally. This was brought about by an arrangement with a jeweller who sold to a grateful patient a gold snuff box which was immediately returned to the jeweller by the doctor who received a sum of money in exchange. Gold coins were not allowed to be exported from Russia and Rogerson overcame this difficulty by sending the money home to Scotland in sacks of corn.[45] The shipping was probably in the hands of the British firm of Thomson, Peters, Bonar and Co., who were established in Russia and by whom William Rogerson, a cousin of the doctor, was for long employed.[46] Various estimates of his fortune have been quoted, one of which credits the doctor with having purchased property in land to the value of above £130,000, besides leaving at his death large personal means which his great-grandson Lord Rollo chiefly inherited.[47]

Catherine II. died in 1796 and the following year Rogerson was promoted to the rank of Privy Councillor. The Empress was succeeded by her son Paul whose reign ended abruptly and not unfashionably when he was strangled by conspirators in 1801. The doctor gave "a melancholy account of the occurrences of the night when that sovereign was killed, particularly of his accompanying the Empress from the country place where the event took place to the palace in town, carrying the [future] Emperor Nicholas on his shoulders. When the doctor said this was the most unhappy day in his existence a gentleman of the Russian factory who was present said, 'Doctor, different people see things in different points of view. I assure you we thought it the merriest day in our lives.' "[48]

Three years later Rogerson was permitted to absent himself for such time as his domestic concerns might require[49] and, having returned to Scotland, purchased Dumcrieff and the farms of Breckonside and Loganwoodhead. In 1810 he bought the Wamphray Estate for £90,000 from Fettes, an Edinburgh

42 Rogerson letters, loaned by Mr J. A. Rogerson, Lockerbie. St. Petersburg, November, 1824. Alex. Rogerson, to his cousin Dr John Rogerson, junior.

43 **The Memoirs of Princess Dashkov** (1958), translated by K. Fitzlyon, 315.

44 Rogerson letters. Copy of notes on Dr Rogerson by Alex. Young, W.S., of Harburn. Both Mr Young's father and grandfather were ministers of Hutton and Corrie.

45 Letter, 28th March, 1955, from Mr J. A. Rogerson, Lockerbie, to W. A. J. P.

46 Carruthers MSS. Letter 13th May, 1788, Wm. Rogerson, Fourmerkland, to his second son Wm. Rogerson at St Petersburg. Wm. Rogerson, junior, died at St Petersburg circa 1810 when an inventory of his effects was taken.

47 W. Johnstone, **op. cit.**, 179.

48 Rogerson letters. See 44 above.

49 Rogerson letters. St. Petersburg, November, 1824, Alex Rogerson to Dr Rogerson, junior, at Dumcrieff.

merchant, who was the man responsible for the building and endowment of Fettes College in that city.[50]

Rogerson left St. Petersburg for good in 1816[51] and returned to Scotland. A few letters written by him after his retirement still survive and contain some items of interest.[52] A letter, Edinburgh, 28th December, 1816, refers to the visit to Scotland of the Grand Duke Nicholas, afterwards Emperor of Russia. He "left us 5 days ago for Glasgow. He was to sleep at Moffat last night on his way to Liverpool. I was constantly with him whilst here." Another, Dumcrieff, 15th July, 1821, to Alexander Rogerson in St. Petersburg records that he was then "in tolerable spirits but find extreme feebleness on the least fatigue . . . but what can a man expect when his 80th year is nearly expended." Other letters indicate the old man's fondness for good living to which he had long been accustomed, for he imported from Russia his favourite salted cucumbers together with caviare, reindeers' tongues and Astrakhan grapes, delicacies which were not appreciated by his friends.

The house which Rogerson first occupied was old and neither sufficiently large nor ostentatious enough for a man of his wealth and standing. It could neither compare with Raehills nor with Rammerscales which had been built by Dr Mounsey, though it was then described in a list of ten other country houses as appearing in "very neat and convenient order, suggesting ideas of comfort and elegance . . ."[53] The Doctor planned to build a new house and had the old one demolished with the exception of the dining-room which he religiously retained, from reminiscences of the hospitality shown him by his early friend George Clerk.[54] This room was recently identified when workmen discovered a bricked-up window when stripping the plaster off an inside wall. On 28th March, 1820, he wrote from Edinburgh. "I am glad the work is going on so well at Dumcrieff and I should think that it will be right to have the additional offices erected as early as may be." Again, ten days later "We leave this place for Moffat the beginning of May and have taken Lord Hopetoun's house for a year."[55]

The building of the house, which was probably finished in 1821, was the least of his many activities. He laid out the policies as they exist today and was responsible for closing down the public road which passed through his grounds and making a deviation round by Craigbeck to join the Old Carlisle road east of the Moffat Water Bridge. He planted many trees and on his Wamphray estate planted up nearly 150 acres, most of which were larch, though the Doctor had tried unsuccessfully to establish pines grown from seed which he had introduced from Poland. He repaired and built many houses and offices on his numerous farms, built many miles of fences and carried out many improvements for the benefit of his tenants.[56] In fact the population of

50 John Paterson, **Wamphray**, 44. 51 **Ibid.**, 44. 52 Rogerson letters.
53 Dr Singer, **Agricultural Survey of Dumfriesshire** (1812), 82.
54 W. Johnstone, **op. cit.**, 179.
55 Rogerson letters. This house is now Moffat House Hotel.
56 Carruthers MSS. Memoranda to Dr Rogerson for years 1818 and 1820 regarding expenditure on his estates.

Wamphray parish increased from 481 in 1811 to 554 in 1821 due, it is said, to the demand for labour owing to the extensive operations then carried on.[57]

Dr John Rogerson, senior, died of "palsy" in 1823 and the good work was continued by his son Dr John Rogerson, junior, who inherited the Wamphray Estate, and by the trustees of his granddaughter Elizabeth for the Dumcrieff Estate. This, in 1827, consisted of the Mains of Dumcrieff and others, Frenchland and Walls, Breckonside, Alton, Woodhead and Gillfoot.[58] In 1855 the trustees rounded off the property by exchanging certain lands in Nithsdale for the adjoining lands of Craigbeck and Woodfoot.[59]

Elizabeth Rogerson married Lord Rollo whose family seat was in Perthshire, where he possessed considerable property, and for this reason the house of Dumcrieff was usually occupied by tenants. In 1920 the estate was broken up and the farms of Hunterheck, Craigbeck, Woodhead, Frenchland, Breckonside, Aikrig and Alton were sold. The mansion house with policies and fields amounting to 160 acres was bought by Mr W. H. A. MacDonnell, a landowner from Ireland who had been most fortunate in disposing of his Irish property and escaping with all his belongings to Scotland.

The mansion of Dumcrieff, now owned by the Rev. Adam Forman, remains substantially the same as when it was built by Dr Rogerson.[60] It has been described as a typical Scottish late Georgian country house, built of local whinstone, with free-stone window jambs, lintels, corner stones and balustrade. The west or entrance front, which has a plain pillared doorway below an Adamesque fanlight, is flanked by two short wings. The south front, measuring 84 feet, contains on the ground floor the dining room, morning room and library.[61]

From the morning room a french window leads on to a pillared loggia, a distinctive feature which has enabled the Doctor and his successors to enjoy many delightful hours of relaxation on warm and sunny days. On the north side of the library a narrow east west passage is thought to be part of the older house and is connected with Rogerson's Funk Hole, an architectural puzzle which can be described as a priest hole with no secret entrance. This "hole" is said to have been used as a hiding place by Dr Rogerson when suffering from attacks of persecution mania but there is no foundation of truth in this story.

Seen from a distance Dumcrieff fits admirably into its surroundings, with backgrounds of magnificent trees; and beyond the trees, when viewed from certain aspects, the rounded contours of the Moffat hills. It is easy to step back into the past and to visualize the peel tower of the Murrays standing stark above the river bank, or the old house of the Clerks, bare and unadorned, with reeking lums and high peaked gables outlined against a winter's sky.

57 **New Statistical Account, Wamphray.**
58 **County Valuation Roll, Dumfriesshire, 1827.**
59 Craigbeck writs.
60 Attic windows were enlarged and added in 1932.
61 Notes on the house supplied by Sheila Forman.

APPENDIX A

OWNERS OF DUMCRIEFF, 1512-1724

(1) Sir Adam Murray of Dumcrieff.
d. 1512.

(2) Cuthbert Murray of Dumcrieff m. Janet Johnstone.
d. circa 1545.

(3) Adam Murray of Dumcrieff.
d. by 1601.

Charles

(4) Adam Murray of Dumcrieff m. Elizabeth Johnstone
d. 1630.

Thomas.

(5) Adam Murray of Dumcrieff m. Christine Douglas.
d. before 1698.

Four children.

(6) Archibald Murray of D. Served heir to his father in 1698.
d. circa 1702.

(7) Robert Murray of D.
d. circa 1713.

Anna m. John Tod of Craigbeck.

Nicolas m. George Johnstone of Girthhead.

(8) Adam Murray of Dumcrieff. Nephew of Adam (5) and "cousin german" of Robert. Retoured heir to Robert in 1713. Died 1714.†

(9) John Murray of Dumcrieff m. Grizzel Douglas in 1713. Heir to the Mains of Dumcrieff in 1714 which he sold in 1724.† Died circa 1730.

Archibald Tod. Portioner in half £10 land in 1713. Died 1716.*

Robert Tod. Heir to his brother Archibald in half £10 land which in 1722 he disponed to his brother Thomas.*

Thomas Tod. Minister of Durisdeer.

Archibald Johnstone. W.S. in Edinburgh. Portioner in half £10 land in 1713.*

Wm Johnstone of Girthhead. Sasine of the above half £10 land in 1714, which he sold to Sir John Clerk in 1728.

Note.—Pedigree based on Dr R. C. Reid's "Notes on the family of Murray of Dumcrieff," with the exception of—
* Craigieburn Writs. † Inventory of Craigieburn Writs, and Clerk of Penicuik No. 2576.

APPENDIX B—OWNERS OF DUMCRIEFF, 1724 TO THE PRESENT DAY.

1724. (10) Lord George Douglas.[62]
1726. (11) Charles, Duke of Queensberry, as heir to his brother.[62]
1726. (12) Sir John Clerk of Penicuik, Baron of the Exchequer, who in 1727 purchased the western half of the £10 land of Dumcrieff.[62]
1737. (13) George, second son of Sir John Clerk's second wife, later Sir George Clerk-Maxwell, to whom Sir John disponed Dumcrieff in 1737.[63]
1782. (14) Alexander Farquarson to whom Sir George Clerk conveyed Dumcrieff as trustees for his creditors.[62]
1783. (15) Lt.-Col. William Johnstone, who bought Dumcrieff from Farquarson with Sir George Clerk's consent.[62]
1792. (16) Dr James Currie, the biographer of Robert Burns.[62]
1805. (17) Dr John Rogerson bought Dumcrieff from Dr Currie shortly before the latter's death, the legal business in connection with the sale being completed by Dr Currie's testamentary trustees in 1806.[62]
1823. (18) Elizabeth Rogerson, the only daughter of Dr John Rogerson, junior, to whom his father Dr Rogerson, senior, had bequeathed the Wamphray Estate in life rent. Elizabeth inherited Dumcrieff and in 1834 married William, 9th Lord Rollo. She died in 1836.[64]
1836. (19) John Rogerson Rollo, 10th Lord Rollo, inherited Dumcrieff from his mother. Born 1835, died 1916.
1916. (20) William Charles Wordsworth, 11th Lord Rollo. Born in 1860 he succeeded his father the 10th Lord Rollo in 1916. He sold Dumcrieff and broke up the Dumcrieff Estate in 1920.
1920. (21) W. H. A. MacDonnell, who bought the mansion house and policies which amounted to about 160 acres.
1932. (22) The Rev. Adam Forman, formerly of Craigielands, the present proprietor.

62 **Memoirs of Sir John Clerk, 249, 250.**
63 Craigieburn Writs.
64 J. Paterson, **Wamphray, 44.**

THE DEVELOPMENT OF THE ROAD SYSTEM IN THE STEWARTRY OF KIRKCUDBRIGHT, 1590-1890

By ALEX. D. ANDERSON, B.Sc., C.Eng.

Part II

In Part I of this paper[1] a general survey was given of the development of the Stewartry road system as a whole. There now follow more detailed descriptions of the more important routes. For the sake of brevity and clarity, references to sources have generally been omitted, (unless these were not referred to in Part I), and the name "Newton Douglas" has also been suppressed. Dates given for bridges or other works may not be accurate to within a year since the original records may refer to grants of money before construction, contracts, or acceptance after completion.

When the "present road" is referred to, it generally means, unless the context indicates otherwise the road as it existed in 1890, and as shown on the 1909 Ordnance Survey. When 20th century alterations have been made this line can usually be easily followed through "lay-bys," etc.

Acknowledgments are given in Part I. In addition to those mentioned the writer's thanks are due to Mr A. Curtis Wolffe, Gatehouse, and Mr James Biggar, Chapelton.

A. Dumfries to Minnigaff or Newton-Stewart.

Timothy Pont shows bridges at Dumfries, Cargenbridge, Old Bridge of Urr, and Fleet. A bridge at Bardrochwood also seems likely. In 1642 the mail route was Dumfries-Steps of Orr[2]-Gatehouse-of-Fleet-Pathhous[3]-Glenluce, etc. There is an ancient route over Trusty's Hill to Anwoth Kirk, and there was a ford at Gatehouse[4] in addition to, or possibly earlier than the bridge, but dates are unknown.

At the end of the 17th century, Symson states that the shortest route from Dumfries to Minnigaff is by the south end of Loch Ken but that this is not the "rode way." Alternative routes from Dumfries to Kirkcudbright are:—Milton-Grange-Bridge of Urr-Carlingwark or Milton-Haugh-Carlingwark "if the water be little." He also refers to Anwoth Kirk "just in the way," Ferrytown, where there "us'd to be a boat," and Machermore Ford.

In 1730, surplus funds remaining from the "causey" at Bridgend were applied to repairing Cargen bridge. In 1733, £13 was appropriated to "cutting rocks and making roads through quagmires" on the road from Goatend to Ferrytown of Cree. Sir John Clerk in 1735 found the road from Kirkcudbright to Dumfries (via Carlingwark) to be "very fine."

1 DGNHAS, Vol. 44 (1967), p. 205.
2 Probably the Haugh. Other possibilities are Waterside or Stepend.
3 Blackcraig.
4 Near the Youth Hostel.

Records of bridges occur as follows (up to 1763): **Fleet**—rebuilding authorised 1661, timber bridge washed away 1721, rebuilt (in stone) 1730, one arch possibly removed 1753, leaving two.

Greddock 1728; **Spotts Burn** 1728.
Twynholm bridge built by the Kirk Session 1740.
" Old " Bridge of Dee 1737-40.
" Old " Tongland Bridge 1737-40.
Palnure Bridge rebuilt 1739-40.
Cree Bridge[5] 1745-8.
Haugh of Urr 1751.

Bridge over Ferry Burn, Creetown, 1758 (probably Beardie's Bridge, but could also have been near the former footbridge. Not Ferry Bridge). The construction of " Old " Bridge of Dee some distance upstream of the old Grainy Ford probably accounts for the reverse bend in the road between Rhonehouse and the bridge.

The route in 1759, as shown by General Roy, and described by Rickson and Debbieg,[6] was generally similar to that of the " Old Military Road " (see below) except between Ringford and Gatehouse, and over the Corse of Slakes. In the first case, the more northerly route[7] over Irelandton Moor was used. Over the Corse of Slakes the route diverged from the present line near Lauchentyre and followed a more direct but steeper line (shown on some Ordnance maps) by Glen and over Stronach Hill, rejoining the present line on Glenquicken Moor.

Following on Rickson and Debbieg's report, the " Old Military Road " itself was constructed in 1763-4, following the existing road except as mentioned above; also between Spotts and Haugh of Urr bridges, where a house was demolished, and other minor deviations.

In 1768-72 a new coach road was constructed from Rhonehouse to Twynholm via " Old " Tongland Bridge and Cumstoun Bridge (built 1771). The section from Rhonehouse to Langbarns may well have followed an older road, but from Langbarns to Twynholm was probably entirely new.

In 1769, Moneypool Bridge[8] collapsed, and was subsequently rebuilt, and in 1771 the road was improved between Cargen Bridge and Dumfries.

" Skyreburn " Bridge was built in the summer of 1772. This almost certainly refers to the bridge on the shore road (now A75). A route from Anwoth Kirk to Ferrytown already existed at this time, although it was not then the main road. It survives as the Anwoth Kirk-Ardwall road, an old track over the hill above Ardwall, the present A75 from Skyreburn to Newton, thence along a dyke and by the back road to Barholm Castle and Kirkdale High Bridge, whence it descended to and ran along the shore to Ferrytown. The route can be partly

5 This bridge, situated 90 yards upstream of the present one, was swept away by a flood on 20th December, 1806. The old Machermore Ford was further downstream near the site of Newton-Stewart gasworks.

6 " Report on a survey of a proposed Road from the River Sark to Portpatrick . . . .," etc., by William Rickson, Deputy Quartermaster General in North Britain, and Hugh Debbieg, Lieutenant of Engineers, Scottish Records Office, Broughton and Cally Muniments, No. 547.

7 Designated " Old Military Road " on certain editions of the Ordnance Survey.

8 Probably on the road now leading to Barholm House.

traced on General Roy's map, and fully on Ainslie's 1780 map of Wigtownshire. The eastern part is referred to in a minute of 1749.

A slight alteration was made by a proprietor at Cree Bridge about 1777, probably resulting in two right-angled bends there. In 1779 the first widening of Fleet Bridge was carried out, and in 1784-5 the widening of Old Bridge of Urr.

Between 1786 and 1788 two important new sections of the road were constructed: from the foot of the Path Brae (at Blackcraig) by a new bridge[9] over the Palnure Burn near Muirfad, re-joining the Old Military Road at Cuil; and from Creetown via Clauchloudon Bridge and Auchenlarie to join the existing local road (see above) at Newton Moss, thus superseding the Corse of Slakes. In 1790 the shore road was completed from Skyreburn to Gatehouse.

The "New" (Buccleuch) Bridge of Dumfries was built between 1790 and 1793, with a contribution of £1000 from the Stewartry,[10] in spite of which tolls were charged by the Burgh. This action led to frequent protests for many years to follow. A new road (Galloway Street, Laurieknowe and Dalbeattie Road) was made to join the Military Road, part of this line being a widening of the "Bullet Loaning."

With the passing of the 1796 Turnpike Act, the construction of an almost entirely new road became possible. Work was started almost at once, the work being carried out in stages as follows:

Excavation at Laurieknowe	1803 (?)
Cassalands—New Cargen Bridge	1801
New Cargen Bridge—Kilnford of Terraughty ...	1800 (?)
Kilnford—Ernespie	1797-1802
Ernespie—Castle Douglas	1803-5
Castle Douglas—The Buchan	1798
The Buchan—"Old" Bridge of Dee	1800
Bridge of Dee—Gatehouse	1802-8 (?)
Gatehouse-Ardwall	1801-6 (?)
Ardwall—Creetown (mainly improvement of the 1788 road, except near Kirkdale and Carsluith and at Creetown)	1806-7
Creetown—Blairs	1800-9
Blairs—Palnure Bridge	1808-10
(Palnure Bridge—Blackcraig constructed 1788)	
Blackcraig—Creebridge	1812-15 (?)

New bridges were constructed at Ramhill (1798-1801), Ferry (Creetown) (1812, rebuilt 1813, demolished 1966), Cree Bridge (1813) and elsewhere.[11] Fleet Bridge was widened for the second time in 1811.

This road survives to the present day as A75, except for various deviations.

9 Not completed until 1790, owing to a collapse.
10 For an account of the construction, see William McDowall's "History of the Burgh of Dumfries," 2nd edn., 1873, pp. 582-5.
11 Including possibly Moneypool Bridge about 1809, but the Minutes are not clear on this point.

Those of the 20th century are generally obvious. Major 19th century alterations were as follows:—

Cally Parks (1812-18), and the Galla Hill Cut (1819-23). The original line leaves A75 at Enrick Mill, passes along the loop in the Sandgreen road, crosses a bridge in a field at the second bend, enters the Cally Parks and appears as a private road leading to the head of Ann Street in Gatehouse. The work was carried out at the expense of Murray of Broughton.

Gerranton (1839). The original route passed by Gerranton steading, and little trace now remains of it.

Threave Bridge (1822-6) and approach on the west side.

Mollance (near Bridge of Dee) (1843). The old road can clearly be seen here.

Tarff Bridge (1832-6) including an alteration between Meiklewood Toll and the bridge.

Ardwall (1860-2), probably between Boreland Bridge and the Anwoth road.

It may be presumed that Murray of Broughton established a toll at Gatehouse in accordance with the 1661 Act of Parliament,[12] and this toll may have been abandoned when the old bridge was washed away in 1721. Toll bars under the 1796 and subsequent Turnpike Acts were established initially on the existing roads at Cargenbridge, Rhonehouse, Gatehouse, and Cree Bridge,[13] all in 1798, also Bardristan (1806). As the new parts of the road were constructed, tolls were sited at Cassalands (1802), Crocketford (1800), Creetown (1803) and Meiklewood (1806). The Rhonehouse bar was transferred to the Buchan in 1799, and the Cargenbridge bar, having been superseded by 1802, remained in use for the Dalbeattie road. "Side bars" were also established at various points on parallel routes to present evasions, in particular at Palmerston,[14] but the Minutes are vague about some of these.

Some of the bars were later moved. The Creebridge bar must have been moved to the new bridge in 1813. The Creetown bar was moved west in 1806 to maintain the statutory distance from the new Bardristan bar, and transferred to Carsluith in 1855. The Gatehouse bar was moved four times—to a site in Ann Street in 1800; to the west end of the Brewery garden (possibly Laurel Bank) in 1806; to the south end of Ann Street in 1820 (when a jail was built on top), and finally to what is now Mr Curtis Wolffe's Office in 1823. Cassalands tollhouse was rebuilt in 1823, with a court house on the top storey (incorporated in the dwelling in 1856), and Crocketford tollhouse rebuilt in 1835.

Bardristan toll was discontinued in 1849, but the others continued in use until 1864.

While some of the superseded roads were abandoned, others remained in use and were subsequently altered at various points. In 1812(?) a new road was constructed from the south end of Haugh of Urr to Hardgate to avoid the steep gradient on the Old Military Road, and in 1825 the latter was diverted between

12 See part I., DGNHAS, vol. 44 (1967), p. 206.
13 Exact sites are not known, except in the case of the Gatehouse Toll, which was opposite Bridge Terrace, west of Fleet Bridge.
14 See part I., DGNHAS, vol. 44 (1967), p. 216.

Milton of Urr and Courthill.[15] The part nearest Dumfries was much altered in the improvement of the Dalbeattie road (see page 225).

In 1811 the Corse of Slakes section was diverted from a point east of Burns into Creetown, the original route having continued along the high bank of the Englishman's Burn to the Hills gate. In 1823 the whole stretch from Gatehouse to Creetown was declared a toll road, and sums allocated from the existing tolls at each end to carry out improvements at Goatend and Woodend.[16]

The old road from Bridge of Dee to Gatehouse was altered in 1849-51 and in 1854 at various places between its junctions with the Ringford-Laurieston road and the Glengap road, including the construction of bridges over the Tarff and the Blackshaw Burn.

B. Newton-Stewart to New Galloway, and thence to either Dumfries or Edinburgh.

The route from Newton-Stewart (or Minnigaff) to Edinburgh is of great antiquity, and as the country it traverses is largely uncultivated, many physical evidences of old roads exist. For the same reason, various parallel routes appear to have been in use at the same times, and the relative positions of Dalry, Balmaclellan and New Galloway have also resulted in duplication. While some of these relics may have the appearance of a continuous "Old Edinburgh Road" running from Queen Mary's Bridge not only right through the Stewartry but almost the whole way to the West Port of Edinburgh,[17] the position, at least in the Stewartry, is not as simple, even without considering the Deil's Dyke, which, whatever it was, and if it existed at all, was certainly not a road within the period under review.[18] [18A]

While this discussion is generally confined to the period 1590-1890, it should be noted here that there are earlier records of this route in the journeys of James IV. in 1497 and 1501, and of Queen Mary in 1563. Symson refers to Queen Mary's Bridge (but not by that name), Talnotry, Craigdews ("beside a cascade") and the Saddle Loup, and Timothy Pont also shows the latter, suggesting that the route changed little after 1590 and until the latter half of the eighteenth century. Symson (1684), Sir John Clerk (1721 and 1735), General Roy (1758), Rickson and Debbieg (1757)[19] and Ainslie (1780) all agree in placing the route along the lower valley now used by A712 west of the Saddle Loup, ascending there to the parallel valley to the north. Rickson and Debbieg refer to an older route lying entirely in the more northerly valley, leaving the other about 1 mile south-west of the Loch of the Lowes and re-joining it north of the Saddle Loup. The "old" road is described as passing

15 The Courthill end of this alteration appears in one of Dr St. Joseph's air photographs. The Old Military Road followed the possibly Roman line.

16 Possibly re-grading on the old line.

17 Parallel sections occur at Tynron, the Well Path, the Cadger's Brig (Biggar), Brownsbank, Dolphinton to the north of Ninemileburn, Braid Road and the Highriggs in Edinburgh, and elsewhere.

18 A. Graham, P.S.A.S., 1948-9, pp. 174-185.

18a M. B. Walker, "The Deil's Dyke and Gildas Sapiens." M. B. Walker, Newton-Stewart.

19 See page 212 and footnote 6. The route by Dalry and Monlaive, thence to Dumfries, was considered as an alternative to the Gatehouse-Carlingwark route, but was rejected.

over uneven, rocky and boggy ground and must have been difficult indeed if it was abandoned in favour of the Saddle Loup. There is no indication of how long it had been disused, but the general agreement of the other authorities suggests that it may not have been in regular use since the 16th century or earlier. Its survival in uncultivated country is by no means impossible. It must have followed a route similar to the traditional "Old Edinburgh Road" but probably not identical since this section of the "Old Edinburgh" is thought to have been constructed in 1792 on new principles (see below).

In 1703 the first Clatteringshaws Bridge[20] was constructed by the Synod of Dumfries.

The Saddle Loup would be a formidable obstacle, and impossible for wheeled vehicles. Some time after 1757, and either before this section was superseded as a through route in 1792, or possibly round about 1802 when the new turnpike road was only open in this area between Calgow and Dallash, a diversion was made over a higher shoulder of Craigdews Hill, involving fairly substantial earthworks. Between the Saddle Loup and the foot of the hill at the ruins of Old Craigdews beside the Grey Mare's Tail Bridge, there appear to be two possible routes, one marked by parallel dykes.

To summarise, the route from Newton-Stewart to New Galloway ran thus —from Machermore Ford or later, Cree Bridge to the south end of Queen Mary's Bridge (following a straight line from Minnigaff to that point), thence by the "Old Edinburgh Road" to a point about 1 mile S.W. of the Loch of the Lowes, continuing beside a dyke through the Forestry Commission plantations towards the present A712 near Dallash. The route then seems to have been roughly followed by A712 to the Grey Mare's Tail Burn. This was crossed probably by a ford,[21] and the road then ascended to the Saddle Loup, after which it followed the valley north of Craigdews and Brockloch hills, once again as the "Old Edinburgh Road," via Tonderghie to the ford, and, later, bridge at Clatteringshaws. East of Clatteringshaws the road forked, proceeding either to Dalry, probably by the Craigshinnie Burn and one or other of the Ken crossings, and to New Galloway. In the latter case there was more than one route as one of these (the "Old Edinburgh Road") was selected in 1749 to be put in a state of repair. In 1752-3, Coom Bridge over the Garroch Burn was built, serving both the Dalry branch and the Ayrshire road.

In 1752 estimates were also to be taken for a bridge over the Ken at New Galloway, but nothing came of this. There is evidence of fords or ferries at Dalry Kirk, Waterside, Boat Knowe and Cubbox.

East of the Ken, a multiplicity of routes again appears. In 1721 the road divided at a cairn (the White Cairn of Corriedoo), with branches to New Galloway and Dalry. From the White Cairn to the county boundary an ancient track can be traced, generally north of A702. The earthworks immediately

20 Now submerged in the reservoir.

21 The burn was deepened during the construction of the present bridge in 1962, and in the course of this a horseshoe of the 18th century or earlier was found (now in the Stewartry Museum). The date of the previous bridge, washed away in 1960, is unknown, but its orientation was more suitable to A712 than to the old road.

above Corriedoo Bridge are of such magnitude as to suggest that they were carried out during the Statute Labour period, but before the survey of 1786 referred to below. Between Corriedoo and the Ken various tracks exist, passing variously via Dalry, Milnmark Ford, Barscobe, Balmaclellan, Grennan Mill, and the "Black House Ford." In 1775 it was suggested that the stone bridge at Grennan Mill[21a] would be useful to the Edinburgh Post when the Black House Ford 1 mile further up the Garple was impassable. General Roy shows the route by Balmaclellan, but no road to Dalry. This may simply mean that he thought the latter of no military importance, although Lieut. Debbieg had inspected it.

In 1786 Mr Taylor, Surveyor of Military Roads submitted alternative proposals for the road from Clatteringshaws to Whitecairn (Corriedoo) either by New Galloway or Dalry, but no details are given. A new bridge at Clatteringshaws was completed in 1790.[22] The new section of road made at that time leaves the Old Edinburgh Road at Tonderghie, crosses the Craigdews Burn by Tonderghie Bridge,[23] and from a few yards east of Craigdews forms the present A712.[24] Brockloch Bridge was built in 1792. In 1790 payment of £14 was authorised for two bridges between Clatteringshaws and New Galloway, when that line had been approved. This road may be the section of "Old Edinburgh Road" which leaves A712 at Clatteringshaws house and lies first to the south, and then to the north of A712, crossing again at Achie, from which point to New Galloway it is still in use. Some work must also have been carried out near Corriedoo, as Ainslie shows approximately the present line in 1796.

In 1794 £50 was voted towards the long-awaited bridge over the Ken at New Galloway. A wooden bridge was first proposed, but the next year a stone bridge was preferred, and built between 1795 and 1797 for a total cost of £577.

The Rev. Samuel Smith of Borgue stated that Lord Daar constructed one of his first "even gradient" roads in a remote part of the county. In 1795 a payment of £150 was made to Lord Selkirk for a road made from Clatteringshaws towards Newton-Stewart by "the late Lord Daar." This probably accounts for the portion of "Old Edinburgh Road" from the point (already referred to) 1 mile west of the Loch of the Lowes to near the Saddle Loup. This section is of more substantial construction than would be likely for Rickson and Debbieg's "old road,"[25] and its construction about this time is indicated by a comparison of Ainslie's maps of 1782 (Wigtownshire) and 1796.

Before considering events after 1796, reference must be made to the

21a Built in 1762 to replace a timber one.

22 This bridge stands alongside the present structure, and originally had parapets. The small flood arch was probably added in 1792.

23 Built 1792. Now demolished.

24 About ¼-mile east of Brockloch Bridge there can be seen, in certain lights, the tracks of ditches continuing the line of a straight section of road on to lower ground. These seem to have been abandoned and the road carried instead in a loop round higher ground. If construction began at the Clatteringshaws end, this may well be the point at which Lord Daar first applied his ideas on road alignment.

25 At the time of writing opportunity has not arisen to verify this route on the ground, but an examination of the Ordnance Survey 6" map shows that this section generally follows the contours very closely, in accordance with Lord Daar's principles, and certainly does not have the "straight line" character of the other sections. Part of this section can be clearly seen from Murray's Monument.

Dumfries—New Galloway section. New Galloway, as such, did not exist in 1590, but became a burgh 22 years later, and may possibly have been built at an existing cross-roads. The crossing of the Ken has already been referred to above.

In 1684 the route was via Shawhead, Lochenkit, "Knockdroket," Nether Barr, "near Crogo," Troquhain, etc. From Shawhead westwards this can be traced by Peartree Hill, Lochenkit, crossing the Urr at Crogo Mill, from whence to Garcrogo Forest it is marked by a dyke. It is probably the road entering Balmaclellan past the War Memorial. At the Dumfries end the route from the Brigend would be via Howgate Street and Terregles Street, and possibly by Terregles and Bonerick to Shawhead, as at the end of the 18th century, but General Roy shows a different route which may be earlier. What was described as the "best," but longer road was by Lochruttongate, Milton, Kirkpatrick-Durham, Kilwhanity (where there was a 2-arch stone bridge), Parton and Shirmers. The drove road left the former route near Lochenkit and passed south to Larg and thence to Dumfries by an unspecified route. It was ordered by the Privy Council to be "marked out" in 1697.

Coming to the 18th century, in 1749, an inspection of the road was ordered to ascertain the line (presumably there were alternatives) in Balmaclellan parish. In the 1759 list the route from Dumfries to New Galloway is by Shawhead, Crogo and the "boat of New Galloway." General Roy shows the route from New Galloway via Balmaclellan to near Lochenkit, making towards Shawhead, but omits the line on the next sheet as far as that point. Thence he shows the route by Nunland and Cargen Bridge.

Kilwhanity Bridge is not on the 1780 list. In the Old Statistual Account (1791) the main road passes through Kirkpatrick-Durham; Ainslie shows both routes. A new Bridge at Knockvennie was built in 1797-9.

Under the 1796 Turnpike Act, the roads were grouped in a different way, as Dumfries-New Galloway-Newton Stewart and New Galloway to Moniaive, thus indicating the decline of the through route to Edinburgh. This arrangement has persisted, becoming A712 and A769-702.

Of the present A712, the section from what is now Craigdews to Clatteringshaws bridge was already in existence in 1796 (see above). The remaining sections were constructed as follows:

Crocketford—Ken Bridge	1800-05
New Galloway—Achie	1802
Achie—Clatteringshaws	1810-15
Craigdews—Dallash[26]	1802-05 (?)
Dallash—junction of Old Military Road near Larg	1800-02 (?)
Larg—junction of new road at Calgow probably (for Ken Bridge, see below).	1812-15

26 The fact that this section was completed later than those on either side suggests that the road, then only recently superseded by the "Old Edinburgh Road," was again in temporary use. It is just possible that the earthworks near the Saddle Loup were carried out in this connection. "Craigdews" refers here to the present house, not its former site beside the Grey Mare's Tail Bridge.

Subsequently, an improvement was carried out involving the rebuilding of Talnotry farm house and the widening of Talnotry Bridge (1833).[27] The old road can be seen as a flat area opposite the now derelict house. The original house was probably in line with the outbuildings to the north-west. An alteration at "Arlosh" (Ironlosh?) was approved in 1856.

The present road from Dalry to Castlefairn, with the branch from Bogue to the other route near Balmaclellan, was started about 1800.[28] Castlefairn Bridge was built in 1829, and an improvement at an unidentified point was approved in 1842.

The first "New Galloway Bridge" over the Ken[29] was washed away in 1806. After much discussion and negotiation, work started on a new bridge, probably in 1814. Telford was closely connected with this work, but apparently not as designer but as a consultant to the Government, who contributed part of the cost. The contractor was John Simpson.

On 25th August, 1815, the partially-completed bridge was destroyed by a flood. The contractor died shortly afterwards, but proceedings were taken against his cautioner, Joseph Loxdale, who was eventually required to pay £2250.[30] The present bridge, designed by William Rennie, was not completed till 1822. A ferry was operated in the interval.

Besides allocations from the tolls at Creebridge, Crocketford, and (after 1847) Caswaylands, toll bars were erected at Talnotry, Clatteringshaws, Ken Bridge, Corsock (all c. 1800) and Bogue and Castlefairn (c. 1802).

C. Kirkcudbright and Castle-Douglas to Ayrshire.

The topography of the Ken-Dee valley, and the positions of Kirkcudbright and Castle-Douglas, have resulted in the development of two parallel routes south of Carsphairn, although the relative importance of these has varied.

The mediaeval "Old Pack Road" from near Glenlee to Carsphairn (which it enters via what is now the Manse drive) is well known, and an old track continues north into Ayrshire, passing over the higher ground west of Glen Muck. Timothy Pont indicates bridges at the "Old Brig" over the Deugh, High Bridge of Ken, and over the Black Water at Kendoon—all of them where good rock foundations were available and fording would be difficult. Old Brig of Deugh (Tinker's Loup) is now submerged;[31] Blackwater bridge was severely damaged by a flood in 1960 and later demolished; High Bridge of Ken underwent major repairs on several occasions during the 18th century but may well incorporate much of the original structure and probably the design, with its narrow high arch.

Symson's details of distances and routes from Kirkcudbright to the various

27 See part I., DCNHAS, vol. 44 (1967), p. 218.

28 Parts of the older route can be traced as a slightly hollow track north of A702 from the summit east of Corriedoo to near Holmhead.

29 The name "Ken Bridge" was not used for this bridge at that time, being reserved for the High Bridge (on B7000). The usual description was "New Galloway Bridge" or "Kenmure Bridge."

30 The action was raised in England, at first in the High Court and later in arbitration before Mr Serjeant Hullock.

31 A photograph of the Old Brig of Deugh appears in Andrew McCormick's "Galloway" (1947 edn.), p. 94. There is a vague hint that this bridge may have been rebuilt at the end of the 18th century.

parish kirks suggest that a route was in existence from Carsphairn southwards on the east side of the Deugh-Ken-Dee division, but that considerable distances could be saved by crossing to the west bank at various points and returning by the Burgh Ferry at Kirkcudbright. The eastern route would presumably be most used in times of spate. The crossings of the Ken are probably the High Bridge and one or more of the crossings near Dalry and New Galloway. The Boat of Rhone seems to have been mainly a crossing of the Dee, although it seems unlikely that the Ken could not be crossed as well. The Dee could also be crossed at the "Boat of Balmaghie" which would be either at Crossmichael or Glenlochar. The western route from Carsphairn is described as "crossing the Ken twice" which suggests that either the Old Pack Road was then disused and the eastern route was followed to Dalry, or, alternatively, that there was no route from near Glenlee to New Galloway. The second alternative is unlikely, since it would mean that part of the parish of Kells would be cut off from its church. The route from Carsphairn may well have run west of the Deugh from Carsphairn Ford to the Old Brig of Deugh, as it is later shown by General Roy.

During the eighteenth century there is little to record north of Carsphairn except repeated repairs to "Brigend" Bridge over the Deugh. This bridge is first mentioned in 1734 and was then already in need of repair. It must have been built before 1728. The first definite information is given in General Roy's map, in which the route shown on the Ordnance Survey as the "Old Pack Road" is indicated. Between Carsphairn Kirk and Brigend the line is very doubtful as this was largely a marshy area which has since been drained. The present line, except in so far as it has been improved at Lagwine, is probably as likely as any other.

The eastern route underwent various changes in the eighteenth century. High Bridge of Ken was repaired more than once and rebuilt in 1745-6. Shirmers Bridge was built in 1729. General Roy shows very little of the eastern route. There is a road from Carnavel to the Old Brig of Deugh on the west bank, with a cross-route to the western road from that bridge. The eastern route crosses Old Brig o' Deugh and High Bridge of Ken, crosses Blackwater Bridge, re-crosses the Ken below the confluence of the Deugh and joins the western route near Knocknalling. Other sections shown are Parton-Boat of Rone and a vague line between Crossmichael and Carlingwark. The 1759 list shows that in fact there was a road from Carlingwark to New Galloway via Shirmers Bridge and the "Boat" at Cubbox

From Cubbox to Dalry there were at least two routes—one by Balmaclellan, Grennan Mill Bridge, and Mulloch Hill,[32] the other by Grennan Bank. This latter road was in 1775 described as "the road first used" but had been closed. It appears to have been re-opened in 1764. The route leaves A713 at Cubbox farm and runs parallel to it on the higher ground as far as Garple Cottage, from whence it was followed by the present road. Garple Bridge was built

32 A stone bridge was built in 1762 by Spalding of Holm to replace an earlier timber one. The track leaves Balmaclellan on the west of the churchyard, but is obscured between A769 and the bridge.

about 1772.[33] There are traces of another track, possibly branching off the Mulloch road north of Grennan Mill Bridge, and running by Grennan farm to join the present road a short distance south of the roads depot.

In 1780 bridges are listed at Water of Ken, Water of Deugh, Blackwater, and Shirmers. In 1796 bridges are listed at Water of Ken, Water of Deugh, Blackwater and Shirmers. In 1796 bridges were built on the Earlston and Cleugh burns, but the route from Dalry to High Bridge of Ken has the appearance of being earlier than this.[34]

A plan of Crossmichael parish dated 1792[35] shows the route from Carlingwark to Crossmichael via Springfield and a line approximately half-way between Greenlaw House and the present road. A dotted straight line runs for two miles from "Fuffock Hill" to "Gibbert Hill" with the note "New Road proposed by Mr Gordon, of Greenlaw, Esq." This was carried out by 1795, and thus originated the longest "straight" in the Stewartry.

During most of the eighteenth century, before the rise of Castle-Douglas. the western route leading directly to Kirkcudbright was relatively of greater importance than it is today or during the nineteenth century. The first mention in the Commissioners of Supply minutes is a 1737 proposal to construct a bridge over the Dee at the "Bridgefoord." This was the original Hensol Bridge, one of the three bridges of Dee built in 1737-40. In 1739 a committee was appointed to repair the road from New Galloway to Kirkcudbright. With the construction of "Old" Tongland Bridge at the same time, this would become the crossing-place instead of the Burgh Ferry. Previous to this it would have been necessary to ford the Tarff, most probably not lower than the crossing of the main east-west route near the site of Stick Bridge.[36] No record has yet been discovered of the route from there to the Ferry.[37]

In 1742 £5 was allocated for the repair of Polharrow Bridge, which lies on the "Old Pack Road" as well as on A713. The old road can be clearly seen at the south end, crossing the Forrest road. Coom Bridge[38] was built about 1751, and in the same year dykes were to be set back between Airds Bridge and New Galloway. Polharrow Bridge was repaired again in 1753.

The 1759 list includes the road from Kirkcudbright to Carsphairn by Tongland Bridge, Airds Bridge, New Galloway and Glenlee Miln (Part of this road can be seen in a field east of A762 between Glenauld and Airntully. The northern part would be the "Old Pack Road") General Roy's map shows the route as described (But see below).

In 1771 the Justices of the Peace approved of the alteration of the "present

33 Not the existing "old" Garple Bridge, but on the same site. See below, p. 223.

34 General Roy for some reason shows no roads whatever to Dalry, although Rickson and Debbieg describe the east-west route through it. It would be reasonable to assume that "B7000" existed at a much earlier date, leading as it does directly from Dalry to two ancient bridges.

35 In the possession of Messrs Lidderdale and Gillespie, Castle-Douglas.

36 It is assumed that the traditional "Queen Mary's Bridge," the site of which is submerged in Tongland Reservoir, was no longer available.

37 A possible track may be seen in a field south of the Cumstoun-Twynholm road at the bend west of Hilltop. At the time of writing this has not been investigated. The Cumstoun Castle avenue is also a possible route, as is a raised track to a field north-west of Mersecroft.

38 Not the present bridge (see below).

road over Barstobrick" so as to pass over the west side of "that hill" and past Beoch houses. This work was carried out at a cost of £159 14s 10½d, including two bridges. It is not clear what was done, or where the previous route was. Part of the new road may be represented by the earthworks west of A762 between Waterside and Fellend, and by the access road to Beoch. A hollow section also exists in an "island" in the marshy ground west of A762 to the north of Beoch.

In 1775 a committee was appointed to "straight and ascertain" the road from Laurieston to New Galloway, with a grant of £50. The wording suggests parallel alternative routes. A similar sum was granted each year up to 1779 and the road completed by 1785 from Duchrae to Burnfoot of Kenmure. The 1780 list of bridges includes Ringford, Culwhae Burn, Beoch Burn, Laurieston Burn and Airds.[40]

In 1786-7 payments were authorised of £54 for a bridge at Burnfoot of Kenmure and £32 2s for bridges at Laurieston and Drumlane.[41]

An old drawing exists showing the roads between the south end of Woodhall Loch and Airds Bridge. While this shows various proposals made by the Road Trustees in 1799, the linen backing has come off in parts to reveal the title "[ ] of the [ ] proposed lines of the [ ] through the estate of D[uch]rae, 1789." The Trustees' proposals must have been superimposed on this. If it is assumed that the Trustees' proposals represent the present road then this route ran a short distance to the east of it alongside Woodhall Loch and crossed it twice within a short distance where the present road swings away from the loch. The old road swung away even more sharply across the marshy ground (now a Forestry plantation). A hollow section in a grassy mound remains here. The road then turned north towards the bridge. A road is also shown running from near Blate's Mill towards the Boat of Rhone, this may be an older line. The inference from this plan is that the section of road from Laurieston to Airds Bridge was probably improved about this time.

One of the toll roads authorised by the 1796 Act was from Kirkcudbright to the "confines of Ayrshire in Dalmellington," and it is obvious from the records that this was intended to follow the eastern route via Crossmichael, Dalry, and High Bridge of Ken. Its subsequent history is marked by much discussion and vacillation, and in some cases it has not been possible to distinguish what was actually carried out from what was merely proposed or approved in principle. What follows must therefore be treated with some caution.

Work appears to have started in 1803 on two sections at opposite ends—Tongland to Glenlochar Bridge and Drumjohn to the Ayrshire boundary—with tollbars at Tongland Smithy and Liggat. The southern portion made use of Glenlochar Bridge, constructed in 1799 to serve the Laurieston road;[42] its

40 The two bridges built after 1771 may still have been under "7 years maintenance" by the contractor, and therefore not listed. The bridge at Ringford is not the present one on A75.

41 It is not recorded what happened to a bridge over the Laurieston Burn built in 1770. This may, however, have been on another road.

42 The reasoning behind many of the decisions is not given in the minutes, and it may well be that the bridge was built with this object in view.

approach from Townhead of Greenlaw, and of a short portion of the Dumfries —Newton-Stewart road near Barstibley.

The tollbar at Tongland was transferred to the north end of the new bridge when it was opened in 1807. Both these sections of road seem to have been generally on new lines, and at Kirkcudbright, St Mary's Street replaced Millburn Street as the main route out of the town. The Ayrshire trustees constructed the section from Dalmellington through Glenmuck about the same time.

The section from Garple Bridge to Cubbox was made on a new, almost level but very winding line in 1807.[43]

Between 1808 and 1809 there appears to have been a tollbar between High Bridge of Ken and the Old Bridge of Deugh.

In 1824 the section from Marchfield, Crossmichael, to Cubbox was made up, on the old line. A tollbar was set up at Parton, and the proceeds of the Ken Bridge bar divided. The Parton toll was moved in 1832 to include the Dullarg road. Shirmers Bridge was re-built in 1825.

In 1828 the section from Castle Douglas to Townhead of Greenlaw was also made a toll road. From 1840 to 1860 there was a toll at Burnfoot of Muirbrack. The date of setting up the toll at Meadowhead is not certain.

Various improvements were carried out along these routes, but details are lacking. Railway alterations were made at Castle Douglas and at Drumskelly, and Garple Bridge was rebuilt in 1890.

The western route was, at first, a parish road, and the information is perhaps even more vague. The line from Laurieston to Airds Bridge was altered over almost its entire length, probably in 1800. Other sections were constructed as follows, all as parish roads:—

Coom Bridge to Waterside, 1802 or 3.
Tongland Bridge—Ringford, 1803 (?).
Barstobrick—Laurieston, 1810-11.[44]
Liggat Bridge,[45] 1802-4.
Ringford to New Mill, 1803 or 1811 (or both).
Polmaddy and Polquhanity Bridges, 1811.
Allangibbon Bridge to Polharrow, 1814.
Carsphad—Carsphairn, 1819-22.

Allangibbon Bridge, which joined the east and west roads (to form the present A713) was built about 1805, and the road from there to Dalry in 1807. The bridge was rebuilt in 1816 (and in 1926).

In 1822 the section from Tongland to Tarff became a toll road, with allocations from Tongland and Meiklewood bars.

43 The old route branches off to the east at the south end of Garple (old) Bridge and runs behind the fir wood to the south. It passed through Cubbox steading and rejoined the new line as the farm access.

44 This departed a considerable distance laterally from the old road through Beoch (see above).

45 Liggat Bridge was constructed on the nearest firm foundation to Carsphairn, and was apparently intended to serve a new road to the south, as such a road (as far as the Polmaddy Burn) was approved in 1803. However, as the Carsphairn-Carsfad section was the subject of further work in 1819-22, this first line may not have been carried out. Liggat Bridge could equally well serve the "Old Pack Road" via what is now the Carnavel access road.

The present Airds Bridge was built in 1823-6, upstream of the old bridge. A cutting was made at Tarff in 1825, and deepened in 1836. Various other improvements were carried out, including the widening of Polharrow Bridge in 1841-2.[46]

In 1841 a toll bar was set up at Mossdale, and in 1849 the section from Ringford to the Balmaghie march received an allocation from toll funds.

Coom Bridge was rebuilt in 1851-2. In 1862-4 the road alongside Loch Ken was raised above the water level, having previously been partially submerged. New Galloway Station Bridge was also built in 1862. Other improvements included Kenmure Castle, 1868 and 1878; Dalshangan, 1860; and Barskeoch, 1870.

D. The road from Kirkcudbright to Gatehouse.

There is very little documentary evidence relating to this road in the earlier part of this period. Symson mentions its existence, but without details, other than referring to the Kirkcudbright ferry. There is no further information until General Roy's survey of 1759 which shows a route which is probably very similar to that described below. The 1759 list refers to the place "where the roads divide" near Gatehouse[47] and to the parish boundary being crossed at the Gaitgill Burn.

Bridges are listed in 1780 on the Gaitgill and Conchieton Burns. A great deal of detailed information can nevertheless be derived from Ainslie's Map, from the various plans later made for new roads, and from physical remains.

The approach from the ferry to Castlesod, superseded in 1868 by the opening of the bridge, is probably the original line. From Castlesod to the Lily Loch there is some doubt. The 1808 plan for the new road shows no alteration in this section but it lies within St. Mary's Isle estate, and may well have been one of Lord Daar's first experiments carried out a short time before. No earlier route for this section has been established, although the Kirkchrist access roads and the angle in the fence (occupied by a seat) just beyond Mersecroft suggest one possible line.

The old line curved round the south end of the Lily Loch and followed a winding route, still south of the present road, until it crossed it near the west end of the Lily Loch "straight" (possibly from a gate on the south side to a lunky in a short length of dike almost opposite) and then across the Cumstounend fields to The Cleuch. From here the route can be clearly followed by Langlands, Ellisford and Conchieton to the existing junction at Minto Cottage (formerly known as Drummore). For a short distance A75 follows the old line before this branches off to the north. The junction with A75 has been "squared" and the old track can be seen crossing the corner of the field on the north-east side of the junction. The old route continues as an unclassified road and where the present A75 rejoins near Enrick it can be clearly seen how the "new" (1819) line joined into the old, which it follows to the junction of the Old Military Road a short distance further on. The latter probably made use of the Kirkcudbright road from here to the junction

46 In the minutes, Polharrow Bridge is identified as "commonly called the Tailor's Bridge."
47 The other road being that to Dumfries via Irelandton.

of the old Dumfries road at Girthon Old Manse, the route being now that of A75.

The present line from Kirkcudbright to Minto[48] was constructed in 1809-10 and Kirkchrist toll bar erected in 1811, although a section which followed an existing parish road from the end of the Langlands straight through Boreland of Borgue to the junction at High Borgue was not finally "made-up" until 1814. After this there were no further developments until the construction of Kirkcudbright Bridge[49] in 1867-8. In 1870 the bridge was lit by gas.

E. The road from Kirkcudbright to Dumfries via Buittle or Dalbeattie.

Parts of this route can be traced back to mediaeval times. At Kirkcudbright it began as the High Street, continuing past the Meikle Yett and the Townend[50] and then by the "Nine Stiles Walk." While the "Nine Stiles" section shows signs of deliberate improvement, probably during the Statute Labour period, there are a number of unmade hollow sections, in particular where it ascends the steep bank behind Woodlands Terrace.[51]

The existence of the "old" and "new" Buittle Castles also indicates the ancient origin of this crossing of the Urr.[52]

Timothy Pont shows a bridge at Kirkgunzeon. Symson gives no details of this route, but his distances suggest that it passed through Kirkgunzeon, and that there was a branch to New Abbey.

Buittle Bridge was built in 1722, but fell the succeeding summer.[53] It must have been rebuilt almost immediately since its first mention in the records beginning in 1728 is a proposal to "repair" it in 1736. Only the east abutment now remains, as it was superseded by Craignair Bridge (see below).

Drumjohn Bridge[54] was built some time between 1752 and 1780.

The 1759 list includes the route from Kirkcudbright to Auchencairn and from thence by Buittle Bridge to Dumfries, with a branch from Buittle Bridge to the guide post near Grainieford (sic) Bridge.[55] This roundabout route is inconsistent with both Symson's distances and General Roy's map, and may have been a matter of administrative convenience in repairing the roads. General Roy's route is by the "Nine Stiles," thence probably by the present roads to near the Buckland Bridge, thence by Meikle Sypland and Whinnieliggate. From here it probably ran approximately one field south of B727 to Gelston.[56] From Burntstick[57] to Buittle Bridge the route can be ascertained from physical remains and from a plan made in 1821.[57a] From Buittle Bridge the road ran probably by

48 Then known as Drummore.
49 See Part I., DGNHAS, vol. 44 (1967), pp. 217 and 222.
50 Here the road to Carlingwark (Millburn Street) branched off.
51 The writer has so far been unable to trace this route beyond its junction with the present Kirkland-Bombie road about 66 yards beyond the junction of the Low Kirkland road. The "walk" ends at the latter, but the old road continues through the wood to the main road.
52 The Mediaeval route by the Motte of Urr, Carton Bridge, etc., has no modern counterpart, and is not considered here.
53 Rev. David Frew, "The Parish of Urr," Dalbeattie, 1909. 43-44. The source of his information is probably a letter published in the Report of the Stewartry Agricultural Society for 1810, Appendix 1, page 71, in which John Maxwell of Munches recollects the incident which occurred when he was 3 years old.
54 Now on the farm road.
55 The Old Bridge of Dee.
56 A plan dated 1793 of the property of William Douglas (in the possession of Messrs Lidderdale and Gillespie) shows this road at Craigleys and Gelston.
57 The junction of B727 and B736.
57a The route lay south of the present road from Caigton to near Hardhills, from whence it is marked by a dyke leading to near Buittle Mains. It then followed the burn to Buittle Place.

Cowpark, Dalbeattie Golf Course, Edingham, and thence by Newfield, Kirkgunzeon, Drumjohn, Drumwhinnie, and Beeswing to Cargenbridge. General Roy refers to this as the "Low Road," as distinct from the "High Road" by Carlingwark.

The 1780 list of bridges includes Drumjohn, Gelston Miln, and Buittle, the latter being repaired in 1777, 1779 and 1781, before being superseded by Craignair Bridge (1796-8).

It seems probable that the section nearest Kirkcudbright was the subject of some of Lord Daar's early experiments, since the first references after 1796 by the Road Trustees describe this as under construction. This would be the present B727 from Kirkland to Gelston, and probably also Silvercraigs Road, although the hand of Lord Daar is less obvious in the latter, which may have been earlier.

The western approach to the new Craignair Bridge was probably at first along the bank of the Urr from Buittle Castle. In 1802 the Trustees disapproved of a new road and refused payment to the "District." This is possibly the road running near Butterhole, round the back of Craignair, and thence to Buittle Mains, and possibly also including that part of the present road from where it crosses to Hardhills.[58]

The present road was constructed (or made up on the existing route in stages) as follows:

(Cassalands-Cargenbridge probably at the time the New Bridge at Dumfries was constructed, but was apparently "made-up" again in 1804-5.)[59]

Cargenbridge-Lochanhead	1805-7 (?)
Lochanhead-Kirkgunzeon	1812-15
Kirkgunzeon-Craignair Bridge	1809-11
Craignair Bridge-Buittle Mains	1818-21[60]
Hardhills-Burnstick	1822-6
Kirkland-Kirkcudbright (Manse Brae) probably after 1800.	

Later 19th century alterations were made at:

Congeath Moss, 1828-9 (details unknown).
Long Wood, 1843 (details unknown).
Long Wood, 1859 (by the railway).

The earliest history of the tolls is rather obscure. Cargenbridge Toll was established in 1798 to serve the Old Military Road, and in 1802, the latter being superseded, the funds were applied to the Dalbeattie road.[61] This bar was later discontinued and the funds of Cassalands bar divided between the two roads. A tollbar was also erected at Breckonside, and the funds from Netherplace (on the Water of Urr Road) (1798); Hardhills (on the Mollance to Palnackie Road)

58 There is no record of who finally paid for this road.
59 See page 213.
60 Probably the last road to be constructed strictly on Lord Daar's principles.
61 As the Old Military Road remained physically open, this resulted in some confusion, and an attempt was made to close it. See Part I., DGNHAS, vol. 44 (1967), p. 216.

(1823), and Burntstick (on the Castle-Douglas-Palnackie Road) (1802) were divided. Some of these tolls were closer than the statutory 6 miles, and pass tickets were issued. The section in Kirkcudbright Parish was never regarded as a toll road. In the course of time, the Dalbeattie-Castle-Douglas road, now A745, and composed of sections of various other roads, as evidenced by the various right-angled turns, increased in importance relative to the Kirkcudbright road.

Space does not permit the consideration of some of the other important routes, but few, with the possible exception of the Newton-Stewart to Ayrshire road,[62] underwent such drastic changes in the period under review The Dumfries to Newbridge Road, although until recently in the Stewartry, was at least during the turnpike period, administered by Dumfriesshire, and the Stewartry papers make little mention of it.

62 See Part I., DGNHAS, vol. 44 (1967), p. 216.

NOTES ON THE MILITIA RAISED AGAINST NAPOLEON

By A. M'CRACKEN

Hyslop, in "Langholm As It Was," (p. 599) states that although there was a strong feeling of patriotism during the early years of the 19th century, the Act of Parliament establishing a Militia to oppose a possible invasion by Napoleon was unpopular in many parts of the country, and was in some areas the cause of riots.

During the sorting of material in Langholm Museum (see these Transactions Vol. 44, p. 226) the minute-book kept by the Deputy Lieutenants of Dumfriesshire while selecting the Eskdale contingent of the Militia, was fortunately discovered. The material it contains is summarised in the following article. Sufficient of the minutes have been quoted to indicate the procedure adopted in selecting the militiamen, arranging substitutes, etc. Only the occupations of the various parishes are considered, for reasons of space. It is hoped that a further article may be produced to illustrate the surnames and place-names listed.

NOTES — Hyslop states that apart from the enrolling of a Militia, a voluntary subscription was taken. The sums collected in the Eskdale parishes were as follows. The populations of these parishes in 1801 are also quoted.

Parish	Population	Sum Collected
Langholm	2536	£97 8s 6d
Ewes	358	£68 14s 0d
Westerkirk	638	£54 4s 9d
Canonbie	2580	£41 11s 10d
Eskdalemuir	537	£31 14s 6d

At Langholm the twentieth day of October on thousand eight hundred and two years.

By appointment of the first General meeting of Deputy Lieutenants for the county of Dumfries for carrying into Execution an Act of Parliament dater the twenty-sixth day of June last entitled "An Act to raise a Militia Force in Scotland" held at Dumfries the twenty-seventh day of July last.

SEDERUNT.

His Grace the Duke of Buccleuch, John Maxwell of Broomholm, Esq., and William Keir at Milnholm, Esq., three of the Deputy Lieutenants for the Eighth division of the said County. His Grace Prases.

It was reported by the Clerk of the district that he had given out the Precepts issued by the said General Meeting to the constables and Schoolmasters following the meeting proceeded to call in the Schoolmasters and Constables in the following order to give account of what they had done in obedience to the said Precepts.

The meeting thereafter appointed George Henderson Writer in Langholm to be clerk to the subdivision meeting of the said division or district to whom they administered the oath de fideli on his appointment to and acceptance of the office.

Thereafter John Graham Schoolmaster of the parish of Eskdalemuir being called

upon he produced a List of the Inhabitants of the said parish in terms of the Precept delivered to him, and being solemnly sworn and interrogated depones that the said List according to the best of his knowledge and belief is a true list made out in conformity to the said Precept, and this is truth as he shall answer to God.

Archibald Graham Schoolmaster of Westerkirk produced a similar List for that parish which was authenticated and sworn to by him in like manner.

William Paterson Schoolmaster of Canonby produced a similar List for that parish and the same was in like manner authenticated and sworn to by him.

Mr Byers Schoolmaster of Ewes produced a similar List for the parish of Ewes and William Dalgliesh constable produced a similar List for the parish of Langholm which Lists were respectively authenticated and sworn to by them.

And the meeting having proceeded to hear the appeals and correct the said several Lists of men, the same were found and determined to stand as mentioned in the following pages herein referred to.

Buccleuch Preses.

Parish of Canonby

Farmers	92	Shoemakers	6	Innkeeper	1
Labourers	50	Merchants	6	Fish hook dresser	1
Weavers	38	Coopers	6	Teacher	1
Servants	34	Shepherds	5	Slater	1
Colliers	22	Carters	3	Miller	1
Joiners	16	Surgeons	2	Charcoalburner	1
Masons	10	Drover	1	Saddler	1
Taylors	7	Bankman	1	Spirit dealer	1
Blacksmiths	7	Toolbarkeeper	1	Gardener	1
Cloggers	7	Carrier	1	Carpenter	1
		Unspecified	5		

Total number of men listed 330
Number exempted 126
Number liable for service 204

65 men had a total of 297 children (men with more than 2 children were exempt).

As for the rest of those exempt, 17 suffered from lameness, 7 were unhealthy, 4 were deaf, 3 insane, 2 had stomach complaints, and 1 each were suffering from rupture, piles, consumption, convulsions and a hump back. Othello Maxwell, exempt, was a Blackmoor.

Parish of Eskdalemuir

Shepherds	26	Labourers	6	Driver	1
Servants	19	Tailors	3	Carrier	1
Tenants	15	Merchants	2	Drover	1
Weavers	7	Wright	1	Clogger	1
		Unspecified	5		

Total number of men listed 88
Number exempted 17
Number liable for service 71

5 men were exempted, having more than 2 children.

Also exempted were 5 constables, 2 apprentices, 2 dull of hearing, 1 blind in one eye, and one old soldier discharged unfit for service.

Parish of Ewes

Servants	25	Labourers	3	Ploughman	1
Shepherds	15	Roadmakers	3	Tollgatherer	1
Weavers	4	Molecatchers	2	Mason	1
Tenants	4	Farmer	1	Unspecified	9

Total number of men listed 69
Number exempted 14
Number liable for service 55

9 men were exempted, having 43 children among them.

Of the rest, 1 was undersized, 1 had a breast complaint, 1 was deaf, and 1 suffered from ill-health.

Parish of Langholm

Weavers	79	Wrights	4	Warehousekeeper	1
Labourers	23	Blacksmiths	4	Watchmaker	1
Masons	20	Innkeepers	3	Candlemaker	1
Joiners	15	Muslin weavers	3	Teacher	1
Servants	15	Surgeons	3	Hosier	1
Stockingmakers	14	Bakers	3	Meal dealer	1
Papermakers	8	Writers	3	Fiddler	1
Tailors	8	Clockmakers	3	Flax dresser	1
Shoemakers	7	Dyers	3	Naval Captain	1
Merchants	7	Shopkeepers	2	Sawyer	1
Shepherds	6	Nailers	2	Drover	1
Chaise drivers	5	Cloggers	2	Student	1
Carters	5	Brewer	1	Forester	1
Tenants	5	Saddler	1	Gamekeeper	1
Manufacturers	5	Cooper	1	Gardener	1
Thread manufacturers	4	Shopman	1	Herd (cow?)	1
		Unspecified	17		

Total number of men listed 298
Number exempted 138
Number liable for service 160

80 men were exempted, having 326 children among them.

Other reasons for exemption were: Lameness, 12; Mental disorder, 4; Unfit for service, 3; Lame hand, 2; Blind, 2; Unsound, 2; while there were one each of ill-health, leg lately broken, wanting an eye, deaf, wanting three fingers, consumptive, pain in side, cripple, liver complaint. There were also 15 apprentices.

Parish of Westerkirk

Servants	25	Joiners	5	Clogger	1
Shepherds	15	Smiths	2	Journeyman joiner	1
Weavers	11	Tailors	2	Miller	1
Farmers	8	Surgeon	1	Shoemaker	1
Labourers	8	Gardener	1	Mason	1

Royal Navy Lieutenant 1 Unspecified 3

Total number of men listed 87
Number exempted 31
Number liable for service 56

17 men were exempted, having 67 children among them.

Other reasons for exemption were: Lameness, 2; Deaf, 2; Blind, 1; Unfit to serve, 1; Paralytic, 1.

At Langholm the Ninth day of December Eighteen hundred and two years.

Met this day John Maxwell Esq. of Broomholm and William Keir in Milnholm Esq. two of the Deputy Lieutenants for the County of Dumfries, agreeable to an appointment of a General meeting of Lieutenancy held at Dumfries the Thirtieth day of November last when the said Deputy Lieutenants proceeded to divide the number of men appointed by the said meeting to serve for the Eighth division of the county being the district of Eskdale upon the parishes therein contained as follows

For the parish of Canonby Ten men
For the parish of Eskdalemuir Four men
For the parish of Ewes Three men
For the parish of Langholm Eight men
For the parish of Westerkirk Three men

being in all twenty-eight men and the Ballots being put up containing the names of the different men found liable to serve for the several parishes in terms of the act of parliament, into the Ballot Boxes, the following names were drawn out.

For the parish of Canonby, County of Dumfries.

1 Simon Dickson, Barngliesh, farmer.
2 David Hill, New Woodhead, farmer.
3 William Beattie, Torcoon, farmer.
4 Richard Thomson, Enthorn, farmer.
5 Adam Swan, Forge, servant.
6 Robert Davidson, Glenziarfoot, farmer.
7 John Waugh, Ladyhousesteads, farmer.
8 Thomas Armstrong, Knowhead, farmer.
9 James Wylie, Woodhouselees, servant.
10 Andrew Waugh, Andrewsknows, farmer.

For the parish of Eskdalemuir

1 James Paterson, Watcarrick, tenant.
2 William Scott in Blackeskhead, shepherd.
3 David Scott, Thickside, shepherd.
4 Thomas Bell, Westside, labourer.

For the parish of Ewes

1 James Anderson, Fiddletonbank, roadmaker.
2 Thomas Grieve, Bush, shepherd.
3 Andrew Scott, Mosspeeble, servant.

For the parish of Langholm

1 Thomas Graham, Bex, servant.
2 William Wilson, New Langholm, weaver.
3 James Armstrong, New Langholm, weaver.
4 George Harkness, Langholm, tailor.
5 Thomas Keir, Milnholm.
6 John Collan, Steenholm, labourer.
7 Robert Armstrong, Langholm, labourer.
8 George Donaldson, New Langholm, weaver.

For the parish of Westerkirk

1 Walter Riddel, Millgillfoot, joiner.
2 Francis Beattie, Kirktonhill, weaver.
3 William Oliver, Millgillfoot, Joiner.

And the said Deputy Lieutenants thereafter proceeded to issue their orders to the Constables of the said parishes to give notice to every man balloted as aforesaid to serve in the Militia to appear at Annan upon Monday the Twentieth day of December current at a meeting of the Lieutenancy then to be held in terms of an appointment of the said General meeting and also of this present district meeting with certification that if they fail to appear or find Substitutes they will be liable to the penalties contained in the said act.

John Maxwell, D.L.
Will Keir, D.L.

At Annan the Twentieth day of December Eighteen hundred and two years.

In a meeting of Lieutenancy held here this day

Present:

Charles Sharpe of Hoddom Esq.
John Murray of Murray Esq.
Colonel William Douglas.
William Keir Esq. Milnholm.
John Maxwell of Broomholm.
Mr Murray Prases.

met for the purpose of inspecting, attesting and enrolling the Balloted Militiamen per the Subdivision of Eskdale and there appeared—

Canonby Parish

1 Simon Dickson, Barngliesh, farmer; who neither appeared nor furnished a Substitute was fined in Ten pounds, which was paid.
2 David Hill, Newwoodhead, farmer; produced a Substitute James Harris aged 20, unmarried, residing in Langholm, Stockingmaker.
3 William Beattie, Torcoon, farmer; produced a Substitute, Robert Dickson, labourer, Dumfries, aged 23, married one child.

.....

9 James Wylie, Woodhouselees, servant, found no Substitute, paid Ten pounds.

.....

Langholm Parish

1 Thomas Graham, Becks, servant, neither appeared nor produced a Substitute was fined in Ten pounds which was paid. Thereafter produced a Substitute Douglas Robertson.

.....

6 John Coltart Steenholm, labourer; did not appear. Thereafter appeared and was inrolled.
7 Robert Armstrong, Langholm, labourer; did appear but was rejected as unfit.

.....

Westerkirk Parish

.....

2 Francis Beattie, Kirktonhill, weaver; appeared personally, approved, aged 22, unmarried.

.....

Geo. Henderson,
Clerk of Subdivision.

At Langholm the Twenty-first day of December Eighteen hundred and two years.

Robert Armstrong in Langholm, labourer; who fell under the Ballot for the Parish of Langholm on the 9th instant having presented himself before the meeting of Lieutenancy at Annan and having been there inspected and found unfit for service.

The Deputy Lieutenants for the Eighth district in consequence of this rejection made a new Ballot to supply the deficiency when the Ballot containing the name of James Beattie tailor in Langholm was drawn out. William Dalgliesh constable in Langholm is hereby appointed to summon the said James Beattie to appear before a meeting of the Lieutenancy at Langholm on the Twenty-eighth day of December current to be there examined and if found qualified to take the oath and be inrolled accordingly.—Thereafter the penalty of Ten pounds was paid for the said James Beattie.

Geo. Henderson, Clk.

At Milnholm the Fifth day of February, 1803.

In a meeting of Lieutenancy for this Subdivision present Messrs Maxwell and Keir, George Harkness tailor in Langholm, a Balloted Militiaman for the Parish of Langholm,

who paid the penalty of Ten pounds for not serving on the 20th day of December last, now produced Alexander M'Kenzie labourer in Hawick and requested that he might be accepted of as his substitute; and the said Alexander M'Kenzie having been first examined by a surgeon was attested and inrolled as Substitute for the said George Harkness accordingly.

Geo. Henderson, Clk.

At Langholm the Second day of June Eighteen hundred and three.

At a meeting of Lieutenancy held here this day Thomas Little shopkeeper in Langholm was balloted to serve in the ordinary Militia for that parish in room of Joseph Atkinson, deserted, who was a Volunteer serving instead of James Beattie tailor in Langholm for whom the penalty of £10 had been paid.

Geo. Henderson, Clk.

Langholm, 9th June, 1803.

The said Thomas Little this day paid the penalty of Ten pounds for not serving. Thereafter paid Five pounds more the additional penalty imposed by the Call out.

Geo. Henderson, Clk.

At Annan the Tenth day of June Eighteen hundred and three years.

In a meeting of Lieutenancy for the eight or Eskdale subdivision of the County of Dumfries.

Sederunt:

Charles Sharpe of Hoddam Esq.
John Murray of Murraythwaite Esq.
John Maxwell of Broomholm Esq.
William Keir, Esq., Milnholm.
Lieut. General Irving of Woodhouse.
Colonel William Douglas, Annan.

Mr Sharpe Prases.

The meeting proceeded to ballot for the Supplementary Militia for the several Parishes in the said Subdivision in terms of the act of Parliament 42d Geo 3 Cap 91 pursuant to a resolution and order of a General Meeting of Lieutenancy held at Dumfries on the eighth day of June current when the names of the persons aftermentioned were drawn and ballotted for the Parishes following viz.

Langholm

1 Thomas Graham, Labourer, Langholm.
2 William Yeoman, Manufacturer, Langholm.
3 Nathan Linton, Merchant, Langholm.
4 John Reid, Servant, Langholm.

Eskdalemuir

1 John Beattie in Davington.
2 William Black, Shepherd, Over Cassock.

Ewes

Thomas Murray in Carrotrig.

Westerkirk

1 Andrew Little, Weaver, in Bamby.
2 Andrew Elliot, Taylor, Netherknock.

Canonby

1 William Graham, Farmer, Whiteknow.
2 Thomas Ferguson, Servant, Whitlyside.
3 James Beattie, Shepherd, Parkhall.
4 Andrew Beattie, Servant, Tomshielburn.
5 Charles Little, Farmer, Thorniewhats.

And the meeting ordain intimation to be made to the above named person who are balloted to Appear to be inspected, attested and Inrolled at Dumfries, on Monday the 27th day of June Current in terms of the act of parliament.

Cha. Sharpe Preses.

At Langholm the Fourth day of September 1803 years.

This day William Scott servant in Megdale a Ballotted man for the Ordinary Militia for the parish of Westerkirk who paid the penalty of £15 for not serving, on 23d August, now produced as his Substitute Joseph Kerr weaver in New Langholm aged 22 years married but has no children, who was examined and approved of and the penalty above mentioned was restored to the said William Scott.

Geo. Henderson, Clk.

At Langholm the Seventh day of September Eighteen hundred and three years.

Present: John Maxwell of Broomholm Esq. and William Keir in Milnholm Esq. the two Deputy Lieutenants for this Subdivision of the County of Dumfries met by appointment of the General Meeting of Lieutenancy held at Dumfries on the Thirtieth day of August last in order to Ballot for the twenty-three men to serve for the several Parishes of this Subdivision for the army of Reserve in Pursuance of the act dated 6 July 1803. The said Deputy Lieutenants having taken under their consideration that it would be proper before proceeding to draw the said Ballots for the army of Reserve to join the two parishes of Westerkirk and Ewes together, they accordingly did join the said two parishes and put the Ballots into one common Box after which the meeting proceeded to Ballot for the said men to serve in the Army of Reserve in the Parishes after mentioned of this Subdivision, as follows viz:

Canonby—8 men

1 John Little, Farmer, Beckhall.
2 John Little, Farmer, Barrascrofts.
3 James Boyd, Servant, Glenzearhall.
4 James Scott, Labourer, Forgebraehead.
5 Regnald Armstrong, Labourer, Knowhead.
6 Richard Little, Bankman, Limycleugh.
7 William Armstrong, Servant, Harelawhole.
8 John Armstrong, Labourer, Smiddysyke.

Langholm—7 men

1 James Hogg, Weaver, New Langholm.
2 Francis Thomson weaver there.
3 Walter Clerk, Broomholmshiels.
4 William Headstanes, Tailor, Langholm.
5 James Bowman, Dyer, New Langholm.
6 Charles Harestanes, Shoemaker, Langholm.
7 Henry Murray, Farmer, New Langholm.

Ewes and Westerkirk conjoined—5 men

1 William Moffat, Tenant, Mosspeeble.
2 Adam Scott, Farmer, Megdale.
3 Charles Beattie, Shepherd, Unthank.
4 William Amos, Ploughman, Carrotrig.
5 William Nixon, Shepherd, Dorniegills.

Eskdalemuir—3 men

1 Archibald Irving, Tenant, Over Fedling.
2 David Hogg, Shepherd, Aberlosk.
3 John Riddel, Weaver, Alingillfoot.

and the meeting appointed the above Ballotted men to be summoned to appear at Annan on Thursday the Twenty-second day of September current to be inspected, attested and Inrolled to serve in the Army of Reserve accordingly.

Geo. Henderson, Clk.

At Langholm the Twenty-fifth day of January Eighteen hundred and four.

In a meeting of Lieutenancy held here this day present William Keer and George Maxwells Esquires Deputy Lieutenants for the purpose of attesting inrolling the three Balloted men on the 18th curt for deficiences in the Army of Reserve in the parishes of Canonby and Langholm.

Alexander Hutton collier in Limycleugh Canonby paid the penalty of £20 for not serving; but John Armstrong servant at Brockwoodlees the other Balloted man for Canonby and David Conner shoemaker in Langholm the Balloted for that parish, neither found substitutes nor paid the penalty and failed to appear though lawfully summoned in terms of law.

Geo. Henderson, Clk.

At Langholm the Twenty-eighth day of March Eighteen hundred and four.

This day in a Subdivision meeting of Lieutenancy Present Wm. Keir and George Maxwell Esquires Deputy Lieutenants in consequence of a letter from Mr Goldie C. G. M. James Thomson weaver in Boglin Canonby was Balloted to serve in the second quota of Militia for that parish in room of James Lunn discharged or unfit for service from debility and asthmatic complaints and he was appointed to be summoned to appear at Dumfries on the 11th April to be attested and inrolled.

Geo. Henderson, Clk.

At Langholm the Twenty-eighth day of March Eighteen hundred and four.

In the above meeting of Lieutenancy John Irving farmer in Hawkhall was Balloted for the Army of Reserve for the parish of Canonby in the room of John Armstrong servant at Brockwoodlees formerly Balloted.

Geo. Henderson, Clk.

A LATE NEOLITHIC—EARLY BRONZE AGE TEXTILE IMPRESSION FROM LUCE SANDS, WIGTOWNSHIRE

BY AUDREY S. HENSHALL

A sherd of pottery with a textile impression on its outer surface was found in 1966 in the Flint Howe area of Luce Sands by Mr W. F. Cormack, when making a search by permission of the Officer Commanding, Royal Aircraft Establishment, West Freugh. The sherd was lying on an eroding land surface at the edge of a small patch of charcoal and shattered stones, possibly a hearth. The same spot has yielded Late Neolithic pottery, in particular the better part of a "Peterborough" pot decorated with bone impressions, now in the Dumfries Burgh Museum. The approximate map reference of these finds is NX 127547.

The sherd under discussion (pl. IX) has been donated to the National Museum of Antiquities, Edinburgh (registration number BHA 344). It is of a rather crumbly ware with many large grits, which do not, however, show on the outer surface. This surface is uneven and lumpy due to pinching, and slurring the clay over protruding grits. The sherd measures 2 ins. square, having broken along two building rings, and is ½ in. thick; as there is little curvature it is obviously from a large vessel. The colour is mid-brown to orange-brown. The sherd belongs with the Class III "domestic wares" in Miss McInnes' recent publication of the Late Neolithic-Early Bronze Age pottery from Glenluce.[1]

The outer surface of the sherd bears the impression of a textile, against which the pot had evidently accidentally leant whilst still in a plastic condition before drying or firing. The textile was a plain weave cloth, with one system of threads much closer together than the other system; the latter would have been hardly visible and they have not registered in the impression. There were about 32 threads per inch in the close-set system, and about 10 threads per inch in the wide-set system. The direction of spin of the former was S (Z on the impression).

The survival of organic material from the medieval or earlier periods is not a common occurrence in Britain, and textile remains survive very rarely and under special conditions which, with very few exceptions, allow preservation of only very small pieces. So far the earliest traces of cloth in Britain have come from English Early Bronze Age burials belonging to the first phase of the rich Wessex culture, dating from the 16th century B.C.[2] In many cases only a scrap of cloth has been preserved due to its having lain beside a bronze object which during corrosion has impregnated it with metal oxide. Other small pieces of textile have been preserved with burials of a slightly later date due to scorching and inclusion with cremated bones in a Cinerary Urn.

These scraps of textiles, about thirty examples of which only about half are now extant, can be supplemented by a few instances of cloth impressions left either on clay or on a pot, the pots in question being either Food Vessels or Cinerary Urns, and so covering the same period as the cloths already mentioned.

The sherd from Luce Sands has produced the first evidence in Scotland for cloth earlier than the two recently discovered Late Bronze Age examples.[3] The date of the Luce Sands cloth is contemporary with the earliest English examples, or probably a little earlier. The only other item from Scotland which may be mentioned in this con-

1 P.S.A.S., XCVII (1963-64), 49.

2 These and other textiles from prehistoric contexts in Britain were discussed and listed in P.P.S. XVI (1950) 130-162. The cloth from Kelleythorpe, Yorkshire, which was not preserved after discovery, may be slightly earlier in date.

3 From Pyotdykes, Angus, P.P.S. XXX (1964), 197-8, and Nydie Mains, Fife, note forthcoming in P.S.A.S.

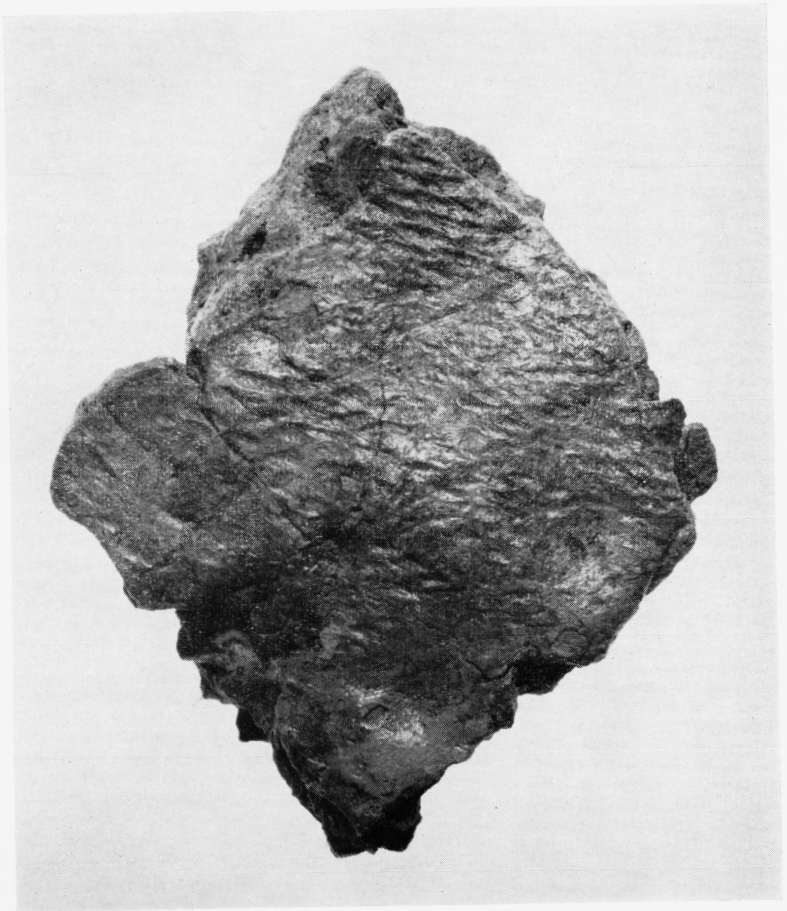


Plate VIII.—A late Neolithic-early Bronze Age textile impression from Luce Sands. Magnified 1½ times natural size.

Photo: Nat. Museum of Antiquities of Scotland.

text is the impression of a coiled mat on the base of a pot, of about the same date, found at Rinyo, Orkney.

All the cloths mentioned above are plain weaves, for there is no evidence that any form of twill was used before the Late Bronze Age, and even after the introduction of twill weave, plain weaves have continued in production to the present day. The Late Neolithic-Early Bronze Age plain weaves vary considerably in texture, and the Luce Sands cloth would come in the middle of the range. But though some cloths may have had a considerable difference in the spacing of the threads in the two systems, none shows the great disparity of the Luce Sands piece where one system seems to have almost hidden the other system: the Luce Sands textile seems to have been almost a repp.

Owing to the smallness of the samples of cloth which have come down to us, the only features which can be recorded is the direction of the spinning of the threads, and an indication of the coarseness of the cloth by counting the number of threads per inch. No piece retains a selvage, nor weaving error, and we have little indication of the size of the webs. The situation is comparable to studying a few undecorated wall sherds found singly by chance on widely scattered sites.

BRONZE AGE SPEARHEADS FROM BENNAN MILLYEA (KELLS PARISH) AND THE GRIERSON COLLECTION

By JAMES WILLIAMS
F.S.A.Scot.

INTRODUCTION

When the Bennan Millyea spearhead was found in April, 1967, it was intended to produce a short note. However, when comparisons came to be made with other local examples it was noted that the Bronze Age spearheads (4) in the Grierson Collection (Thornhill) had never been fully published. They are all mentioned in P.S.A.S. XXII. (1887-88), p.376, and the Dunscore spearhead is illustrated and mentioned briefly by John Coles in his article on "Bronze Age Metalwork in Dumfries and Galloway" in T.D.G.N.H.A.S. XLII. (1965), p. 61-98, figs 10-13.

The spearheads to be described (fig. 1) belong to the following classes: Class IIIA., Class IV., and Class V.[1] The dating of these types is as follows: Class III.A (basal looped) and Class IV. (leaf) belong to the Middle Bronze Age. The leaf blade appears to be relatively common in South-West Scotland and may represent a regional type. From associated finds in the South a date sometime about the closing centuries of the second millenium B.C. seems to be suggested. The area of production of the basal looped blade has not, as yet, been determined—its associations in Britain suggest a date from circa 1200 B.C. Class V. (leaf with rivet) spearheads belong to the Late Bronze Age—their associated finds from elsewhere in Scotland do not suggest a dating of earlier than the mid eighth century B.C.

1. BENNAN MILLYEA, PARISH OF KELLS

In late April, 1967, a bronze spearhead (Class IV.) was forwarded, for examination and recording, to Dumfries Burgh Museum by Mrs Brown of the Kirkcudbright County Library. It had been found in clay, by a farm worker, at about 1000 feet on the N.E. slopes of Bennan Hill, and about ½ a mile from Forest Lodge, Kells. The Nat. Grid. Ref. of the find-spot, as far as can be determined, is NX53608637. At the time of

1 The classes are based on Greenswell & Brewis in Archæologia LXI (1909), 439—also see Coles in P.S.A.S. XCIII (1963-64), p. 104.

writing the spearhead is in the possession of Mr Olsen of the well-known Norwegian Shipping Line.

The spearhead weighed 32.72 grams, had a total length of 13.6 cms., and the diameter tapered from 1.6 cms. at the socket, to 0.4 cms. at the tip The thickness of

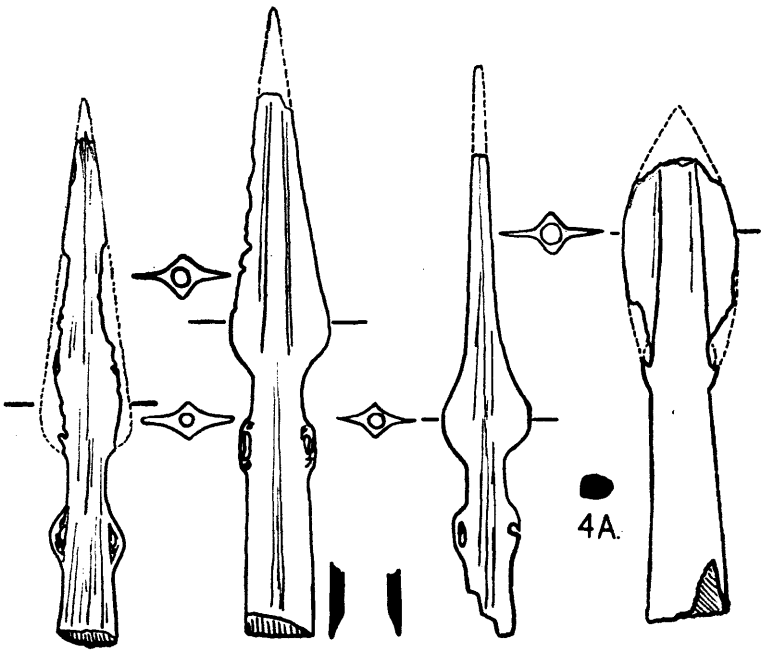


Fig. 1—Bronze spearheads from 1, Bennan Millyea; 2, Bowhouse, Caerlaverock; 3, Spearford Bridge, Crossmichael; 4, Tinwald. All x ¼.

the metal at the socket (incomplete) was 0.2 cms., and the sideloops were displaced, one from the other, by 0.2 cms. The surface was covered by a dark brown glossy patina—presumably due to the ferruginous clay in which it was found. Where the patina was broken a pale greyish-green oxidation product was observable—there is probably very little, if any, metal left in the spearhead. One side shows a distinct mould-mark down one mid-rib whilst the opposing side appears to have been filed smooth and (?) polished some time in antiquity to leave a "flat." A little wood was recovered from the tip of the socket and this has been identified as Ash (Fraxinus excelsior) by Miss M. E. Ransom, Department of Botany, University of Cambridge. For a detailed report see Appendix.

2. BOWHOUSE, CAERLAVEROCK

This Class IV. spearhead was found at Bowhouse of Caerlaverock in 1881 by a Mr Robert Crosbie—it was presented to Dr T. B. Grierson on 16th February, 1886 (Reg. No. 1232).[2] The length is 14.2 cms.; tapers from 1.75 cms. at the socket, to 0.9 cms. at the tip (incomplete). The complete socket remains and the metal thickness tapers from 0.25 cms.

2 All Register numbers are taken from Dr Grierson's M.S. Catalogue which is now retained by Dumfries Museum.

to nil—this has been cast in this form and not turned from the solid.[3] The greatest width across the blade is 2.4 cms. The weight is 77.19 grams. There appears to have been very little oxidation as the dirty green patina is very thin and patches of yellow bronze are visible.

3. SPEARFORD BRIDGE, CROSSMICHAEL

A Class IV. spearhead found in a garden at Spearford Bridge, Parish of Crossmichael, and presented to Dr Grierson by a Mr James Grierson, teached at Wallace Hall, on 12th May, 1877 (Reg. No. 941). Length 12.7 cms.; tapers from 1.35 cms. at the socket (incomplete), to 0.4 cms.; the metal is 0.15 cms. thick at the socket and the blade, at the widest point, is 2.15 cms. across. The weight is 30.96 grams and the whole is covered by a very thin patchy patina—yellow bronze visible in many places.

4. TINWALD

A Class III.A spearhead (i.e. with basal loops) which was "found near an ancient encampment believed to be Roman, in the Parish of Tinwald, Dumfriesshire." It was presented to Dr Grierson by Mr John Halliday of (?)Burn Cottage, Tinwald, on the 19th of (?)June, 1867 (Reg. No. 616). Length 12.0 cms.; tapers from 2.0 cms., at socket, to 1.1 cms. at the tip (broken). The metal thickness, at the socket, is 0.25 cms.—same type of socket casting as that from Bowhouse of Caerlaverock. The blade is 2.8 cms. across; weight is 49.82 grams; dirty green patina—very thin with yellow bronze showing in many places.

4A. A bronze ring was found associated with the spearhead described above. The ring is 5.8 cms. in external diameter, 0.8 cms. thick, and weighs 41.68 grams. The ring is a rounded "D" in cross-section. One point of the circumference is badly worn and suggests that it may have been used as a (?)cauldron handle.

5. SPRINGFIELD, DUNSCORE

This Class V. spearhead was "found on the farm of Springfield Hill, Parish of Dunscore, it was turned up by the plough on a piece of ground that had not been previously ploughed. About three-quarters of a mile from the place there is Camp Hill, on the top of which, are the remains of entrenchments. The finder was the son of Mr Hyslop, the farmer of the ground. Nov., 1865. I paid 2s 6d for it."[4] Reg. No. 526. Length is 32.8 cms.; the spearhead is complete except for the socket—the break occurs at the level of the rivet-hole (the metal is 0.2 cms. thick at this point, the diameter being 2.5 cms.); the greatest width of the blade is 4.75 cms. and the weight is 199 grams. Both this spearhead and that from Bennan Millyea bear traces of fine file-work at the extreme tip of the blade—suggesting that they were both cast from the tip as is suggested for some of the English and Scottish bronzesmiths.

APPENDIX

WOOD FROM THE SHAFT OF THE BENNAN MILLYEA SPEARHEAD

By MISS M. E. RANSOM
Sub-Department of Quaternary Research, Cambridge

A sample of the wood was submitted by A. E. Truckell, Dumfries Burgh Museum, for identification. As the pieces of wood were small, they were embedded in wax and sections then cut by hand. The wood was found to be well preserved and readily identified as **Fraxinus excelsior** (Ash), on the following features:

Strongly ring porous, vessels of early wood large up to 250u diameter, late wood vessels small, few and scattered with vasicentric parenchyma. Rays mainly homogenous, uni, bi and triseriate, no compound rays. Vessels wide with simple perforations and no spiral thickening.

Cambridge, 20th June, 1967

3 There appears to have been a tendency for English and Scottish bronze-smiths to cast spearheads from the tip—opposed to the Irish, who appear to have favoured casting from the socket. See R. F. Tylecote in "Metallurgy in Archæology" p. 113.

4 The find conditions are quoted direct from Dr Grierson's M.S. Catalogue.

A BURIAL CAIRN IN LUCE SANDS, WIGTOWNSHIRE

BY W. F. CORMACK, F.S.A. Scot.

During the summer of 1964, three members of this Society (R. J. Little, A. M Cracken and the writer of this note) were making one of their periodic searches through Luce Sands, by kind permission of the Officer Commanding, Royal Aircraft Establishment, West Freugh, when they observed at approx. map ref. NX129546, a number of quartz pebbles eroding from the upper of two old land surfaces which had appeared in the side of a "blow out." Both surfaces consisted of 6 in. thick layers of black sand—the lower had a few small pebbles incorporated in it but no signs of any

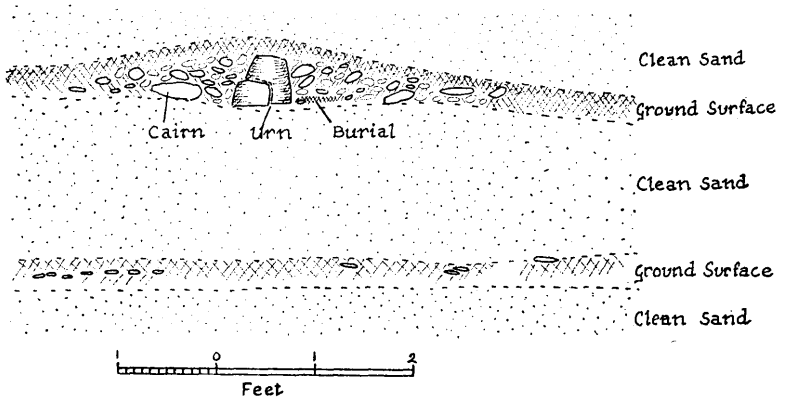


Fig. 2—Section of small cairn in Luce Sands showing bucket urn.

occupation. Above these two land surfaces was an indeterminate thickness, perhaps 20 feet, of clean sterile sand dune.

Among the pebbles which had already tumbled out were an unburnt flint knife and a fragment or two of cremated bone. Since the association of quartz pebbles with burials in Luce Sands has been stressed on previous occasions, it was decided to investigate further the source of those which were appearing.

A few minutes scraping with a trowel revealed that they were coming from a small cairn (fig. 2), approximately 4 feet diameter and 8 ins. high made of rounded Silurian stones (3 to 6 ins. diam.) such as occur on the present beaches around Luce Bay, interspersed with quartz pebbles (1 to 2 ins. diam.). In the centre of the cairn, inverted over a cremation burial was a cinerary urn. Beside this urn lay a second unurned cremation burial. As will be observed from the section, the burials had been placed on the subsoil in a shallow scooped area in the ground then the cairn heaped over them. No traces of a textile or other container for the unurned burial were observed nor was there any evidence which might imply that one of the burials was secondary. Indeed they appeared to be contemporary with each other.

The black line covering the cairn would indicate that eventually soil had accumulated on the cairn and vegetation covered it. The urn, however, had been inadequately covered with stones, or perhaps slipping of the latter had reduced the cover, so that destructive agencies had been able to attack and destroy the base of the urn.

The urn, which is bucket shaped and undecorated, is 9 ins. diam. at the rim, approx. 4 ins. diam. at the base and with a surviving height of 8 ins. It is No. 63 of Mr A. Morrison's corpus in this volume of Transactions and is illustrated on p. 129 supra. A photograph of the urn in situ appeared in Royal Aircraft Establishment News. Vol. 17, No. 9, p. 22. The urn and flint knife are now in the Burgh Museum, Dumfries.

As Mr Morrison points out, bucket urns in South-West Scotland are predominantly coastal in distribution and he concludes that they may well have been used during the major part of the Bronze Age. The small cairn under discussion, though clearly sepulchral, is rather reminiscent of the numerous enigmatic congeries of stones mostly occurring on the higher ground (c. 800 ft.) in South-West Scotland, which have been identified by one school of field observers as field clearance heaps, by another as funerary monuments. In support of the former view is the apparent absence of any bone, much less pottery, while on the other hand Gen. Scott-Elliot has recently marshalled in these pages (Vol. 44, p. 99) several cogent reasons why many, if not all, of these small cairns may be funerary. This Luce Sands find may encourage further investigation of these small cairns before they are engulfed by encroaching afforestation.

A FURTHER RING-BROOCH FROM LUCE SANDS

BY ETIENNE RYNNE
Department of Archæology, University College, Galway

Early in April, 1967, Mr W. F. Cormack, member of this Society, found the penannular ring of a small bronze ring-brooch while making one of his periodic searches for evidence of ancient habitation-sites in Luce Sands, near Glenluce, Wigtownshire, by kind permission of the Officer Commanding, Royal Aircraft Establishment, West Freugh. This discovery was made at a spot about 200 yards north-west of the place

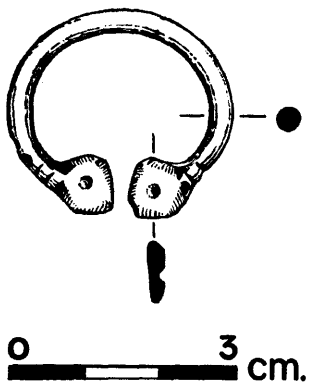


Fig. 3—A further ring-brooch from Luce Sands. Nat. size. From a drawing by Rosaline Murphy.

where a bronze ring-brooch of probable 5th or 6th century date was found in 1964.[1] The area in which it was discovered is rich in prehistoric finds but, apart from iron slag, had not heretofor produced any find of significance datable to the Early Christian period.[2]

The brooch (Fig. 3) is in perfect condition except that it has a smooth greenish patina and is missing its pin. The hoop is round in cross-section and is of uniform thickness (3 mm.) throughout. The terminals are roughly lozenge-shaped (7.8 mm. by 7 mm.) in plan and are thinner (2.6 mm.) than the hoop. They are flat and plain on the backs but the fronts have roughly bevelled edges and a central dot-like depression. The junctions of the hoop with the terminals are each marked by two scored lines across the front of the hoop which create the impression of slight transverse mouldings. The whole was

1 E. Rynne, TDGNHAS, 3rd ser. 42 (1965), 99-113.
2 Ibid., p. 99.

probably cast in its present form, though it is possible that the bevelling of the terminals may be due to post-casting hammering. The ring measures 2.95 cm. (just over 1¼ ins.) in maximum width across, and 2.8 cm. from the top of the hoop to the bottom of the terminals. The missing pin could have been short (about 3.5 cm.) or long (anything up to about 6 cm.), but unfortunately there is now no method of knowing. The brooch is now in Dumfries Burgh Buseum.

This new discovery is slightly larger than the three other bronze ring-brooches recorded from Luce Sands,[3] though like them it is small in comparison with the general run of penannular brooches. It can be fitted into Type G, as identified in the two most recent studies dealing with penannular brooches.[4] This type is defined as having terminals which "are squared or faceted and ornamented with a central dot, or a diamond with four internal dots."[5] There seems to be no chronological difference discernible between brooches of this type having one or four dots on their terminals, both varieties being known from sub-Roman and Anglo-Saxon contexts.[6]

A very close parallel to the Luce Sands example is an even smaller one from Twlc Point, Llangenydd, in Glamorganshire, for which a date in the 4th to 6th centuries seems to be suggested.[7] Another, somewhat larger example, which seems to be related to the Luce Sands brooch was found in Linney Burrows, in Pembrokeshire, and a date in the 6th or 7th century seems to be suggested for it.[8] Close parallels for the Luce Sands brooch are also to be found among the clay mould-fragments discovered during the 1913 excavations at the Mote of Mark, Dalbeattie, in the Stewartry, the main occupation of which site can be dated on historical and archæological grounds to about 475-675 A.D.[9] The most complete mould from the site was intended for casting a pair of penannular rings with round-sectioned hoops and lozenge-shaped terminals,[10] apparently very similar to the specimen from Luce Sands. Another mould-fragment from the same site was intended for casting a similar ring but with terminals which would have had four small bosses enclosed within a lozenge.[11] Nothing quite like the brooches under discussion appears to have been found in Ireland.

One might conclude from the evidence outlined above that the ring-brooch recently discovered in Luce Sands was probably made in the locality, perhaps at the not too distant Mote of Mark, some time during the 5th, 6th or 7th century, a date which agrees with that already suggested for the other bronze brooches from the area.[12] It is also of interest to note a possible connection with South Wales, much of which, like the south-west coastal regions of Scotland, was settled by Irishmen at about the same period.[13]

Acknowledgments

I wish here to acknowledge my grateful thanks to Mr W. F. Cormack for so kindly inviting me to publish this most important and interesting discovery, and to Miss Rosaline Murphy, of the National Museum of Ireland, for the fine drawing of the Brooch.

3 **Ibid.**, p. 112.
4 E. Fowler, **PPS.** 26 (1960), 149-177.
E. Fowler, **Arch.J.**, 120 (1963), 98-160.
5 E. Fowler, **op.cit.** (1960), 153.
6 E. Fowler, **op.cit.** (1963), 109.
7 H. N. Savory, **Dark Age Britain: Studies presented to E. T. Leeds** (edit. D. B. Harden), London 1956, p. 53, fig. 12:3.
8 **Ibid.**, p. 51, fig. 11:5.
9 E. Rynne, **op.cit.**, p. 104.
10 A. O. Curle, **PSAS**, 48 (1913-14), 144, figs. 13:6 and 14:6.
11 **Ibid.**, p. 144, figs 13:4 and 14:4.
12 E. Rynne, **op.cit.**
13 M. Richards, **JRSAI**, 90 (1960), 133-162.

A GROUP OF STERLINGS FROM CLOSEBURN

By IAN STEWART

A group of eight thirteenth and early fourteenth century sterlings were recently sent in to the Dumfries Burgh Museum by Mr J. W. Raffle, 33 Gresford Avenue, Liverpool, 17, who remembered being told that his grandfather, then a ploughman, had got them in Closeburn in the early 1900's. Mr A. E. Truckell, the Curator, has been kind enough to let me examine the coins and has invited me to write this note on them. They may be described as follows:

Edward I.-II. of England

1. Fox[1] class Xb/IXb mule, London.
2. Fox class Xc-f, 2nd bust (Burns A41), Canterbury, holed through centre.
3. —, 3rd bust (Burns A43), reads hYB :, London.
4. —, 3rd bust ? (Burns A43 ?), Canterbury.

Alexander III. of Scotland

5. Burns Group II., class I. (Stewart class D), 2 mullets of six points, 2 stars of seven (B. fig. 160).

Ireland (Edward I.)

6, 7 Dolley Group V. = Allen Class H, one pellet below bust, Dublin (2).

Aquitaine

8. Edwardian sterling, Hewlett pl. VI 5.

The oldest coin in the parcel is the Scottish sterling of Alexander III., which belongs to a coinage which probably did not long outlast the king's death in 1286. The absence of coins of John Balliol is unremarkable : they are much scarcer than Alexander's. Those of Bruce are very rare, even if they had been struck before the date of deposit of the hoard from which these coins are apparently strays.

Mr Tatler and I have suggested that Fox class X. in the English series lasted until about 1310[2], and the four coins of this class represented range from early to late in the class. The two Dublin pennies are apparently of the variety to be associated with the English recoinage of 1300.

Earlier writers attributed the Edwardian sterlings of Aquitaine to Edward III., but on the basis of the Carsphairn hoard of 1913 G. C. Brooke argued convincingly for their being not later than Edward II.[3] Mr Dolley has lately suggested in the context of the Cockburnspath hoard of 1856 that they may even have been struck late in the reign of Edward I.[4]

A very large hoard of the period was discovered about 1844 at Closeburn, Dumfriesshire,[5] but the present parcel seems on the face of it more likely to have derived from another find at Closeburn in 1900, known from the name of the farm on which it was discovered as the Borscar hoard.[6] Over 1300 coins were submitted to the National Museum of Antiquities, but there may have been others which were dispersed on discovery. The coins submitted ran as late as Burns A50, Fox class XVd, which belongs to the early years of Edward III.

Of the coins in Mr Raffle's parcel, the English, of Fox Class X, accord with the most heavily represented issue at Borscar;[7] there were also three Dublin pennies and five of

1 Classification according to: Fox, **British Numismatic Journal**, vi-x (1910-4); Burns, **The Coinage of Scotland**, 1887, i; Stewart, **The Scottish Coinage**, 1955; Dolley, B.N.J., xxviii (1956), pp. 150-2; Allen, **Num. Chron.**, 5th ser., xvi (1936), pp. 115ff.; Hewlett, **Anglo Gallic Coins**, 1920.

2 B.N.J. xxxi (1963), p. 84.

3 **Num. Chron.**, 4th ser., xiv (1941), pp. 382-3.

4 **Numismatic Circular**, April, 1962, p. 80.

5. J. D. A. Thompson, **Inventory of British Coin Hoards**, No. 92-93.

6 Thompson No. 47; described by A. B. Richardson in **P.S.A.S.** xxxv (1901).

7 Richardson may have exaggerated the number of coins of Burns A40, for which his totals perhaps contain examples of A44-49 (Fox XI-XVc). Of these later varieties he distinguishes none of London and 2 only of Canterbury, but of Durham as many as 42, because there are characterised by easily recognisable episcopal marks.

Alexander III. of Scotland. The Borscar list contains no denier of Aquitaine, but continental sterlings of Flanders, Hainault, Brabant, Serain, Porcien and Guelders were present.

Circumstantially, the argument for these eight coins being strays from Borscar is, if Mr Raffle's tradition of their acquisition by his grandfather is accurate, a strong one. The objections are three: first, the high proportion in the parcel of non-English sterlings which formed only 2% of the Borscar coins as submitted to the authorities (though the parcel may have been a deliberate selection); second, the presence of the Aquitaine denier (the same explanation could apply); and third, the fact that one of the English pennies is pierced through the centre, whereas none of those listed by Richardson are recorded as mutilated.

Sir John Craig refers to an order of 1319 that whoever found a clipped coin should bore a hole through it.[8] Such coins do not normally occur in Edwardian hoards, but because of their very deficiency they would not presumably have been saved for hoarding. Though it is possible that we have here an example of such a coin, it is more likely to be merely an ordinary piercing, for suspension or mounting. In the first place the coin is not much clipped, if at all; and, secondly, the neat hole appears to have been punched out, with the removal of a small disc of silver from the middle, rather than being roughly done with a spike as one would expect in response to the order of 1319.

It is indeed possible that the parcel of coins here described came from the great Borscar hoard of 1900, but for the reasons above set out I think that their discrepancies from the norm of the contents of that hoard as submitted to the National Museum make it no more than a possibility, and a dangerous assumption in the absence of more positive evidence.

REVIEWS

"Excavations at Clickhimin, Shetland," J. R. C. Hamilton; H.M. Stationery Office, 1968.

Mr Hamilton's Report, on behalf of the Ministry of Works, on the excavation of Jarlshof a few years ago set a new standard for such reports; out of a long succession of excavations by different people, with record-keeping of very varying standards, capped by his own highly efficient work, he built a vivid and coherent account of the history of that site from the late Neolithic into the Middle Ages. Now he has done the same thing for Clickhimin. This islet on the Shetland coast has proved a very important site for the Iron Age; the most important part of this period was lacking at Jarlshof, and when the excavations finished there in 1952 work moved to Clickhimin, with its fort and broch, continuing until 1957. Eleven years has been a long time to wait for the report: but it proves well worth it. Similar in sumptuous format to the Jarlshof report, with abundance of first-rate plans, sections, drawings of finds, photographs and reconstruction drawings, some by Alan Sorrell, it presents the most important new evidence for many years on the structure of Iron Age forts, showing that strongly-built blockhouses plus dwelling and other buildings, all more or less rectangular, lay against the high surrounding wall of the fort; and abundant evidence that this was indeed the normal form of such forts is quoted from the early Celtic—particularly Irish—traditions: the expert eye of scholarship shows just what the relevant passages mean.

Well-written, absorbing, and full of meat: the price of £6 10s is not too high, by modern standards, for a book which should have a permanent place on the shelves.

A. E. T.

8 The Mint, 1953, p. 60.

13th October, 1967—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 was in the Chair. Before the business of the meeting commenced members recorded their deep regret at the loss of two members who had given outstanding service to the Society, the late Professor Balfour-Browne, past-President, and the late Mr James Taylor, Vice-President. The Accounts of the Hon. Treasurer were adopted and the list of office-bearers and members of Council nominated by Council approved. Mr R. J. A. Eckford, was elected as an Honorary Member. 16 adult and 3 junior members were elected. Sqdn. Ldr. W. B. Russell lectured on "Climbing in Nepal" illustrating his talk with colour slides.

27th October, 1967—Mr E. Dicerbo, a well known local ornithologist gave a programme on "Craigielands and its Birds" consisting of a very fine series of colour slides of the birds on the estate and their habitats with recordings of bird song and a recorded commentary. 8 adult members were elected.

10th November, 1967—Mr J. A. B. McDonald, former Conservator for the South Region of the Forestry Commission, spoke on "A Forestry Trip to Canada" his lecture being illustrated with colour slides. 3 adult members were elected.

24th November, 1967—Dr Helen Parker of the Department of Archæology of the University of Glasgow, lectured on "Excavations in the Mediaeval Port of Kings Lynn, Norfolk, 1963-67" and showed colour slides. 1 adult member was elected.

8th December, 1967—This was a joint meeting with the Institute of Physics and the lecture, entitled "Was Stonehenge a Computer for Eclipses?" was by Dr G. G. Matthews, Senior Lecturer in Applied Physics at the Rugby College of Engineering Technology, who used colour slides and charts to illustrate his talk.

12th January, 1968—Mr Charles M. Daniels of the Museum of Antiquities of the University of Newcastle, lectured on "The Garamantes and Rome; a client kingdom in the Sahara" his talk being illustrated with colour slides.

26th January, 1968—A Members' Night was held in the Unionist Rooms, Dumfries. Short talks were given by Messrs Cormack, D. A. G. Brown, John Young, Varie, Truckell and Dr McAdam. Exhibits were shown by Messrs Ansell, Anderson, D. A. G. Brown, Cormack, Gillies, Truckell, Williams, The Solway Ringing Group and Miss Jane Rodgers. Tea was served and there was an interval to allow members to examine the interesting and varied exhibits. 2 junior members were elected.

9th February, 1968—Mr J. B. Delair lectured on "Fossil Footprints" his talk being illustrated with slides.

23rd February, 1968—Mr Angus Maclean kindly substituted for the lecturer and showed a very fine series of slides of the archæological riches of Greece and the Greek Islands with a most interesting commentary. 1 adult member was elected.

8th March, 1968—Mr A. D. Anderson of the Stewartry Roads Department, lectured on "The History of the Stewartry Roads" with fine colour slides.

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