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EDITORIAL

The new format initiated with the previous Volume has been very well received, subject only to one or two criticisms on points of detail. The Editors will be pleased to receive suggestions for the further improvement of the Transactions.

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

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The illustration on the front cover is from an Article, "The Early Church in Dumfriesshire," by the late W. G. Collingwood, in Volume XII (1924-25) of these Transactions. It is of the Wamphray grave slab, 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.

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LANDSCAPE EVOLUTION IN GALLOWAY

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Introduction

The region discussed here (Fig. 1), Galloway in the widest sense, comprises a number of physical units the limits of which are determined in the main by underlying lithology and rock structure. The northern part is the western third of an almost continuous hill range of Ordovician rocks extending from near Loch Ryan to the North Sea at St. Abbs Head. Elsewhere, much of the high ground is underlain by granitic rocks, as Cairnsmore of Carsphairn (2612 feet),

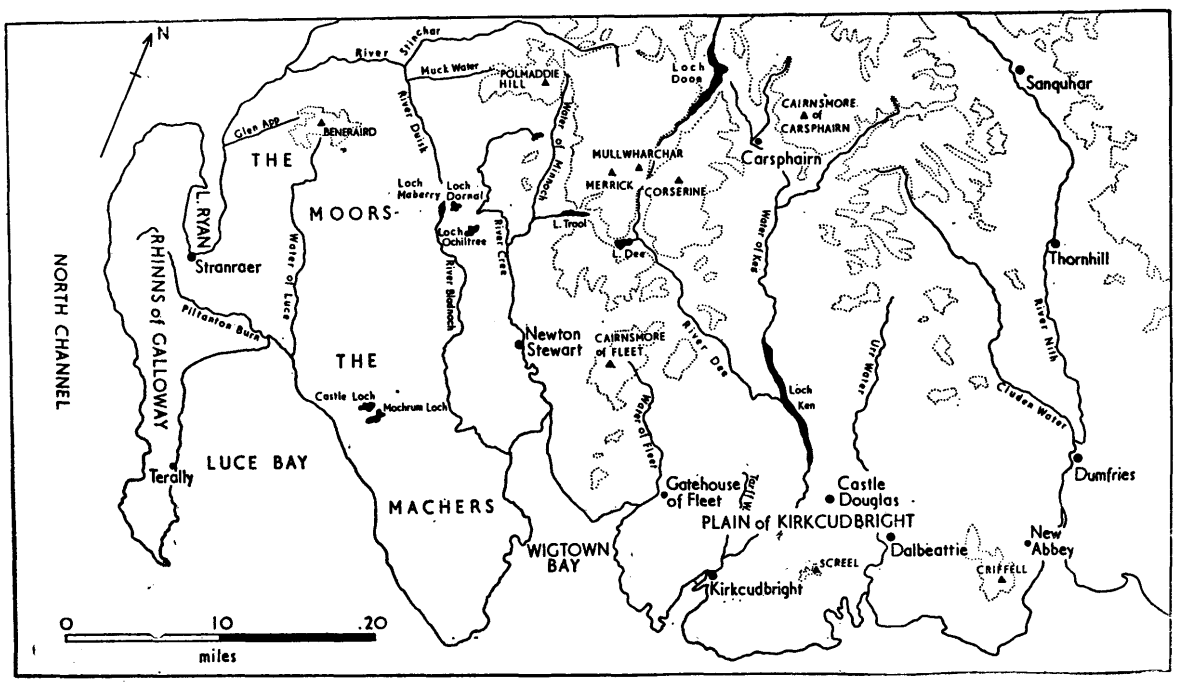

Fig. 1—Map of Galloway showing the main physical features and localities to which reference is made in the text. The 1000 ft. contour is shown by the dotted line.

Cairnsmore of Fleet (2331 feet), Mullwharchar (2270 feet), and Criffell (1866 feet) or has as its foundation the metamorphic aureole circumscribing the granitic mass of Loch Doon, as the "Range of the Awful Hand" (Merrick, 2764 feet) and the Rhinns of Kells (Corserine, 2668 feet). Commonly the hilly ground of the Lower Palæozoic outcrops is smooth, the summits being mantled in grass-covered rock debris or covered by a veneer of peat. By way of contrast,

in the granite areas bare rock is often exposed, massive rounded blocks, fractured by joints and scored and polished by the Pleistocene ice, being interspersed with ragged stretches of water or with deep peat-bogs occupying rock basins.

The Rhinns of Galloway, the isthmus between Loch Ryan and Luce Bay, the Machers of Wigtownshire, and the Plain of Kirkcudbright constitute the lowlands of Galloway (Fig. 1). The Rhinns, the Machers, and the Plain, underlain by Lower Palæozoic rocks, show general similarities in landscape; in places glacially-produced drumlins dominate, elsewhere small-scale corrugations are due to lithological variations in the vertically arranged foundation strata. The isthmus between Loch Ryan and Luce Bay, on which Stranraer stands, differs in being underlain by Upper Palæozoic rocks and Quaternary sands and gravels. Solid rock does not appear at the surface, but near Stranraer at least 540 feet of sandstone occur below 140 feet of unconsolidated sediments (Lawrie and Craig, 1945, p. 15). Most of the superincumbent material is morainic or fluvio-glacial in origin; some is glacial till. In the south irregular dunes of blown sand border Luce Bay.

Tertiary Origins

In Galloway, as in other parts of northern Britain, the detailed account of landscape evolution is mainly the story of the greater, long-continued effect of rivers and marine waters, of the lesser, comparatively short-lived influence of ice and its meltwaters, on the varied foundation rocks. Thus, the relative durability and structural relationships of the underlying rocks locally played an important part during the etching of relief in Galloway. These factors, however, did not control relief development on a regional scale. The major relief features were shaped before the Pleistocene ice age, and control of erosion was exercised by the regional base-level to which the contemporary watercourses were adjusted. There is evidence that the regional base-level fell periodically, the rivers adjusting themselves approximately to a series of datum-planes (Jardine, 1959). The geological time at which these changes in base-level are believed to have taken place has been indicated elsewhere (Jardine, 1959, p. 65), as has been the time of initiation of the drainage system (and hence commencement of relief etching) of the Southern Uplands (George, 1955, pp. 2-5). Briefly, the landscape of Galloway began to be etched in mid-Tertiary time, and throughout the later part of the Tertiary era Galloway, together with the rest of the Southern Uplands and, indeed, the rest of present-day upland Britain, rose relative to sea-level by a series of vertical movements interrupted by periods of still-stand. The periods of still-stand are reflected nowadays in remnants of a series of erosion platforms identified in the field in Galloway by Jardine (1959, pp. 65-66), and farther east by George (1955, pp. 5-7).

Pre-Tertiary Heritage

The regional distribution of the erosion platforms, giving the impression of

a stepped land surface aligned approximately from south-west to north-east, is significant. It suggests that in Galloway the initial watershed of the mid-Tertiary river system was located close to the northern hill range, and that drainage from that ridge of resistant Lower Palæozoic rocks was to north-west and to south-east, to the Midland Valley and Solway Firth areas respectively, where softer, younger rocks were exposed (Jardine, 1959, p. 73).

Thus, there is a south-west to north-east grain to the landscape of Galloway, seen in the remnants of erosion platforms, in the corrugations of alternating tough greywackes and softer shales forming the southern Machers and the Plain of Kirkcudbright, and in the flow directions of short reaches of many of the streams (Linton, 1933, p. 173). Cutting across this grain are the Rhinns of Galloway, the depression containing Loch Ryan and Luce Bay, the long-axis of the Machers and, on the eastern margin of the area, Nithsdale. On first consideration these features appear to have as their sole heritage the Tertiary drainage system, the Rhinns and Machers being drowned inter-fluvial areas, but the north-west to south-east depressions, cutting athwart the regional rock strike, may well have their origins in a geological past much older than mid-Tertiary time, as will now be seen.

It has long been held that Nithsdale is located on a zone of structural weakness in addition to linking basins of Carboniferous and New Red Sandstone sediments within the Lower Palæozoic foundation. Stainier (1916, p. 33) claimed that the dale, structurally continuous with the Vale of Eden, is a Caledonian syncline, subsidiary to the main south-west to north-east trend, which experienced rejuvenation during the Armorican earth movements. If this theory is correct, the structural depression of Nithsdale and the Vale of Eden existed in pre-Carboniferous times, and renewed activity along that line of weakness at later dates resulted in accentuation of the depression, and tectonic formation of the Nithsdale basins (Pringle, 1948, p. 76).

The age of the Loch Ryan - Luce Bay depression may be as great as that of Nithsdale. The oldest post-Silurian rocks found within the basin are Upper Carboniferous marine sediments at Leswalt, three miles north-west of Stranraer. It appears that at least an embayment of the Upper Carboniferous sea of central Scotland extended into the Loch Ryan area; more likely, a strait breached the Lower Palæozoic block to link with the Solway Firth area during the Carboniferous period. The bulk of the later consolidated sedimentary rocks are continental deposits, Permian (or Carboniferous by implication from Mykura, 1965) in age. Sandstones and conglomerates outcrop on the western flank of the Stranraer isthmus and dip gently eastwards or south-eastwards so that the depression in which they are located is believed to be asymmetrical in form, limited on the east by a fault or faults with cumulative downthrow on the western side of several hundreds of feet (Fuller, 1954, pp. 32-35; Mansfield and

Kennet, 1963, p. 150; Bott, 1964, pp. 389-390). The time of faulting is uncertain. It may be as old as Armorican, but similar disruption of Mesozoic sediments in the comparatively nearby areas of Arran and of County Antrim, Northern Ireland, invites comparison, and a Miocene age is possible (*cf.* George, 1960, p. 103). Thus, like Nithsdale, the site of the present-day Loch Ryan - Luce Bay depression was a zone of structural weakness certainly in Palæozoic and possibly in Mesozoic and Tertiary time, long before etching of the present landscape commenced.

Tertiary Relief Development

As seen above, the determinative lithological and structural foundation of Galloway's landscape was established during the Palæozoic era. On the other hand, the presence of the essentially unwarped erosion platforms, together with evidence of the valleys of the adjacent Sanquhar area being younger than transcurrent Palæogene dykes (age of dykes by implication from data in Miller and Brown, 1964), indicates that the scenery of Galloway has developed in its entirety possibly since the beginning of the Pliocene period, that is during the last seven million years (Funnell, 1964, p. 185), certainly since the beginning of Miocene times, about twenty-six million years ago (Funnell, 1964, p. 187).

The erosion platforms that are identifiable in the region, both in the field and on the basis of cartographical analyses fall into two groups, a higher and a lower. The higher surfaces recognisable in the field (see Jardine, 1959), at 1350-1400 feet in the neighbourhood of Beneraird near the Wigtownshire-Ayrshire boundary south of Glen App, at 1700-1800 feet in the Polmaddie Hill area near the source of the River Cree and in the ground between Carsphairn and Sanquhar, and at 1900-2000 feet near Cairnsmore of Carsphairn (Fig. 1), are much more fragmentary and are less well defined than those at lower levels. The second group consists of five surfaces between present sea-level and 1100 feet O.D., each of which is identifiable in at least three widely separated areas. Remnants of the 200-ft. platform occur in the Machers of Wigtownshire, in the valley of the River Cree north of Newton-Stewart, in the Thornhill basin of the Nith Valley, and in the valleys of the Tarff Water and River Dee north of the town of Kirkcudbright. Fragments of two surfaces, the 450-500-ft. platform and the 600-700-ft. platform, persist in the Cree-Minnoch drainage basin, in the Moors and Machers of Wigtownshire, in the Ken-Dee valley, and in Nithsdale. In addition, relics of the 450-500-ft. platform are preserved in the Rhinns of Galloway. A 750-850-ft. platform is identifiable in the Ken-Dee drainage area, in the Sanquhar area of Nithsdale, and in the Moors of Wigtownshire, whilst the highest of the lower group of surfaces, the 1000-1100-ft. platform, occurs in the Cree-Minnoch basin north of Bargrennan, near the village of Carsphairn in the Deugh-Ken drainage area, near the summit of Screel hill south of Castle-Douglas, and in the Keir hills of Nithsdale, south-west of Thornhill.

The scarcity of erosion surfaces at levels above 1100 ft. and comparative frequency of them at lower levels is largely due to the fact that in an area of pulsatory uplift and continual subaerial and fluvial erosion, upper, older surfaces have been more heavily mutilated and eroded than later-formed surfaces at lower elevations. Nevertheless, the possibility that there is a fundamental difference in the character of the surfaces above and below 1100 feet O.D. cannot be completely dismissed.

Throughout Scotland, Peach and Horne (1910, p. 458) recognised three major erosion planes, each representing a protracted period of denudation during Tertiary time, the upper limit of the Intermediate Plateau occurring at about 1000 feet O.D. In the central Southern Uplands, George (1955, p. 7), while admitting that no direct evidence was available of the origin of virtually horizontal surfaces ranging up to 2650 feet, suggested that benches at levels below 600 feet are almost certainly of marine formation. Farther south, in the Lake District (Hollingworth, 1937; Parry, 1960), Northern Ireland (Proudfoot, 1954; George, 1960, p. 101), north Midlands of England (Sissons, 1954), North and South Wales (Brown, 1957; Brown, 1960; George, 1961; Embleton, 1964), and North Devon and West Somerset (Balchin, 1952), staircases of erosion platforms have been identified by field work and cartographical analyses at various levels, some below 1100 ft. O.D., some above. Whereas there is disagreement regarding the subaerial or marine origin of the higher platforms—Pleistocene ice is believed to have removed all traces of any marine deposits that may have accumulated in the course of Tertiary or early Pleistocene formation of the surfaces—most authors concur in attributing the platforms at levels below 1000 feet or, more commonly, below about 700 feet, to marine planation during late-Pliocene or early Pleistocene time (Sparks, 1960, p. 355; Embleton, 1964, pp. 23-24).

The reluctance of many authors to ascribe to the whole range of platforms, from sea-level to the summit levels of Wales, the Lake District, and the uplands of Scotland a similar, marine origin seems to be due to the assumption that stratigraphical evidence of the Tertiary history of Britain is preserved in south-east England alone. There a (?) Plio-Pleistocene sea cut notches in the Chalk dip slopes of the Chiltern Hills and North Downs, and deposited sediments at levels that are now between 550 and 650 feet above Ordnance datum. Inferentially the platforms of that region at levels below 550-650 feet are marine in origin and (?)-Pleistocene in age, while the only other higher surface present in the region, the summit surface at altitudes of about 800 feet, is regarded by many authors as a subaerial peneplain, possibly Mio-Pliocene in age (see, for example, Wooldridge, 1952, pp. 297-298 and p. 308). It follows from such a contention that any higher platforms found elsewhere in Britain are likely to be subaerial in origin, though Sissons (1960, p. 30) pointed out that this need not be the case, that the so-called Mio-Pliocene peneplain of south-east England may

in fact be a subaerially mutilated marine bench representing an exceptionally long period of still-stand in the general emergence of Britain.

In anticipation of Sissons' claim, Hollingworth suggested (1938, pp. 76-77), and George repeatedly affirmed (1960, pp. 99-105; 1961, pp. 248-250; 1964, p. 456) that evidence of the age of the upper as well as the lower platforms is to be found in western and northern parts of Britain, where stratified and other igneous rocks of confirmed early Tertiary age occur. There, pre-Tertiary sedimentary rocks and Eocene basalts and other igneous rocks were folded and faulted by "Alpine" earth movements that are considered to be Miocene or, at oldest, Oligocene-Miocene in age. Despite this, the erosion platforms present in the areas of upland Britain already mentioned, and ranging up to levels well over 2000 feet above Ordnance datum, are essentially unwarped and hence their formation must post-date the period of Tertiary deformation. Apart from the tendency, as in Galloway, for the surfaces at lower levels to be more extensive and better preserved than those at higher elevations, there are no marked differences in the characters of the platforms throughout the whole vertical range to be found in much of upland Britain, circumstances that led George to claim that all the benches are likely to be marine in origin.

Reverting to Galloway, where the platforms at levels at and below about 1100 feet O.D. are better preserved than those above, it is suggested that the period of still-stand represented by the 1000-1100 ft. platform was an unusually long one in the pulsatory (relative) uplift of land that preceded and followed it. It is further suggested that evidence of the same protracted still-stand is preserved elsewhere in upland Britain in the "1000-foot" platform that was recognised by several of the earlier writers including Peach and Horne, in the bench at 1070 feet recognised by Hollingworth and by George, and (echoing Sissons) perhaps in the summit surface of south-east England. The still-stand corresponding to the succeeding (?) Plio-Pleistocene sea of the last-named region is probably represented by the "600-ft. platform" that has been identified in Exmoor, South Wales, North Wales, and the Lake District, and may be represented in Galloway by the 600-700 ft. platform of that region.

The denudation chronology of Galloway during and after the stadium represented by remnants of the 600-700 ft. platform is more fully recorded in the present-day landscape than earlier episodes. In broad terms, the general form of the Rhinns of Galloway and Machers of Wigtownshire was fashioned during these last stages of pulsatory vertical rise of land or fall of sea-level. In addition, as is now discussed, it may have been during this time that the southern part of Wigtownshire appeared above the waters of the contemporary sea to be added to the already well-established northern part of the county.

The man-made distinction between the counties of Wigtown and Kirkcud-

bright is a reflection of the differences in the physical features of these two parts of Galloway. A critical line from north-north-west to south-south-east across the region is that of the Duisk - Cree through-valley and its continuation as the eastern shore of Wigtown Bay. East of this line of demarcation the Stewartry of Kirkcudbright is an area of predominantly high ground, although there is regional down-stepping of the land surface from north to south. To the west Wigtownshire forms much lower ground (see Fig. 1).

The difference in relief west and east of the Cree valley is due certainly in part, and probably in large measure, to the influence of the granitic intrusions which occupy about one-fifth of the surface area of the county of Kirkcudbright in contrast to a few small igneous intrusions in Wigtownshire. In detail, the later stages of landscape evolution of the southern parts of the two counties may have been very different. The whole of the Machers and the Rhinns of Galloway occurs at less than 650 feet O.D., whereas much of the southern part of the Stewartry rises to greater heights. Thus, it is possible that while much of southern Kirkcudbrightshire persisted as dry land except, perhaps, where the (present) valley of the River Dee formed a wide firth, contemporaneously the Machers and Rhinns during the stages of erosion represented by the 600-700 ft., 450-500 ft., and 200 ft. platforms were largely covered by the waters of the Solway Firth. Progressive emergence of the Rhinns and Machers took place as stepped uplift of the Southern Uplands block ensued.

(?) - Pleistocene Modifications

The lowest of the Galloway erosion platforms now stands approximately 200 feet above present sea-level. Clearly the story of relief evolution would not be complete without reference to the changes that have taken place since uplift of that platform commenced. Yet it is of the very late stages of relative uplift of the land—but still prior to the Recent fluctuations of sea-level discussed elsewhere by Jardine (1964)—that field evidence is most fragmentary and to which the greatest uncertainty attaches. The exact age of the 200 ft. platform is not known. If, as suggested above, the 600-700 ft. platform of Galloway were formed contemporaneously with the " 600 ft. platform " of other parts of Britain including the Plio-Pleistocene bench of south-east England, clearly the 200 ft. platform is Pleistocene in age, and its uplift took place within the last million years. In addition, the 600-700 ft. and 450-500 ft. platforms of Galloway may have been cut and elevated during Pleistocene time, and a Pleistocene emergence of much of southern Wigtownshire is thus implied.

In the interpretation of the late geological history of the Galloway region it must also be taken into account that during the Pleistocene period there were certainly three epochs, possibly four or more, each amounting to several tens of thousands of years and contemporary with times of extensive glaciation in northern Europe and North America, when world-wide sea-level was as much

as 300 feet lower than its present level (Godwin, 1963; Flint, 1957, p. 270). During each of these episodes the coastal configuration of Galloway must have been very different and the total extent of the land surface, albeit partially ice-covered, very much greater than now.

Some indication of the modifications that perhaps took place during one of the periods of lower sea-level is provided in the Stranraer area. There, between the outcrops of solid strata of the Rhinns of Galloway and the steep rock scarp extending from Cairn Ryan to Dunragit stretches an expanse of superficial deposits about 30 square miles in extent. The Quaternary tills, sands, gravels, and associated silts, clays, and peats of the area vary in thickness from place to place, but nowhere in the neighbourhood of Stranraer is solid rock exposed. Indeed, as indicated in the introductory paragraphs above, at West Freugh (Nat. Grid ref. NX/109543), five miles south-east of Stranraer, 140 feet of the superficial deposits overlie red sandstone. As the height of the land in the neighbourhood of West Freugh is about 50 feet O.D. it seems a reasonable inference (unless the site overlies a deep local hollow in the rock surface) that, were the Quaternary sediments not present, the Rhinns of Galloway would now be separated from the remainder of Wigtownshire by a deep salt-water channel of unknown width.

The mode of formation of such a channel is problematical. The cutting of the trough may have been the exclusive work of one physical agent or the collective work of several. It is arguable that the agent most likely to have excavated the hollow in the soft Upper Palæozoic rocks underlying the Stranraer isthmus was glacial ice travelling southwards from Ayrshire and the Firth of Clyde area during one or more of the major glaciations of the Pleistocene period; the fact that the area appears to have been one of thick deposition in the last of the glaciations does not necessarily mean that it could never have been an area of glacial erosion in an earlier glaciation or during the last glaciation. On the other hand, the cutting of the channel may have been the combined work of a Ryan - Luce river and marine waters attacking the coast of Wigtownshire both from north and south during one of the Pleistocene episodes of low sea-level. The buried channels of the Rivers Clyde and Kelvin of the Glasgow area, which the Ryan - Luce channel may resemble, have been attributed to fluviatile rather than glacial action though hitherto their cutting has been regarded as pre-Pleistocene rather than intra-Pleistocene in age.

Glacial Modifications of Relief

The Tertiary rivers and streams determined the location and shape of the major valleys and hill ranges of Galloway, giving to the region its main physical characteristics, but it was the ice of the Pleistocene period, partly by erosive, partly by depositional processes, that added the minutiæ that have endowed

Galloway with its distinctive beauty of landscape. The glacial modifications take a number of forms; only a few can be discussed here in detail.

Several of the largest natural lochs of Galloway occupy rock basins carved in the floors of the pre-glacial valleys or in less durable areas on flatter ground. Loch Doon, Loch Trool, and Loch Ken were formed within pre-existing valleys, whilst Castle Loch and Mochrum Loch occupy shallow ice-eroded depressions within the plain of the Machers (Fig. 1). The distinction between these two types of loch is important as witness to the much greater erosive power of the ice when confined within the bounds of the upland valleys of the Gala Lane, Water of Trool, and Water of Ken, in contrast to its reduced erosive power when spread over the Machers. Loch Doon consists of two ice-scooped basins, the southern 100 feet deep, the northern 58 feet deep (Murray and Pullar, 1910, pp. 92-119), whilst Loch Trool and Loch Ken have several basins, the greatest depth being a little more than 100 feet in each case. Other deep rock basins are the upland lochs of the central granite area—between Merrick and Mullwharchar—Loch Enoch (with several separate basins, the deepest 127 feet), Loch Neldricken, the Round and Long Lochs of Glenhead. In marked contrast, the mean depth of both Castle Loch and Mochrum Loch is 7 feet, and the maximum depth 12 feet. Other shallow lochs of the plains which probably owe their origin partly to glacial scouring of hollows, but which are present now on account of their damming by glacial debris, are the large lochs situate on the moors north-west of Newton-Stewart—Lochs Dornal, Maberry, and Ochiltree (Fig. 1).

The above examples of landscape modification by the production of different types of lochs emphasises the contrast between the effects of the Pleistocene ice in the high ground of the centre and north of the region and in the lower areas of the Rhinns, the Machers, and the Plain. Much of the upland topography is typically bare or covered with a veneer of peat, solifluxion debris or, occasionally, morainic rubble. At lower levels the landscape has been modified mainly by deposition of glacial material: stiff clay is arranged in drumlin swarms over much of the Machers and over certain parts of the Rhinns and Plain; sand and gravel hummocks dominate the scenery in the northern half of the Stranraer isthmus; vast peat-bogs occupy the inter-drumlin hollows in the ground between Glenluce and Newton-Stewart where the Machers and the Moors of Wigtownshire merge.

Late-Pleistocene and Recent Coastal Changes

For its total areal extent of 1384 square miles the region of Galloway possesses a remarkably long coastline, approximately 220 miles from the town of Dumfries in the east to the boundary between the counties of Wigtown and Ayr near Glen App in the west. Some of the changes that may have taken place along that coast during late-Tertiary and early Quaternary time were dis-

cussed above. Late-Pleistocene and Recent coastal changes, that took place during the last fifteen thousand years or so, remain to be considered.

About 12,000 years ago, towards the end of Jessen's vegetation Zone I, sea-level in western Scotland stood, with respect to the land, about 80 to 100 feet higher than at present (Godwin, 1956, p. 19). The approximate balance between sea-level, rising (eustatically) due to general wastage of the European ice-sheets, and the northern part of the British landmass, rising due to the removal of its ice load, was maintained sufficiently long for a series of beach and estuarine sediments to accumulate in certain parts of western Scotland; a general drowning of the coastline occurred. According to the Geological Survey map (One-inch, Sheet 3, 1923) and Memoir (Geikie and Irvine, 1873, p. 24), many of the unconsolidated deposits that now occur on the isthmus between Loch Ryan and Luce Bay are shallow-water deposits (the " 100-ft. raised beach " deposits) that accumulated in the strait produced between the Rhinns of Galloway and the Wigtownshire " mainland " by the invasion of this Late-glacial sea, and much of the superficial sediments of that area was laid down under similar marine conditions in later times of relative still-stand of land and sea, that is during the (so designated) " 50-ft." and " 25-ft." stadia.

Some of the deposits of the Stranraer area certainly are marine in character as is proved by their content of lamellibranch shells and ostracods (Brady, Crosskey, and Robertson, 1874, p. 68), and clearly Loch Ryan and Luce Bay extended slightly farther south and farther north respectively in Zone I times than they do now. Nevertheless, the claim that at that time Loch Ryan and Luce Bay were linked by marine waters seems unfounded, for field evidence in the main substantiates Charlesworth's contention (1926, pp. 33-34) that the northern part of the deposits of that isthmus, a broad belt of sand and gravel ridges and mounds—typical " dead-ice " topography, in fact—represents what he called a kame-moraine, that at that time blocked the valley flanked on the west and east by Lower Palæozoic rocks.

In contrast, fourteen miles south of Stranraer the low neck of land that now extends from Port Logan Bay on the western side of the Rhinns of Galloway to New England Bay and Terally Bay on the eastern side almost certainly was invaded by the sea during part of Late-glacial time. The clays at Terally brick works (Brady, Crosskey, and Robertson, 1874, p. 69), standing 45 feet above present sea-level, contain a marine ostracod fauna associated with an Arctic molluscan assemblage, and in sedimentary texture, elevation, and fossil content closely resemble the clays, referred to above, at Clashmahew near Stranraer.

Eastwards from Luce Bay as far as the estuary of the River Nith scattered remnants of the " 100-ft. raised beach " are recorded on Geological Survey maps, and it is likely that, in general, the Late-glacial counterpart of the Solway Firth had a slightly greater extent than the present firth. Nevertheless, on the basis of preliminary field investigation, it must be agreed with W. B. Wright (1928,

p. 102) that in the detection of remnants of the marine deposits laid down during this time of relatively high sea-level "river gravels and outwash fans have frequently been mistaken for marine terraces, and in some areas, as for instance along the northern shore of the Solway Firth, all glacial deposits below the 100-foot level have been interpreted as raised beaches."

In western Scotland the Late-glacial episode of relatively high sea-level was succeeded by a period during which the rising northern landmass of Britain outpaced the contemporaneously rising sea so that, in effect, sea-level stood relatively low. This episode was succeeded by a world-wide rise of sea-level between about 8000 and 5000 years ago, the effects of which rise in south-west Scotland have been discussed more fully elsewhere (Jardine, 1964). As far as its influence on the landscape of Galloway was concerned, this rise of sea-level had varied results. The immediate effect of the rising sea was to bring about the inundation of areas—probably including expanses of Late-glacial beach and associated sediments—that immediately prior to that time had been dry land. More or less simultaneously with the drowning of former land surfaces, extensive deposition of beach, estuarine, tidal-flat and lagoonal sediments took place. When slow uplift of the northern landmass of Britain continued after about 5000 years B.P. (before present), although by this time the world-wide rise of sea-level had virtually ceased, these sediments were exposed as dry land to add many hundreds of acres to the surface area of Galloway. Such areas, occurring now about 15-30 feet above Ordnance datum, comprise narrow sand and gravel tracts at the heads of Loch Ryan and Luce Bay, more restricted raised beaches occurring sporadically along the Wigtownshire and Kirkcudbrightshire coasts, together with the very much more extensive tracts of "carse" clay-lands at the head of Wigtown Bay, between Gatehouse and the mouth of the Water of Fleet, around the shores of the estuary of the River Dee at Kirkcudbright, near the mouth of the Urr Water south of Dalbeattie, and extending from near the mouth of the New Abbey Burn on the west bank of the River Nith as far as the southern outskirts of Dumfries.

Thus, while at first glance the coast of Galloway seems to be dominantly a drowned one, an impression given by the wide inlets of Loch Ryan, Luce Bay, Wigtown Bay, and lesser embayments at the mouths of the Water of Fleet, River Dee and Urr Water, victory has not solely been to the waters of the Firth of Clyde and Solway Firth in the long geological history of Galloway since its landscape first began to be etched in mid-Tertiary time. Since then, emergence of this south-western part of Scotland has been a slow but steady process, interrupted now and again by temporary setbacks, more clearly recorded in late-Pleistocene and Recent times than in the seven million years or so that went before. The trend has been towards the addition of new land to the already established hinterland, and what has been lost has always, so far, been more than balanced by what has been gained.

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FOSSIL FOOTPRINTS FROM DUMFRIESSHIRE, WITH DESCRIPTIONS OF NEW FORMS FROM ANNANDALE

By J. B. DELAIR

Introduction

Fossil vertebrate tracks and footprints from Scotland are known especially from the Permo-Triassic rocks of the Elgin district of Morayshire, and from the same series in the Annan and Nith valleys of Dumfriesshire. The present paper is concerned with material from the latter county.

The Annandale footprints were accorded considerable palæontologic importance in several of the earlier attempts (Harkness 21, 22, 23; Holmes 27; Murchison 41; Murchison and Harkness 42; and Sherlock 49) to correlate the so-called New Red Sandstones of south-west Scotland with those of Cumberland and elsewhere. Indeed, in 1909, they formed a part of the survey of British Permian ichnites conducted by Hickling (26), who concluded that, with the exception of Triassic *Chirotherium (Labyrinthodon)* footprints recorded by both Harkness (22: p. 206) and Binney (3: p. 138) from Corse Hill quarry near Annan, all the Dumfriesshire examples and those from Cumberland—first noticed by Murchison and Harkness (42: p. 150) in 1864 and described by Varty-Smith (55) twenty years later—were of Permian origin. Hickling traced many differences of configuration between these typical "Permian" footprints and those known elsewhere from Triassic formations; he asserted that they could henceforth be used as guide fossils.

Hickling's suggestion regarding the correlative value of the footprints found in these widely sundered sandstone formations has been repeatedly queried (14: p. 305; 50: p. 113): and since, more recently still, the antiquity of these sandstones has been reinvestigated (43), and their supposed Permian age challenged, the relevant age factor of both the sandstones and the footprints is currently a matter of great interest.

As a subject subsidiary to this recent geological research, it may not be inappropriate here to review our knowledge of these remarkable trace-fossils, and to communicate accounts of some hitherto undescribed kinds of vertebrate tracks from the Annandale strata.

1. History of the Dumfriesshire Fossil Footprints

Historically, occurrences of fossil footprints in Dumfriesshire date from 1828, when a brief notice about them appeared in the *London and Paris Observer* for February 10th. The first scientific accounts appeared later that year when the Rev. Henry Duncan described several tracks from the famous quarry at Corncockle Muir, Annandale (12) (a locality situated about 1½ miles above the confluence of, and between, the rivers Annan and Kinnel, near the town of Applegarth), and James Grierson (18; 19) speculated upon their significance. Grierson also contributed another paper (20) in 1829.

Certain of the tracks described by Duncan were, at that time (1828), to be seen on a slab built into a wall of the summer-house belonging to Ruthwell Manse (12, pp. 195f), a fact seemingly alluded to by Cameron-Smith in 1925 (7, p. 233). This slab, however, was later removed to Mt. Kedar Church, near Dumfries, when Duncan became minister at that church, and was only secured by Mr A. E. Truckell for the Dumfries Burgh Museum in the mid-1950's. The fate of other tracks mentioned by Duncan is less certainly known.

Buckland briefly referred to these tracks later the same year (5), when their probable chelonian origin was commented upon, and a cast of one of Duncan's specimens was subsequently figured by Buckland in his *Bridgewater Treatise* (vol. 2, pl. 26), where its marked affinities to chelonian tracks was again stressed. Buckland also instanced the occurrence of other tracks in similar strata at Craigs, two miles east of Dumfries (6: vol. i, p. 259), noting that Sir William Jardine had informed him that essentially the same kind of tracks also occurred in other quarries near Corncockle Muir. These quarries were not named, although it is probable that they were those at Templand and Redhall, both of which are now known to have yielded footprints similar to those described by Duncan.

In 1839, a further reference to the Corncockle Muir impressions occurred in the *Proceedings of the Geological Society of London* (vol. iii, p. 81) where they were alluded to without identification as "fossil footprints."

These early specimens from Corncockle Muir formed the authority of the short notice on the "New Red Sandstone Tortoises" by Owen in 1841 (45: p. 160), when the probable chelonian origin of the tracks was again upheld. Owen, who also noted the occurrence of similar footprints at Craigs, created the name *Testudo duncani* to receive the impressions first described by Duncan *(Ibid.)*.

In 1850, the stratigraphical position of these footprints was discussed at considerable length by Harkness (22), who, in addition to mentioning the *Chirotherium (Labyrinthodon)* footprints from Corse Hill quarry (21: p. 397; 22: p. 206), also referred to the discovery in the famous quarry at Locharbriggs—a locality frequently spelt Locherbriggs in the literature—of tracks like those from Corncockle Muir (21: p. 391). An addendum to Harkness's paper was published the same year by Jardine (30), who proposed that certain of the tracks described by Duncan be named *Chelichnus* and *Herpetichnus* (*op. cit.*, p. 209). On that occasion Jardine founded the species *Chelichnus duncani, C. gigas, Herpetichnus sauroplesius* and *H. bucklandi (Ibid.)*.

The following year, Harkness described several new tracks from these quarries, to which he gave the following distinctive appellations: *Chelichnus plancus* (23: p. 92), known by material from quarries at Craigs, Locharbriggs, and Green Mills near Caerlaverock in the Nith valley; *C. obliquus (op. cit.*, p. 93) and *Chelaspis jardini* (*op. cit.*, p. 92), both from Green Mills quarry; *Saurichnis acutus* (*op. cit.*, p. 94); *Batrichnis stricklandi* (*op. cit.*, p. 95), also known from

Green Mills quarry; and *Labyrinthodon lyelli* (*op. cit.*, p. 95). There is little doubt that the last named form is a variant of *Batrichnis*-like tracks, and Jardine's assignation of it to that genus in 1853 (31) is entirely admissible.

More important than Strickland's brief reference to these ichnites in 1852 (53), was the sumptuous folio published by Jardine in 1853 (31), in which many of the then known kinds of footprints from Corncockle Muir and Green Mills (erroneously given by Jardine as Geenmills) were reviewed. Descriptions and life-sized illustrations of ten different kinds of footprints were featured by Jardine, who distinguished them by the following names:

Chelichnus duncani (Owen).
„ *?duncani* (Owen).
„ *gigas,* Jardine.
„ *titan,* Jardine.
„ *ambiguus,* Jardine.
„ *plagiostopus,* Jardine.
Herpetichnus sauroplesius, Jardine.
„ *bucklandi,* Jardine.
Actibates triassæ, Jardine.
Batrichnis lyelli (Harkness).

Jardine, who, in accordance with the best opinions then prevalent, referred these tracks to the Bunter (Triassic) period (*op. cit.*, p. 4), regarded most of them as being of reptilian origin. He also appears to have been the first writer to have reported the occurrence of similar tracks at Templand (*op. cit.*, p. 17).

References of varying importance to these by now celebrated footprints continued to be made in print from time to time. Special mention should be made of those by Binney (3: p. 140), who erroneously referred to Green Mills as Greenbank; by Huxley (29: p. 459), who compared them (especially those designated *Chelichnus*) with tracks from the Trias of Cummingstone, Morayshire, and who referred to Batrichnis lyelli as *Batrachichnus lyelli* (*op. cit.*, pp. 455f); and by Owen, who for unknown reasons compared them with the problematical and totally dissimilar tracks from Binks, Roxburghshire (46: p. 178).

No further references to Dumfriesshire ichnites seem to have appeared until 1878, when Dudgeon described and figured a new species of *Herpetichnus (H. loxodactylus)* from Locharbriggs (11: pp. 154-5). From Dudgeon's figure of the type specimen (*op. cit.*, pl. i, opp. p. 154) it would appear that it is either the specimen, or very like the specimen, listed as *H. loxodactylus* in Black and Bisset's catalogue (4: p. 20) of the contents of the remarkable private museum of the late Dr Grierson of Thornhill.

The next writer to mention the Dumfriesshire tracks seems to have been Smith, who, in 1889, described and figured some peculiar track-like markings from the vicinity of West Kilbride, Ayrshire. These were compared with the Corncockle Muir footprints (52: p. 202), but as there is some doubt as to the

vertebrate origin of Smith's material, which has, incidentally, never been named, the significance of the Ayrshire track in relation to the Dumfriesshire specimens remains uncertain. The following year, Lydekker (37: p. 218) recorded the existence of a single specimen of *Chelichnus duncani* (43576 B.M.) in the collection of the British Museum (Natural History). This specimen, reputed to have come from Corncockle Muir, was also referred to the Bunter series of the Lower Trias, although there is now every reason for regarding it as being of Permian antiquity.

In addition to Geikie's identification of the Corncockle Muir tracks as Labyrinthodont (17: p. 456) in 1901, and Watt's brief reference to them in 1902 (56: p. 221), the most important review of these ichnites to date is unquestionably that of Hickling, who, in 1909, discussed in considerable detail all the Dumfriesshire footprints named prior to that date (26). Hickling's work, however, appears to have been based upon earlier references in the literature and on a study of the Jardine collection of Dumfriesshire tracks by that time preserved in the Royal Scottish Museum, Edinburgh. The several very interesting tracks from Corncockle Muir and Locharbriggs available for study in the Annan, Dumfries, Paisley, and Thornhill museums seem to have been unknown to him.

Hickling's contribution unfortunately contained several inaccuracies and ambiguities. For example, the nomenclatural confusion in his paper surrounding figure 22 (pl. 3) of the footprints elsewhere named by him as *Chelichnus plancus* (*op. cit.*, p. 11) and *Batrichnis lyelli* (*op. cit.*, pp. 7-8) is very misleading. Also, without any apparent justification, he consistently misspelt the generic terms *Batrichnis* and *Saurichnis* respectively as *Batrichnus* and *Saurichnus* (*op. cit.*, pp. 7-8, 11). He seems, moreover, to have regarded *B. stricklandi* as synonymous with *B. lyelli (Ibid.)*, despite the fact that in Harkness's original paper on those tracks the former had priority of description.

Horne and Gregory referred to the Corncockle Muir tracks in 1916 (28: pp. 375-6, 384), and Cameron-Smith did so in 1925 (7: p. 233), but specific forms were not mentioned by these authors who simply alluded to the footprints as "reptilian."

Nopcsa's researches of 1923 (44), while embracing all the species described to that date, seem, so far as *Actibates triassæ, Batrichnis lyelli,* and *Herpetichnus loxodactylus* are concerned, to have initiated a train of nomenclatural discrepancies that have hardly yet been resolved. Among other statements Nopcsa wrongly cited Hickling as the author of *Batrichnis lyelli* (*op. cit.*, p. 139). He also asserted that *Actibates* (erroneously spelt in his paper as *Acibates*) was identical with the Continental *Korynichnium sphærodactylum* (*op. cit.*, p. 135), a belief in which he was followed by Lotze in 1927 (36: pp. 170f) and Korn (32: p. 170) in 1933. It is important to note that *Korynichnium* was founded by Nopcsa in 1923, and thus post-dates *Actibates* by seventy years; Jardine's genus *(Actibates)* therefore has priority over *Korynichnium.* Nopcsa, who followed Huxley in misspelling *Batrichnis* as *Batrachichnus,* also wrongly spelt

Herpetichnus loxodactylus as *Herpetichnum loxodactylum* (*op. cit.*, pp. 131-140), the latter procedure being complicated still further by Abel, who, six years later, referred Dudgeon's species to the genus *Ichnium*, as *I. loxodactylum* (1: p. 13).

A new Dumfriesshire locality for fossil ichnites was recorded by Simpson and Richey in 1936, when unnamed three-toed and ?four-toed imprints were reported from the flaggy sandstones of Euchan Water, in the upper reaches of Nithsdale (51: p. 48). On this occasion, when illustrations of the three-toed footprints were published (*op. cit.*, fig. 13), the tracks were considered to have been created by amphibians. Mykura's recent studies of the New Red sandstones of Dumfriesshire (43) suggest that the Euchan Water series antedates the Permian strata near Dumfries, where definite reptilian ichnites occur, thus the identification of the Euchan Water tracks as amphibian is at least in accord with the known evolution of Carboniferous and Permian tetrapods.

In 1958, Dudgeon's species *Herpetichnus loxodactylus* was again highlighted when Kuhn briefly referred to it under its original appellation (33: pp. 14-19), as also he did *Batrichnis lyelli* (*op. cit.*, p. 10). Kuhn, however, reduced *Actibates triassæ* to the rank of a synonym, placing it in the new genus and species *Hueneichnium permicum*, a form created to receive not only *Actibates* but certain other named Permian ichnites (*op. cit.*, p. 13). The following year, Schmidt resurrected *Actibates triassæ* (48: pp. 29, 63-4), and proposed that as Dudgeon's *Herpetichnus loxodactylus* represented a distinct kind of footprint meriting generic separation from *Herpetichnus*, it should henceforth be known as *Loxodactylus* (*op. cit.*, p. 29).

The remaining references to Dumfriesshire footprints that I have succeeded in locating are very brief. They occur in Swinton's important review of the history of *Chirotherium* ichnites (54: p. 451), and in M'Cracken's summary of the geological material in Dumfries Burgh Museum (38: p. 13). Both writers, who confine themselves to mentioning Corncockle Muir tracks only, agree in stating that the footprints are of Permian age.

2. The Material and Its Mode of Occurrence

It will be useful for future reference to list here all the specimens of Dumfriesshire footprints that I have been able to locate or study. They exist in museum collections at Annan, Dumfries, Edinburgh, Glasgow, London, Oxford, and Paisley, and have been identified as follows:

Annan: Moat House Museum

(1) **Chelichnus duncani** (Owen). An unnumbered slab showing a section of a track from Corncockle Muir.

Dumfries: Burgh Museum (unless otherwise stated, all the specimens below are from Corncockle).

(1) **Chelichnus duncani** (Owen). 5 DBM: one of Duncan's original slabs.
(2) **Chelichnus duncani** (Owen). 4 DBM: slab with part of a track.
(3) **Chelichnus sp.** 14a-b DBM: two halves of a broken slab showing a section of a track.

(4) **Chelichnus pricei,** Delair (sp. nov.) with **Cardiodactylum permicum,** Delair (gen. et sp. nov.). 10 DBM: a slab showing footprints of both these forms The type specimen.
(5) Indeterminate track. 2 DBM: these footprints exhibit affinities to those assigned to **Chelichnus sp.**
(6) **cf. Actibates sp.** 12 DBM: a slab showing several indistinct footprints similar to those described as **Actibates triassæ,** yet possessing certain differences from that form.
(7) **Herpetichnus ?robustus,** Delair (sp. nov.). 8a-b DBM: two halves of a small slab showing a single footprint of about the same size as the type of this species at Edinburgh.
(8) Indeterminate track. 1 DBM: part of a track exhibiting affinities with those ascribed to **Herpetichnus.**
(9) **Prochirotherium truckelli,** Delair (sp. nov.). 7 DBM and 6 DBM: two parts of a track. Type specimen.
(10) Indeterminate track. 16a-b DBM: two halves of a broken slab showing 21 imprints forming a track of uncertain affinities.
(11) Indeterminate track. 15 DBM: part of a track composed of 6 imprints of the manus and 6 of the pes, all arranged obliquely in a single line. These footprints possibly have affinities with those described as **Saurichnis** by Harkness (23) in 1851. This slab is reputedly from Locharbriggs.
(12) Indeterminate isolated footprints on a slab traversed by sun-cracks. 11 DBM.
(13) **Loxodactylus sp. (Herpetichnus loxodactylus,** Dudgeon). An unnumbered footprint very like Dudgeon's type specimen. Mentioned by Black and Bisset (4: p. 20) in 1894 as having been obtained from Locharbriggs (ex. Grierson collection).
(14) **?Saurichnis sp.** An unnumbered slab exhibiting an interesting track, showing manus and pes impressions, from an unnoted locality in "Annandale." Mentioned by Black and Bisset (**ibid.,** p. 20) in 1894 (ex. Grierson collection).

Edinburgh: Royal Scottish Museum (unless otherwise stated, all the undermentioned specimens are from Corncockle Muir, and were formerly a part of the collection of Sir William Jardine. They were acquired by the museum in 1875).
(1) **Chelichnus ambiguus,** Jardine. 1875.28.1, figured by Jardine (31: pl. vi).
(2) **Chelichnus ambiguus,** Jardine, and **Herpetichnus sauroplesius,** Jardine. 1875.28.2, figured by Jardine (**ibid.,** pl. xi).
(3) **Chelichnus ambiguus,** Jardine. 1875.28.3a-b, part and counterpart.
(4) **Chelichnus ?ambiguus,** Jardine. 1875.28.4.
(5) **Chelichnus duncani** (Owen). 1875.28.5a-b, part and counterpart. Slab 1875.28.5a only figured by Jardine (**ibid.,** pl. ii).
(6) **Chelichnus duncani** (Owen). 1875.28.6a-b, part and counterpart. Slab 1875.28.6a figured in part by Jardine (**ibid.,** pl. iii, left-hand fig.), and slab 1875.28.6b figured in part by Jardine (**ibid.,** pl. iii, right-hand fig.).
(7) **Chelichnus duncani** (Owen). 1875.28.7.
(8) **Chelichnus duncani** (Owen). 1875-28.8.
(9) **Chelichnus duncani** (Owen). 1875.28.9.
(10). **Chelichnus duncani** (Owen). 1875.28.10.
(11) **Chelichnus duncani** (Owen). 1875.2.15. Part of a track found in 1860 at Redhall. Presented by John Miller.
(12) **Chelichnus ?duncani** (Owen). 1875.28.11, figured by Jardine (**ibid.,** pl. viii).
(13) **Chelichnus gigas,** Jardine. 1875.28.12a-b, part and counterpart. Slab 1875.28.12a only figured by Jardine (**ibid.,** pl. i).
(14) **Chelichnus plagiostopus,** Jardine. 1875.28.13a-b, part and counterpart. Slab 1875.28.13a only figured by Jardine (**ibid.,** pl. x).
(15) **Chelichnus titan,** Jardine. 1875.28.14, described by Jardine (**ibid.,** p. 10).
(16) **Chelichnus sp.** 1875.28.15.

(17) **Chelichnus sp.** 1875.28.16.
(18) **Herpetichnus bucklandi,** Jardine. 1875.28.17, figured by Jardine (**ibid.,** pl. vii).
(19) **Herpetichnus sauroplesius,** Jardine. 1875.28.18, figured by Jardine (**ibid.,** pl. iv).
(20) **Herpetichnus sauroplesius,** Jardine. 1875.28.19, figured by Jardine (**ibid.,** pl. v).
(21) **Herpetichnus sauroplesius,** Jardine. 1875.28.20.
(22) **Herpetichnus sauroplesius,** Jardine. 1875.28.21.
(23) **Herpetichnus robustus,** Delair (sp. nov.). 1875.28.22, the type specimen.
(24) **Herpetichnus sp.** 1875.28.23.
(25) **?Herpetichnus sp.** 1875.28.24.
(26) **Actibates triassæ,** Jardine. 1875.28.25, figured by Jardine (**ibid., pl. ix**).
(27) **Actibates triassæ,** Jardine. 1875.28.26.
(28) **Batrichnis lyelli** (Harkness). 1875.28.27, figured by Jardine (**ibid., pl. xiii**). From Green Mills quarry.
(29) **Batrichnis ?lyelli** (Harkness). 1875.28.28. From ?Corncockle Muir.
(30) Indeterminate track, showing imprints of the right and left sides, manus and pes. 1875.28.29, possibly noted and figured by Hickling (26) in 1909.

Glasgow: Hunterian Museum
(1) **Chelichnus sp.** V.911, plaster cast of a track which does not match any original that I have been able to locate or examine. From an unnoted locality in " Annandale."

London: British Museum (Natural History)
(1) **Chelichnus duncani** (Owen): (43576 BM). Noticed by Lydekker (37: p. 218) in 1890. From Corncockle.

Oxford: University Museum
(1) **Chelichnus duncani** (Owen). F.187 OUM, and F.188 OUM, part and counterpart. Buckland collection. From Corncockle Muir.
(2) **Chelichnus duncani** (Owen). F.189/P OUM, plaster cast of one of Duncan's original specimens from Corncockle Muir. Presented by Duncan in 1827, and two-thirds figured by Buckland (6: vol. ii, pl. 26) in 1836.

Paisley: Museum and Art Gallery
(1) **Chelichnus duncani** (Owen). An unnumbered slab from Locharbriggs.
(2) **Chelichnus ambiguus,** Jardine. An uncatalogued slab from Locharbriggs.
(3) **Herpetichnus robustus,** Delair. 35/1953, a single footprint of this species from Locharbriggs. Acquired from the Royal Scottish Museum, Edinburgh, in 1953. This specimen is very similar to the single footprint in Dumfries Burgh Museum 8a-b DBM already listed.

It is regrettable that the interesting footprints recorded from Euchan Water have not been preserved (51: p. 48), although Simpson and Richey's illustrations of the three-toed examples are fortunately still available for study.

Of special significance is the fact that none of the aforementioned specimens were found in association with skeletal remains, and that the strata bearing them is absolutely devoid of other organic fossils. The Annandale footprints, and those from Green Mills quarry in Nithsdale, however, are not infrequently found in beds yielding ripple-marks and sun-cracks, one noteworthy slab at Dumfries (11 DBM) exhibiting footprints superimposed on a granulated surface traversed by petrified sun-cracks. Impressions of alleged rain-drops are also occasionally obtained from these beds, and the suggestion was long ago advanced that these

pittings were not so much those of rain-drops as of sea-spray. Indications are indeed strong that the strata, generally agreed to be of æolian origin, was deposited near or along some ancient sea coast. This would explain the presence of ripple-marks and sun-cracks, and the occurrence of ?spray-pitted surfaces, as well as the absence of plant fossils and skeletal remains—especially as beaches are notoriously exposed places where carcasses are rapidly devoured by scavengers and organic debris removed by scouring tides. On the other hand, the total absence in these sandstones of invertebrate fossils, of types that could be expected to have been preserved under such conditions in reasonable abundance, is very puzzling, and the problem will obviously only be satisfactorily resolved by future research.

3. Description of New Genera and Species

Chelichnus pricei, sp. nov.
(fig. 1)

Diagnosis.—Pes with four digits or more or less equal length, disposed along the anterior margin of a sole or pad possessing an obliquely oval or semi-circular shape. Manus imperfectly known, and with apparently only two digits.

Type.—10 DBM, a slab showing six imprints forming a section of a track.

Horizon and Locality.—Permian of Corncockle Muir quarry, Dumfriesshire.

History and Remarks.—The type and only known specimen was discovered during the 1880's (exact year unknown) by Mr W. Price, from whom it was subsequently acquired by Dumfries Burgh Museum. An interesting point concerns the occurrence on this slab of an isolated footprint (fig. 1, imprint G) representative of another kind of animal; this is hereafter described as the type of the new genus and species *Cardiodactylum permicum.*

Description.—The footprints forming this track (fig. 1, imprints A-F) exhibit considerable variation of shape due to their imperfect preservation. Of the four imprints of the pes (A, B, E, and F) in this track, A alone shows four digits, although lacks a complete sole; B possesses a complete sole, three well-defined digits, and traces of what appears to be a fourth; E, showing only three digits and no vestige of a sole, is too imperfect to be of much value; and F, represented by the smallest portion of the posterior margin of a sole, is only of value in that it confirms the track-like sequence of these footprints. The anterior extremities of digit III in footprints A and B, and to a lesser degree in E, tend to a spatulate shape. This feature is also discernible in what is here interpreted as digit II in the manus imprints designated C and D in figure 1. The single, complete, sole in imprint B, is characterised by an obliquely oval shape, and is generally rather shallow in comparison with the moderately deep indentations of the digits. No interdigital membranes are traceable.

Relationships.—The nearest approach to this kind of ichnite is found among those named *Chelichnus ambiguus,* a form which has been figured from time to

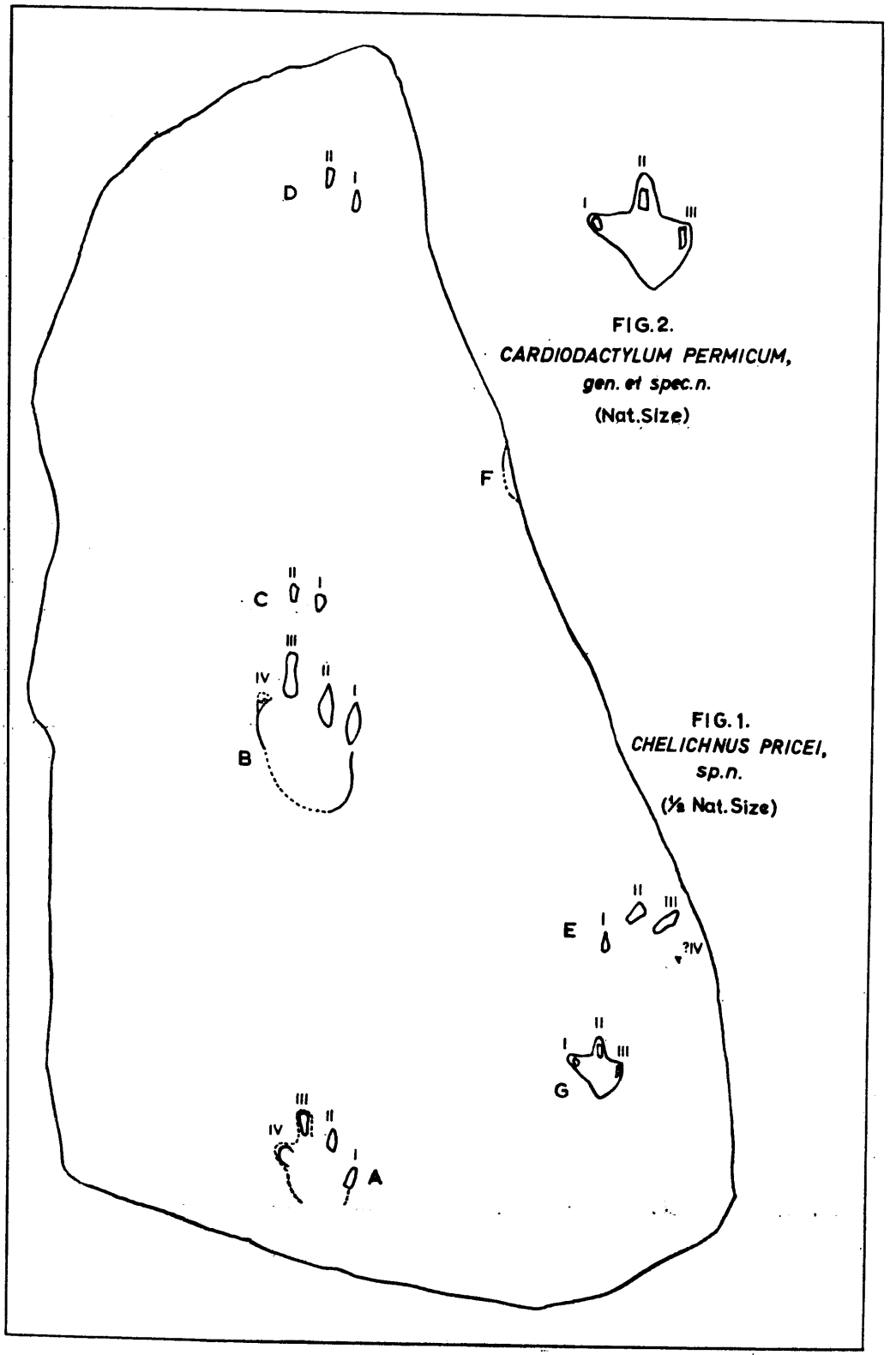

FIG. 2.
CARDIODACTYLUM PERMICUM,
gen. et spec. n.
(Nat. Size)

FIG. 1.
CHELICHNUS PRICEI,
sp. n.
(½ Nat. Size)

time as possessing 4 and 5 digits. That species, and the better known *C. duncani,* however, differ from the present specimen in several particulars, including the more gently curved anterior borders of their respective soles or pads. Neither do they possess digits with anterior extremities of spatulate shape. Since it seems desirable to distinguish the present form of ichnite, I propose that it henceforth be known as *Chelichnus pricei,* the specific name being in honour of its discoverer.

Cardiodactylum permicum, gen.et sp.nov.
(figs. 1 and 2)

Diagnosis.—Footprint with three digits, the outer two being short and scarcely differentiated from the heart-shaped sole or pad. Middle digit comparatively long and slender.

Type.—10 DBM, a single footprint on the slab containing the six imprints constituting the type of *Chelichnus pricei.*

Horizon and Locality.—Permian of Corncockle Muir quarry, Dumfriesshire.

History and Remarks.—See *Chelichnus pricei.*

Description.—This footprint is characterised by three widely spaced digits nearly evenly disposed along the anterior margin of a uniformly shallow heart-shaped sole. The indentations marking each digit are entirely enclosed within the contour limits of the imprint, indicating that each digit was formerly thick and fleshy, and that interdigital membranes were probably present during life. As preserved, the size of each digit, especially the two outer ones (I and III), is small in relation to the overall size of the footprint. Both outer digits are comparatively very broad and blunt, being scarcely differentiated from the sole. The middle digit (II), while basally still broad, is relatively much longer and of a more tapered shape.

There can be no doubt that this footprint represents a form separate from that denoted by the type track of *Chelichnus pricei,* for not only is it out of sequence with those imprints but its size and shape are also different. The distinctness of its contour suggests that a more or less complete ichnite is represented.

Relationships.—I have been unable to find descriptions or figures in the literature of Permian footprints even remotely resembling this specimen, which appears to be unique. Although there are reasons for suspecting that it may have been created by a batrachian vertebrate, it does not agree very closely with the kinds of imprints that the known Permian amphibians could have been expected to have made, and the new generic and specific appellation *Cardiodactylum permicum* is accordingly erected for its reception.

Prochirotherium truckelli, sp.nov.
(fig. 3)

Diagnosis.—Footprints with five digits arranged on the Chirotheroid pattern,

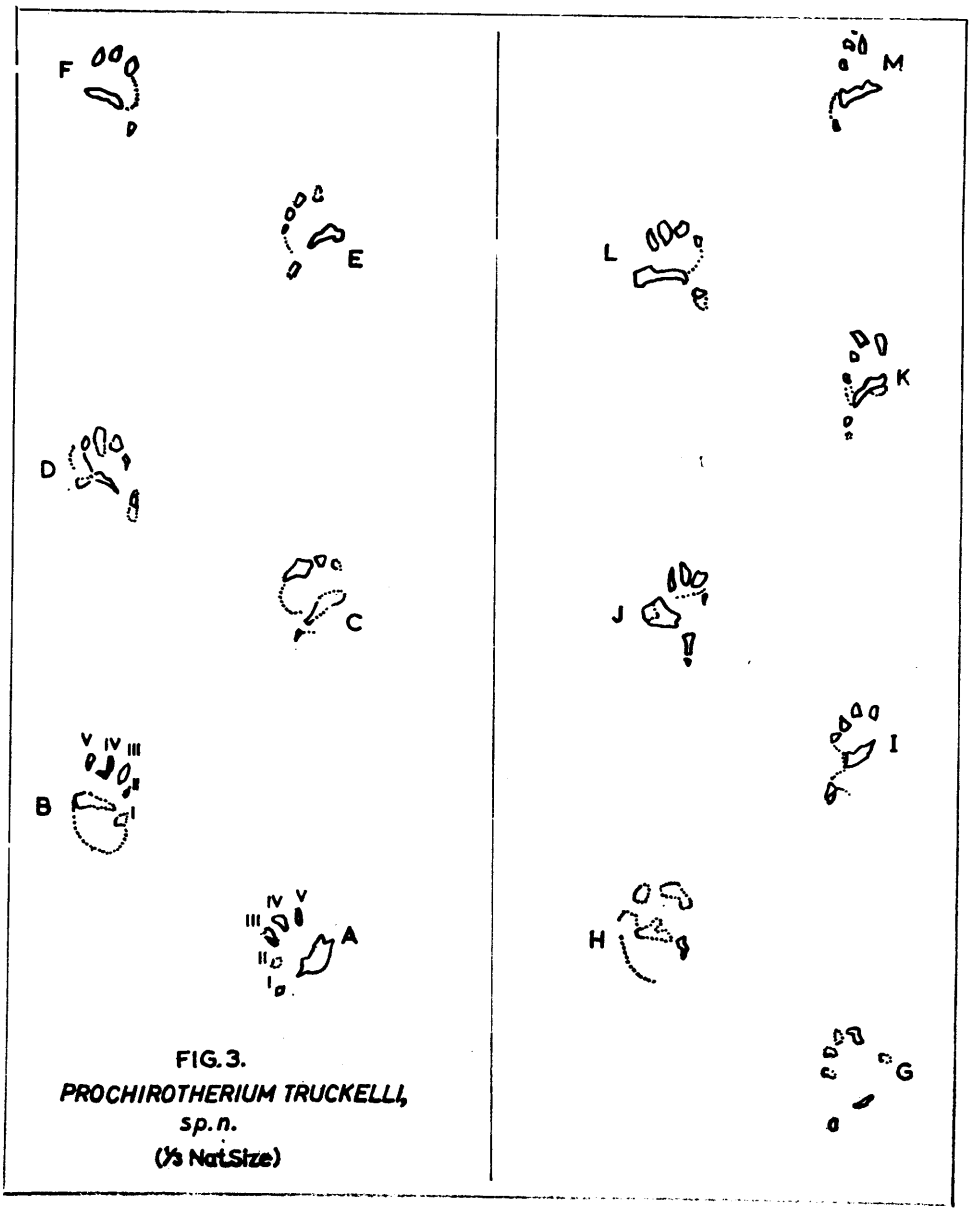

FIG. 3.
PROCHIROTHERIUM TRUCKELLI, sp. n.
(⅓ Nat. Size)

Note.—Imprints G-M are in prolongation of those designated A-F.

with digits II to V of uneven length and set closely together. Digit I small and set very far back.

Type.—6 DBM and 7 DBM, two sections of a track composed of thirteen associated imprints.

Horizon and Locality.—Permian of Corncockle Muir quarry, Dumfriesshire.

History.—Unknown.

Description.—Of the thirteen footprints constituting this track, those designated A, B, I, and L (fig. 3) are the best preserved and afford the greatest number of details by which the characters and affinities of the series can be determined. In all cases, however, only the anterior extremities of the digits are preserved, and nowhere do they merge with the pads or soles, which, themselves, are very imperfectly represented. Indeed, only in imprint B is the full shape and size of the sole indicated, and this is seen to be of oval shape and small in comparison with the overall length of the footprint. The consistently imperfect preservation of the digits in these footprints renders it impossible to trace recurring features, although in the majority of imprints digits IV and V appear to be longer than the others. In some imprints, however, only four digits are certainly preserved. These factors make it very difficult if not impossible to distinguish between impressions of the manus and pes. In every example the inner or first digit is small and set very far back on the inside edge of the sole, and in nearly every imprint its connection with the "palm" region of the pad (indicated by a slightly curved ridge, or, in some instances, by a curved depression) is readily apparent. The position of digit I, in relation to digits II to V, is further back on the imprint than in *Chirotherium barthi* or any *Chirotherium* species yet figured. The feature is well seen in the accompanying illustration of this track (fig. 3).

Relationships.—The affinities of this track almost certainly lie with the Chirotheroid groups of footprints known mostly from Triassic strata. Leonardi, however, has described and figured a Chirotheroid footprint (*Prochirotherium permicum*) from the Permian of the eastern Dolomites (34: p. 2; 35: pp. 14, 16), thereby extending the geological range of this kind of ichnite. Compared with the present track, Leonardi's footprint specimens show some differences of proportion in the digits, both relative to each other and to the imprint as a whole, and there can be no doubt that the Corncockle track represents a species quite distinct from the one named by Leonardi. As the present track seems to represent a hitherto unrecognized form of ichnite, I propose that it be referred to Leonardi's genus as the type of the new species *Prochirotherium truckelli,* the specific title being in honour of Mr A. E. Truckell, who has been instrumental in securing some of the historically important Duncan specimens for posterity, and who first drew my attention to the existence of these footprints in the Dumfries collection.

Herpetichnus robustus, sp.nov.

(fig. 4)

Diagnosis.—Footprints with four digits, arranged as one short inner digit,

and three longer outer digits with expanded basal extremities. Pads broader than long, and shorter anteroposteriorly than in other *Herpetichnus* species.

Type.—1875.28.22, Royal Scottish Museum, Edinburgh. A track composed of seven footprints, of which three belong to left feet, and four to right feet.

Horizon and Locality.—Permian of Corncockle, Muir quarry, Dumfriesshire.

History and Remarks.—The type specimen was formerly a part of Sir William Jardine's collection which was acquired by the Royal Scottish Museum in 1875. In view of its excellent state of preservation, and its omission from Jardine's *Ichnology of Annandale,* it is assumed that the specimen was discovered subsequent to the publication of that folio.

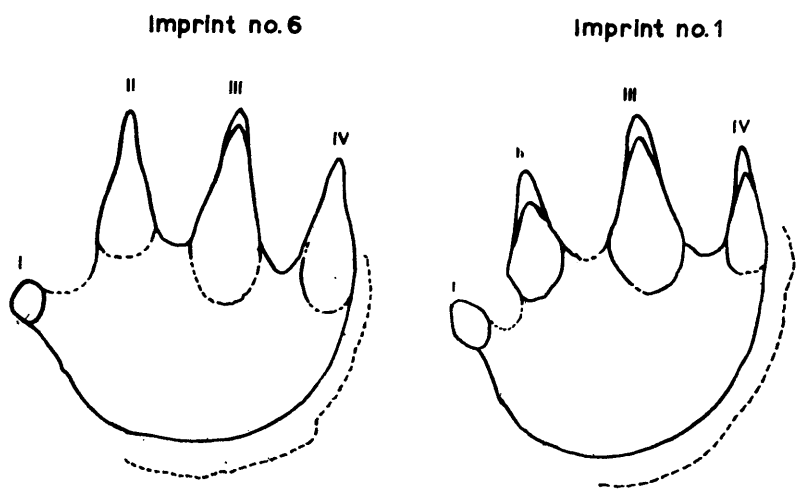

FIG. 4.
HERPETICHNUS ROBUSTUS, sp. n.
(½ Nat. Size)

Description.—The seven footprints composing this track each exhibit four digits only. The imprints are generally so similar to one another that it is very difficult to distinguish between manus and pes. Although they show considerable variation of shape due to the uneven consistency of the ground at the time of their creation, every example exhibits in varying degree the greatly thickened bases of the three longest digits (II to IV), a feature most clearly seen in footprints one and six (see fig. 4). The robust character of the basal extremities of these digits is also well shown in the two single footprints (8a-b DBM) (35/1953) of this species respectively preserved in the collections at Dumfries and Paisley. Digits II to IV are broader and more robust in proportion to the overall length

of the foot than in other *Herpetichnus* species, and also characterised anteriorly by tapered extremities. The latter feature, however, may possibly be due to the mode of preservation. Digit I is much smaller and possesses a sub-circular or oval configuration. All the digits (I to IV) are deeply impressed relative to the sole or pad, which, in contrast, is very shallow, especially toward the posterior margin. No interdigital membrane impressions are discernible.

Relationships.—The affinities of this kind of footprint lie with *Herpetichnus*, the closest approach being to the species *H. sauroplesius*. The present footprints, however, differ from that and all other *Herpetichnus* species in having relatively shorter, broader, and basally much thicker digits, and soles shorter antero-posteriorly in proportion to the overall length of the imprints. The configuration, disparity in digit lengths, and arrangements of the large and small digits in these footprints distinguish them from the larger *Chelichnus* specimens, to which they bear a certain superficial resemblance. The shapes of the individual digits in the present examples are not unlike those of *Barypodus gravis* figured by Schmidt (48: fig. 22) in 1959, but the presence in that species of five digits seems to immediately separate it from that under discussion.

Comparison of these Corncockle footprints with a large number of other Palaeozoic ichnites—including those figured or described by Baird (2), Carman (8), Dawson (10), Dunkle (13), Frenguelli (15; 16), Hickling (25; 26), Matthew (39), Moodie (40), and Romer (47)—has failed to reveal an established form to which they can be assigned. In view of this, I propose that these footprints be henceforth known as *Herpetichnus robustus*, the specific name being a reference to the basal thickening of the digits.

4. Acknowledgements.—My sincere thanks are extended to the following persons, without the ready co-operation of whom much of this essay would never have been written: Dr C. D. Waterston of the Royal Scottish Museum; Dr W. D. I. Rolfe of the Hunterian Museum; Mr A. E. Truckell, curator of the Dumfries and Annan Museums; Mr H. P. Powell of Oxford University Museum; Miss Ann I. Wood of Paisley Museum and Art Gallery; Mr W. Hood of Kirkcaldy Art Gallery and Museum; and Mr R. Hogg of Carlisle Museum and Art Gallery.

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THE FISH FAUNA OF THE CASTLE AND MILL LOCHS, LOCHMABEN, DUMFRIESSHIRE

(With special reference to the Lochmaben Vendace, *Coregonus vandesius* Richardson)

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In spite of the frequent casual mention of the Castle and Mill Lochs, Lochmaben, Dumfriesshire, in the literature on British freshwater fish (e.g. Yarrell, 1859; Couch, 1878; Regan, 1911; etc.) very little has been published on the fish fauna of these lochs as a whole. Almost all the references in the literature have been in connection with the occurrence there of the Lochmaben Vendace, *Coregonus vandesius* Richardson, a form of whitefish considered to be unique to the area; no new information has been published on this little known fish since 1908. As a result of this dearth of data, the Lochmaben Vendace is often considered to be extinct now (e.g. Dottrens, 1958); because this is certainly not the case at present, but could well be the case in the near future, it was considered worthwhile preparing this account of the fish fauna of the Castle Loch and the Mill Loch and in particular, attempting to ascertain the present status of the Vendace in the Lochmaben area.

HABITAT

The Castle Loch and the Mill Loch both lie very close to the small burgh of Lochmaben in Dumfriesshire, Scotland (fig. 1), but in many respects they are quite different from one another. Both lochs were surveyed in 1905 by Murray and Pullar (1910).

The Castle Loch, Lochmaben, is the largest body of water in the basin of the River Annan, and lies immediately to the south of the town (fig. 1). This loch is subtriangular in outline, with a surface area of about 78 hectares, and the water running into it drains a catchment area of 1036 hectares. It is a very shallow loch, the maximum depth found by Murray and Pullar (1910) being 5.5 metres, whilst in 1964 the deepest water located by the author was only 4.8 metres. The mean depth of the Castle Loch is estimated at 2.6 metres, whilst the volume of water which it contains is about 2,000,000 cubic metres. The surface of the loch is about 41.5 metres above sea level. There are several small streams running into the Castle Loch, the most important entering on the south-west shore (the Vendace Burn) and on the east shore—these are in fact the outflows from the Kirk Loch and the Mill Loch respectively (fig. 1). The outflow from the Castle Loch is called the Valison Burn; this leaves the loch at the south end, cutting through a peaty flat there.

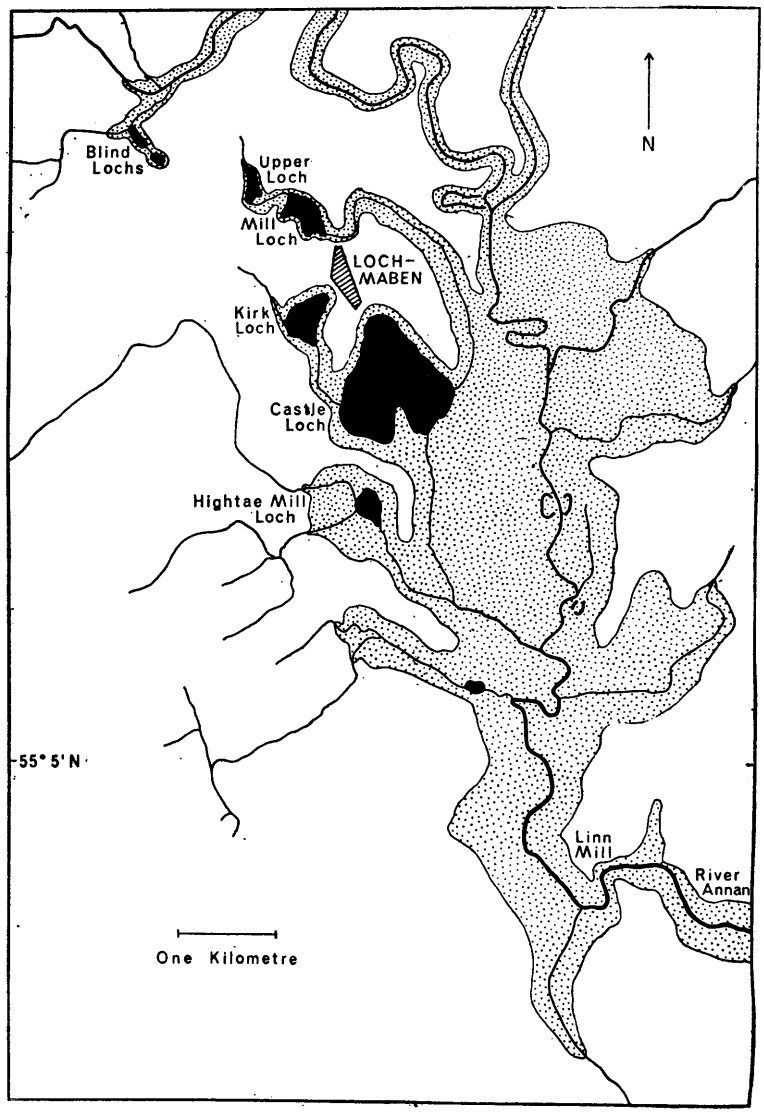

Fig. 1.—The valley of the River Annan, Dumfriesshire, in the Lochmaben district. The stippled area represents land below about 55 metres above sea level, this being essentially the basin of the late-glacial Loch Maben suggested by Bishop (1963).

Much of the Castle Loch is surrounded by emergent vegetation—notably *Phragmites communis* Trin.—though there are stretches of stony shore on the west and east sides. This loch is undoubtedly a highly eutrophic one; this is in part due to its shape and its surroundings, but is also due without doubt to the discharge of the effluent from the Lochmaben sewage works on the east side. The effect of this effluent is discussed further below. The eutrophic nature of the Castle Loch is reflected in the nature of its fauna—both fish (as discussed below) and invertebrates. Several species of leech (Hirudinea) are common, including *Batracobdella paludosa* Carena and *Hemiclepsis marginata* (Müller), both of which are characteristic of eutrophic waters (Maitland, 1963). Several species of leech found in the Castle Loch and in the Mill Loch are new to Dumfriesshire (vice county 72), and these have been recorded in detail elsewhere (Maitland, 1966). In 1964, as early in the year as the beginning of April, the water of the Castle Loch was very turbid due to a massive bloom of phytoplankton; zooplankton at the same time was also very abundant. This was in complete contrast to the paucity of plankton in oligotrophic waters such as Loch Lomond which were examined at the same time. Rare elsewhere in Scotland, *Anodonta cygnea* (L.) is common in the Castle Loch and large specimens collected here in 1964 constituted only the second authentic record of this species in the country. Several shells of this species, which is common in hard waters in England, have been deposited in the Royal Scottish Museum.

The Mill Loch lies immediately to the north of Lochmaben (fig. 1) and is rather rectangular in outline—its main basin running from north-west to south-east. It has a surface area of about 13 hectares and drains a catchment area of some 130 hectares. For its size, the Mill Loch is a rather deep one; the maximum depth found by Murray and Pullar (1910) was 16.8 metres, whilst in 1964 a similar depth was recorded by the author. Its mean depth is estimated at 6.3 metres, whilst the volume of water it contains is over 1,000,000 cubic metres. The loch surface is about 52.4 metres above sea level. The main inflow to the Mill Loch comes in at the north-west side and is the outflow from the Upper Loch (fig. 1). The outflow from the Mill Loch is by a man-made channel from the south-east corner which runs under the main road into the former Brumel Loch (now drained) and then into the Castle Loch.

The main inflow to the Mill Loch has built up a delta which is overgrown by a large bed of *Phragmites communis;* large growths of *Elodea canadensis* Michx. and two species of *Potamogeton* are common in the loch itself and frequently interfere with seine netting. The Mill Loch is undoubtedly far less rich than the Castle Loch and no large molluscs and far fewer leeches were noted there in April, 1964, and August, 1965; the plankton also was far less dense than that in the Castle Loch at these times.

Both lochs are fished regularly by anglers, most of whom are attempting to catch specimen Pike, Perch, Roach or (in the Castle Loch only) Bream. In

April, 1964, the author spent three days in Lochmaben, fishing intensively in the Castle Loch and in the Mill Loch. In both places gill nets were fished continuously at different depths for periods of over 24 hours, whilst seine netting was also carried out from the shores. A second visit was made to the area in August, 1965, when further gill netting was carried out in both lochs. Gill nets were also set in the Kirk Loch on this occasion. The results of these surveys are discussed fully below.

COMMON FISH SPECIES

There appears to be no previous complete account of the fish fauna of the Castle Loch and the Mill Loch. Other than numerous references in connection with the Vendace (see below) the most useful information has been published by Marjoribanks (1845), who gives a list of the fish found in the Castle Loch, and Gladstone (1912), who gives a complete account of the fish species occurring in Dumfriesshire. Other than the species listed below, the only other fish mentioned by Gladstone (1912) in connection with these lochs are two species: Gudgeon, *Gobio gobio* (L.), which was supposed to have been introduced to the Castle Loch about 1909, but of which there are no records since; and White Bream, *Blicca björkna* (L.), which had previously been recorded as having been obtained at Lochmaben. Gladstone considers this record to be doubtful, as does the present author—Regan (1911) notes that this species is found only in England, in eastern rivers from Yorkshire to Suffolk. It is improbable that few, if any, species other than those mentioned below occur either in the Castle Loch or in the Mill Loch.

PIKE, *Esox lucius* L.

This species was found both in the Castle Loch and in the Mill Loch during the present survey, most specimens being taken in the former locality. Roach were found in the stomachs of Pike from the Castle Loch, but the stomachs of all those from the Mill Loch were empty. As noted in greater detail below, the diet of Pike in the Mill Loch certainly includes Vendace—during part of the year at least. Marjoribanks (1845) and Hewison (1912) list Pike from the Castle Loch, whilst Gladstone (1912) notes that this species is especially common in lochs in the Lochmaben area, and that during the 19th Century many large specimens between 15 and 20 kilograms were caught.

EEL, *Anguilla anguilla* (L.)

A single Eel was caught by gill net in the Mill Loch in 1965; none were ever taken in the Castle Loch, but it is probable that this ubiquitous species is common in both lochs. It would only rarely be caught by the methods used here. Eels can cause great damage to Vendace when the latter are being caught in gill nets, as was found both in the Mill Loch (see below) and more recently

in Bassenthwaite Lake and Derwentwater in the English Lake District—the only known localities for the Cumberland Vendace. The author is informed that during 1962 Eels were fished for commercially by trap net in both the Castle Loch and the Mill Loch and very many specimens were removed. The species is recorded from the Castle Loch by Marjoribanks (1845).

MINNOW, *Phoxinus phoxinus* (L.)

No Minnows were seen in either loch during the present survey—though as with the Eel this species is recorded from the Castle Loch by Marjoribanks (1845). Again, both lochs offer a suitable habitat for this species (with convenient spawning streams), and it is probable that it may occur in them; it, too, would not normally be captured by the fishing methods used here.

CHUB, *Squalius cephalus* (L.)

A single specimen of this species about 30 centimetres in length was taken by gill net in the Castle Loch; none were seen in the Mill Loch. Gladstone (1912) records the Chub as being common in lower Annandale, but the only actual records from either loch appear to be those of Marjoribanks (1845) and Hewison (1912), who note its presence in the Castle Loch. The species does not appear to be common there and it is possible that specimens found there may have travelled up from the River Annan itself, where Chub are common (fig. 1).

ROACH, *Rutilus rutilus* (L.)

This species is very common in both lochs, and many were caught in gill nets set at 4 metres in the Castle Loch and even at 16 metres depth in the Mill Loch. As with Pike and Perch, the average size of Roach from the Castle Loch was much greater than of those from the Mill Loch. As noted above, several Roach were found in the stomachs of Pike from the Castle Loch. Roach were recorded from the Castle Loch by Marjoribanks (1845) and Hewison (1912), whilst Gladstone (1912) notes that in Dumfriesshire, the species is especially common in the lochs near Lochmaben.

BREAM, *Abramis brama* (L.)

Bream were not found in the Mill Loch, but many specimens some of them heavier than 2 kilograms were caught in the Castle Loch where the species seems to be abundant. Bream are rare in most other parts of Scotland. The species is recorded from the Castle Loch by Marjoribanks (1845) and Hewison (1912), whilst Gladstone (1912) notes that it is not uncommon in the Lochmaben lochs and in the lower reaches of the River Annan.

ROACH x BREAM HYBRID

In the Castle Loch, as well as Roach and Bream (both of which are very common), intermediate forms between these two species were found; these were identified as Roach x Bream Hybrids. These fish, though common, did not

appear to be so abundant as either of the parent species. Most of the standard texts on British freshwater fishes (e.g. Yarrell, 1859; Couch, 1878; and Day, 1880) make no mention of hybrids occurring between Roach and Bream; however, Regan (1911) notes that such hybrids are known from several places in England where the adult species occur together (e.g. the Rivers Avon, Colne, Nen, etc.). None appear to have been recorded previously from Scotland. Regan (1911) records Roach x Bream hybrids of more than 30 centimetres in length (the largest specimen found in the Castle Loch was 31.5 centimetres), and gives a short table of the characteristic differences between the hybrids and the parent fish.

In the hybrid Roach x Bream from the Castle Loch the form of the body is similar to that of a deep Roach, the length of the body being normally about 3.5 times the maximum depth (Plate I). The mouth is almost terminal, with the lower jaw only slightly shorter than the upper. The dorsal fin is midway between the pelvic and the anal fins, the latter being elongate. The principal external numerical characters noted in five specimens of each fish from the Castle Loch are given in Table 1. It can be seen that the hybrids can most easily be separated from either of the parent species of fish by the number of rays in the anal fin, this number in the hybrids (15 to 19) always being intermediate between that found in Roach (9 to 12) and in Bream (23 to 29).

STONE LOACH, *Nemacheilus barbatula* (L.)

No Stone Loach were seen in either loch during the present survey. However, as with Eels and Minnows, conditions there are quite suitable for this species, and it was in fact recorded from the Castle Loch by Marjoribanks (1845). It would not normally be caught by the fishing methods used here.

PERCH, *Perca fluviatilis* L.

This species was found in both lochs, but most specimens were caught in the Castle Loch, and these had a greater average size than those from the Mill Loch. Perch are recorded from the Castle Loch by Marjoribanks (1845) and Hewison (1912), whilst Gladstone (1912) notes that this species is abundant in many Dumfriesshire lochs and rivers.

THREE-SPINED STICKLEBACK, *Gasterosteus aculeatus* L.

Three-spined Sticklebacks were found both in the Castle Loch and in the Mill Loch. None were actually caught in the Castle Loch, but several specimens were clearly seen near the mouth of the tributary burn entering the east side of the loch. In the Mill Loch, a single specimen was found in a large mass of *Elodea canadensis* brought in with the seine net. The species is recorded from the Castle Loch by Marjoribanks (1845) as the "Banstickle," whilst Gladstone (1912) notes that it is common in burns and ditches throughout Dumfriesshire.

TROUT, *Salmo trutta* L.

Trout have been recorded from the Castle Loch by Knox (1834), Marjoribanks (1845), and Hewison (1912), the first of these authors mentioning several large specimens taken in his time. A single specimen was caught in 1953, also in the Castle Loch, by Dr H. D. Slack (personal communication), but none were seen in either loch during the present survey.

THE LOCHMABEN VENDACE

VENDACE, *Coregonus vandesius* Richardson

The Lochmaben Vendace is undoubtedly one of the rarest of British freshwater fish, and, as mentioned more fully below, it could quite easily face extinction in the relatively near future. This species has been the subject of much speculation, and locally and elsewhere there were formerly many superstitions and traditions connected with it. One of the main purposes of the present paper is to give as clear a picture as possible of the present status of the Lochmaben Vendace.

Historical

One of the earliest references to the Lochmaben Vendace is that of Sibbald (1684), who noted "Pifcis in Lacu Mabano, Vandefius. In eodem Lacu Gevandefius." There are numerous subsequent accounts available in general works on fish (e.g. Pennant, 1776; Jenyns, 1835; Yarrell, 1859; Couch, 1878; Day, 1880; Seeley, 1886; Maxwell, 1904; Malloch, 1912; Regan, 1911; Jenkins, 1925, etc.). The information contained in many of these is not new, most of the original work on the Lochmaben Vendace having been carried out by Jardine (1831) and Knox (1834, 1855).

Formerly held entirely by the Crown, fishing rights to all the local lochs in the Burgh of Lochmaben were finally decreed in a Royal Charter granted by James VI. During the 19th Century the Lochmaben Vendace was evidently a very common fish, and two clubs fished regularly for them—a rather select group of aristocratic men in the Vendace Club and a much larger number of people in the more democratic St Magdalene Vendace Club. The latter body, after fishing the lochs for Vendace each summer, held a meeting for border games; in the mid 19th Century this was a big event in the area. The Vendace Club appears to have been wound up about 1870, the St Magdalene Club having closed shortly before that. Regan (1911) notes that a Vendace Club was re-established about 1907, but was less successful than formerly—the annual netting procuring only about six Vendace on each occasion. Maxwell (1904) notes that just at the end of the 19th Century, local fishermen had from time to time small catches by net of 12 to 24 fish. He notes that "it has always been unusual to take more than a very few dozen," and is presumably referring to the commercial Vendace fishermen, most of whom gave up fishing at the

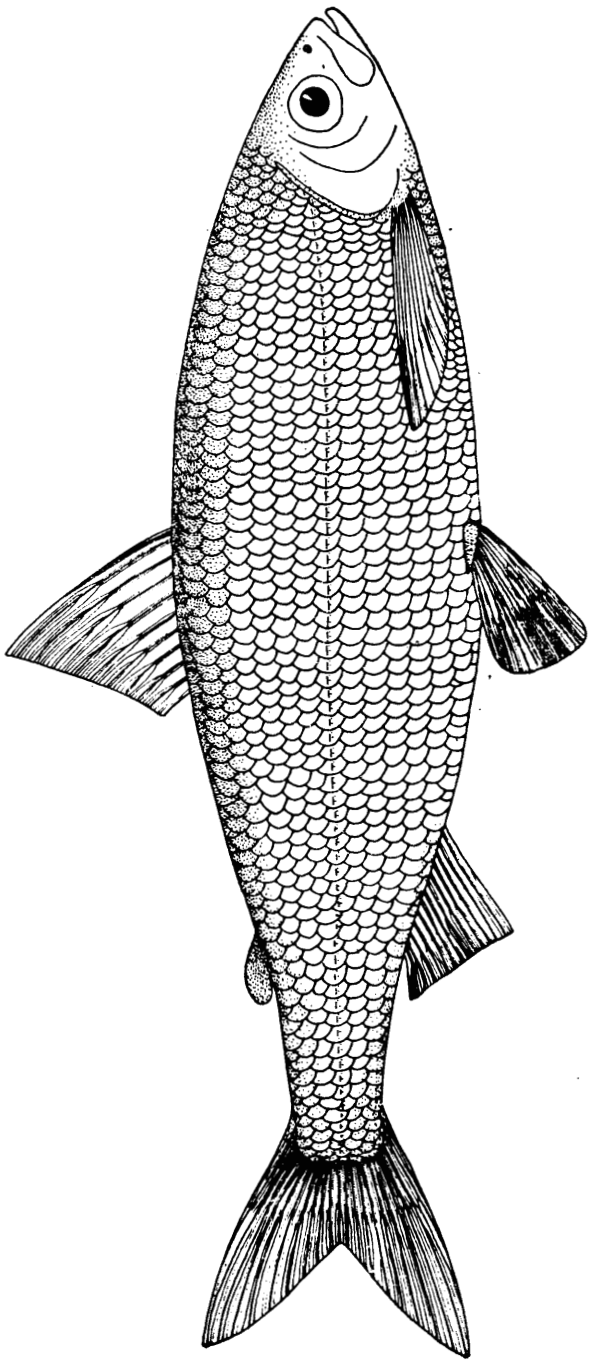

Fig. 2.—A drawing of a recent specimen of the Lochmaben Vendace from the Mill Loch (natural size).

beginning of this Century. The last commercial Vendace fishery was operated by Mr Smith of Lochmaben, whose son, Mr John Smith, has kindly given to the author much information concerning it. In the Dumfries Burgh Museum there is an Edinburgh fishmonger's receipt for Vendace early in this Century, and also specimens of Vendace net. A piece of what was probably one of the last Vendace nets is also in the possession of the author; it is a gill (hang) net made of fine cotton, with a mesh of 2.2 centimetres knot to knot. This net was always fished on the bottom of the loch.

There has been considerable speculation in the past as to the origin of the Vendace in the Lochmaben area. Local tradition holds strong that the species was introduced by Mary Queen of Scots, who visited Lochmaben Castle in 1565, when the keeper was Sir John Maxwell; a second suggestion has been that it was introduced by monks from Italy, whilst other equally unlikely suggestions have been forwarded from time to time (e.g. Jaffray, 1793; Marjoribanks, 1845). Most of such theories are discounted by Yarrell (1859), Couch (1878), Day (1880), Regan (1911) and others—mainly because of the difficulty of transporting fish of this type at the time in question, when transport was very slow.

There seems little reason to doubt that the Lochmaben Vendace originated in much the same way as the Cumberland Vendace, *Coregonus vandesius gracilior* Regan, namely from a stock of originally anadromous fish which entered these areas from the sea during the last Ice Age (see below). After isolation for about 10,000 years, these forms have become distinct from one another (Regan, 1911).

Distribution

Past accounts of the distribution of the Vendace in Dumfriesshire vary considerably. Marjoribanks (1845) noted that the Vendace was found only in the Castle Loch of Lochmaben, whilst Couch (1878) and other authors state vaguely that it is peculiar to Lochmaben and neighbouring waters. Yarrell (1889) says that the species is not confined to the Castle Loch, but is found in several other neighbouring ones, " some of which have no connection with that in which they are thought to be peculiar." He further states that the Vendace occasionally descend the River Annan to the Solway Firth where they are taken by stake nets in the estuary. Regan notes that Vendace occur only in the Castle Loch and in the Mill Loch, as do both Gladstone (1912) and Schindler (1957)—Gladstone also saying, however, that a few may find their way down to the River Annan, where they soon die.

In spite of some of the above accounts, there appear to be no authentic records of Vendace from any of the lochs in the Lochmaben area, other than the Castle Loch and the Mill Loch (though see below). The species certainly occurred commonly in both of these at one time, for they were caught there regularly by the Vendace Clubs mentioned above. Authentic records from the

beginning of this Century are very few indeed, and as noted below, all of them concern fish taken from the Mill Loch only.

If the Vendace did enter the area during the last glaciation, it would appear possible that it could have occurred in most of the lochs in the area. Bishop (1963) has suggested that the lochs in the vicinity of Lochmaben, lying roughly on the 50-metre contour represent the dismembered remnants of a once continuous sheet of water. The distribution of these lochs was controlled by the location of deep hollows in the floor of this larger body of water—these hollows having been formed by a local re-advance of ice in the Lochmaben area from the Kirkmichael Fells, giving rise to large kettle holes in the unconsolidated clays and silts moved by the glacier. Bishop suggests that the original large loch, which he calls the late-glacial Loch Maben, ceased to exist following downcutting of the outlet near Dormont Island (in the River Annan, near Linn Mill—see fig. 1) and that since that time the changes in the meandering course of the River Annan have resulted in the deposition of alluvium over most of the remaining loch deposits. Thus the possibility of Vendace occurring in lochs in the area other than the Castle Loch and the Mill Loch is quite strong; the species may have been (and indeed still may be) present in lochs such as the Kirk Loch, undetected by man.

Recent Records

As noted above, only a few specimens of the Lochmaben Vendace have been recorded this Century, and all of them were taken from the Mill Loch. Only 5 such records are known to the author. In 1947 a single Vendace was caught by Mr R. J. Lamb of Lochmaben in the Mill Loch (Mr J. E. M. Stevenson, personal communication), whilst in 1949 another was taken from the stomach of a Pike there (" The Scotsman," July 28th, 1956). A small specimen about 10 centimetres long was caught at the edge of the Mill Loch in 1956, and this was subsequently presented by the Lochmaben Burgh Council to the Department of Zoology at the University of Glasgow. In 1960 another specimen was found, again in the Mill Loch (" The Annandale Herald," September 8th, 1960).

In September, 1963, Mr C. Whitaker caught a Pike of about 2.3 kilograms in the Mill Loch which, whilst the hook was being removed, disgorged 2 Vendace —another 2 were afterwards found in its stomach. All 4 fish were of a similar size (about 15 centimetres) and clearly identifiable, in spite of the fact that 2 of them were partly digested. One of them, a female, had well developed ova present. Three of these specimens were kindly presented to the author by Mr Hadfield of Lochmaben, and are now in the Department of Zoology at the University of Glasgow.

The purpose of the present author's visit to Lochmaben in April 1964 was mainly an attempt to collect more Vendace, following on the sure knowledge that they were still present in the Mill Loch. In spite of the relatively small

sizes of the lochs concerned, however—especially the Mill Loch—and the different methods of capture used, no Vendace were caught in either place. As noted above, very many specimens of several other species of fish were caught in both lochs. It is of interest to note that in 1953 Dr H. D. Slack (personal communication) made a similar unsuccessful attempt for this species in both lochs, after which Dottrens (1958) assumed that the Lochmaben Vendace was extinct.

Different netting techniques were carried out by the author in August 1965, and in the Mill Loch several Vendace were caught in less than 12 hours fishing. This is certainly the largest catch of this species which has been recorded this century. Three of these specimens were in good condition and after examination were returned alive to the loch, the others were preserved and are at present in the author's collection in the Department of Zoology at the University of Glasgow.

Similar netting was carried out at the same time in the Castle Loch, but though many fish of the species mentioned above were taken no Vendace were found. Identical nets set in the Kirk Loch also proved to be empty of the species, though Pike, Perch and Roach were taken in them. It is very probable that Vendace may be absent from both lochs.

Description

The Lochmaben Vendace has been described by several workers, the best accounts being found in Yarrell (1859) and Regan (1911). None of these accounts is complete, however, and as several authors are at a variance in some details, as full a description as possible of the external features is given below. One of the few photographs available of this species has been published by Malloch (1912), another is included in Plate II.

This species is probably the smallest of the British and Irish *Coregonus,* and there are no records of specimens longer than 23 centimetres; normally adults are from 15 to 20 centimetres in length. Knox (1855) notes that the females, which may reach over 20 centimetres are normally longer than the males which are rarely over 18 centimetres in length.

The body is fusiform in shape, but compressed laterally, the convexity of the dorsal and ventral surfaces being almost equal. The head is conical, the snout sharp, with the oblique mouth superior and the projecting lower jaw fitting into a shallow groove in the upper jaw. The maxillary normally extends below the anterior part of the eye (Plate II). The mouth is small with a square opening, whilst the teeth are few, minute and deciduous; when persistent in the adults they are found only on the tongue. The branchial arches have numerous long and slender gill rakers.

The ratio of the head to the total length of the body is about 1:6, whilst the greatest depth of the fish to the total length is about 1:4. The body is almost entirely covered with relatively large scales, and there are normally 62 to 73 of

these along the lateral line, which passes straight along the side of the body. There are 6 to 7 rows of scales between the origin of the dorsal fin and the lateral line, and also between the lateral line and the base of the pelvic fins.

The origin of the dorsal fin (which has 11 rays) is almost equidistant between the end of the snout and the base of the caudal fin (which has 19 rays). The pectoral fins, which originate immediately below the posterior edge of the opercula (fig. 2), have 16 rays and are not quite equal in length to the head. The pelvic fins (with 11 rays) originate immediately below the dorsal fin, whilst the anal fin (with 15 rays) starts midway between the origin of the pelvic fins and the base of the caudal rays—its largest ray being about equal in length to the base of the anal fin. The longest ray of the caudal fin is about twice the length of its base. The normal number of vertebrae is about 54.

As with other species of *Coregonus,* the colour of the Lochmaben Vendace is for the most part a silvery white. The back normally has a greenish-blue sheen and sometimes this darker colour may extend downwards towards the lateral line; below this the body may have a golden or yellowish tint, whilst the dorsal, caudal and pectoral fins always tend to be darker towards their ends.

There are few references which suggest that the populations in the two lochs differed in form. Day (1880), however, notes that in the Vendace from the Castle Loch the lateral line is medial, whilst in those from the Mill Loch it is nearer the dorsal surface. The fish from the Mill Loch are also said to be thicker and possess larger heads than those from the Castle Loch.

Like other species of whitefish, the Lochmaben Vendace appears to be gregarious, and there are records of shoals having been seen near the surface at certain times of the year. Regan (1911) says that the species stays in deep water during warm weather, but moves about freely at other times. Both Couch (1878) and Regan (1911) state that it spawns in November, in shallow water near the edge, but Knox (1855) found several females with large ova as late as December, so that the species may in fact spawn later than was originally thought; a similar position formerly existed with regard to the Powan, *Coregonus clupeoides* Lacépède in Loch Lomond. These were formerly thought to spawn in October (Lamond, 1931), but are now known to do so much later than this. As with other species of *Coregonus,* the Vendace appears to feed mainly on zooplankton, supplemented by insect larvae and other aquatic invertebrates (Yarrell, 1859; Regan, 1911; etc.).

Systematic Position

It should be noted that this account is based only on material available to the author up until 1964, and does not take account of the specimens caught in 1965. It is intended to reserve full analysis of these until a complete taxonomic study of all members of the Genus in Great Britain can be published. The nearest British form to the Lochmaben Vendace is the Cumberland Vendace *(Coregonus vandesius gracilior)* which is found in Derwentwater and Bassenthwaite Lake.

Regan (1911) gives a table of the main distinguishing characters between the 2 forms. All the known British and Irish forms are listed in Table 2, from which it can be seen that there are at least 13 different populations.

The most recent analyses of the populations of *Coregonus* in Europe are those of Svärdson (1957) and Dottrens (1959), whilst an interpretation has also been given by Schindler (1957). Svärdson (1957) gives data for many species of *Coregonus* in the Palæarctic region, and he lists altogether 7 species—*Coregonus pidschian* (Gmelin), *C. nasus* (Pallas), *C. lavaretus* (L.), *C. oxyrhyncus* (L.) and *C. peled* (Gmelin), as whitefish proper, and *C. albula* (L.) and *C. baunti* Muchomedijarov as ciscoes. He places Vendace in *C. albula,* Loch Lomond Powan in *C. lavaretus,* and refers all other British and Irish populations to *C. oxyrhyncus* (with differing amounts of introgression by various forms). Schindler (1957) groups the European species into four types—*Coregonus wartmanni* Bloch, *C. acronius* Rapp, *C. albula* L., and *C. oxyrhyncus* L. He states that *C. acronius* includes *C. clupeoides* (and therefore Gwyniad, Powan and Schelly), whilst *C. albula* includes *C. vandesius* and *C. pollan* (and therefore all Vendace and Pollan). The most recent account of the Genus in Europe is that of Dottrens (1959). As noted above, this author (Dottrens, 1958) had already assumed the Lochmaben Vendace to be extinct and there is no mention of it in his later paper (Dottrens, 1959). In the latter he divides the European fish into 6 species—*Coregonus acronius* Smitt, *C. fera* Jurine, *C. lavaretus* (L.), *C. wartmanni* (Bloch), *C. macrophthalmus* Nusslin and *C. albula* (L.). The Loch Lomond Powan and the Ullswater Schelly are placed in *C. wartmanni,* the Lough Neagh Pollan, the Haweswater Schelly and the Llyn Tegid Gwyniad in *C. macrophthalmus,* and the Lough Erne Pollan in *C. albula.* A summary of these major classifications is given in Table 2.

Neither Svärdson (1957) nor Dottrens (1959) appears to have had data referring to fish from Lock Eck, Castle Loch, Mill Loch, Red Tarn, Derwentwater, Bassenthwaite or Lough Dearg; it is clear that further systematic work must be carried out on the Genus in this country before the British and Irish species can be categorised accurately. The author is at present collecting material for such an analysis: until such a study—covering all the British and Irish populations—is carried out, it would seem most useful to refer them still to the names suggested by Regan (1911).

DISCUSSION

The fish faunas of the Castle Loch and the Mill Loch both present certain unusual features. Bream, which are common in the Castle Loch are rare in most other parts of Scotland, as are Roach x Bream hybrids which also occur in this loch. Lochmaben Vendace, which are certainly still present in the Mill Loch are rarer still, and this may be a unique population. How abundant this species is there and what the position in the future will be is uncertain. Present conditions in the Mill Loch appear to be reasonably favourable for the Vendace, for in

spite of its small size this loch is relatively deep (see above)—thus being similar to the other lochs in Scotland in which *Coregonus* are known to occur—Loch Lomond and Loch Eck. The Castle Loch on the other hand, though it undoubtedly possessed a thriving population of Vendace in past years, now appears to offer very unsuitable conditions for this species—especially with regard to its shallowness and high eutrophy; both of these conditions are inimical to *Coregonus*—a Genus which is commonly accepted as being characteristic of deep oligotrophic lakes. Though most lakes tend to fill in and increase in eutrophy with age, this tendency in the Castle Loch has undoubtedly been accelerated in recent years by the establishment of the local sewage works and the discharge of its effluent into the loch, as mentioned above. Probably largely due to this the Vendace may now be extinct in the Castle Loch.

It is clear that in order to safeguard the existing population of Vendace in the Mill Loch, adequate steps should be taken as soon as possible. As important as watching the loch itself is the guarding of the quality of all the water draining into it—a single misplaced quantity of derris or other agricultural insecticide in the watershed above the Mill Loch could quickly eradicate its unique population. All those concerned in the Lochmaben area should be forewarned against such an eventuality.

SUMMARY

There is no previous complete account of the unique fish fauna of the Castle Loch and the Mill Loch in Dumfriesshire. In this paper a description of these lochs is given and the 11 species of fish occurring in them are noted—Pike, Eel, Minnow, Chub, Roach, Bream, Stone Loach, Perch, Three-spined Stickleback, Trout and Vendace. Hybrids between Roach and Bream are recorded and described—these have not previously been reported from Scotland. Of particular interest in the fauna is the Lochmaben Vendace, which is certainly still present in the Mill Loch, and a full account of this species in the area is given. It is suggested that this species of *Coregonus* is probably extinct now in the Castle Loch, and the possibility of a similar occurrence in the Mill Loch in the future is considered and discussed.

ACKNOWLEDGMENTS

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FISH	ROACH					BREAM					HYBRID				
Code letter ...	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e
Length in millimetres	240	262	266	271	272	257	348	365	368	433	236	253	275	283	315
Depth in millimetres	75	81	82	88	92	94	136	140	144	174	77	86	94	95	108
Dorsal fin rays ...	11	11	11	10	12	10	10	10	10	10	11	11	11	10	11
Caudal fin rays ...	19	20	19	19	20	19	20	19	19	19	19	19	19	19	20
Anal fin rays ...	12	11	11	11	10	28	25	26	28	27	16	18	16	17	16
Pelvic fin rays ...	9	9	9	9	8	9	9	9	9	9	9	9	9	9	9
Pectoral fin rays ...	14	15	15	15	15	17	16	19	17	18	16	16	16	15	16
Lateral line scales ...	43	42	43	41	44	55	55	56	57	53	50	50	51	52	49
Scales from dorsal fin to lateral line ...	9	9	9	9	10	14	14	14	14	13	11	12	12	12	12
Scales from lateral line to pelvic fin	6	6	6	5	6	8	8	9	8	8	7	7	7	7	8
Sex	M	F	M	F	F	M	M	M	F	F	M	M	F	F	M

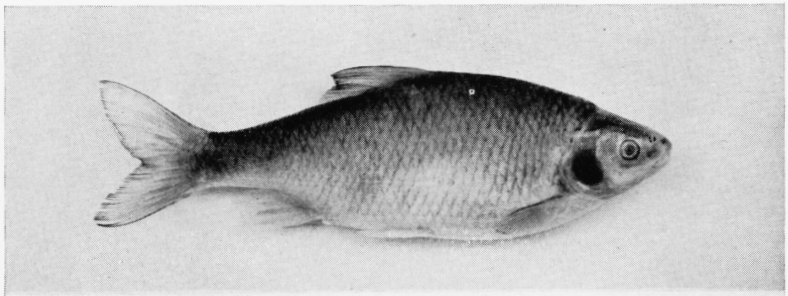
Table 1.—The external characteristics of some Roach, Bream, and Roach x Bream Hybrids from the Castle Loch.

COLLECTION	NO. OF FISH	LOCALITY	DATE	DONOR
Town Hall, Lochmaben	1	Mill Loch	1947	R. J. Lamb
Town Hall, Lochmaben	1	—	1960	—
W. Hadfield, Lochmaben	1	Mill Loch	1963	C. Whitaker
I. G. Henderson, Lockerbie	1	—	—	—
Burgh Museum, Dumfries	1	—	—	ex-Grierson Museum, Thornhill
Hunterian Museum, Glasgow	1	Mill Loch	1956	Lochmaben Council
P. S. Maitland, Glasgow	3	Mill Loch	1963	W. Hadfield
Royal Scottish Museum, Edinburgh	3	Loch Maben	1882	J. Jones
British Museum, London	3	—	1850	P. Stevens
British Museum, London	2	—	1855	C. Hasler
British Museum, London	1	—	—	W. Yarrell
British Museum, London	1	Loch Maben	—	—
British Museum, London	1	Castle Loch	1858	D. Baird
British Museum, London	2	Lochmaben	1860	W. Jardine
British Museum, London	1	Lochmaben	1904	L. M. J. Cameron
Kenoick Museum	1	Lochmaben	1904	L M. J. Cameron
Leningrad Museum, Russia	1	Lochmaben	1904	L. M. J. Cameron

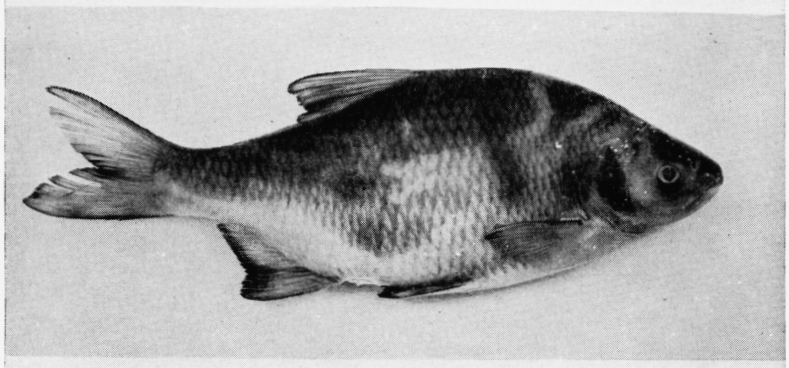
Table 2.—Existing collections of Lochmaben Vendace known to the author.

LOCALITY	LOCAL NAME	REGAN	SCHINDLER	SVARDSON	DOTTRENS
Loch Lomond	Powan	**clupeoides**	**acronius**	**lavaretus**	**wartmanni**
Loch Eck	Powan	**clupeoides**	**acronius**	**lavaretus**	**wartmanni***
Ullswater	Schelly	**c. stigmaticus**	**acronius**	**oxyrhyncus**	**wartmanni**
Haweswater	Schelly	**c. stigmaticus**	**acronius**	**oxyrhyncus**	**macrophthalmus**
Red Tarn	Schelly	**c. stigmaticus**	**acronius**	**oxyrhyncus***	**macrophthalmus***
Llyn Tegid	Gwyniad	**c. pennantii**	**acronius**	**oxyrhyncus**	**macrophthalmus**
Castle Loch	Vendace	**vandesius**	**albula**	**albula**	(extinct)
Mill Loch	Vendace	**vandesius**	**albula**	**albula**	(extinct)
Derwentwater	Vendace	**v. gracilior**	**albula**	**albula**	**albula***
Bassenthwaite	Vendace	**v. gracilior**	**albula**	**albula**	**albula***
Lough Neagh	Pollan	**pollan**	**albula**	**oxyrhyncus**	**macrophthalmus**
Lough Erne	Pollan	**p. altior**	**albula**	**oxyrhyncus**	**albula**
Lough Dearg	Pollan	**p. elegans**	**albula**	**oxyrhyncus***	**albula***

Table 3.—The British and Irish forms of **Coregonus** classified according to Regan (1908), Schindler (1957), Svärdson (1957), and Dottrens (1959).
* Not actually mentioned by name.



1



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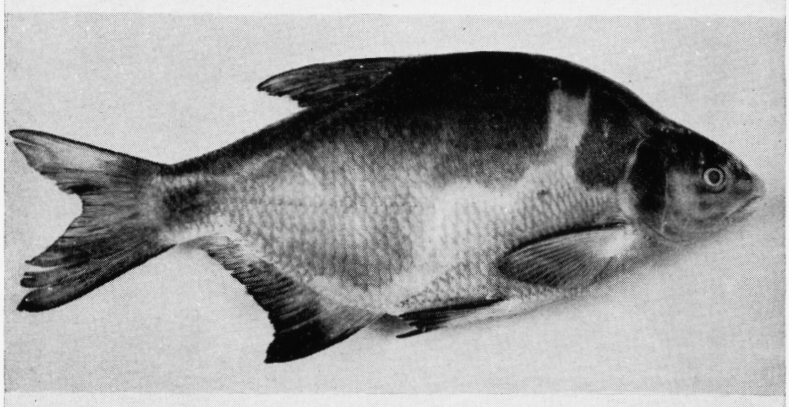

3

Plate I.—Typical specimens of (1) Roach, (2) Roach x Bream Hybrid, and (3) Bream from the Castle Loch (all x $\frac{1}{4}$).

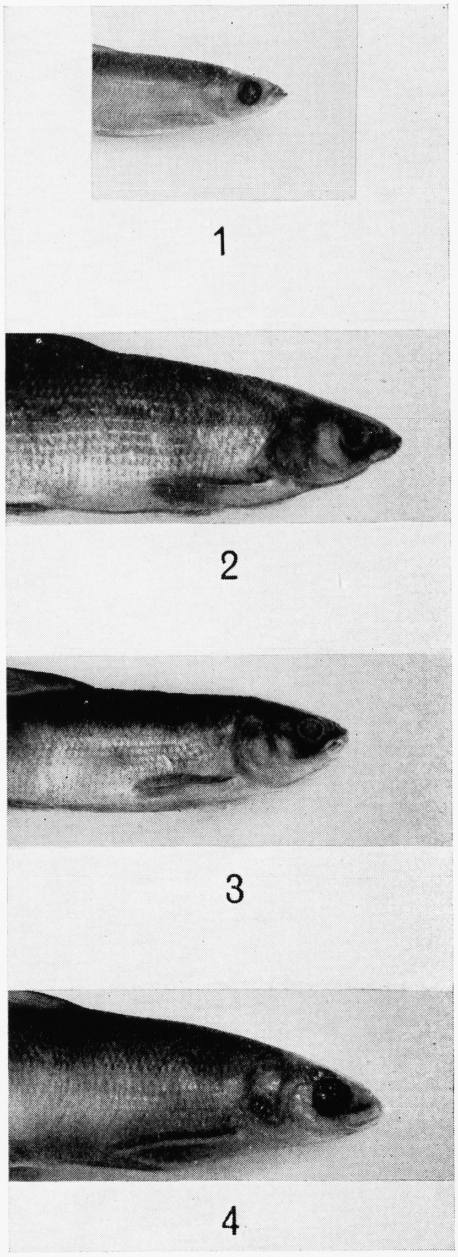

Plate II.—The anterior end of typical specimens of **Coregonus** from (1) Mill Loch, (2) Loch Lomond, (3) Loch Eck, and (4) Llyn Tegid (all x 2/5ths).

THE ROOKERIES OF DUMFRIESSHIRE, 1963

By DEREK SKILLING, ROBERT T. SMITH, JOHN G. YOUNG

Including Comparisons with the Surveys in 1908 and 1921 by Sir Hugh S. Gladstone

ACKNOWLEDGMENTS.—This paper is the result of a joint effort by Derek Skilling, Robert T. Smith, and John G. Young.

Derek Skilling did a vast amount of the necessary field work, and has worked on and checked the figures used in this paper.

Robert T. Smith had the idea to conduct a Rook survey and he has done, by far, the bulk of the field work, also organising, preparing maps and cards.

John G. Young was also in the field and has analysed the material and written this paper and wishes to make clear that the opinions expressed may not necessarily be held by the collaborators.

This was throughout a team effort and we are grateful to fellow members of the Study Group for their help and permission to write up the results. Nowhere in Dumfriesshire was permission refused to count rookeries and we are indebted to the landowners and tenants concerned. We have made every effort to ensure that everyone who counted Rooks or has helped in other matters, is acknowledged below. If there are any omissions, we humbly apologise. We are extremely grateful to the following, who gave their time, and were involved, in some cases, in expense:—

R. Adamson, L. Allison, D. D. Anderson, W. Austin, B. Bell, A. Black, J. Cluckie, E. Dicerbo, Miss J. Donnan, P. Gordon, J. Johnstone, D. Manson, J. Maxwell, M. McDonald, Dr P. K. McCowan, G. McLean, Mr and Mrs J. K. R. Melrose, A. Petrie, J. Philips, J. Robinson, R. Richardson, J. Todd, T. Todd, G. Waterston, T. Wright, J. F. Young.

We are especially indebted to Sir Arthur B. Duncan and to Donald Watson, who have read and commented on this paper.

SUMMARY.—In 1908 Gladstone found 17,555 nests in 122 Rookeries and in 1921 there were 15,999 nests in 116 Rookeries. In the 1963 Survey, there were 16,945 nests in 200 Rookeries. The decrease in the total number of nests from 1908 to 1963 "610" represents a fall (3.48%), while the larger number of Rookeries in 1963 "78" represents an increase (64.0%).

The mean size of Rookeries has fallen from 144.0 in 1908 to 84.7 in 1963, a decrease of 41.1%.

Table I gives a comparison of total numbers, Table II shows changes in Rookery sizes, Table III gives the density and changes in habitat, Table IV a list of Parishes used in text and Table V gives the mean size of Rookeries and percentage alteration, followed by a detailed list of Rookeries and number of nests.

INTRODUCTION.—Rooks (*Corvus frugilegus*) L. were common residents in Dumfriesshire in 1844. Further ornithological adjectives described their status as "Great flocks" in 1765 and in 1802 and 1812 mention is made of their "vast numbers."

The late Sir Hugh S. Gladstone, when engaged in writing his "Birds of Dumfriesshire," circularised known ornithologists, landowners and gamekeepers and prepared lists of known Rookeries in 1908 and 1921.

With the exception of a paper by Sir Arthur B. Duncan, read to the Dumfries and Galloway Antiquarian Society in 1951, no major work nor complete census has been published on the status or distribution of the Rook in Dumfriesshire.

In 1963 a detailed Survey was organised by a private study group. Known ornithologists were invited to survey one or more parishes and maps of all parishes were prepared from one inch to the mile Ordnance Survey Maps. Lists were compiled of known Rookeries in 1908 and 1921 and a census card was designed and printed. These were distributed to the volunteers, and counting, with only a few exceptions, was carried out between 1st and 30th April.

The cover of known Rookeries in 1908 and 1921 was 100 per cent. and as diligent a search as was practicable was attempted in all suitable woodland.

It was never intended that this Survey should be considered as a biological or ecological study, but merely as an inventory and, as such, poses more questions than it answers.

I have taken all nests counted to be occupied and, considering the severity of the gales the preceding winter, and the known fact that Rooks will dismantle old nests, this would appear sound. It was noted that on checks made on some eighteen Rookeries that some nest building took place during the month of May which was outwith the closing date for the count, but as it was generally agreed that counting became more difficult towards the end of April, I feel we were correct in ending the field work by the 30th of that month. The margin of error cannot be calculated and all tables and calculations are from the precise figures.

The Spring of 1963 was perhaps not a representative period owing to the possible effect of the extremely severe winter which preceded it. A sample of counts taken in April, 1964, showed that due to the yearly fluctuations of rookery sizes, it was impossible to calculate any effects the winter may have had, although this sample was restricted to three parishes in Nithsdale and therefore could not claim to be entirely representative.

This paper is concerned mainly with a direct comparison of the 1963 results with the lists as published by Gladstone. I believe the 1963 Survey is as accurate as can ever be expected in such a Survey over an area of 1106 square miles, and the 1908 work by Gladstone to be comparable, although there is some evidence that Gladstone did not receive the same enthusiastic support for his second census in 1921 and the total figure for it may have to be treated

with some reserve. The figures on rookery sizes in this work is certainly of interest.

Results:

TABLE I.

Comparison of the total number of Nests and Rookeries

Year	Rookeries	Nests	Mean
1908	122	17,555	144.0
1921	116	15,999	138.0
1963	200	16,945	84.7

This Table shows a decrease of 610 nests from 1908 to 1963 (3.48%) and an increase over the same period of 78 rookeries (64.0%). Taking into consideration the possible effects of the 1962-63 winter and the margin of error, a fall of 3.48% of the total number of nests is not significant and the population can be considered to be at the 1908 level. The increase in the number of rookeries may well be attributable to timber policies carried out by respective owners, but may also be related to an increase in arable land and the wider distribution of grain crops.

TABLE II.

Changes in the size of Rookeries

No. of Nests	1908	1921	1963	% Alteration 1908-63
1— 20	16	17	44	+175%
21— 150	76	67	126	+ 65.8%
151— 250	16	17	20	+ 25.0%
251— 500	9	13	7	− 22.2%
501— 750	0	0	3	—
751—1000+	5	2	0	—

TABLE III.

(a) Density of Nests

	1908	1963	% Alteration
Per square mile ...	15.9	15.3	− 3.77%
Per arable acre ...	1 nest per 7.6 acres	1 nest per 13.3 acres	−75.0%
Per woodland acre (Private 1905)	1 nest per 1.7 acres	1 nest per 1.6 acres	+ 5.9%

(b) Changes in Land Use (Woodland)

Acres under wood	1905 =	30,275 acres
Private (plus small woodland)	1963 =	27,350 acres
Forestry Commission woodland	1963 =	37,000 acres

Decrease of private woodland 2925 acres (−9.8%)

(c) Changes in land use (Agricultural)

Arable land	1909	=	133,732 acres	
Arable land	1963	=	225,289 acres	
Increase of arable land ...		=	91,557 acres	(+68.5%)
Rough grazing	1909	=	500,112 acres	
Rough grazing	1963	=	379,319 acres	
Decrease of rough grazing ...		=	120,793 acres	(−24.1%)

Tables II. and III. should be considered jointly. Table II. clearly shows the changes in rookery sizes from the large to the smaller unit, and this also is probably related to the amount of suitable woodland for breeding and the distribution and availability of the food supply. I would expect a decrease of 2925 acres of what could be considered more suitable woodland to have an effect on the distribution and density in different areas and therefore alter rookery size.

The decrease of rough grazing which is attributable to the increased acreage taken by the Forestry Commission is less important to rooks.

The increase of arable land is all to the good, but it is a question of considerable importance why, with an increase in what must constitute the main food supply, of 91,557 acres (68.5%) plus the vastly improved yield in grain crops over the period, that the population has failed to "increase" significantly. This present position of an increase in arable land, without having an increase in the total number of Rooks dependent on it, has led to a decrease in the density of nests per acre of 71.7%, which is certainly pleasing to anyone who maintains that Rooks are harmful to agriculture. I can find little evidence of any other factor that may have had any "real" effect on the failure to increase.

There is no evidence or indications that agricultural chemicals are having an effect on the breeding success of Rooks in Dumfriesshire. I am informed that 70% of Dumfriesshire Rookeries are still shot over, but that due to the increased price of cartridges, this pressure is less than formerly. It is extremely doubtful whether the shooting of young birds has ever had any controlling effect at all, since it requires only a very small percentage to attain adult age and breed, to maintain the desired numbers. It is unfortunate that people who shoot Rooks in the pretext of reducing their numbers have not yet realised that they are wasting their own time and money, as the juvenile mortality in the first winter is extremely high.

It has also been suggested that the greatly increased numbers of Woodpigeon (*Columba palumbus*) are now competing with the Rook for the available food and this is probably true to a certain extent.

The point I wish to underline is, that while I feel justified in including here these changes in habitat, and have given mention to other factors that may influence eventual numbers, before any worthwhile analysis could be made, a long-term population study with a very large number of marked individuals would have to be done, with special attention to age, dispersal, mortality and

adult replacement, and detailed observations of feeding habits. Until such data is available, it seems safer to suggest that the Rook is capable of extending its social behaviour to limiting its own numbers.

TABLE IV

A numbered alphabetical list of the Dumfriesshire Parishes as used in Table V.

(1) Annan.
(2) Applegarth and Sibbaldbie.
(3) Caerlaverock.
(4) Canonbie.
(5) Closeburn.
(6) Cummertrees.
(7) Dalton.
(8) Dornock.
(9) Dryfesdale.
(10) Dumfries.
(11) Dunscore.
(12) Durisdeer.
(13) Eskdalemuir.
(14) Ewes.
(15) Glencairn.
(16) Gretna.
(17) Half-Morton.
(18) Hoddam.
(19) Holywood.
(20) Hutton and Corrie.
(21) Johnstone.
(22) Keir.
(23) Kirkconnel.
(24) Kirkmahoe.
(25) Kirkmichael.
(26) Kirkpatrick-Fleming.
(27) Kirkpatrick-Juxta.
(28) Langholm.
(29) Lochmaben.
(30) Middlebie.
(31) Moffat.
(32) Morton.
(33) Mouswald.
(34) Penpont.
(35) Ruthwell.
(36) St. Mungo.
(37) Sanquhar.
(38) Tinwald.
(39) Torthorwald.
(40) Tundergarth.
(41) Tynron.
(42) Wamphray.
(43) Westerkirk.

TABLE V

Regional Distribution and Mean Size of Rookeries and Percentage Alteration, 1908-1963

Parish No.	No. Rookeries 1908-1963		Mean 1908	Mean 1963	Percentage Alteration 1908-1963	% Distribution of Nests 1963
1	3	5	356.6	85.8	− 75.6%	2.5%
2	4	9	318.5	123.7	− 61.2%	6.6%
3	2	3	75.0	45.0	− 40.0%	0.8%
4	2	7	6.5	47.3	+627.7%	1.9%
5	4	7	187.5	98.3	− 47.5%	4.1%
6	6	2	162.6	298.5	+ 83.5%	3.5%
7	3	3	398.3	266.3	− 33.2%	4.7%
8	2	3	165.0	31.7	− 80.8%	0.6%
9	3	8	76.7	79.5	+ 3.7%	3.8%
10	4	4	60.7	53.5	− 11.8%	1.3%
11	5	5	226.0	259.6	+ 14.9%	7.7%
12	0	7	0.0	105.9	—	4.4%
13	0	3	0.0	22.3	—	0.4%
14	1	0	12.0	—	—	—
15	6	3	47.0	103.0	+119.2%	1.8%
16	2	9	35.0	32.6	− 6.9%	1.7%
17	0	0	—	—	—	—
18	9	7	93.3	119.9	+ 28.5%	5.0%
19	4	12	181.2	78.1	− 56.9%	5.5%
20	5	3	64.4	198.0	+208.4%	3.5%
21	0	2	0.0	111.0	—	1.3%
22	1	1	130.0	98.0	− 24.6%	0.6%
23	0	3	0.0	119.7	—	3.5%
24	4	2	183.7	156.0	− 15.1%	1.8%
25	1	8	150.0	93.4	− 37.8%	4.3%
26	8	5	220.8	65.6	− 70.4%	1.9%
27	0	8	0.0	32.6	—	1.5%
28	4	3	68.7	29.0	− 57.8%	0.5%
29	3	10	150.0	41.6	− 72.4%	2.5%
30	5	3	113.0	76.0	− 32.8%	1.4%
31	6	11	70.8	33.7	− 52.4%	2.2%
32	0	2	0.0	10.5	—	0.1%
33	3	0	69.6	0.0	—	—
34	0	0	0.0	0.0	—	—
35	5	5	123.0	29.8	− 75.7%	0.9%
36	1	5	200.0	61.2	− 69.4%	1.8%
37	2	3	262.5	115.0	− 56.3%	2.0%
38	2	11	270.0	101.1	− 62.5%	6.6%
39	0	3	0.0	45.7	+ 45.7%	0.8%
40	6	11	53.3	47.3	− 11.5%	3.1%
41	0	1	0.0	130.0	—	0.8%
42	4	3	120.0	146.7	+ 22.3%	2.6%
43	2	0	40.0	0.0	—	—

Table V is designed to show, that while the total population in 1963 has been shown to be at the 1908 level, large fluctuations and local movements have taken place.

Detailed List of Rookeries and Number of Nests

Parish and Place:	Nests in 1908	1921	1963
Annan:			
Mount Annan	1000	300	110
Greenbank	Some	20	0
The Moat	30	49	0
Fruids Park	40	20	0
Solway Cottage	0	20	0
Blacketlees	0	0	102
Annan West	0	0	83
Carsehill	0	0	119
Violet Bank	0	0	15
	1070	409	429
Applegarth:			
Jardine Hall	1020	900	237
Balgray	120	120	372
Hewke	64	100	77
Sibbaldbie	70	70	0
Hallhills	0	190	0
Lammonbie	0	120	28
Dinwoodie	0	60	119
Millhousebridge	0	0	85
Fourmerkland	0	0	46
Perchhall	0	0	13
Broadholm Parks	0	0	136
	1274	1560	1113
Caerlaverock:			
Wardlaw Hill	100	280	96
Hutton Hall	50	0	0
Conheath House	0	0	24
Caerlaverock Manse	0	0	7
	150	280	135
Canonbie:			
Crow Wood	Some	0	0
Irvine House	3	0	0
Auchanrivok Bank	10	0	0
Rowanburnfoot	—	—	40
Orchard Farm	—	—	20
Byreburn	—	—	120
Gilnockie	—	—	55
Canonbie	—	—	45
Torres Farm	—	—	41
Upper Murbie	—	—	10
	13	0	331

Parish and Place:	Nests in 1908	1921	1963
Closeburn:			
Castle Wood	350	280	0
Sheep Parks	150	100	0
Brattlesbelt	200	120	0
Sand River Belt	50	50	0
Park Wood	0	4	0
Hatchery Wood	0	0	84
Clauchrie Glen	0	0	70
Shawsmuir	0	0	131
Closeburn Manse	0	0	111
Closeburn Castle	0	0	57
Dessertland	0	0	131
Crichope Linn	0	0	104
	750	554	688
Cummertrees:			
Murraythwaite	220	0	0
Glenstuart	150	350	537
Cummertrees Station	50	0	0
Hoddam	200	0	0
Hoddam Castle	150	0	0
Forkhill	200	100	0
Charlesfield	0	0	60
	970	450	597
Dalton:			
Denbie House	95	95	93
Kirkwood	850	1020	613
Dormont	250	450	93
Braehill Bank	0	35	0
	1195	1600	799
Dornock:			
Robgill Tower	150	0	32
Stapleton	180	190	56
Wood Hall	0	0	7
	330	190	95
Dryfesdale:			
St. Michael's	80	70	0
Lockerbie Burgh	Some	0	26
Bishopcleuch	50	12	67
Underwood	100	100	0
Old Walls	0	150	269
Croftheads	0	300	0
Broadholm	0	0	74
Mainholm	0	0	41
Quaas	0	0	41
Dam Rookeries	0	0	49
Blackford	0	0	0
Peelhouses	0	0	69
	230	632	636

Parish and Place:	Nests in 1908	1921	1963
Dumfries:			
Castle Street	2	0	0
Dalscone Bank	40	0	0
Signpost Wood	60	24	0
Castledykes	141	36	0
Burgh	Some	90	0
Marchmount	0	0	15
Heathhall	0	0	61
Hannafield	0	0	26
Acre Glen	0	0	112
	243	150	214
Dunscore			
Dalgonar	175	250	683
Laggan	Some	0	0
Upper Linburn	40	0	0
Friars' Carse	850	450	351
Sundaywell	30	0	0
Greenhead	35	25	95
M'Cheynston	0	0	51
M'Murdoston	0	0	118
	1130	725	1298
Durisdeer:			
Castlehill	0	0	129
Gateslack Round	0	0	107
Gateslack Farm	0	0	26
Gateslack Cottage	0	0	185
Woodhouse Lea	0	0	177
Coshogle W.	0	0	7
Coshogle E.	0	0	110
	0	0	741
Eskdalemuir:			
Crurie	0	200	0
Manse	0	0	9
Lyneholm	0	0	47
Raeburnfoot	0	0	11
	0	200	67
Ewes:			
Sorbie	12	0	0
Unthank	Some	0	0
Mosspebble	Some	0	0
The Manse	Some	0	0
	12	0	0

Parish and Place:	Nests in 1908	1921	1963
Glencairn:			
Gaitloch	100	0	0
Barbuie	10	0	0
Dalwhat	1	0	0
Snade	100	125	0
Shancastle	11	0	0
Gilmerston	60	40	16
Stewarton	0	0	39
Dardarroch	0	0	254
	282	165	309
Gretna:			
East Scales	50	75	0
Scales Bank	20	10	0
Gretna Hall	Some	200	40
Gretna Green	0	0	14
Hills	0	0	63
Redkirk	0	0	20
Alison's Bank	0	0	6
Solway Lodge	0	0	8
Browhouse Road	0	0	14
Aitchison's Bank	0	0	98
Westhills	0	0	30
	70	285	293
Half-Morton:			
Half-Morton	0	0	0
Hoddam:			
Knockhill	250	300	93
Aitchison's Hill	30	0	0
Shortrigg	50	0	39
Crossfield	2	2	0
Kirkconnel Hall	150	150	0
Relief	100	100	0
Burnswark	150	100	181
Newfield	100	100	0
Hoddam Kirk	8	0	0
Hoddam Bridge	0	0	31
Ecclefechan N.	0	0	100
Ecclefechan E.	0	0	180
Burnfoot	0	0	215
	840	752	839

Parish and Place:	1908	Nests in 1921	1963
Holywood:			
Gribton	200	200	232
Broomrigg	Some	0	169
Cluden Bank	25	83	82
Portrack	250	350	202
Cowhill	250	250	51
Kilness	0	0	25
Stepford House	0	0	20
Holywood Station	0	0	33
Fourmerkland Tower	0	0	22
Cairnvale	0	0	18
Steilston	0	0	49
Nether Gribton	0	0	34
	725	883	937
Hutton and Corrie:			
Cowburn	40	106	0
Paddockhole	32	90	0
Shaw	200	350	151
Marygill	40	52	348
Upper Hutton	10	20	0
Balstack	0	27	0
Whiteknowe	0	80	0
Parkcleughfoot	0	0	95
	322	725	594
Johnstone:			
Panlands	0	0	22
Dykehead	0	0	200
	0	0	222
Keir:			
Barndennoch	130	0	0
Auchenage	0	0	98
	130	0	98
Kirkconnel:			
Gateside	0	7	194
Kelloside	0	0	27
Tower	0	0	378
	0	7	599
Kirkmahoe:			
Carnsalloch	200	0	0
Cullivate	170	240	107
Duncow	300	220	205
Castlehill	65	65	0
	735	525	312

Parish and Place:	1908	Nests in 1921	1963
Kirkmichael:			
Courance	Some	0	0
Kirkmichael Estate	100	196	0
Kirkmichael Glebe	0	50	0
The Barony	0	100	0
Dalfibble	0	0	13
Corses Cottages	0	0	35
Nethermill	0	0	40
Burrance of Courance	0	0	110
Gillrig	0	0	320
Townhead	0	0	92
Kirkland, I.	0	0	27
Kirkland, II.	0	0	110
	100	346	747
Kirkpatrick-Fleming:			
Broats House	50	0	0
Mossknowe	450	20	78
Wyseby	200	0	43
Hayfield	50	0	0
Grahamshill	90	50	144
Springkell	6	0	0
Woodhouse	900	200	0
Kirkpatrick House	20	60	0
Robgill	0	0	57
Hillhead	0	12	0
Workhope	0	0	6
	1766	342	328
Kirkpatrick-Juxta:			
Craigielands	0	0	59
Poldean	0	0	10
Skellywell	0	0	57
Beattock Manse	0	0	16
Harthope	0	0	22
Palaceknowe	0	0	29
Woodfoot	0	0	42
Marchbank Wood	0	0	26
	0	0	261
Langholm:			
Greenbank	100		15
Townhead Kirk	90	150	0
Erkinholm	20/30		32
Langholm Burgh	60	50	40
	275	**200**	**87**

Parish and Place:	Nests in 1908	1921	1963
Lochmaben:			
Broadchapel	100	100	0
Broomwood	200	100	0
Bruce's Castle	150	0	0
Thorniethwaite	Some	0	0
Corncockle	0	200	0
Millriggs	0	200	9
Old Spedlings	0	31	0
Millriggs Wood	6	0	140
Hunter House	0	0	14
Small Rigg	0	0	148
Kinnel Bridge	0	0	3
Priestdykes	0	0	9
Halleaths	0	0	16
Crocket Hill	0	0	31
Beebinklees	0	0	20
Todhillmuir	0	0	26
	450	631	416
Middlebie:			
Craigs	85	0	0
Waterbeck	Some	0	0
Burnfoot	100	80	20
Kirtle Water	80	0	0
Donkins Kirtle	Some	105	0
Eaglesfield	0	30	0
Torbeck Hill	150	200	65
Gilmartin	150	250	0
Blackwood House	Some	0	0
Kirtleton	0	0	143
	565	665	228
Moffat:			
Craigieburn Wood	200	465	30
Heathery Haugh	50	13	37
Archbank	34	38	0
Ballplay	40	0	4
Parish Kirk	75	15	0
Emu Villa	26	22	0
Laurencefield	Some	0	0
Drumcrieff	Some	0	0
Shortwood End	Some	0	0
Alton	0	78	0
Millmeadows	0	127	0
Bodesbeck	0	0	45
Craigbeck	0	0	17
Crofthead	0	0	37
Tankwood	0	0	10
Larch Hill	0	0	16
Penrose Hill	0	0	3
Ericstane	0	0	86
Torthorwald Wood	0	0	86
	425	758	371

Parish and Place:	Nests in 1908	1921	1963
Morton:			
Thornhill Station	0	0	18
Thornhill Village	0	0	3
	0	0	21
Mouswald:			
Brocklehirst	110	0	0
Manse	24	3	0
Beyond the Burn	75	300	0
	209	303	0
Penpont:			
Penpont	0	0	0
Ruthwell:			
The Manse	100	100	0
Summerfield Farm	125	108	0
Comlongon Castle	80	13	23
Nether Locharwoods	80	40	28
Peter's Plantation	230	0	0
Belridding Farm	0	9	0
Straggling Walk	0	50	0
Lovers' Plantation	0	0	75
Comlongon Castle Wood ...	0	0	20
Mid Locharwoods	0	0	3
	615	320	149
St. Mungo:			
Castle Milk	200	0	30
Haylaw	0	0	20
Norwood	0	0	25
Whitehill Rookeries	0	0	101
Murrayfield	0	0	130
	200	0	306
Sanquhar:			
Glengenny		33	0
Littlemark	400	170	169
Twentyshilling		100	0
The Manse	125	120	0
Blackaddie	0	40	64
Brandleys	0	0	112
	525	463	345

Parish and Place :	Nests in 1908	1921	1963
Tinwald:			
Amisfield	Some	150	156
Dalruscan	140	90	0
Carse Glen	400	280	0
Glenae	Some	0	42
Tinwald House	0	0	157
Robertland	0	0	22
Hazelrigg	0	0	67
The Slacks	0	0	146
Pinnacle	0	0	47
Bankhead Glen	0	0	30
Amisfield Tower	0	0	203
Tinwald House	0	0	190
Hunter House	0	0	53
	540	520	1113
Torthorwald:			
Manse	Some	0	0
Redhills	0	0	12
Barluith	0	0	75
Linns	0	0	50
	0	0	137
Tundergarth:			
Whitstonhill	50	130	0
Wylie Hole	50	80	77
Pearsby Hall	100	140	100
Burnheadwood	10	0	33
Grange	50	125	0
North Burn	Some	0	20
West Wood	60	0	0
Dixons	0	54	0
Cudscroft	0	250	0
Whitsunhill	0	0	25
Crowthat	0	0	37
Scroggs	0	0	11
Tundergarth Mains	0	0	90
Raggiewhate	0	0	32
Tinnhall	0	0	80
Chapelfoot	0	0	15
	320	779	520
Tynron:			
McQueston	0	0	130

Parish and Place:	1908	Nests in 1921	1963
Wamphray:			
Milnehouse	300	125	0
Near Station	10	0	0
Girthhead	150	150	158
Shawwood, Fingland	20	49	0
Wamphray Church	0	0	125
Wamphray Glen	0	0	157
	480	324	440
Westerkirk:			
Westerhall	Some	0	0
Douglan Burn	Some	0	0
Burnfoot	50	0	0
Kemra Bank	30	0	0
Glendinning	0	8/10	0
	80	8/10	0

Samples by Young, in 1964, 1965, and 1966, calculated for the county on a percentage of change, have indicated a total number of nests as:—

1964 — 18,200 nests restricted to 13 rookeries in 3 parishes.
1965 — 17,600 nests, restricted to 46 rookeries in 10 parishes.
1966 — 17,000 nests, restricted to 46 rookeries in 10 parishes.

THE GRIERSON COLLECTION, THORNHILL, AND ITS DISPERSAL

By A. E. TRUCKELL, M.A., F.M.A., F.S.A., Scot.

Dr. Thomas Boyle Grierson, born at 101 Irish Street, Dumfries, on the 19th February, 1818, was the son and grandson of Dumfries merchants of Penpont origin (his father left an important MS. diary for the years 1794-1809): he was educated at Dumfries Academy and later at Penpont School, his father having bought Grovehill there and leased Boatford nearby. He took his Doctor's degree at Edinburgh University and set up practice in Thornhill in 1842, moving shortly thereafter to Moniaive but returning after two years or so to Thornhill in response to a signed appeal from many Thornhill residents. He lived first in New Street, then bought a house in Drumlanrig Street, and it was in a ground floor room of this that, probably about 1852, the Museum first took shape, being used from the first as a teaching centre for young people —particularly farm lads and apprentices: Joseph Thompson, the future explorer of East Africa, had his interests aroused as a member of this group. The Doctor also founded in 1850 a very vigorous "Thornhill Institute" to which talks on a variety of subjects were given by many distinguished speakers and the Doctor himself. He was a co-founder and for a time President of our own Society.

Doctor Grierson received a grant from the Duke of Buccleuch of land at the end of New Street, and a Museum building and house took shape there, being begun in 1869 and opened to the public in 1872.

The Doctor was a man of keen intelligence and omnivorous interests, and had an exceptionally attractive character: he was a warm friend and correspondent of many famous 19th-century scholars, scientists and travellers: thus his Museum of 4,000-odd catalogued specimens (and many more) and Library of 3,000-odd books contained much of real importance as well as reflecting a remarkable and unusual personality. Left, with inadequate funds, to a Trust on his death late in 1889, it languished for many years: finally the Department of Education for Scotland held a local Enquiry and drew up a Scheme which on 24th June, 1965, became an Order in Council, under which a Committee of the Dumfriesshire Educational Trust was to disband the collection, giving first choice to local institutions.

As the collection has now been dispersed, and as a good deal of the material is either recorded as being "at Thornhill," or has received insufficient attention, the table which follows gives some of the more important items and their present locations. All items listed as "local" are from the Society's three counties—Dumfries, Kirkcudbright and Wigtown—and have been transferred to Dumfries Museum except where otherwise stated: present locations are given for non-local items. The table relates only to material in public institutions

and not to articles—mainly in the recent and ethnographic brackets, and books —disposed of to dealers.

MINERALS

Local

A good representation of **WANLOCKHEAD** minerals: antimony from **GLENDINNING** and **THE KNIPES,** hæmatite from **AUCHENCAIRN**: amethyst from **BORELAND,** among local sites.

Non-local

British, Continental, American, African, Asiatic and Australian minerals are well represented and have been retained as a teaching collection at Dumfries.

Notable geologists who contributed to the geological collection include Geikie, Hugh Miller, Plant, and, locally, Patrick Dudgeon, Dr. Gilchrist and Dr. Wilson of Wanlockhead.

PALÆONTOLOGICAL

Local

Ordovician and Silurian. Several fine large "tuning-fork" Graptolites from **WANLOCKHEAD.**

Carboniferous. A large and important representation, mainly marine fossils, from **CLOSEBURN** limestone quarry: large Nautiloids, large and very complete Orthocerids, and large Productids, are especially prominent. There are a few very fine fern impressions and plant stems. While most of this group is at Dumfries small selections went to the Royal Scottish Museum, Edinburgh University, the Hunterian Museum and Glasgow City Museum.

There is also a good representation of fern impressions and plant stems from the **SANQUHAR** and **KIRKCONNEL** coal measures.

Permian. A set of footprints from Annandale, probably **CORNCOCKLE** Quarry, and a set of footprints of "Herpetichnus Loxodactylus" from **LOCHARBRIGGS.** (See Article p. 14 supra.)

Non-local

The very large collection of English, European and American fossils has been retained at Dumfries as a teaching collection. There is a particularly strong group of Barrow Lias specimens.

Structural Geology. This small group has been retained at Dumfries. It includes local and foreign material.

BOTANY

The Herbarium collection was much decayed but a considerable amount remained in good condition: this has been rearranged, and contains a proportion of local specimens.

ARCHÆOLOGY

Local

Mesolithic. Large End-Scraper, **LUCE SANDS.**

Neolithic

Scrapers, **LUCE SANDS.**

Saws, **LUCE SANDS.**

Two bi-triangular Arrowheads, **LUCE SANDS.**

Pitchstone Blades, **LUCE SANDS.**

Polished Stone Axes: **DALBEATTIE, BARNDENNOCH** (Keir), **BALTERSAN, TERREGLES, BARHILL** (Keir), **INGLESTON RIGG, CARSON'S PARK** (Auchenhessnane), **BYREHOLM** (Keir), **DURISDEER,** and **DUMFRIES.**

Hammer-stone and anvil-stone, **LUCE SANDS.**

Bronze Age

Arrowheads:

Tanged flint, **LUCE SANDS.**

Barbed and tanged, **LUCE SANDS; STANDING BRAE,** Farding, Keir; **POLSKEOCH,** Penpont; **BARNDENNOCH,** Keir (chert); **TOWNHEAD,** Closeburn.

Plano-convex flint knife from cist in cairn at Barndennoch (Keir).

Large Perforated Axe-Hammers:

GLASSERTON, Wigtownshire; **AUCHENAGE** (Keir), **KIRKPATRICK-DURHAM, KEIR MILL, OLD GAITSLACK, BALTERSAN** (Holywood), **PARK OF CLOSEBURN, HOLYWOOD, HIGH KILROY, GREENHEAD** (Closeburn), **BLACKPARK, WHITEHALL** (Kirkmahoe).

Small neat axe-hammer in igneous stone from a cairn at **TYNRON.**

Partly perforated small pink quartzite hammer from **FAIRHOLM,** Lockerbie.

Small deep perforated hammer from **BALAGGAN** (Durisdeer).

Flattened hammer with very small perforation, local.

Small deep perforated hammer from **COSHOGLE,** Durisdeer.

Maceheads:

TINWALD (quartzite, beautifully made); **DALGARNOCK,** Old Churchyard.

Carved Quartzite Ball, **CREE MOSS.**

Bronzes:

Chisel-like small Axe with slight flanges, **RAEBURN BOG,** Eskdalemuir.[2]

Flanged Axes from **KIRKLESS,** Durisdeer; **TOWNSFOOT LOCH,** Closeburn; **PARK OF CLOSEBURN.**[2]

Socketed Axe, **AUCHENCAIRN HILL,** Closeburn.[2]

Spearhead, leaf-shaped, almost 13 inches long, **SPRINGFIELD,** Dunscore.[2]

Spearhead, five inches long, with two loops standing out from the socket on either side, from **SPEARFORD BRIDGE,** Crossmichael.[2]

Spearhead, incomplete, five and a half ins. long, with a loop on each side of the socket, found at **BOWHOUSE,** Caerlaverock.[2]

Spearhead, leaf-shaped, incomplete, with loops, **TINWALD** parish.[2]

Bronze Ring 2¼ inches in diameter, found with above.[2]

Three Rapier blades from hoard found at **DRUMCOLTRAN,** Kirkgunzeon, abt. 1840.[2]

Pottery:

Piece of Food Vessel from Society's excavation of a cairn at **NEWBY,** near Annan, in 1864.[1]

Iron Age

Ring of mottled claystone, **HOLSTANE,** Durisdeer.

Jet Ring one and three-eighths inches external diameter, **LOCHAR MOSS.**

Melon bead in green vitreous paste, **BAITFORD,** Penpont.

Ring-bead of brownish-yellow glass, **BLACKWOOD,** Keir.

Unfinished stone ring, **HOLSTANE,** Durisdeer.

Small Whetstone from beside Sanquhar Crannog site.

Hammerstone, crannog in Craigenveoch Loch, Wigtownshire.

Roman

Bronze Patera from road-post in mouth of Well Path above Durisdeer—it was found in the ditch beside the fortlet gate.[3]

Ballista Ball from Burnswark—presented to Dr Grierson many years before the 1898 excavation.

Dark Ages

Large melon-shaped glass bead with blue, red and white ornament—local but no site named.

Stone Mould for casting something like a wide-toothed comb, **ENTERKINFOOT.**

Late Anglian Cross, **CLOSEBURN**—10th cent.[4]

Late Anglian Cross, **DURISDEER** Churchyard—10th cent.[4]

Late Anglian Cross, **GLENCAIRN** Church—10th cent.[4]

Interlace-work Headstone, 11th cent., **PENPONT.**[4]

Headstone, triquetrae, 11th cent., **PENPONT.**[4]

Mediæval

Tripod Ewer, brass, with animal-head spout, from moss at **BEUCHAN,** Keir.

Tripod Pot, brass, ornamented with raised chevron band: two lugs: from peat-moss at **APPIN,** Tynron.

Tripod Pot, brass, from peat-moss at **DRUMBUIE,** Kells.

Dagger from field next to **TIBBERS** Castle—13th-14th century.

Small piece of Chain Mail from Kinnel Water near Moffat.

Green-glazed Tiles from **MORTON** Castle.

Green-glazed pottery, etc., Crannog in Friars' Carse Loch.

Small 13th-14th century grave-cover bearing a dagger, unprovenanced but probably from **WOODHEAD,** Penpont.

Large quern-stone with cross in relief.

Ornamented bronze bell for harness, found in Roman fort field at **BANKHEAD,** Dalswinton.

Key, **KIRKCUDBRIGHT** Castle.

Key, **PENPONT** Church.

Key, site of **DUMGREE** Church, Annandale.

Coffin Handle, **LOCHMABEN CASTLE.**

Coffin Handle, **DUNDRENNAN ABBEY.**

Forked Bronze object, **HOLYWOOD** Churchyard.

Coins found in Mid-Nithsdale, and presumably part of the several large hoards found there over the past century and a half—17Edward Sterlings, Richard III Groat and sterling, Alexander III Sterling, James IV silver Plack, Billon Plack, James IV or V, Q. Elizabeth Shilling.

Wooden Spades, found in peat at Closeburn and at **MERKLAND,** Dunscore.

Spindle-Whorls (see Addenda Antiquaria, p. 149 infra): **DURISDEER** (3), Local but no precise find-spots (14), **GLENCAIRN** (2), **BLACKWOOD** (1), **KIRKCONNEL** (2), **GLENGAP,** Sanquhar; **CLOSEBURN** (2), **ENOCH,** Durisdeer: **DURISDEER** Churchyard: **COSHOGLE,** Durisdeer (2): **ALLANTON** Mill, Dunscore: **BARNHILL,** near Dumfries: **DRUM,** Morton: **LANDS,** Tynron: **NEWABBEY** parish: **FINGLAND,** Dalry: one "found under the hearthstone of an old house in Galloway": one from **STEPENDS,** Penpont: one from **KIRKGUNZEON** parish: one from **KIRKCONNEL** parish: one from **DRUMCRUIL,** Durisdeer, and one from **CORSOCK.**

Small collection of Dumfries 16th-century documents.

Heavy domestic axe-head, local.

Recent

Three carved oak panels, local, early 17th cent.

Piece of carved oak Pulpit of Glencairn Church bearing date 1607.

Piece of Chest broken up in Closeburn and bearing date 1606.

Richly-ornamented collecting-box, 17th cent.: bears intricate pattern of rosettes and swags and much stamped ornament.

Large collection of locally made or found 18th and early 19th century material in the field of agricultural and craft and domestic implements, dress, crockery and the like, including two attractive wooden spice or snuff mills, one of them from Annandale, wrought-iron brackets for holy-water stoups from local churches, and a tally-stick giving a reckoning of the hill drains on Glenmaddie, Sanquhar.

Non-local

Zoology

Royal Scottish Museum, Edinburgh University, Zoology Dept. of Glasgow University: mainly skeletal material.

Ethnographic and foreign archæological material

Royal Scottish Museum, Glasgow City Museum, Durham University and Leicester University, the latter receiving some Danish archæological material —a flint dagger from North Oland and a flint axe from Angeln. The ethnographic collection was of good early material and world-wide in its scope: in addition to recent material, North American archæology was strongly represented. Dumfries has retained for teaching purposes the Egyptian, Assyrian, and some of the Central and South American material, several pieces of a fine late-classical lead sarcophagus (see Article p. 80 infra) and a selection of the 18th and early 19th century ethnographic material.

British Archæology

Neolithic

Polished Stone Axe, Strathdon—Aberdeen City Museum.

Axes from **BORLAND** Smithy, Old Cumnock, and from **DRUMBOWIE,** Ochiltree, both in Ayrshire—Glasgow City Museum.

Axe, Shetland—Shetland Museum.

Leaf-arrowhead, Banffshire—National Museum of Antiquities.

Bronze Age

Barbed tanged arrowhead in cherty flint, and a flake showing secondary working, both from Strathdon—Aberdeen City Museum.

Barbed tanged arrowhead, Inveraray, Aberdeenshire—Aberdeen City Museum.

Barbed tanged arrowhead, Banffshire—National Museum of Antiquities.

Flint Dagger, Glenochar, on the Portrail (or Potrail) Burn, Crawford Moor—National Museum of Antiquities.

Bronze Leaf-sword from Doonally, near Gort, Galway—National Museum of Ireland, Dublin.

Cinerary Urn fragments, **BORLAND,** Old Cumnock—Glasgow City Museum.

Urn fragment, **CARLIN HILL,** Coylton—Glasgow City Museum.

Urn fragments from estate of **STIRLING** in Stirlingshire—Stirling Museum.

Iron Age

Blue glass Melon Bead, Castle Newe—National Museum of Antiquities.

Quartzite Pebble from underground house, Castle Newe—National Museum of Antiquities.

Triangular bead of white vitreous paste inlaid on the surface with yellow enamelled spirals from Strathdon—Aberdeen City Museum.

Mediæval

Tripod Brass Pot from **FELL BOG,** Wintercleuch, Lanarkshire—Glasgow City Museum.

Spindle-whorls not relating to Dumfries and Galloway have gone to their local Museums.

Recent

The National Museum of Antiquities and Glasgow Museum have taken a selection of 19th century industrial and craft material: the Royal Scottish Museum have taken a selection showing 19th century uses of natural history material.

LIBRARY

Local books from the Library have been divided between Dumfries County Library and Dumfries Museum: other books have gone to libraries over most of Scotland — the law books, for instance, to the law department of Queen's College, Dundee — and to dealers.

A good deal of material not of interest to Museums, mainly in the Recent and Ethnography sections, was disposed of to dealers.

The purpose of the Doctor's museum was strongly didactic: from the beginning he used it as a teaching centre, with a lively group of young people being stimulated to do research in, or based on, his Museum. In addition to the Thornhill Institute, founded by him in 1850, and very closely linked with the Museum and its library (which functioned as a lending library), school visits were frequent and made a great impression on the children. He had reduced-fee or free days for children — on one of these, 1st January, 1863, he held a competition among the large number of boy and girl visitors as to who could give the longest and most accurate list of objects in the Museum: the winner, John Williamson, named 170 items. His displays relating to particular industries — building, foundry-working, textiles, telegraphy, printing, glassmaking, candle-making — even false-teeth making — and his very large collection of plant raw materials and the textiles, food, drugs, etc., made from them, were without parallel at this date: every art and science and every important human culture was represented in his collection: his Library was even more closely a teaching instrument, covering an astonishing range of subjects, with religion and the sciences most strongly represented: it was kept up to date: the latest volume of popular science lectures would be on the shelves — often with a warm presentation note from the author — as soon as it came out: several learned journals were regularly taken.

All this was largely financed by his medical skill—he was a very popular doctor, having patients well outside the mid-Nithsdale area—and his personal frugality: Laing Waugh, in "Thornhill and its worthies" remembers how he, as a boy, spent a hard Christmas Day forenoon helping the Doctor rearrange the library, and was hoping for a share in the Christmas dinner: but the Doctor and the Doctor's Mary (Mary Ferguson, his housekeeper from 1858) dined on a cup of tea each and a finnan haddock between them!

The Doctor's interest in education led to his seeking election to Morton Parish School Board, on which he served for several triennial terms, being Chairman for one of these. In politics he was a Liberal: in Church affairs (though he seems to have been interested in all the major religions and every

Christian sect, including an early edition of the Book of Mormon in his library) he was a Free Church supporter, being a member of Virginhall Church.

So much for the official man: but there was a very great deal more to the Doctor than that. One typical find during the clearing of the Museum, among the boxes and drawers of cuttings, letters, and miscellaneous scraps, was a sheaf of testimonials, from many distinguished men, dating to his medical student days in the late 1830's: all, without exception, while emphasising his merits as a student, pointed out his remarkably warm, friendly personality, and all hinted at the childlike quality in him.

He was on terms of close friendship with an astonishing number of famous 19th-century scholars, scientists and travellers (as previously mentioned) and was a member of many learned societies: for most of his adult life he attended the meetings of the British Association every year; besides which many of his friends came to visit him at Thornhill: there is a photograph of Mrs Hugh Miller in the Thornhill Museum garden, and the visitors' book contains many famous names.

He was a man of exceptionally high intelligence—probably in the genius range—but had never lost his childish curiosity and spread his energies far too widely: he was avidly interested in everything: religious doctrine, ethnography, botany, archæology, the physical sciences, art, literature (when he appeared in print, the printers tactfully altered his spelling: he, like his father before him, practised a highly erratic free spelling, and was an early member of Isaac Pitman's Phonetic Society): he had a strong hankering towards physiognomy and phrenology and a sneaking interest in the supernatural: he was a surprisingly good artist—Laing Waugh records that when the Waughs moved into the Doctor's former house they found the room doors gaudily painted with scenes of disaster—earthquake, war plague and famine, all in the Doctor's unmistakable style: fortunately, quite a few of his paintings have survived, from the large number in the Museum—mainly copies of prints plus a painting of his pet monkey and a very good pencil sketch of a kitten monstrosity. He was a highly emotional man, and was much affected by any mischance to his friends: an "essay" of his on Hugh Miller's suicide, written in a kind of free verse, in his bold hand and erratic spelling, still has a powerful impact.

Though an apostle of science—he pasted portraits of famous men of science all over the woodwork of several of his cases—chaos reigned in his Museum—it was said that only he and Mary knew where everything was. Dr George Black of the National Museum of Antiquities, reorganising the collection in 1894 five years after the Doctor's death, managed while systematising the display, to retain a good deal of the original very individual impact. Plate III shows something of the effect the display gave until its dispersal—a gasp of surprise at the unbelievable agglomeration was the usual reaction of the modern scholar or museologist, even though warned in advance: and most of it was very good stuff.

Despite this chaos his MS. Catalogue, beautifully illustrated with his own drawings of the objects, is a model of its kind: he gives in full all the information he can gather on each object, giving variant versions if his sources differ, obviously taking great care for accuracy and fullness: and it shows how from the first he carefully collected things just going out in the countryside, and things still in use, knowing their future importance: Laing Waugh records that very often he took small items of interest from cottagers in lieu of payment in cash for his services, and thus saved things which would have disappeared —the folk-material element in his collection is a very important one.

There was a good deal of "Griersoniana" in the collection—personal books, his midwifery diary, his instruments, photographs, his excellent medical library—and this is now at Dumfries Museum, with his paintings, drawings, some of his writings, a book of coloured posters of his many public talks, the minute book of the Thornhill Institute, many scrapbooks and boxes of cuttings and notes, and so on—a monument to a remarkable man, who in his life-time was regarded with affection and pride in his home area, and with respect in the world of learning.

1 Sir William Jardine, TDGNHAS, first series, vol. II., p. 12, and vol. III, p. 11. Dr Derek Simpson, TDGNHAS, vol. XLII., pp. 25-50.
2 Dr John Coles, TDGNHAS, vol. XLII., pp. 61-98.
3 J. Curle, PSAS, vol. LXVI., p. 370.
4 W. G. Collingwood, TDGNHAS, vol. XII., pp. 46-62. Dr R. Cramp, TDGNHAS, vol. XXXVIII., pp. 9-20.

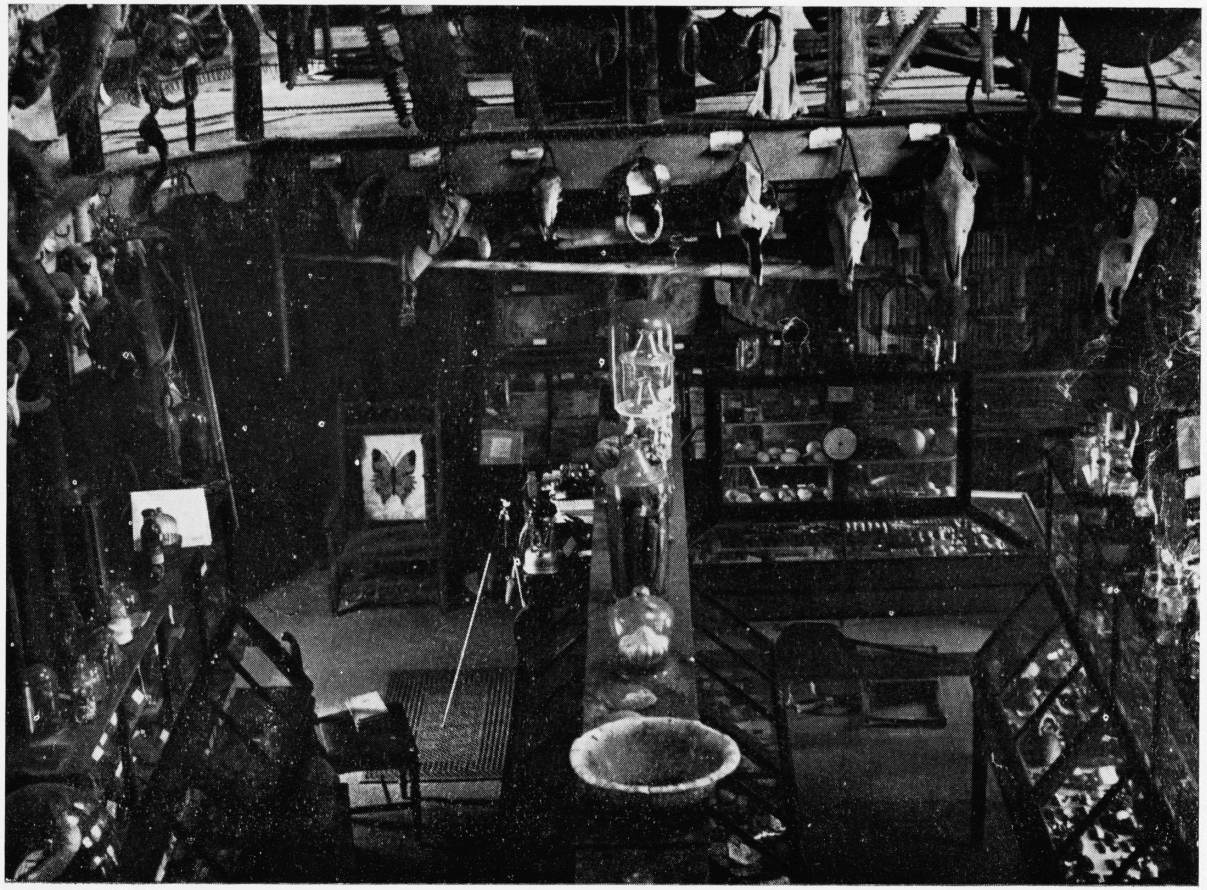

Plate III.: The Grierson Museum, Thornhill, in 1965. "A gasp of surprise at the unbelievable agglomeration was the usual reaction of the modern scholar . . . ."

[Photo: J. Williams.

EXCAVATIONS AT McNAUGHTON'S FORT, KIRKCUDBRIGHT

By J. SCOTT-ELLIOT, D. D. A. SIMPSON and J. M. COLES

The site and its setting (fig. 1)

The site lies six miles north-west of Dumfries at a height of 400 ft. above sea level overlooking the valley of the Old Water (Nat. Grid Ref. NX873778). Before excavation the site presented the appearance of a roughly circular area 56 ft. in diameter enclosed by a rampart and external ditch with traces of a counterscarp bank on the west. It was only in this latter area that the earthwork was at all well preserved, the bank standing to a height of 3 ft. The ground slopes steeply away from the site on the north and east and this has the effect of exaggerating the height of the monument. On the north, the earthworks had been truncated by the construction of a stone dyke beyond which was an area of marshy ground. On the east, traces of the ditch were visible and also a causewayed entrance. The rampart was clearly visible on the southern sector but the ditch in this area had been filled up to ground level although its presence was confirmed by a magnetometer survey. No surface features were visible in the level interior which had been cultivated from time to time. The site is briefly mentioned in the Royal Commission volume for Kirkcudbrightshire (No. 319) and an imprecise reference exists to the discovery in the ditch of a number of bronze (?) spearheads with gold binding on the sockets, arrowheads and other worked flints (*PSAS,* XXVII, 1892-3, p. 112).

A somewhat similar association between Bronze Age material and an earthwork appears to have existed at Drumcoltran (*RCAHM, Kirkcudbright* No. 280) and more recently Late Neolithic material has been found apparently associated with a palisaded enclosure at Beckton, Lockerbie (*TDGNHAS,* XLI, 1964, p. 111ff). The excavations at McNaughton's fort were therefore undertaken in the hope that further material could be found to determine the precise relationship between these earlier finds and the earthwork and also to throw light on the actual structure of the latter. The work took place in April and again in July and August 1965, when the rampart was sectioned and the entrance causeway and an area of the interior examined.

The magnetic survey

A magnetic survey of the interior of the fort and of an area outside the rampart was made in April 1965, using a proton magnetometer. The method is based on the theory that the magnetism of a buried archæological feature may differ sufficiently from that of the surrounding undisturbed subsoil so that the intensity of the magnetic field just above the surface is altered. The proton magnetometer detects and measures this alteration. Strongly magnetic structures such as pottery kilns and hearths are easy to detect because of the thermo-

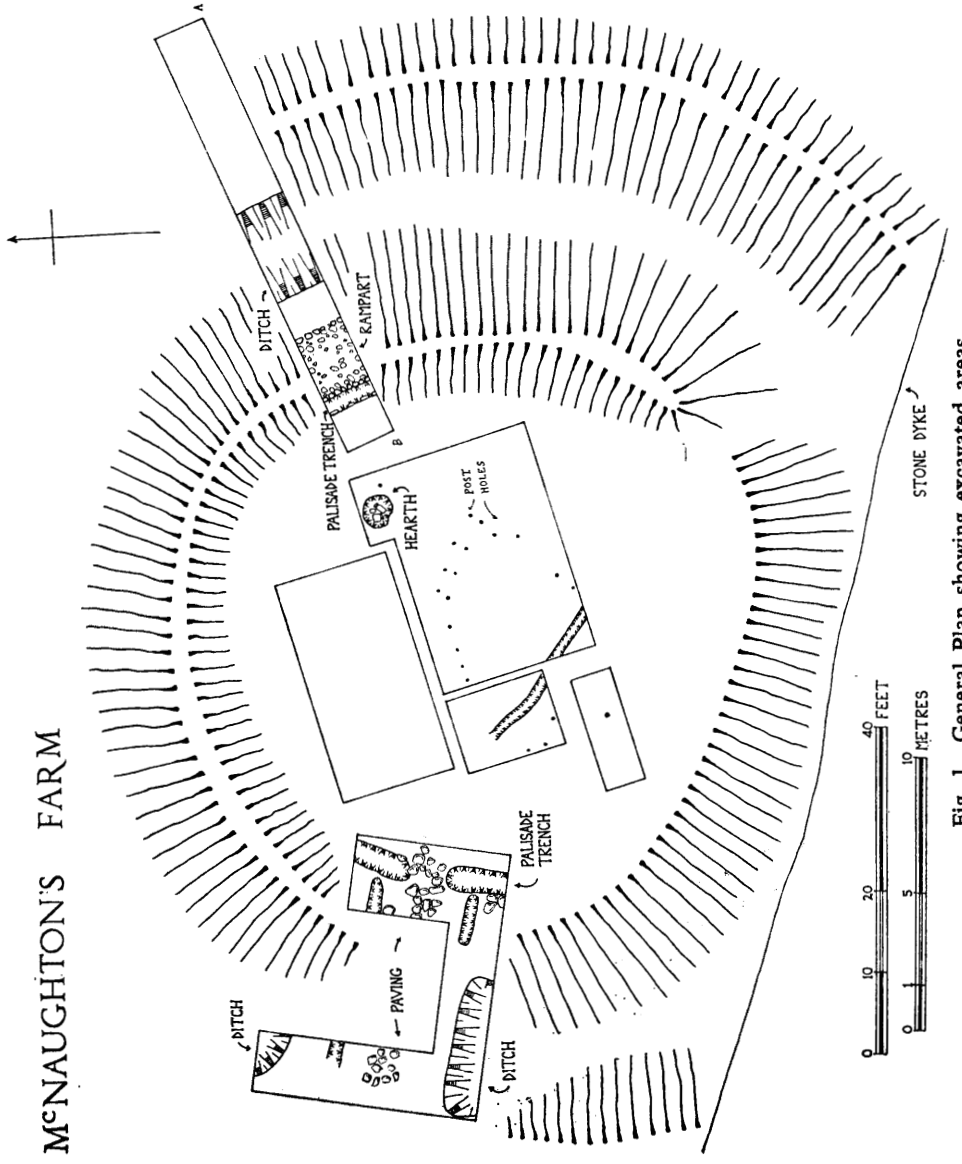

Fig. 1 General Plan showing excavated areas.

remnant magnetism in the iron oxides of the clay. Pits and trenches are also detectable because of their higher humus content; this humus also allows iron oxides to form a more magnetic field. At McNaughton's, the detector bottle was carried at a height of one foot above the ground, and readings were taken at five foot intervals over a measured grid, providing 121 readings in the 50 foot square which covered most of the interior of the fort. Only one major anomaly was detected, covering an area some 8 feet in diameter; this proved to be a hearth. The post holes subsequently found by excavation were not detected by the magnetometer. The existence of a ditch outside the rampart on the north side was indicated by a magnetometer traverse.

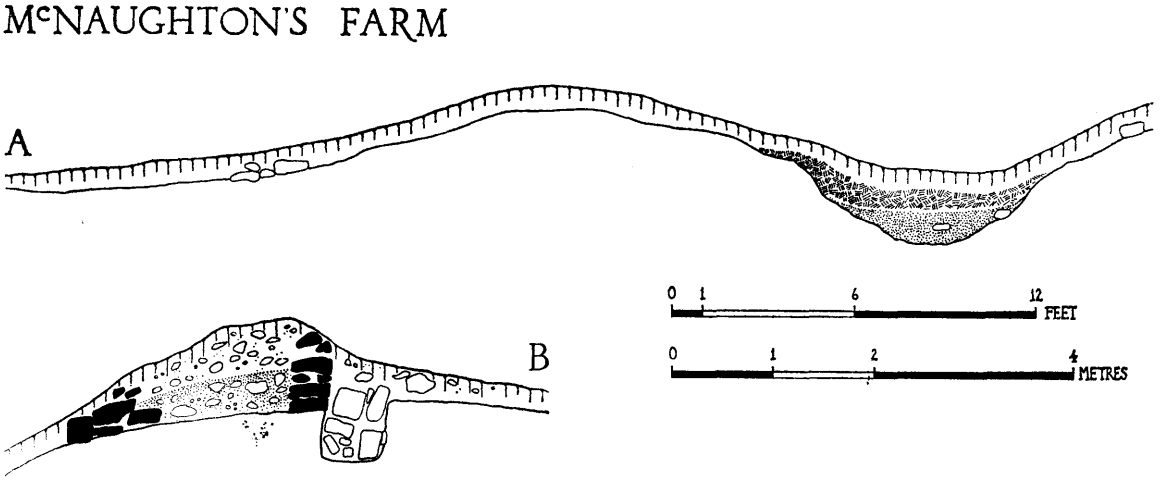

Fig 2 Rampart section.

The rampart (fig. 2)

A single cutting, 56 ft. long and 5 ft. wide, was laid out across the rampart and ditch. The rampart, which had a maximum height of 3 ft., was composed largely of boulders intermixed with material excavated from the ditch. It was supported on its inner face by a stone revetment surviving to a height of three courses, 2 ft. Immediately behind this inner stone face was a palisade trench 2 ft. wide and 3 ft. 3 in. deep, filled with packing stones. No individual post holes could be detected within this trench (except at the entrance—see below) and it must be assumed that it supported a continuous series of close set timbers. In the soft earthy fill were found fragments of burnt bone and a quantity of carbonised wood. A sample of the latter submitted to the Faculty of Science, Gakushuin University, Tokyo, for radiocarbon determination produced a date of 280 + 100 B.C. (GaK 808). That this palisade trench was in fact contemporary with the rampart rather than representing the remains of a pre-earthwork phase, as has been noted at other sites in southern Scotland (e.g. Hownam Rings, Roxb.

PSAS, LXXXII, 1950, p. 193 ff.), was indicated by the fact that the inner stone revetment was flush with the outer edge of the trench. The outer edge of the rampart was defined by a single course of rounded boulders which might represent a toe for the rampart bank or the surviving bottom course of a dry revetment wall similar to that on the inner face (Pl. IV). From this outer stone face the ground sloped steeply to the floor of the ditch and lying on this face were a number of large stone slabs—possibly collapsed revetment material. The flat-bottomed ditch had been dug 3 ft. into the glacial till, the present water table being 1 ft. above its floor. Lying on the undisturbed subsoil 3 ft. inside the area defined by the bank and palisade trench was found a worked flint.

The entrance (Fig. 1; Pl. V)

The entrance consisted of a causeway 19 ft. 6 in. wide between the simple rounded ends of the ditch on which had been laid large slab like boulders providing a paved way into the interior of the site. At the edge of this paving was found a waterworn pebble which had been utilised as a pounder and rubber; a second smaller polishing stone was found in this same area. The sides of the rampart flanking this paved entrance were revetted with timbers set in a small palisade trench 6 ft. 6 in. long and 2 ft. 3 in. deep. This small palisade trench was separated by some 3 in. of undug soil from the larger revetment trench at the back of the rampart. On the south of the causeway the small palisade trench corresponded with the width of the rampart. That on the opposite side of the causeway began at its inner end at the same point but was produced outwards almost to the outer edge of the main ditch—a distance of 23 ft. The main palisade trench in the entrance area extended some 4 ft. beyond the ends of the rampart to provide an entrance gap 4 ft. wide at the inner end of the causeway into the site. The paving of the causeway extended approximately 3 ft. beyond this gap in the palisade trench into the interior.

The interior (Fig. 1)

About one-third of the interior was stripped. The topsoil varied in depth from 7-12 in. The western portion of the interior had a quantity of made-up material consisting of stones and yellow soil, presumably to provide a horizontal living surface. Ploughing appeared to have disturbed the topsoil to a depth of 7 in. A number of post holes 7-11 in. in diameter and cut 6-11 in. into the subsoil were located in the excavated area. These post holes appeared to make no recognisable pattern. Further slight hollows 5 in. or less in depth could have been stone holes or ploughed out post holes. In the south-west corner of the excavated area was a palisade trench or drain 12 in. wide and 6-8 in. deep. The trench ran roughly North-west - South-east; only the North-west end was located within the cutting. The only other feature was a hearth in a shallow scoop 4 ft. square and 1 ft. deep. In the hollow were a number of flat stones 1 ft. by 1 ft. 5 in. with a series of upright slabs on the north. Beneath the stones was

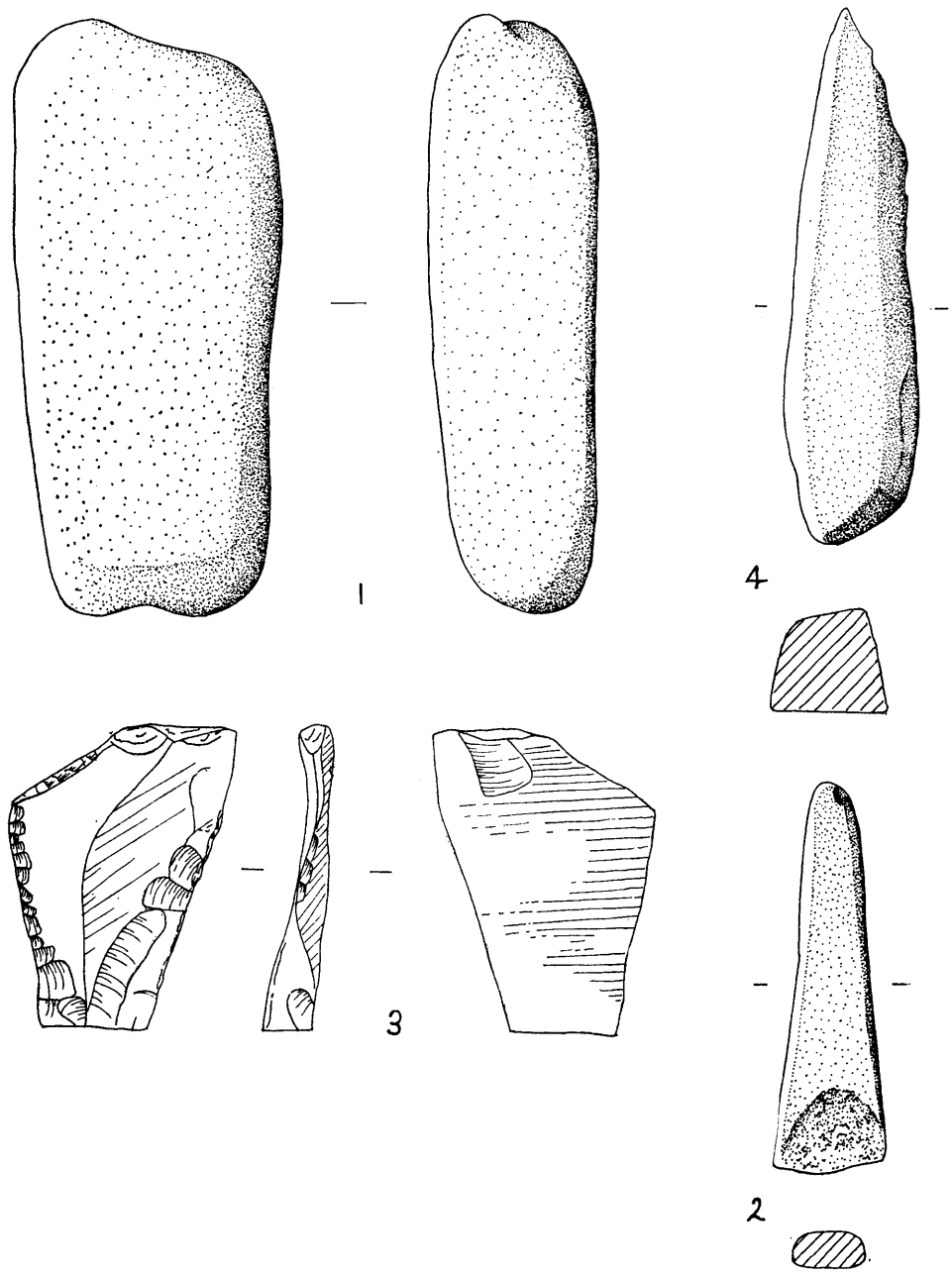

Fig. 3 Small Finds: No. 3 nat. size; remainder ½.

a deposit of black ash and black stained earth to a depth of 8 in. Near the top of the ash layer was found a small quantity of animal bones. Among the stones of the hearth was a whetstone set on one end in the ash.

Finds (Fig. 3)

Stone rubber (Fig. 3, 4); length 5.6 in., maximum width 1.1 in. The stone bears traces of use as a grinder on both broad axial faces. South end of palisade trench in the interior of the site.

Stone rubber (Fig. 3, 1); length 6.2 in.; maximum width 2.9 in. The object bears traces of polishing on one broad axial face. In small internal palisade trench.

Stone rubber (Fig. 3, 2). Length 6 in.; maximum width 0.9 in. Traces of use as a polisher on all four axial faces and at one end. Set upright among the hearth stones.

Stone rubber and pounder (Pl. VI). Length 5.8 in.; maximum width 2.5 in. Traces of polishing on one side and abrasions at both ends. From the south side of the paving in the entrance causeway.

Flint knife (Fig. 3, 3). Length 1.6 in.; maximum width 1.1 in.; grey flint; reverse re-touching along both sides; on top of the natural subsoil 3 ft. within the area enclosed by the bank and palisade trench.

Discussion

In spite of the comparatively large interior area examined, no certain structural form could be recognized from the plan of the post holes recovered, unless they be interpreted as forming the supports for an oval building some 30 feet long, the trench or drain running across its western end. The hearth would in such a case be outside and to the north-east of the structure. However, another possibility is raised by the quite substantial size of the palisade built against the inner face of the bank, and which might indicate that the whole area enclosed by the palisade formed a single building. The bank would then merely serve to give support to the palisade taking the main thrust of the roof, with smaller internal timbers. The ditch would provide a catchment area for water draining off the roof, as well as providing material for the bank. Such a building is reminiscent of Site II at West Harling, Norfolk (*P.P.S.*, xix, 1954, fig. 3, page 5). Another analogous site is Ballacagen A on the Isle of Man (*Journal of the Manx Museum*, V, no. 72-3, 1945-6, page 177). This site consisted of a flat circular area some 120 feet across surrounded by a low bank with an outer narrow ditch, and a low broader bank with outer quarry ditch outside. The inner ditch was incomplete and also seemed to have served as a quarry for the inner bank. This bank had formerly supported a palisade, represented by small post holes set some 2 to 5 feet apart. The inside edge of the bank abutted on to a palisade trench in which closely set stout posts had been placed. Inside this roughly circular setting were six other series of post holes, all roughly concentric about a central

hearth. Only one of these settings was in fact a recognisable circle some 35 feet in diameter. The excavator considered that the entire area enclosed by the inner bank had been roofed, forming a very large structure. The absence of drip channels or drains anywhere inside the inner bank, and the remains of a wooden floor over the entire area, formed the evidence for this interpretation. The differences between Ballacagen A and McNaughton's Fort include the position of the hearth, and the absence at the latter site of regularly-spaced post holes. The area enclosed by the bank is, of course, appreciably smaller than on the Isle of Man site. Nevertheless, the substantial palisade trench placed in contact with the inner built face of the bank at McNaughton's suggests that the two sites may have been of the same general form.

If this interpretation is correct, the structure at McNaughton's Fort represents a different tradition from other excavated Iron Age earthwork sites in southern Scotland where a palisaded enclosure appears to precede an earthwork phase enclosing small circular huts. The results emphasize the sketchiness of our knowledge of this period in the area, made all the more difficult by the general absence of finds with cultural and chronological significance. It would be dangerous to draw many conclusions from such an isolated site or lone radiocarbon date, but both may imply a building tradition of southern and eastern origin brought by immigrants into south-west Scotland at a time considerably earlier than the traditional but unconfirmed chronology for their appearance.

Acknowledgments

The writers would like to thank Mr G. Jobey for his comments on this site, and Professor Kigoshi for undertaking the radiocarbon determination.

Plate IV.—McNaughton's Fort: Rampart and ditch from the E., showing outer revetment and collapsed material on slope.

Plate V.—McNaughton's Fort: Entrance causeway from the N., showing palisade trenches and paving.

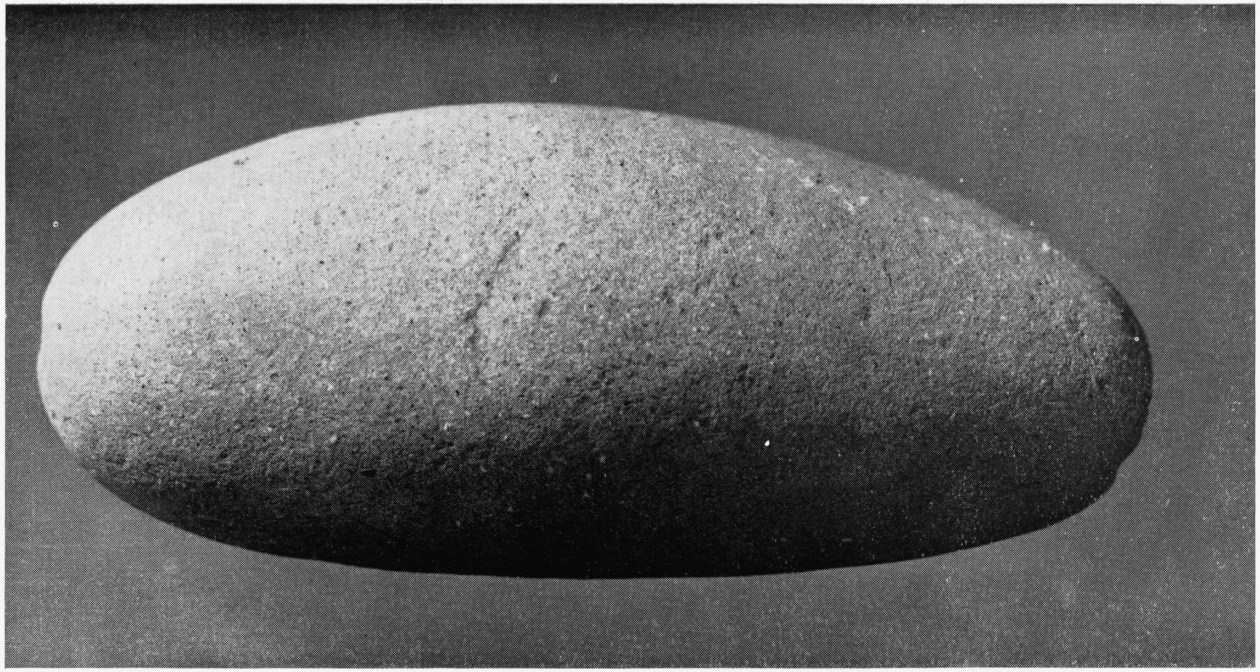

Plate VI.—M'Naughton's Fort: Stone rubber and pounder; nat. size.
[Photo: Univ. Mus. of Arch. and Eth., Cambridge.

FRAGMENTS OF A ROMAN DECORATED LEAD SARCOPHAGUS FROM THE GRIERSON MUSEUM, THORNHILL, DUMFRIESSHIRE, NOW IN DUMFRIES BURGH MUSEUM

By Professor J. M. C. TOYNBEE

(a) Description

Fragment I. 9 inches long by 4¾ inches high. (Plate VII.)

This fragment is part of a horizontal border, edged above and below with bead-and-reel motif. The main field of the border is occupied by separate, identical pairs of narrow, pointed leaves, which meet at the base and then fork apart until their tips almost touch the bead-and-reel edgings. In the centre of each leaf there is a strongly accented vein. Four pairs of leaves are contained on Fragment I. It is likely that the leaves are pointing leftwards, since the straight edge of the fragment below them, when they are viewed as pointing in that direction, seems to be the original lower finish to the portion of the sarcophagus to which the fragment belonged.

Fragment II. 10 inches long by 4½ inches high. (Plate VIII.)

The left-hand portion of this fragment is part of a border of the same type as that on Fragment I, with the leaves again pointing leftwards; but here only two pairs of leaves are preserved between the bead-and-reel edgings. On the right-hand portion of the fragment is the lower part of a group showing a charioteer, of whom the torso and head are lost, standing to the front and driving four horses. The horses are rendered in two pairs, each pair being seen in profile and facing one to the right and the other to the left. The breastwork of the chariot is visible between the rumps of the two pairs of horses. In the case of the left-hand pair, the head of the front horse only can be certainly made out, although a slight bump just above it might be the second horse's head: the double forelegs and hindlegs can, however, be clearly distinguished. Of the right-hand pair only the body of the front horse and the hindlegs of both remain. A thick, curving feature runs below the hooves of both pairs of horses. The bead-and-reel edging under the leaves in the left-hand part of the fragment is continued beneath the chariot group.

Fragment III.—9½ inches long by 6¼ inches high. (Plate IX.)

The left-hand portion of this fragment is occupied by an almost complete chariot group, which appears to be identical with that on Fragment II. The charioteer's head and body are in relatively high relief; but all the details of the features, hair, and dress have vanished, so that the sex of the figure cannot be determined. The two pairs of horses are the same as on Fragment II, with bumps that may represent the back horses' heads. But only the left-hand half of the thick, curving feature, the part beneath the left-hand horses' hooves,

can be seen. It would seem that the same terracotta or wooden stamp was used for the chariot groups on Fragments I and II. To the right of the head and left shoulder of the charioteer is a thick, verticle, triple line, perhaps part of the frame of a panel. Below the chariot group is a bead-and-reel edging which extends to the right-hand edge of the fragment. On the right-hand portion of the fragment there are two superimposed zones of decoration. Below is a border, also edged above with bead-and-reel, containing two pairs of leaves of the same type as those on Fragments I and II, but this time the leaves point towards the right. Above the upper bead-and-reel edging of this leaf border, apparently occupying part of a panel, is what would appear to be a large stylised bud or flower, seen lying on its side when the chariot group is viewed the right way up.

Fragment IV. 7 inches long by 7¾ inches high. (Plate XI.)

This fragment contains the major portions of four roughly square panels, which are divided from one another horizontally (if one takes length and height to be as above) by a border of four, thick, close-set lines and vertically by bead-and-reel edgings. In each of the two lower panels is an isolated human head, with thick, curly hair: no neck or body are shown. The eyes in each case are large and bean-shaped, the nose is somewhat thick and wedge-like, and the mouth is small and straight. The motifs in the two upper panels are very badly worn, but each panel would appear to have held a large roundel.

Fragment V. 1 foot, 4 inches long by 7 inches high. (Plate XII.)

This fragment, the right-hand end of which is badly buckled up, contains two superimposed zones of decoration. The lower zone is a leaf border similar to those on Fragments I, II, and III. In the border are eight pairs of leaves pointing towards the right, only part of the pair on the extreme left being preserved. The border is edged below with bead-and-reel, above by a single thick line. The upper zone comprises parts of five more or less square panels. These panels are divided from one another vertically by thick bands of triple, close-set lines: at their lower ends these bands pass over the upper edging of the leaf border and penetrate for a short distance into the latter. The contents of the fourth and fifth panels (reading from left to right) are very poorly preserved. The motif in the fourth panel has virtually gone, but in the fifth panel a large roundel or circular plate with an ornamented rim can just be discerned. The first panel holds what would seem to be either three small *paterœ* (dishes) or three large nail-heads, rather irregularly arranged. The second panel contains a large roundel or circular plate with an ornamented rim (*cf.* the fifth panel); and the third panel has within it an isolated head of the same type as that of the heads on Fragment III, seen lying on its side, with the chin pointing leftwards, when the leaf border is regarded as the bottom of the fragment. A bead-and-reel edging runs right across the bottom of all five panels, between the upper edging of the leaf border and the motifs that the panels hold.

(b) Discussion

The Thornhill fragments clearly belong to a sarcophagus that was decorated with repeating motifs viewed from various angles. Fragment IV could come from either the lid or from a wall. But all the leaf borders, those on Fragments I, II, III, and V, would appear to have an original lower finish on one side of them (*cf.* p. 80); and since there is no indication that any of these borders were at one time bent over, in the way in which the edges of the lid are bent over the walls of a lead sarcophagus, these fragments are likely to have come from the bottom edges of the walls of the piece. This squares with the fact that the central vertical axis of each chariot group is at right angles to the original edge immediately below it. On the other hand, the horizontal position of the head on Fragment V is, in this case, strange.

Roman lead sarcophagi[1] may be roughly divided into two main groups—(1) the very large eastern group of pieces found, and obviously produced, in Syria and Palestine: a number of these have made their way, either entire or as substantial portions, to European and American public and private collections; (2) the western group of pieces discovered in Gaul and Britain and obviously produced locally. To which group does the sarcophagus represented by our five fragments belong? They entered the Thornhill Museum after the death in 1889 of its founder, Dr Grierson, and both their provenance and their previous history are unrecorded. It would seem, on the face of it, to be rather improbable that anyone would have troubled to bring back from the Near East to Britain, or to any other European country, heavy broken fragments of lead on which the decoration is neither strikingly beautiful in form nor fine in execution and has in places vanished almost completely. The bead-and-reel motif is ubiquitous on both eastern and western lead sarcophagi; and although borders composed of groups of leaves are frequent on eastern pieces, there three leaves, not two, form each unit.[2] On eastern pieces isolated heads occur, but they are normally classical Medusa or Bacchic masks; whereas the isolated heads on Fragments IV and V have a distinctly Romano-Celtic look, as has also a moustached and bearded isolated head on a fragment of a western lead sarcophagus in the Gallo-Roman Museum at St. Germain-en-Laye near Paris. Could the Thornhill fragments, then, represent the relics of a lead sarcophagus cast in southern Roman Britain, where most locally made objects of this class have come to light?

On the other hand, while I know of no parallels on any western or eastern piece for the stylised bud or flower on Fragment III or for the large roundels or dishes on Fragments IV and V, nail-heads appear on some eastern pieces[3] and it is an eastern sarcophagus found at Beirut which provides the only

1 For a discussion of Roman lead sarcophagi in general, see J. M. C. Toynbee, **Art in Britain under the Romans**, 1964, pp. 345-53.

2 E.g. **Syria**, 1935, pl. 41, nos. 1a, 12; p. 329, no. 1b; Ny Carlsberg Glyptotek, Copenhagen, Cat. No. 791a=**Berytus** v, 1938, pl. 13, fig. 1; Museum of Fine Art, Boston, Mass., Nos. 95.5a, 95.5b, 96.5, 96.6, 96.7, 96.8, 96.9; Stuttgart Museum piece; Louvre Nos. A.017268, A.010227.

3 E.g. **Syria**, 1935, pl. 13, no. 27.

parallel known to me for the frontal chariot group on Fragments II and III.[4] This eastern chariot group (plate X) is in all essentials the same as that on Fragments II and III, but with all the details far more distinct. Beneath the two pairs of horses there is the same curving feature, here obviously seen to be a stylised calyx of acanthus leaves, not clouds, as it is interpreted in the publication cited in footnote 4; and here, too, the heads of all four horses, as well as the eight pairs of legs, are very clearly shown. Furthermore, on the Beirut piece the charioteer is definitely female, with hair falling on to the shoulders, a tunic V-shaped at the neck, well developed breasts, and large wings springing from the back. She must be Victory, not Psyche, as the author of the above-mentioned publication describes her, since her wings are of the normal type and are not the butterfly wings characteristic of Psyche. Of wings belonging to the charioteer there is now no trace whatsoever on the Thornhill Fragment III. Were there once wings on that fragment which have disappeared? Or did the wings exist on the wooden or terracotta stamp, but failed to come out in its negative impression on the sand-bed and so did not appear in positive on the lead—the result of faulty casting? Were these fragments cast in an east-Roman workshop and brought to this country in modern times? Or were they cast in Roman Britain, a stamp prepared in the east for the chariot group having been imported into this western province and used by local craftsmen? Or was the stamp used for our chariot groups a copy or adaptation, made in Roman Britain, of an imported eastern stamp, the wings of the charioteer having been, for some reason, intentionally omitted? So far as I can see, these are all questions to which no certain answers can be given.

As regards the funerary meaning of the motifs employed for the decoration of the Thornhill fragments—Victory in her chariot would represent the soul's victory over death; the isolated heads could be those of other-world divinities; the rows of leaves might symbolise after-life fertility; and the nail-heads (if such they be) on Fragment V would suggest the finality of death.

4 **Mélanges de l'Université Saint Joseph xxi, 1937-38, pl. 53, fig. 3, pp. 207-8.** This frontal chariot group was judged, at the time of its publication, to be unique so far as lead sarcophagi are concerned

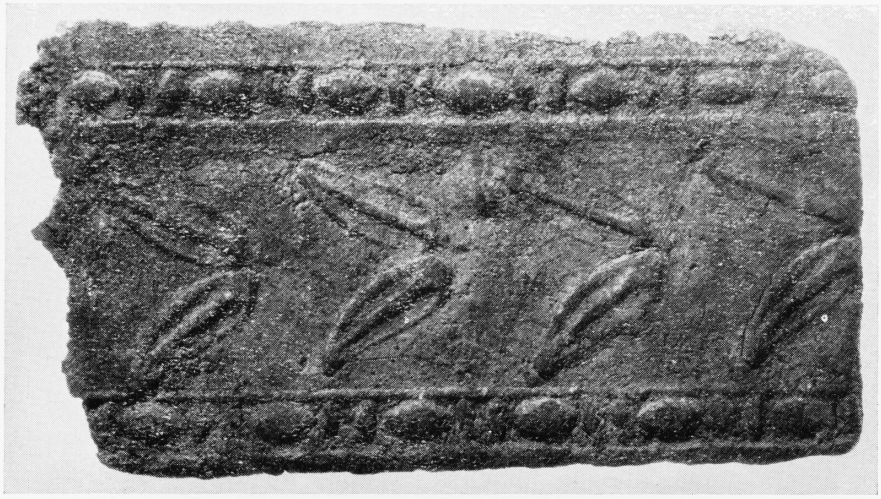

Plate VII.—Roman Sarcophagus, fragment I (x½).

Plate VIII.—Roman Sarcophagus, fragment II (x½).

Plate IX.—Roman Sarcophagus, fragment III (x$\frac{1}{5}$).

Plate X.—Chariot-group from Sarcophagus found at Beirut.
(Drawn by Miss Helen Gibson, of the Ashmolean Museam, Oxford)

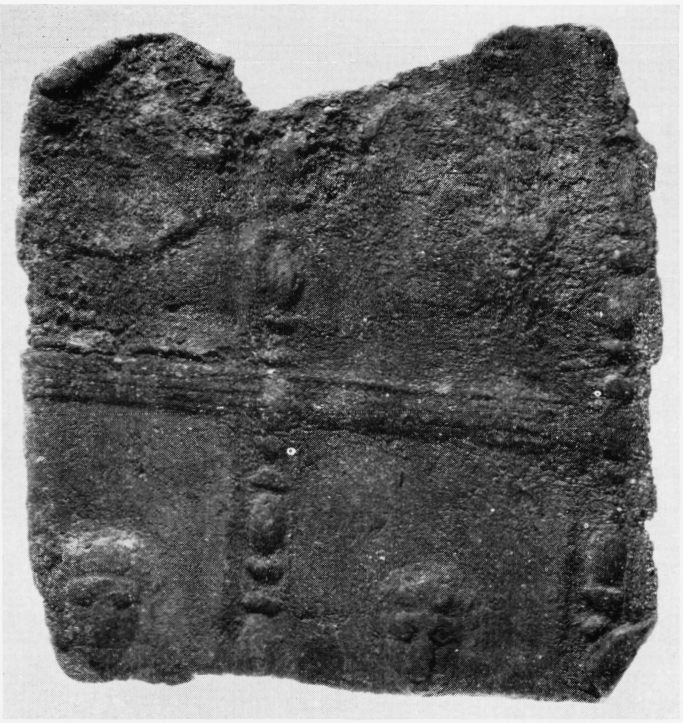

Plate XI.—Roman Sarcophagus, fragment IV (x½).

Plate XIV.—Dunrod: Inner Rampart—South retaining wall base with natural black soil layer visible behind and at end of excavation.

ARDWALL ISLE: THE EXCAVATION OF AN EARLY CHRISTIAN SITE OF IRISH TYPE, 1964-5

By CHARLES THOMAS, M.A., F.S.A., F.S.A.Scot.

INTRODUCTION

The work described below was carried out, under my direction, during the summers of 1964 and 1965 by members of the Department of Archaeology, University of Edinburgh, as part of a wider investigation into the physical nature of early Christianity in southern Scotland. The specific aim, which was accomplished, was to locate and examine a chapel and burial-ground rooted in the earliest strata of Scottish Christianity, and preferably not encumbered by any post-Margaretan, or post-medieval, church. In this case, a secondary aim logically developed; the elucidation of any external influences detectably at work on the early church in Galloway. This is presented, briefly, in the Discussion.

Two preliminary (duplicated 4to.) reports were privately circulated from the Department in July 1964 and July 1965. The present paper is an expanded interim report, and will concentrate on the various phases of the chapel and its attendant cemetery. Full consideration of the later structures on the Isle will be carried forward, together with specialist reports and a number of tedious details, to the final report, which it is hoped to produce for a forthcoming volume of *Medieval Archaeology.*

ACKNOWLEDGEMENTS

Our main inspiration came from Lady (Esmé) M'Culloch, who not only lent us the house on the Isle for both seasons, but provided all practical help and kindness in so many other ways. All those taking part are deeply grateful to her, and delighted that her continuous belief in the importance of Ardwall Isle as an early Christian site was so successfully vindicated. A similar debt of gratitude is due to her son and daughter-in-law, Mr and Mrs Walter M'Culloch of Ardwall, for all their hospitality, aid, and interest in the work.

It was a source of much pleasure to me that I should have been able to carry through this task as a member of the D.G.N.H.A.S., tempered with some regret that the late Dr R. C. Reid, who introduced me to the archaeology of the region, could no longer share in the discoveries. Special thanks are due to Major-General J. Scott-Elliot, Mr A. E. Truckell, and Mr W. F. Cormack, for help and encouragement, both on and off the site; and to my old friend and mentor Dr C. A. Ralegh Radford, a familiar figure in Galloway as in so many other places, for much fruitful advice and discussion. During both seasons, my colleague Miss Mary-Jane Mountain acted as assistant, and Mr Kenneth White skilfully undertook the heavy photographic burden. Mr J. P. Stengelhofen

kindly acted as surveyor in 1965. The excavators were for the most part students of the Department, but students from several other universities joined us in both seasons. To all these people I am more than grateful.

The work was largely financed by the Russell Trust in 1964, and by the Munro Fund in 1965; both administered through the University of Edinburgh. Our gratitude is due to the relevant Trustees and Committee for this essential backing. Finally, I must warmly thank Professor John MacQueen for reading this paper in typescript and for making a number of useful comments.

I—THE EXCAVATION

The Site

Ardwall Isle (NX 573495) is an uninhabited island, one of the four main Isles of Fleet, lying south-east of Gatehouse of Fleet, Kirkcudbright. Save at low water, when it can be reached across mud-flats on foot, the Isle is surrounded by shallow sea. Indeed, it is possible that the silting which now permits this tidal access is of comparatively recent origin.

The Isle is about a half-mile long (north-south) and about a quarter-mile wide, the only real eminence being a small hill near the south end, crowned with a modern cairn that may itself stand on an earlier mound. There is a solitary stone cottage south of this hill, hard by the ruins of a 19th (or 18th ?) century farm-house, and patches of rig-and-furrow confirm a tradition that there were several agricultural holdings on the island. Opposite the passage from the mainland shore there is a small beach, Sandy Bay, and from here, leading inland up a stone ramp, there is a constructed trackway across the Isle to the south end. A once-continuous stone sheep-dyke encircles the whole island, with a gateway at the top of the ramp at Sandy Bay.

Early Discoveries.

In 1928 or 1929, two local men engaged in dyke-building unearthed what appears to have been a lintel-grave just inland from Sandy Bay.[1] The two long side-slabs they broke up; the cover slab had fallen off, and being reversed, proved to bear an incised outline cross. This slab now stands in a small circular garden at Ardwall House; it is perhaps 11th century in date (*TDGNHAS XIII* (1925-6), 125). It must also be assumed to be of local origin, since there is a very similar cross-slab now in Anwoth Old Kirk, by Gatehouse.[2] It would also seem[1] that another and similar slab was unearthed at much the same time, and built entire into the dyke, but this has not yet been found.

In 1961, whilst excavating the fort at Trusty's Hill, near Gatehouse (*TDGNHAS XXXVIII* (1959-60), 58-70), the writer and his colleague Dr Bernard Wailes saw the cross-slab at Ardwall House, and in company with Lady

1 In litt., R. Lillie, Esq., Gatehouse, to Lady M'Culloch, 30 Sept. 1929 and 3 Jan. 1930; I am grateful to Lady M'Culloch for providing me with these first-hand accounts (contemporary and detailed interviews with the finders).

2 W. G. Collingwood, Northumbrian Crosses . . . &c. (1927), fig. 226, no. 44 (said to be circa 1100).

M'Culloch, visited the Isle. It was at once apparent that the suspicion raised by the 1928-29 discovery, namely that a burial-ground of early type should exist here, was a justifiable one. There proved to be no difficulty in identifying the cemetery enclosure, and some form of internal foundations detectable below the turf. Such remains, on an off-shore island and superficially rather older in character than the date of the Ardwall House cross-slab might alone imply, clearly merited publication, and a descriptive note appeared in these pages (*TDGNHAS XXXVIII* (1959-60), 71-82).

Description

The visible remains comprised a low bank, partly free-standing, partly backed into the hill-slope in the form of a revetment, and partly incorporated into the base of an elliptical bulge in the peripheral sheep dyke. It could be seen from the surface that this bank was, at certain points, stoned-faced. Rather off-centre, partly-visible courses of crude walling and the configurations of the uneven ground-surface suggested the existence of several rectilinear structures, one of which was presumptively the latest stage of a stone chapel. The general resemblance to the basic Western British enclosed cemetery with its chapel, of early Christian date—the Irish and Scottish *cill,* the Manx *keeill,* the Welsh *llan,* the Cornish *lan*—was unmistakeable.

Since preliminary historical research indicated that there was no record of any medieval Christian site on the Isle, no relevant burial-ground traditions, and no toponymic evidence, it was decided to excavate the whole site at some length; and, in particular, to apply total clearance to any chapel which might be found, in the hope of locating (as at Church Island, Co. Kerry[3]) wooden structures which might underlie those of stone. Work accordingly took place for four weeks in 1964 and for a further five in 1965.

Summary of periods (see Fig. 1)

Discounting the abundant evidence of sub-recent land use and occupation on Ardwall Isle, and the distinct possibility of some form of prehistoric occupation as well, five phases can be regarded as having been defined by the excavations. Of these, Phases I to III relate to its Early Christian character and are derived from the three successive archæological stages of the cemetery and its chapel. Phases IV and V, which are now summarily described in reverse order, refer to medieval and Georgian times.

The Tavern (Phase V)

The foundations seen in 1961 proved, when cleared of turf, to constitute the basal courses of a rectangular building, lying roughly north-south and unevenly partitioned by stone walls into three (or more) rooms. The associated small finds—green bottle-glass, trailed Staffordshire mugs, animal bones, and some

3 M. J. O'Kelly, "Church Island near Valencia, Co. Kerry," Proc. Roy. Irish Acad. 59 C 2 (1958), 57 ff.; especially op. 58-9 and fig. 2.

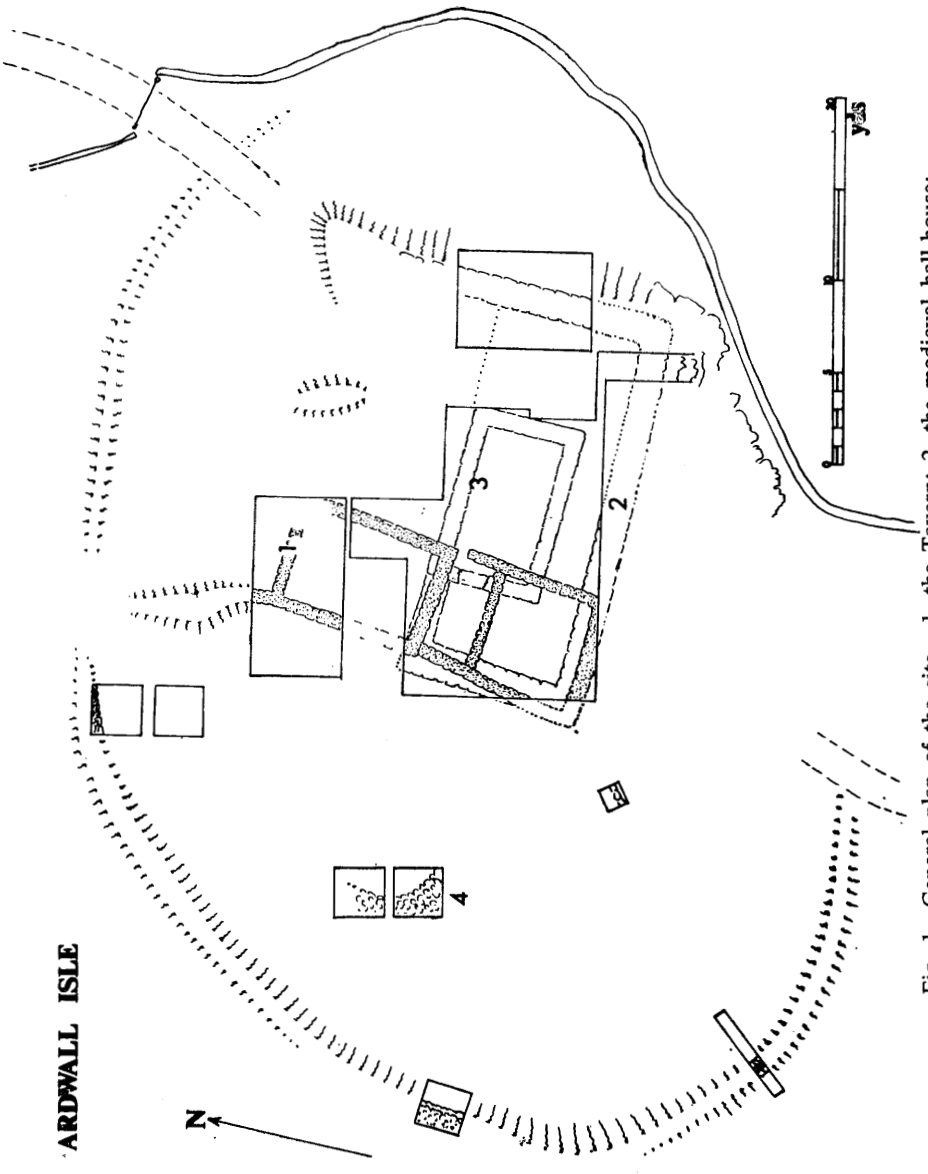

Fig. 1 General plan of the site. 1, the Tavern; 2, the medieval hall-house; 3, the Chapel; 4, ruined cells?

corroded ironwork—combined to suggest a date in the late 18th and early 19th centuries; the building was doubtless heavily robbed for dyke material in the last century. This allows the tentative identification as the (unlicensed?) tavern which tradition claims once flourished here. It may well have been supplied from within the Manx smuggling industry.[4] A series of remarkable subterranean features, mostly along the south and west shores of the Isle, appears once to have been regarded as graves,[5] but it is more probable that they were laboriously constructed—and some of them are actually rock-cut to an impressive depth—as hiding-places for contraband.[6] The best-preserved of these was drawn in measured section and plan, but time did not allow the projected clearance of two other choked ones.

The Hall-House (Phase IV)

In the 1964 season, it became clear that the *southern* end of the Tavern, unlike its northern half, was grounded not on the decayed bedrock but on a compacted mass of rubble and stones a foot or more in depth. When most of this rubble had been cleared, stone foundations of a more robust build than those of the tavern, up to four or five feet across, were revealed. These foundations employed sizeable boulders as grounders, and though in two places they underlay the tavern walls, they were not on the same alignment.

Further development of the site in 1965 produced the outline plan of a large rectangle defined by this massive foundation, internally some 22 feet by 60 feet. Though further work is needed to prove this, it seems that the shorter end-walls of this large rectangle, which is aligned east-west, are both extended to the north. If so, they enclose, as curtilage walls, a kind of courtyard on the north side. The very uneven nature of the rock floor within the actual rectangle, the scarcity of finds on the lowest levels and the paucity of associable post-holes, the absence of any hearth, and certain other traces, all imply that these thick walls constitute merely the footing, undercroft, or built cellarage, of a timber hall of considerable size. Such a hall would of course have rested on transverse beams laid across the shorter axis of the rectangular foundation. The relevant finds—pottery of various kinds, two bronze dress-pins, and some other fragments—suggest approximating dating of 1250 to 1350, and imply a comparatively short life for this hall-house. No doubt it was superseded by one of the mainland keeps, perhaps (as Dr Radford suggests) by Cardoness Castle just west of Gatehouse. A smaller but similar insular roost has been postulated in connection with visible foundations on Heston Island (*TDGNHAS XXXV* (1956-7), 33-37).

The Chapel Sequence (Phases I to III)

Late in the 1964 season, it was noticed that the central portion of the north wall of the hall foundations appeared to form an isolated stretch, somewhat

4 See, e.g. R. H. Kinvig, **A History of the Isle of Man** (2nd edn., Liverpool, 1950), 115-118.
5 Cf. C. H. Dick, **Highways and Byways in Galloway and Carrick** (1916), 136; "Ardwall Isle has some excavations—Norse graves originally, it is believed, but used later by smugglers for concealing contraband."
6 **J. Maxwell Wood, Smuggling in the Solway** (Dumfries, 1908), 26-27.

thinner than the rest of the foundations, and that there were traces of similar, slighter, walling running due south into the interior of the "undercroft" from either end of this stretch. Whilst, functionally, it could be argued that these had been left standing when the hall was constructed, in order to provide piers for the support of any transverse beams, it also followed that they could belong to a pre-existing structure. This structure could be seen to lie due east-west (and thus to have influenced the alignment of the hall foundations which in part incorporated it), and to be, externally, some 18 feet by 29 feet. Preliminary clearance disclosed a medieval rubbish-pit, dug from a high level, and a large clay-lined post-socket dug from a similar high level, but otherwise no signs of any domestic occupation; and the further revelations that the walls of this smaller structure were (unlike the Hall or the Tavern) bonded with a fine clay, and that its floor apparently held disturbed human bones, made it tolerably certain that the chapel had been located.

The whole chapel area was meticulously opened (save for the actual walls, which were cleared but left otherwise untouched) during the 1965 season; about thirty skeletons and over twenty fragments of worked or inscribed stone were recovered in and around the area. Three distinct phases could be defined, and they will be briefly described in reverse order, starting with Phase I (the earliest, and extending the scope slightly to embrace the surrounding cemetery and enclosure as well as the actual chapel.

Phase I

During this phase, which represents the foundation and early use of a consecrated cemetery on the Isle, an unknown number of oriented inhumations took place, probably centred on a spot slightly south-west of the later (Phase III) stone chapel. Owing to the activity during subsequent phases, it is now impossible to say how deep the graves were, but one gets the impression that they were dug only a foot or so deep, through the contemporary turf and into the easily-broken slatey bedrock below. The graves are comparatively narrow and only long enough to take an extended adult, the head (or west) end being cut slightly deeper and in several cases squared off. No complete undisturbed Phase I skeleton could be recovered, but there was ample evidence of the scattering of these primary inhumations by the digging of Phase II and later graves.

The focus of the little burial-ground at this stage was a curious feature, parallels for which have to be sought outside the region. A roughly rectangular pit, about 4 feet north-south and (as far as can be judged without removing some as yet undisturbed Phase III chapel walling) about 2 feet 6 inches east-west, was dug into the bedrock to a depth of 1 foot 6 inches—say 2 feet 6 inches from the contemporary turf. As the natural fracture of the rock would, and did, produce a sloping bottom to this pit, it was levelled up and floored with

thin slabs, set neatly in a crazy-paving fashion. A layer of black carbonaceous soil an inch or so thick immediately on these paving slabs hints at the collapse of some inner container, possibly wooden.

Neither the confined dimensions, nor the north-south orientation, of this rock-cut hollow make it in the least likely to have been a normal grave. On the other hand, the clustering of the disturbed Phase I burials around it raise the inevitable suggestion that it was a partly-subterranean shrine, containing (in a wooden chest?) the translated skeletal remains of some holy person who had been buried in normal style—on the Isle or elsewhere—and who had been duly enshrined as a more or less disarticulated skeleton. A pre-Christian cist-grave is a possibility, but as no trace of any cremation could be found, this would have to have contained a crouched inhumation and it may be thought likely that similar cist-graves would, in these circumstances, have been found near it. No bones were found either. Moreover, as will be seen further below, there *is* an early class of shrine—the "slab shrine"—known from Ireland, into which this strange Phase I feature suitably fits.

PHASE II

If Phase I on the island comprised no more than an isolated burial ground, albeit with a focal shrine, then Phase II sees the development of a more elaborate foundation to which the Irish term *cill* can justifiably be applied.

In clearing the rock-cut hollow, it was found that a deep and irregular post-hole had been cut down through its northern edge, displacing two paving-stones. Careful horizontal clearance of the interior of the chapel, particularly its western half, revealed others, well-defined as black-filled cylindrical hollows in the yellowish clay or silt floor. In two cases, burials attributable to Phase I slightly overlapped such post-holes. It seemed probable that a slight timber construction had existed, later than the rock-cut hollow of Phase I, and earlier than the burials associated with the stone chapel (Phase III) or, putatively, than the chapel itself, since its west wall appeared to traverse the axis indicated by the post-holes.

This Phase II structure (fig. 2), uneven in plan as it is, can be seen as rectangular, approximately 7 feet 6 inches in 11 feet. Its longer axis lies more or less east-west, now some 9 degrees north of east, and there is a median post-hole of smaller dimensions at the east end. The internal proportions (approximately 2: 3), the small size, and this orientation, no less than the context, imply that this is a wooden chapel or oratory[7]; and, as such, it is the first of its kind to be exposed, demonstrably as the predecessor of a stone-built chapel, on the British mainland. Directly associable with it, in Phase II, are a number of

7 The strict distinction is that a chapel should possess an altar for the celebration of Mass, and the oratory need not. The Phase II structure, from its size and context, is more likely to be a chapel, but to avoid pre-judging this issue it has been labelled "oratory" in fig. 2. There is a tendency now to use the term "oratory" for all very small, or subsidiary, early Christian chapels in western Britain.

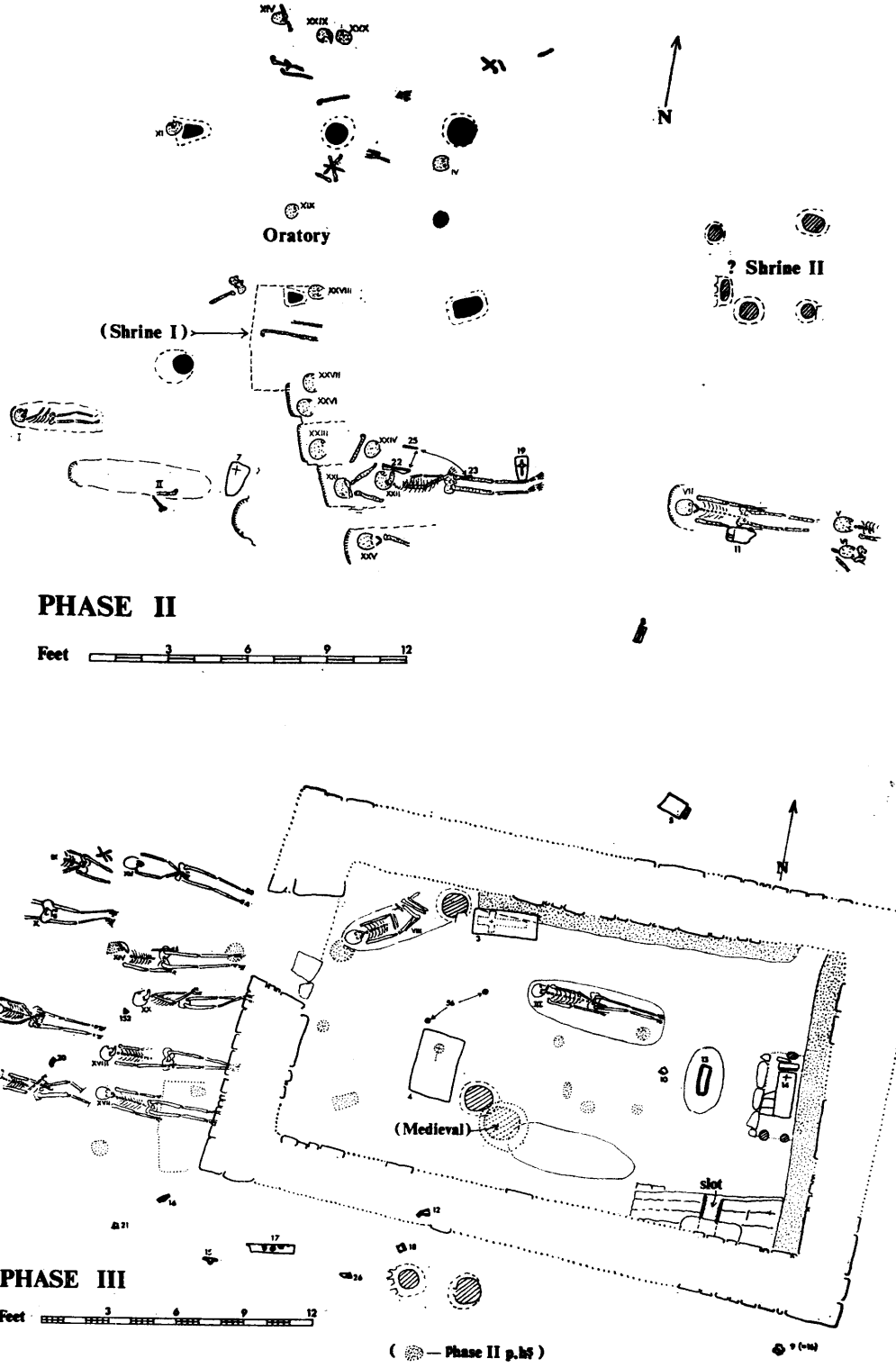

Fig. 2 Ardwall Isle: site plans (Roman numerals = burials, Arabic numerals = worked stones).

inhumations. Whereas some of these, on the south side of the rock-cut Phase I shrine, may really belong to Phase I (fig. 2, XXI, XXIII, XXV), another (XXVI) lies in a grave which just cuts the southern edge of the shrine, and the head of XXVII, which disturbs XXVI, was found lying directly upon one of the paving-slabs in the shrine. A similar relationship could be claimed for the very crushed skull of XXVIII. It also seems likely that XXII and XXIV, which disturb XXI and XXIII respectively (see fig. 2), antedate the Phase III stone chapel and thus belong to Phase II. The skeletons I (a child), II (fragments only in a disturbed grave) and the group V, VI and VII some feet E.S.E. of the rock-cut shrine also appear to be of this stage.

The absence of any unitary skeletal deposit from the Phase I shrine became less puzzling with the discovery, some eight feet east of the timber oratory, of a cluster of shallow post-sockets in the floor of the later stone chapel. These were clearly not relevant to Phase III at all, had been compacted (by human feet) well into the chapel floor—they were only revealed in the last stages of trowelling—and one of them had been largely destroyed by a late grave (III) inserted within the stone chapel. While this cannot now be proved, it seems most probable that these post-sockets mark the position of a composite stone shrine contemporary with the Phase II timber oratory. They would not need to be very deep, and may have been reinforced, functionally, by an irregular stone revetment, but their purpose would be to receive the feet of four stone pillars of a "corner-post" shrine, and their position vis-à-vis the oratory—outside the south-east corner and anywhere in an arc ranging from due east to due south—is in fact the conventional position for such a shrine. Into this would have been translated the skeletal remains previously interred in the Phase I rock-cut shrine, the latter being (in Phase II) to some extent inaccessible below the south wall of the timber oratory (see fig. 2).

It is at this stage that one might expect to place the foundation of the *cill* on Ardwall Isle. Insofar as they can be aged and sexed without complete removal for laboratory study—and this action was deliberately avoided in the case of all skeletons of all three phases—the Phase II burials (with the solitary exception of the unassociated child's skeleton (I)) are those of adult males. Skeleton XXII is that of an elderly man with a deformation of the cervical vertebrae suggesting an arthritic condition. The appearance of a timber house of worship, the evidence for the successive burials of adult males, the above-ground shrine, no less than the general situation of the Isle, add up in the writer's immediate opinion to a communal hermitage. If lay persons, who would of course have visited the site for occasional services and for the veneration of the shrine, were also interred here, they may at this stage have been interred elsewhere within the enclosure. The enclosure itself probably originates in Phase II rather than in Phase I; though, as usual, the physical separation of the enclosure bank from any of the features which it contains and surrounds precludes clear stratigraphical investigation of this question. Furthermore, some

very preliminary clearance in 1965 suggested that small stone-built, or stone-footed, living cells, heavily robbed at some later stage, may have stood some distance west of the chapel but still within the enclosure (see fig. 1).

PHASE III

The stone-built chapel which marks this phase is a building of great interest. There is some evidence that the whole site for the chapel was levelled up before building commenced, and the base of the foundation-courses of the walls is a good foot above the level (base of contemporary thin turf cover) at which Phase II features become apparent. The chapel walls are built with local stone, taken from the beach or split off coastal or inland outcrops on the island, large squareish boulders being employed for the external coigns. The walls are set in a yellowish clay which dries hard, and which was employed not only as a rough pointing mortar but as the core of the wall itself, admixed with small stone rubble. In some cases, notably the well-preserved south-east corner, the flat stones were laid with some skill in an attempt to produce a fair face internally. This method of building is in sharp contrast to that of the medieval Hall, where the sole aim seems to have been to produce a massive foundation without much regard to technique, or the much later Tavern, whose walls employ large slabs set horizontally and packed with earth and small spalls.

The doorway of the chapel is in the west wall, and is set several feet north of the central position. No explanation can be adduced for this. When first located, this doorway had been roughly packed with stones in order to fill it to existing wall height, and as this west wall then formed the foundation of a Tavern wall, one may assume this blocking took place only in the 18th century. The entrance is flanked with large squareish stones which have not moved at all since they were first built in, and this confirms that the very distinct splay —inwards—is an intended original feature. Though the chapel walls were left standing to a few courses, and in the case of the (down-hill) east end to several courses higher, in the medieval re-building, no doubt because they formed piers across the projected line of the Hall on which the cross-beams could rest, no part of any chapel wall is high enough to show whether windows or opes existed.

The floor of the chapel, cleared of all subsequent accumulations and deposits, proved to be a yellow clay not unlike that used in the walls. A dirty compacted surface indicated the level when the chapel was in actual use, and in some places, notably around the sides, this was confusingly overlain by deposits of clay mortar which had been washed out of the chapel walls. This clay floor is of some depth, and though confined generally to the chapel area, need not be (as it first was) regarded as artificial. Extruding sills of bedrock are encountered south and west of the chapel—one such comes up through the floor of the chapel's inner south-east corner (see fig. 2)—and it seems likely that the clay floor represents a local pocket of silt deposited among bare rock by a former high sea-level.

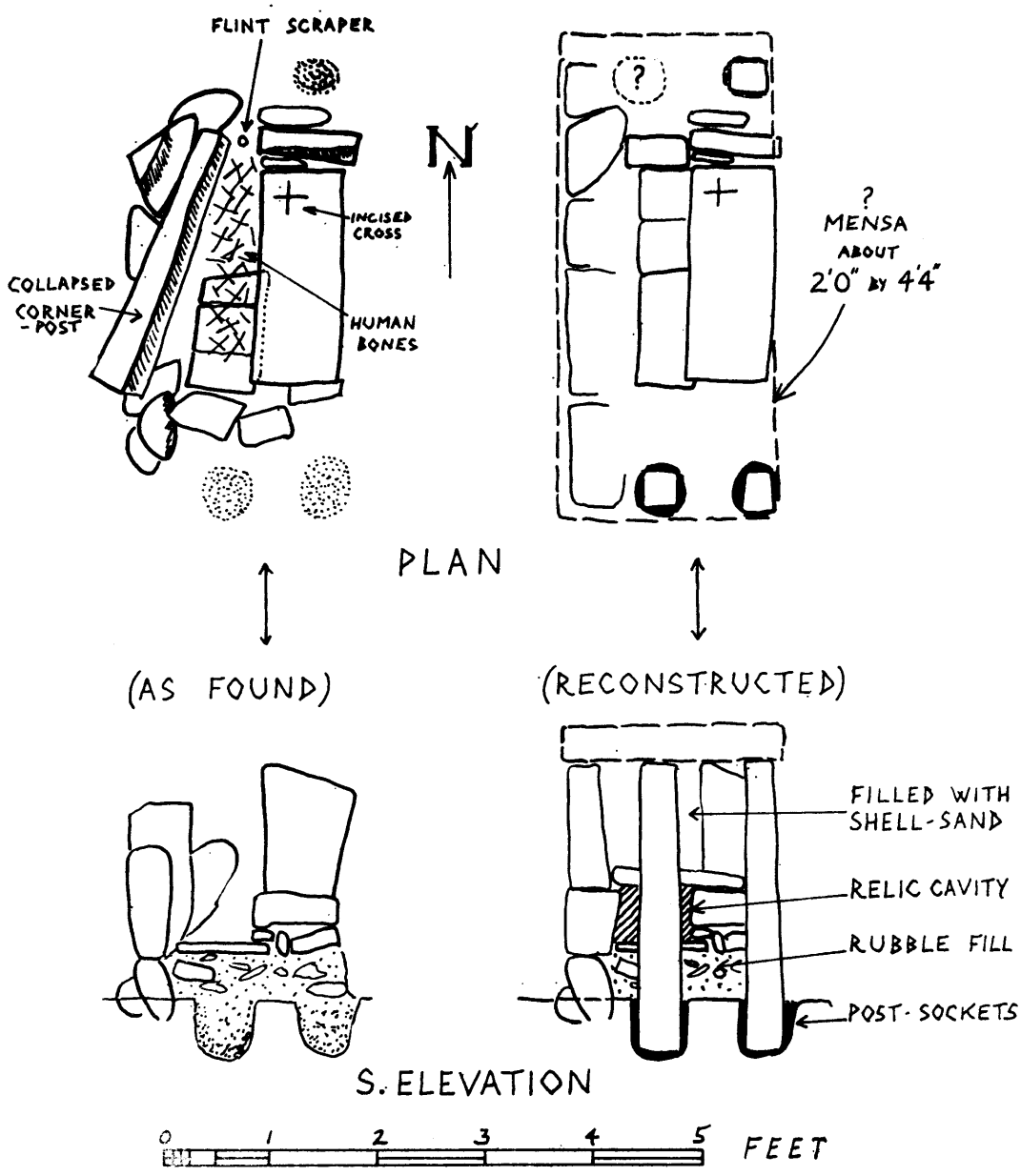

Fig. 3 Ardwall Isle: altar of phase III (stone chapel).

There are several internal features of interest. Along the inner face of the east wall, and for much of the north wall, a shallow gully occurred, with a sticky black filling. The inner line of this gully is exactly co-terminous with the inner face of the wall, and in the south-east corner, the rock outcrop has been neatly cut away to allow this gully to penetrate to the angle. A possibility is that these gullies—which are not drains—held beams or horizontal members sunk some nine inches below floor level, into which vertical wooden panels or screens were morticed or fixed. Some very large post-holes, three encountered within the chapel and two more outside the south wall, have no demonstrable connection with the structure. With internal dimensions of only some 13 feet by 23 feet, they would be functionally quite superfluous in it. One of them—marked "Medieval" in fig. 2—intersects a curious empty grave which must belong to some later stage in Phase III itself, and also intersects a post-hole which it may have replaced. One is inclined to see all these large post-holes as sockets for short but robust uprights driven through the floor (like an intrusive rubbish-pit (not shown)) at the time the medieval Hall was built.

The altar (fig. 3) is a most complex affair and, despite its very ruined condition, can be to some extent reconstructed. It stands clear of the east wall by the amount needed to clear the gully. There is evidence that it possessed four stone corner-posts, sockets for three of which were located, as well as a built stone front. Near its base, a thick rectangular slab was laid along the back of the altar, overlapping some thin slabs which formed a sort of narrow platform, in front of this backing slab but behind the altar front. In this enclosed space, a large quantity of human skeletal remains were crammed; this is by no means a complete skeleton, but *parts* of nearly all the major skeletal components, including a number of teeth, seem to have been included. A simple cross (marked "14" on fig. 2) was cut at the north end of the backing slab. The whole cavity must have been roofed, and the body of the altar filled with a quantity of coarse shell sand which can be exactly matched on a small beach about a hundred yards away. The missing *mensa*, or horizontal slab, must then have been placed over the top, resting on the four corner posts.

Without exact parallel, this altar can none the less be explained in terms of other known instances; notably those from St. Ninian's Point, Bute[8], and from St. Helen's, Isles of Scilly[9], both of which possessed relic cavities. This is an attempt to combine both altar and shrine, and it is unfortunate that the evidence was insufficient to reveal whether the skeletal remains were totally and permanently enclosed, or (as is more probable) were somehow accessible, e.g. through some lateral aperture. The very imperfect condition of the remains suggests that this is not a direct exhumation and an enshrinement, but the last of several such removals; and the context surely implies that the altar formed

8 W. G. Aitken, **Trans. Bute Nat. Hist. Soc.** (1954).
9 H. O'Neil, "Excavation of a Celtic Hermitage on St. Helen's, Isles of Scilly," **Arch. Journal CXXI** (1964), 40-69; see fig. 2 "Oratory"), p. 48, and detail (three stones on south side of top of altar) in pl. xiii B.

the last resting-place of the *sanctus,* as he (or she) must have been, who successively occupied the rock-cut shrine of Phase I and the postulated free-standing shrine of Phase II.

A bizarre feature was the discovery, in an ovoid pit dug in the floor a few feet before the altar, of a broken cross-slab of Anglian type (fig. 2, no. 13). This was not only inverted, so that the actual cross head would have been invisible, but the cross head and the two lines of the shaft faced west, away from the altar. The rationale of this action seems inexplicable. In the south-east inner corner of the chapel, a rectangular slot cut neatly into the bed-rock sill which must have protruded a foot above floor-level seems rather more functional and may have constituted a socket for some kind of chair or little bench.

Three presumably late graves were encountered within the chapel. The diagonally-set VIII, near the doorway, is that of an adult on his or her back, the skull neatly overlying a disused Phase II post-hole. The legs have been displaced and crammed back into the area occupied by the femora, presumably when the very large (medieval ?) post-hole which slights the foot of this grave was dug. Of the two graves side by side in the centre, the southern (un-numbered) appears, from its section, to have been dug and then re-filled with the material taken out from it; if it was ever occupied, it cannot have been occupied for long. Grave no. III, of an adult female, could be shown from the cross-section in the baulk over it to have been dug at a late stage. It is probable that cross slab no. 3, found on its face, belongs to this grave—if so, it is of the type at Anwoth Old Kirk and the one found on the Isle now at Ardwall House, and must be, like this grave, late 10th or 11th century. Cross-slab no. 4, similarly inverted, is earlier, perhaps 9th or 10th century, but whether it lay on the empty grave or was associated with grave VIII is not known.

What may be called the Phase III grave-yard was encountered directly outside the west wall. The earlier row of burials, the heads of which are concealed by the west wall of the Hall foundations and could not thus be exposed, lie in a series of shallow graves. No. X is an adult female lying on her front, the wrists and hands below the pelvis. The later row lie next to the chapel, the heads of their graves in some cases (e.g., XVII to XIII, XV to IX) disturbing the feet of the earlier row. Despite the apparent overlap shown in fig. 2, it seems that the feet of the graves of this later row were deliberately tunnelled *under* the outer face of the chapel's west wall—the greatest penetration is only some 8 inches—and the vertical view must not be taken as implying that these graves are earlier than the chapel. It will be noted that the Phase III burials are in general aligned on the stone chapel axis, whereas those of Phase II—if one goes by the heads of the graves, XXVII to XXV—may have been aligned on the axis of the Phase II timber building.

Small Finds, Phases I to III

These were not of any outstanding interest or significance, and in many cases, being in clearly disturbed contexts, could not be allotted to one or other phase. There appears, for example, to have been no pottery of any kind in use prior to the period (Phase IV) of the medieval Hall. Fragments of flint, on the other hand, occurred sparsely at all levels.

A rather well-made circular flint scraper was found, directly associated with bones, in the northward spill of the skeletal deposit in the Phase III altar. The possibility that this was a relic associated with the skeleton cannot be dismissed; two small flint scrapers were found in the lowest level of the small cell on Tor Abb, Iona, which is generally accepted as St. Columba's living cell and which was subsequently filled with pebbles and probably treated as a shrine.[10]

From the Phase III chapel floor came a small strip of bronze in the form of an angle binding, 57 mm. long, 15 mm. wide if spread flat, with three rivet holes 2 mm. dia. on the angle, and an extremely delicate decoration of bordered lines carried out with a tiny triangular punch. The possibility that this comes from a small shrine or reliquary framed in bronze strip and sheet must be considered. Very similar strip bindings appear on the "gable angles" of, for example, the Lough Erne reliquary, now at Dublin.[11]

In no case could any small find be associated with any individual burial or grave.

Worked or Inscribed Stones

A preliminary catalogue of these was given in the two duplicated reports, numbered consecutively (July, 1964: nos. 1 to 11—July, 1965; nos. 12 to 26). It should be noted that slab no. 2 has not yet been found, though the evidence for its existence is quite sound[1], and that stone no. 20, though fashioned by man, is not a gable finial.

Apart from a single piece (no. 12) which seems to be architectural, and a group of joining fragments (nos. 22, 23 and 25) which, it is claimed, form a portable altar, most of the stones are to be regarded as commemorative of the dead, and to fall into two categories; small stones placed, like Northumbrian pillow-stones or grave-markers, in, with, or on the head of, graves, and large slabs which either stood upright by, or were recumbent upon, graves. A full catalogue, description, and discussion of this whole group of stones must be reserved for the final report, and limited comment only be given here.

Phases I and II

While certain stones can be assigned, on grounds of close proximity, to Phase II graves, others in the same style which are not so assignable (but apparently simpler, and putatively earlier, than Phase III) may belong to either of the two earlier phases. It is easiest to treat of them as an "early" group.

10 These may of course have been everyday losses during Columba's life-time.
11 See, e.g. F. Henry, **L'Art Irlandais I** (Zodiaque, 1963), pl. 20 upper: A. Mahr, **Ancient Irish Handicraft** (Limerick, 1939), pl. 15, no. 2: M. and L. de Paor, **Early Christian Ireland** (1958), pl. 29.

This group includes three small plaques (7, 19, and 8) which are probably grave-markers. No. 7, found by the foot of burial II, has an equal-armed linear cross cut on a grit slab; no. 19, over the left shin of skeleton XXII, has an incised outline Latin cross on another grit slab, and no. 8, which was displaced (perhaps from grave VII) a deeply-incised Latin cross in outline formed by four intersecting lines. On the reverse of no. 8, the capital letters "M M" have been lightly scratched.

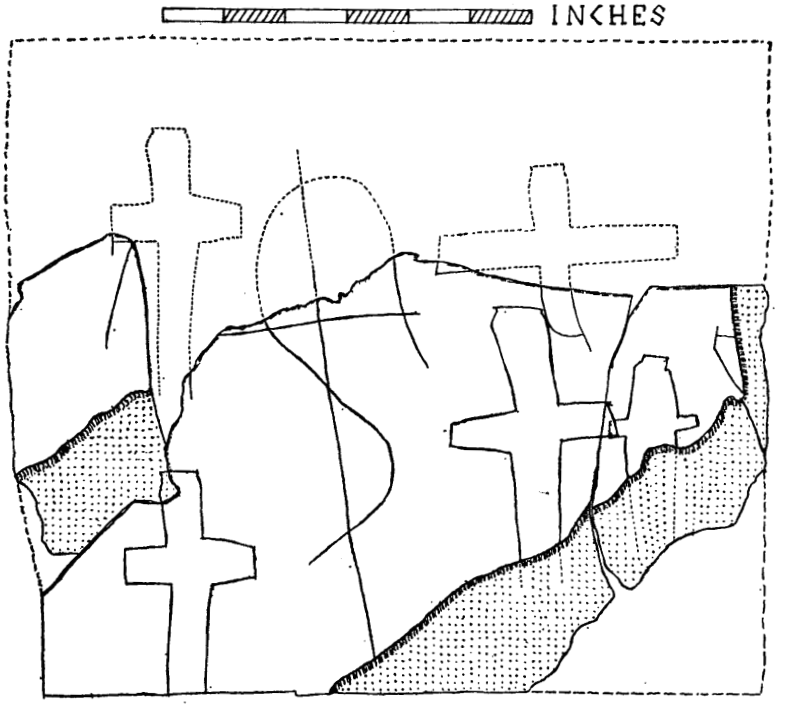

Fig. 4 Portable altar of slate (reconstructed) found with burial xxll.

A very curious grit slab, no. 11, found in rubble immediately over the right hip of skeleton VII, proved to bear knife-point *graffiti* at one end. These display an outline figure, apparently in a cowl, with one outstretched hand holding a small crozier; and a similar, slightly taller, outline figure besides it, holding either another crozier or a stiletto-shaped cross.

Three fragments of what must have been a squared plaque of slate, 11 ins. by 12 ins. (nos. 22, 23 and 25) were found in a position which suggests the intact original lay on the chest (or perhaps over the head) of the elderly man, skeleton XXII. The reconstruction (fig. 4) shows a central Latin cross with a sinuous "S" superimposed, and four flanking outline Latin crosses, the curious nicks at the top of the upper arm being repeated on the outline Latin cross on stone no. 19, found by this skeleton's foot. The squared plaque must be seen as a

portable altar, buried with (presumably) a cleric, but whether it was a genuine altar or, as its technique suggest, an *ad hoc* substitute prepared especially for burial, is uncertain. This piece appears to be unique.

Phase III

The worked stones which can be ascribed to this phase are of course more numerous, since the phase occupies a longer stretch of time—from the actual construction of the stone chapel which, as will be argued below, may be the early 8th century, if no earlier, up to the period indicated by the Ardwall House cross-slab (the end of the 11th century).

The most noticeable difference is a change in technique. The "early phase" stones are worked, or rather incised, with a knife, flint, or some other pointed object. Phase III stones exhibit grooves which must have been reamed out, or cleaned up to a V-section, with some metal tool, but the preliminary work is all pocking and must have been executed with the equivalents of a modern quarter-inch mason's cold chisel or a punch, and a heavy hammer.

A number of small fragments—no. 10 found in the chapel, nos. 15, 16, 18, 21 and 26 outside the south-west corner (but at a higher level than the Phase II burials here) and no. 9 outside the south-east corner—belong to small *shaped* crosses with either rectilinear or curved expanded arms and (in one instance) a central boss. Nos. 9 and 19, found some 30 feet apart, join, and make up a small free-standing cross which presumably stood in the ground at the head, or foot, of a grave. The general feeling is distinctly Anglian. The larger cross-slabs include the three (nos. 3 and 4 found face-down inside the chapel, no. 1 now at Ardwall House—and presumably the missing no. 2) which either stood upright at one end of, or were recumbent upon, graves, and stylistically should run between 800 and 1100. There are two much thicker pieces which unquestionably stood upright. Just north of the chapel, the shaped tenon butt of a cross-shaft (no. 5), shaped to fit into some rectangular socket, occurred, and this may be commemorative or dedicatory in function and not funerary at all. At a displaced level—built, in fact, face downwards into a cross-wall of the Tavern, approximately above the lower half of skeleton XX in fig. 2, was a remarkable stone weighing several hundredweights (no. 6).

This was roughly rectangular in section, and the upper half of one face bore, pocked out in irregular and uneven minuscules, the name CUDGAR. Below this, pocked out and then reamed evenly, occurs an expanded-arm cross within a circle, so arranged that the four arms form a saltire and not the usual upright "Greek" cross. Several pieces had splintered off from this design, but the most careful search revealed two of them, which have been re-affixed in position. Above and to the right of the wheel-cross, below the "R" of the name, some much smaller letters have been laboriously scratched on an uneven patch in a mixture of capitals and minuscules; these appear to read HUTHGA..., the margin of the stone, which is chipped here, presumably having held a final R(?).

A very remarkable slab of a reddish stone, one half of which has split off longitudinally and is lost, bears, deeply incised in V-section, four designs. This stone (no. 17) was in disturbed rubble, approximately over the head of skeleton no. XXII. The designs, reading downwards, are: the hindquarters, back legs and tail of some quadruped—about half of the wheel-cross—a complete wheel-cross, similar to the one above it, and also resembling the cross on the CUDGAR slab, in that the arms are set diagonally in saltire fashion—and all but the head and leading fore-leg of a similar quadruped, perhaps intended as an *Agnus Dei*. This stone, even if complete, should be regarded in the nature of a trial piece, perhaps, rather than as a finished memorial-stone.

The broken cross-slab (no. 13) found inverted in a pit before the altar also bears a pocked shafted cross of Anglian type, the arms curving in towards what W. G. Collingwood neatly labelled "the arm-pits," and with a small pocked hollow in the centre. Likes Nos. 1, 3 and 4, it is not easy to decide whether this stood upright or was recumbent, still less to which grave it should belong.

The most important of the three architectural fragments, one of which (no. 20) is frankly dubious and may belong to Phase II, is no. 12. This is a small, curved, chunky grit fragment, one face of which has a pocked border following the outline; it was found embedded in the top of the chapel's south wall. It is the tip of a stone gable-finial of a specifically Irish kind, an instance of which was recently found at Church Island, Co. Kerry.[12] No. 152, a spall off the tip of a similar, or another, finial, was found some four feet out from the east wall of the chapel.

Parallels and Chronology

Phase I

The burial ground clustered around a focal shrine may, in Britain, go back to the 5th century—there is no proof of this, but all the circumstances indicate it—and as an "undeveloped" cemetery, could have been current until the 7th or 8th centuries. In this case the shrine itself affords some clue. We may assume that the visible portion consisted of a stone superstructure like a ridge-tent—two long side slabs meeting along a common ridge, and two triangular end-slabs, possibly pierced for access to the relics. Such "slab shrines" occur in early-looking *cills* in County Kerry, with known outliers in Counties Clare and Meath.[13] A date in the early 7th century is perfectly feasible, and probably one in the 6th as well. The origin of the type is uncertain but the gabled sarcophagus-lid of the late antique world, introduced as an idea in post-Roman times directly to southern Ireland, is a fairly obvious explanation.

Phase II

The main feature, the timber chapel or oratory, is quite at home in the

12 O'Kelly, **op. cit.** note (3), p. 94 and fig. 7. I am indebted to Etienne Rynne for a list of gable-finials on buildings of early Christian character; they seem largely confined to the west of Ireland.

13 Four in Co. Kerry (Henry, in **Proc. Roy. Irish Acad. 58 C 3** (1957), pp. 82, 96-98 and 101); two in Co. Clare (Champneys, **Irish Ecclesiastical Architecture**, p. 108); one in Co. Meath (most recently, Waterman in **Ulster Journ. Arch. 23** (1960), p. 88 n. 13).

7th century. In the vast field of Irish literature and hagiography, one need refer no further than to the life of St. Brigit attributed to Cogitosus[14] for numerous and credible references to the construction of altars, doorways, chapels and (in the 8th century) an elaborate and complex church, all in wood. Bede's *Historia* refers constantly[15] to wooden churches and chapels in 7th-century Northumbria: whilst many of these must represent a native building idiom, others at places like Lindisfarne stem from a tradition brought from Iona and bear out Bede's comment[16] that building churches in timber was, in any event, a practice *more Scottorum,* "in the Irish fashion." This comment may refer to the 7th century, if not to Bede's own time of writing (the early 8th) as well; but the belief in the existence of an equally antique mainland British tradition in timber construction can be seen in Bede's remarks about Whithorn,[17] where the church of stone by then attributed to Nynia was said to have been built *insolito Brettonibus more,* "in a manner uncustomary with the Britons."

The only definite instance of a small timber place of worship underlying a stone one, and this is apart from the presumptive evidence of such a sequence recorded by Bede for, e.g., York, occurs at the site of Church Island in County Kerry, to which reference has been made.[3] In this case, the small size of the structure, despite the numerous burials aligned by it, makes it probable that it was at the most a chapel with an altar designed to accommodate the celebrants, lay persons standing without. The Ardwall Isle Phase II structure is, on the other hand, no smaller than the tiniest of the admitted stone chapels. There are two features which lead one to think that that, for the innovations of Phase II, one should look westwards, and that it is still too early to look eastwards to Northumbria.

The first is that the proportions of the timber building—more or less 2: 3 (breadth: length)—conform to those general in the earliest Irish churches, as the late H. G. Leask pointed out.[18] This simple rule-of-thumb may indeed have acquired the force of tradition, if not sanctity, and is actually mentioned in an early law tract.[19] It is of course equally possible that similar proportions marked the early or mid-7th century timber churches which must have stood at Lindisfarne, Old Melrose, Coldingham and perhaps Abercorn, but the evidence from other churches, or portions of churches, in stone, from late 7th and 8th century Northumbria, suggests that a rather more elongated plan may have been current from the Tyne southwards.

The second feature is the extremely simple form of the Phase II, or "early phase" (Phases I and II) worked stones. The small grave-markers or standing slabs with simple equal-armed incised crosses, or with Latin crosses drawn in

14 Best edition, **AA. SS. BB** Feb. I (1658), pp. 135-141. The accounts of the wooden altar where Brigit makes her vows, and of a wooden doorway altered in size, are too detailed to permit scepticism.
15 Bede, **H. E.** II. 14 (York, **Campodunum**): III. 17 (Yeavering, Lindisfarne): III. 25 (Lindisfarne): Bede, Prose Life of St. Cuthbert, caps. 46 and 47.
16 Bede, **H. E.** III. 25.
17 Bede, **H. E.** III. 4.
18 **Irish Churches and Monastic Buildings,** I (Dundalk, 1955), 49-51.
19 Accessible in George Petrie's **Ecclesiastical Architecture of Ireland** (2nd edn., Dublin 1845), 365.

outline, but with no further ornament or distinctions, seem characteristic of the offshoot areas of the Irish church in the 6th and 7th centuries, if not of Ireland itself. Examples of small slabs with roughly-chipped crosses can be seen, for instance, on Iona (unpublished), where they doubtless could have marked the graves of the Columban era. If the island sanctuary of Eileach an Naoimh[20] is really to be connected with Iona in Columba's time, it provides at least two more examples.

The most striking parallels come however from the Isle of Man. In an excavation of great interest, conducted with much skill and undeservedly overlooked by most students, J. R. Bruce and William Cubbon exposed a chapel with attendant, and perhaps earlier, burials. The group of small slabs or grave-markers from here, whose general association with the graves and the chapel is not in doubt, bear precisely the same limited range of ornament—equal-armed linear crosses, outlined Latin crosses—in incised technique, as do the Ardwall Isle ones. The site, Cronk yn How[21], is on the Ayre, the north-west coastal flats of Man, and the nearest point to Galloway. It must have been connected with the monastery at Kirk Maughold, a short distance away, and survival of this type of very simple memorial is seen at Maughold where a simple linear cross occurs on top of a 4-feet high slab.[22]

Not too much weight can be laid on the existence of a corner-post shrine in Phase II, the very existence of which can only be suspected; but in general this is a phenomenon centred on the 7th century. In summary, phases I and II must, on the evidence, belong to pre-Anglian Galloway; and the external parallels —slab-shrine, timber structure, simple worked stones, and perhaps the corner-post shrine—suggest that between them these two phases cover an unknown stretch of time in the 6th (probably later 6th) and 7th centuries.

Phase III

The significant factors in this phase, apart from the replacement of the timber structure by a stone chapel, are the small crosses whose general shape recalls the earliest (Anglian) Whithorn types, and the name "Cudgar" which is Anglian and not British. It would be rash to suggest that the whole phase is ushered in at the time of, and as a result of, the Anglian domination of Galloway —within a generation of A.D. 700—since other elements in Phase III could equally well be Irish-inspired or even native, and it is not certain that the stone with "Cudgar" on it is primary in this phase, though it cannot be much later.

The chapel is again internally of the order 5: 9 (actually it is, taking the mean, 13 ft. by 23 ft., or 2: 3.65) and, as a single-celled building with a west doorway, would be at home anywhere in the Irish Sea region around 700 or later. The only known parallels to the curious constructed altar with its relic

20 Trans. Glasgow Arch. Soc. n.s. VIII ii (1930), 86, fig. 19.
21 J. R. Bruce and W. Cubbon, "Cronk yn How. An Early Christian and Viking site at Lezayre, Isle of Man," Arch. Cambrensis LXXXV (1930), 267 ff.: crosses at pp. 297-9, figs. 13 and 14.
22 Journ. Manx Museum, VII (1966), pl. 8 and p. 27 (no. 172).

cavity occur in western areas—Bute and Scilly—where Irish influence must be suspected; and neither chapel need be much later than *circa* 700, though the proportions of the Scillonian one confirm to the local 1: 2 or double-square style[23] rather than to the Irish proportions. The gullies along the north and east wall faces, if they held wooden panels, give us little clue as to origin, and it must be recalled that the number of chapels of this period excavated under rigorous modern conditions are few and far between.

On the other hand, it does seem that, at some point in Phase III, small crosses or grave-markers of a type otherwise associated with the founding of a formal Northumbrian diocese at Whithorn—an event of the period *circa* 710 to 730, which may none the less mark the culmination and not the beginning of a lengthy period of Anglian infiltration[24]—came into use at Ardwall Isle. The fairly simple wheel-cross on the " Cudgar " stone does not have to be later than the 8th century, and if it is hard to find parallels for the saltire placing, the form of the cross itself occurs locally on the much older, and then visible, Kirkmadrine inscribed stones[25] and also in the Isle of Man.[26] That some of the very large slabs—nos. 1, 3, 4, 5 and 13—take us into the 9th, 10th and 11th centuries, if not later—merely indicates sporadic but continuous use of the site. The chapel itself may have become ruined by the time that grave no. III, dug from a high level and probably associated with the late cross slab no. 3, was inserted into its floor. By the 13th century, when the Hall was built, the burial-ground as well as the chapel must have been forgotten, and I have already suggested[27] that the now-superseded burial-ground at Kirkandrews or Kirkanders, a few miles away on the mainland, replaced it, presumably in the 12th century.

Phase III, then, if linked with the construction of the stone church, may belong to the early part of the 8th century. If the style be local, the impetus to re-build in stone may well have come from Whithorn in the time of Pecthelm or his near successors; and the *Cudgar* stone gives us a glimpse of a small community of mixed origin. The enclosure wall, and any living-cells which it may eventually prove to have contained, could well date from the 7th century and be a Phase II feature; or they could have been added in Phase III. But the evidence of the skeletons themselves rather implies that in Phase II, where burials appear to be those of adult males, a small communal hermitage of Irish character flourished, and the enclosure wall is perfectly proper to any such establishment. In Phase III, the burials include at least one woman of early date (X), another admittedly much later (III) and at least one adolescent (XX): this is a state of affairs one would associate with a lay cemetery for the local Christian populace—in this case employing a burial-ground and chapel whose sanctity, and no doubt antiquity, cannot have been in doubt.

23 Thomas, " Post-Roman Rectangular house plans in the south-west," **Proc. West Cornwall F.C.** II. 4 (1959-60), 156 ff.

24 Cf. John MacQueen, **St. Nynia** (Edinburgh, 1961), 23-26.

25 W. G. Collingwood, **Northumbrian Crosses . . . &c.** (1927), figs. 2 to 4: cf. also (without prejudice to date) fig. 5, the PETRI APVSTOLI stone, and figs. 6 and 8 (Whithorn), perhaps as likely to be 8th century as 9th.

26 Maughold no. 21 (Kermode, **Manx Crosses** (1907), 109 and pl. ix).

27 **TDGNHAS XXXVIII** (1959-60), 81-82.

The lost eponym or dedication

A final but relevant point is of course the identity of the person whose remains were found in the Phase III altar, a person supposedly enshrined before this in (successively) the Phase I rock-cut slab shrine and the hypothetical Phase II corner-post shrine. It is most unlikely that the name *Cudgar* refers to him, since it is (a) Anglian, and (b) to be connected with a cross-slab which can hardly be earlier than the beginning of Phase III and is probably a good bit later. This is bound up with the sorry fact that the name of the Isle itself is lost. "Ardwall" merely refers to its post-medieval attachment to the estate of that name, and it is locally also known as "Larry's Isle," after one Lawrence Higgins who lived here in recent times. It is possible that the original name embodied that of the person whose shrine must have been here.

Professor G. W. Barrow (Newcastle-upon-Tyne) kindly informs me[28] of a list of nine churches and two chapels, confirmed to Holyrood by John, Bishop of Galloway (1189-1209). The last two names in this list, all of which are otherwise identifiable, are Anwoth (the old parish church) and the chapel of "Culenes" *(cum capella de Culenes).* In the absence of other dated forms of this name and, as Dr W. F. Nicolaisen points out to me, any clue as to how it was pronounced, it is rash to try to interpret it; but the temptation to see the second element as *inis,* "isle, small island" is strong.[29] This gets us but little further since, if "Culenes" refers to the Ardwall Isle chapel, it does so at the last possible stage of its existence, and only a generation or so before the point where, on pottery evidence, the medieval Hall was constructed.

II—DISCUSSION

Early Christianity in the region

The two western counties of Galloway form the northern side of a comparatively sheltered maritime reach, the North Irish Sea; its other bounds, clockwise, are the Solway Firth, the western littoral of the Lake District, the Isle of Man, and the Ulster coast. In considering the history, or for that matter the pre-history, of any part of this region, it is impossible to ignore all or any of the other parts. Intercommunication across this extended "pond" in all directions, and necessitating little more than currachs or fishing-boats, has been a feature during the last four millenia. In the specific instance of Ardwall Isle, one can stand on its solitary hill and look across the water to the Isle of Whithorn, the ramparts of whose cliff-castle are visible ten miles away. One can also look south, and on many days see the northern tip of Man, the Point of Ayre, some twenty-eight miles distant, with the hills of Man looming beyond it. The Rhinns of Galloway themselves are only twenty-three miles from the Antrim

28 In litt., 28 October 1965.
29 If the stress is not penultimate (Culen-es) but on the last syllable, with the first -e- obscure (Culenes) one might suspect the Norse ness, "headland"; I do not know whether there is any other traditional record of a chapel in Anwoth.

coast, and in the last century it was not uncommon for Portpatrick people to do their shopping in Ulster.

The sequence of Christianity around the North Irish Sea is most imperfectly known. It is reasonable to believe that, by the late 4th century, scattered but organised groups of Christians could have been found here—for example, in the *vicus* at Carlisle. From here, or from north-west Wales, the faith may have reached the Isle of Man. In Ireland, however, pre-Patrician Christian groups seem more likely to have existed on the south-eastern seaboard (in close contact by sea with the south Wales plain) than in the modern Ulster. Tertullian, writing *circa* 200 (his *Adversus Judæos,* vii) appears to refer to Christianised Britons in regions unreached by the Romans, which may conceivably refer to Ireland or some area of Scotland.

It is generally accepted that Bede, though writing in the early 8th century, was retailing an historically sound tradition when he stated that a British bishop called Nynia ruled an episcopal see from Whithorn.[30] The evidence for late Roman Christianity at the west, or Carlisle, end of Hadrian's Wall,[31] and the presence of a Christian memorial stone, found at Whithorn, with a long and distinctive inscription[32] attributable to the mid or late 5th century, tend to confirm Nynia's traditional *floruit* of the early 5th century. There is nothing intrinsically improbable in the despatch of a native bishop to the cure of a Christian flock, however thin in the ground, and the most obvious parallel would be the despatch of first Palladius and then St. Patrick to a similar cure in connection with Christians in Ireland, events of the 420's and early 430's.

The question which is almost never asked is: why Whithorn? The siting of the episcopal seat and, in so far as most students would credit Bede, an important church, here, can hardly be a matter of chance or whim. One may postulate, earlier, a progressive Romanisation of the Galloway coast—the distribution-maps of Roman coins[33] form a suggestive index—no doubt fed continuously from the Carlisle region. A variety of possible factors could be held to account for this; casual colonisation of the rich coastal lands, refugees from the western stretches of the Wall, the accessibility of the region by small boat from the Solway, perhaps some emphasis on sheep-rearing. But the choice of *Whithorn* (rather than Kirkcudbright, or Gatehouse, or Creetown) implies that a late Roman Christian community existed here, a feature possibly not paralleled elsewhere in Galloway at this specific point in time. The most recent work at Whithorn itself, the excavation below the east end of the medieval Priory church,[34] does hint at this, if the oriented skeletons found right down near the bedrock could be those of late- or sub-Roman Christians. These burials

30 Bede, **H. E.** III. 4.

31 J. C. M. Toynbee, "Christianity in Roman Britain," **Journ. Brl. Arch, Assn. 3rd ser. XVI** (1953), 1-24: W. H. C. Frend, "Religion in Roman Britain in the Fourth Century," **ibidem, XVIII** (1955), 1-18, map and list, pl. I (p. 16): R. C. Shaw, **Post-Roman Carlisle and the Kingdoms of the North-West** (Preston, 1963), chap. 2.

32 Best discussion and reading, Radford, **TDGNHAS XXXIV** (1955-56), 170-175 and fig. 9.

33 A. Robertson, in **P.S.A.S. XCIV** (1960-61), 182-3, maps 1-4.

34 S. E. Cruden, "Excavations at Whithorn and Iona," in **The Scotsman** (Week-end Magazine section), 4th May 1963.

have disturbed a cremation or cremations, fragments of which were found in the soil, and though it is of course correct to describe these cremations broadly as "pagan," it must be remembered that Romanised Britons, as well as their countrymen *extra limites,* were accustomed to cremate the dead until the 3rd century, when the fashion for inhumation supplanted the older rite. If a late Roman Christian burial-ground formed a continuation of an older pagan one, and further became the locale for the first permanent church at Whithorn, the whole of this sequence may not have started before the 2nd century A.D.

We know almost nothing of the way in which the British church of the 4th and 5th centuries was organised. On the permissible analogy of contemporary Gaul, the large diocese and the urban episcopal seat could be envisaged as the model. The recorded British bishops who went to Arles in 314 were from York, London, and either Lincoln or Colchester.[35] The presence of Nynia at Whithorn instead of at Carlisle rather implies that the latter *vicus* already possessed a bishop of its own. But the physical distribution of inscribed Christian memorial stones in southern Scotland, attributable to the period 450-650 approximately, and owing their epigraphy and form to ultimate Roman models, allows the supposition that the Whithorn sphere of influence embraced most of the area between the Hadrianic and Antonine Walls.

Within this area, the limited information that we possess indicates, not widespread rural Christianity, not even necessarily the spread of Christianity, but three or four focal Christian regions. One such is, of course, Whithorn, and the extension to the Rhinns shown by the early Kirkmadrine stones. Another is the middle Tweed basin, with its handful of inscribed stones. A third is perhaps Clyde mouth, with the possibility that the Coroticus to whose soldiers Patrick addressed himself was a converted ruler at Dumbarton Rock, and that the cemetery at Glasgow mentioned in the life of St. Kentigern really was initiated in the Ninianic period. A fourth, more certain, is the Edinburgh-to-Stirling stretch, with the early "Catstane" cemetery at Kirkliston, numerous undeveloped[36] inhumation cemeteries—the "long-cist" burials—of early Christian type, and (on the evidence of the *Gododdin* poem) a Christian ruling class at Edinburgh by the late 6th century. Two of these foci, and perhaps a third (Tweed), appear to correspond to the seats of power in the 5th and 6th centuries, and it will not be forgotten that the Yarrowkirk stone specifically commemorates the sons of some local kinglet.[37] Are these not localised Christian groups, with a distinct flavour of the upper class looking nostalgically back to Rome and to civilisation? Such groups must have possessed their own *presbyteres* or *sacerdotes,* like the two (or three, if one reads *IDES* and not

35 Toynbee, **op. cit. n. 31 supra, p. 4.**

36 An "undeveloped" cemetery is one which, founded however early and quite probably possessing an enclosing bank or wall, appears to have had no subsequent chapel or other ancillary buildings within, or attached to, it.

37 Cf. R. C. A. M. Scotland, Selkirk **Inventory** (1957), 110 (no. 174), discussion and reading by Jackson and Radford.

ID ES(T)) mysteriously commemorated at Kirkmadrine, but under the nominal jurisdiction of a series of forgotten Whithorn bishops.

The Whithorn of Anglian times

The crux of the Whithorn problem is this; despite his tantalising brevity, the apparent description of Whithorn and Nynia given by Bede *circa* 730, taken with the very valuable clues offered by the somewhat later poem, the *Miracula Nynie Episcopi,* cannot be reconciled with the foregoing picture, which results from the archaeological evidence and from an approach from the standpoint of late or sub-Roman Christianity in the western Empire. Bede states that the southern Picts, or so it was then said and so he thought worth stating, had accepted the Faith through Nynia's teaching. There is no evidence that this is generally true. Neither the Christian memorial stones of the early Whithorn period, nor the limited iconography associated with them, occur north of the Antonine Wall. The southern Picts, who are nothing to do with Galloway or the inter-Wall area,[38] lived north of this Wall and south of the Mounth, and there is no evidence that they were Christianised until (probably) the 7th century.[39] The various claims for Ninianic or immediately-associated missions in the north and east of Scotland, and even in the northern isles, rest ultimately on unproven hypotheses and on a chain of ecclesiastical dedications; none of these can be shown to be early and many of them derive from post-medieval records. The really telling point is that there is no evidence that the church of Nynia, or of his episcopal successors, had any such missionary rôle. The limited evidence of archæology in fact directly contradicts this, and as E. A. Thompson has shown, such a rôle would, in the context of the time and the locality, be quite unparalleled in history. Nynia was first and foremost a late or sub-Roman British bishop, sent to administer an area containing extant Christian communities, no doubt at their request and with their approval; and, as Professor Thompson pertinently reminds us, he need not even have been the first bishop at Whithorn.[40]

Bede further tells us that Whithorn had by this time become incorporated in Bernicia, the northern province of Northumbria, and he implies that the Angles had quite recently (*iam nunc*—the period 710-730 is generally assumed for this) established a diocese of their own church here. These statements are, as one might suppose, perfectly acceptable and are borne out by other independent

38 J. MacQueen, TDGNHAS XXXIX (1960-61), 127-143.

39 It is of course perfectly possible that some Picts in the Stirling area became Christians in the 5th century; it is also possible that Picts from here or Dunbartonshire, apostate Christians, were in the service of Coroticus at Dumbarton Rock when Patrick addressed them (Epistola, c. 440-450—so L. Bieler). Doubt has been cast on the latter episode by D. A. Binchy (Studia Hibernica 2 (1962), 106-112) who wavers between the Ceretic of Strathclyde (early Patrician chronology) and the Ceretic of Cardigan (late Patrician chronology) and appears (op. cit., 167) to favour the latter. But neither possibility will suffice to confirm Bede's statement either as it stands or as recent scholars seek to interpret it; nor is there any support from archæology. For these reasons I continue to reject this particular remark of Bede insofar as it implies a 5th-century missionary campaign by Nynia and his followers in what is now the area of Fife, (east) Perth, Angus, Kincardine, and (south) Aberdeen—still less in the areas north of the Mounth.

40 E. A. Thompson, "The Origin of Christianity in Scotland," Scot. Hist. Rev. XXXVII (1958), 17-22.

evidence. He also states that Nynia had built a church there (at Whithorn) in stone, in a manner to which the Britons were not accustomed; that—accepting John MacQueen's careful analysis of this difficult passage—the church was named after St. Martin, that is, was at the time Bede wrote dedicated in honour of St. Martin (of Tours); and that Nynia himself and many other *sancti* lay buried there.

The contention that a church of stone had really been built at Whithorn at the time of Nynia, and that by Bede's time had gathered to itself the (Latin) soubriquet of *Candida Casa,* is by no means incredible. One might even go so far as to say that, given the assumed circumstances, a small structure in the Roman manner with dressed coigns, solid walls, and some attempt at internal and external facing, a provincial imitation of the Roman public style, is just as probable as a structure of split logs. Not a great deal can be gained from any discussion of what *candida* originally meant (or what word it originally may have translated) in these circumstances; as MacQueen points out, it may in the first instance have been used metaphorically (" pure "), and one could also point out that in the insular Celtic languages, the words which have given Irish *fionn* and Welsh *gwyn* may have possessed, as their modern forms do, the dual meanings of " white " and " fair, blessed, holy, pleasant, fine." It was taken as " white " by Bede's contemporaries (*hwit*) and the name *Whithorn* is due to this equation. But there remains a suspicion that a neat little buildling in the Roman idiom, set on its small hill above the surrounding and perhaps rather undistinguished late Romano-British village, was called some adjective like **uuin* because of its regularity rather than because of any whiteness.

The association with Martin of Tours, who died about 397, has been not unnaturally seized upon because it would support the late 4th century date for Nynia's activities. It is, however, open to the same objection as is Bede's ascription of a missionary rôle to Nynia's period; anachronism. Martin was, like Nynia, a bishop within the late Imperial framework, and the subject of a massive cult in later centuries; but he was neither an Apostle nor a martyr, and the dedication of a provincial church, or of any church, to a figure of this kind at this date would be unparalleled.[41] Whenever this ascription was added, it can hardly have been in Nynia's time.

That Nynia was buried in his own church, or in *a* church, at Whithorn, is credible, and is borne out not only by the *Miracula* poem but by all subsequent tradition and by the architectural record. That, by Bede's day, Nynia had been removed from his original grave and enshrined is, in the light of what we know of insular practice, equally probable, and is also borne out by the *Miracula* poem; the latter appears to describe a shrine beside a main altar, a placing which was current practice in Bede's Northumbria and with which he would have been familiar—indeed, might have expected to be reported from Whithorn.[42]

41 Cf. Professor Owen Chadwick's remarks, in **Studies in Early British History** (ed. N. K. Chadwick), Cambridge, 1954, 176-182. He would accept Mrs Chadwick's suggestion that the Martin dedication at Whithorn is not early than the end of the 6th century.

42 Cf., of many instances, the enshrinement of Cuthbert and probably Aidan in this position: **H. E.** III. 17, IV 30.

The "Monastery" Problem

The real discrepancy between what one might call the sub-Roman view of Whithorn, and Bede's view of Whithorn, is not primarily due to anything that Bede says. This is important. Bede's information is generally regarded as coming, not from a visit in person, but from Pecthelm, another Angle, an acquaintance if not a friend, and bishop of Whithorn in Bede's literary years. Pecthelm's information must have come—in Latin—from clerics at Whithorn, who could by 730 have numbered Britons, Irish, and conceivably Angles, among themselves. Their information may have been traditional—common sense suggests that in part it must have been—or literary, in the sense that some kind of official *Vita* of Nynia had been composed there prior to the establishment of the Anglian see. We are not entitled to assume, and from the chain of information which eventually reached Bede at second- or third-hand and became a paragraph in his *Historia,* we have no warrant whatsoever to assume, that Nynia founded a monastery at Whithorn; nor that Nynia himself, bishop in the early 400's, was even locally assumed to have founded a monastery.

This does not imply that Whithorn, by (say) 710 - 730, was not a monastic establishment. The evidence strongly suggests that it was; and that, had Pecthelm and his associates not encountered a monastery of North Irish Sea type there, they would in all probability have founded one, of the (related) Northumbrian type. The problem to be discussed below—and this is where Ardwall Isle, and a host of other sites, are directly relevant—is, When and under what circumstances could such a monastery have come into being?

The ascription of a monastic foundation to Nynia has very ill-defined roots, and it would require the most prolonged search through a mass of studies in, and commentaries on, the Ninianic church, to unearth these. It will suffice to draw attention to those statements, *passim,* in the Whithorn volume of these *Transactions (XXVII,* 1948-49, pp. 92-94, 117-119) and to the Ministry of Works *Official Guide* (H.M.S.O., 1953 and reprints) to Whithorn and Kirkmadrine, and to omit the numerous accounts which have drawn on these. The gist of these is that Whithorn was a Celtic monastery founded, if not by, then very soon after, Nynia, that Nynia may indeed have studied under St. Martin at Tours, and that Martin's establishment at Tours (Marmoutier, *maior monasterium*) formed the physical prototype of Whithorn.

The objections to any contemporary association with Martin, for which the ascription first recorded by Bede could be evidence, have already been voiced, and the specific statement that Nynia visited Martin at Tours stems first from the un-historical Life compiled by Ailred of Rievaulx in the 12th century. There are other objections. Martin's establishment is very fully described by his contemporary biographer, Sulpicius Severus. It was a peculiar, and for its age and region, probably unique, foundation of eremitic type, and the biography makes it clear that at both Ligugé and Poitiers, Martin was experimenting with a form of "communal hermitage." Like the early 5th century foundations

(Lérins, off Cannes, and St. Victor's near Marseilles) in southern Provence, this cannot be totally disassociated from similar movements in the Egyptian desert in the third and fourth centuries; but it is by no means the developed communal or cœnobitic monastery, starting largely with St. Pachomius' early fourth-century system in Egypt, spreading to the northern shores of the Mediterranean, and by the early 6th century taking root in western Britain. As Mrs Chadwick succinctly puts it,[43] St. Martin's foundations give "no impression of an elaborate organized economy, or regular discipline, and his monastery left no permanent monastic tradition." The coincidence of Martin's followers at Tours having hollowed out caves as retreats for themselves in a cliff, and the cave at Physgyll associated with St. Nynia and possessing rock-cut crosses at least as early as the 7th century, is interesting, but need be no more than a coincidence; there is no evidence (apart from mention of a *horrendum antrum* in the *Miracula* poem, cap. 14) that Nynia ever used it and caves, like islands, abound as personal retreats in this period of Christianity.

A less weighty objection is that, despite many seasons of the most meticulous excavation around the medieval ecclesiastical ruins at Whithorn, and despite anything which field-work and aerial photographs in the vicinity of the burgh might conjointly be hoped to reveal, no sign of a large monastic enclosure of the type known from (in part) Glastonbury, Tintagel, Glendalough, Clonmacnoise, Inis Cealtra, Iona, Applecross, Deerness, Coldingham, Old Melrose, etc., can be found. These large communal monasteries and monastic schools are in any event foundations of the 6th and 7th centuries—Tintagel and perhaps Glastonbury could be very late 5th[44]—and the type itself thus post-dates Nynia by something like a century.

The real evidence for Whithorn being monastic during Bede's and Pecthelm's day is inferential rather than actual, but none the less seems acceptable. As we have seen, it does not derive from Bede, nor can it be immediately derived from early Irish sources, since (as P. A. Wilson shows, and this is discussed below) it is not certain that Irish references to persons being educated at a famous monastery on the British mainland do all refer to Whithorn. It comes, of course, partly from the historic fact that the major church centres of Northumbria in the late 7th and early 8th centre, and this category would include an episcopal seat like Whithorn, were essentially "minsters" housing one or more church buildings and a variety of ancillary structures and personnel. This is in no sense a direct derivation from the true monasteries of pre-664 Bernicia, led by Lindisfarne, themselves derived from the prototype on Iona and (it seems) physically indistinguishable from contemporary monasteries in Ireland; it stems just as much from the quite "non-Celtic" foundations of the Jarrow-Monkwearmouth-Hexham-Ripon kind, in architecture and lay-out at once more compact and, as

43 **Poetry and Letters in Early Christian Gaul** (1955), 143.
44 This is on the evidence (at Tintagel) of imported pottery of Class A, but at the very earliest only a decade or so before 500.

both literary sources and recent excavations[45] show, little in retard of Continental developments.

This is confirmed by a close study of the *Miracula* poem, in Mrs MacQueen's edition and translation, *TDGNHAS XXXVIII* (1959-60). The poem, a florid composition with much striving for effect, was composed at Whithorn in the late 8th century by an (Anglian?) former pupil of Alcuin of York, and sent to his master, whose surviving letter acknowledges it with pleasure. Professor MacQueen has discussed[46] the possibility that it draws to some extent on a postulated "Anglian *Vita*" which may itself have stemmed from an indigenous composition ("Celtic *Vita*") of pre-Anglian times but, one would add, probably no earlier than the 7th century.[47] It could, of course, equally have drawn on local tradition and have reflected the actual *mise-en-scène* of the time.

The poem contains several descriptions of Nynia's tomb, which, though not to be taken as either factual in detail or as reliable archæological evidence, have none the less a cumulative value. Nynia was buried in his own church (cap. 9, *titulus*). The tomb is described as *sacrata busta sacelli* (1.300), "sacred coffin of the shrine (?sanctuary)," and (cap. 11) a tomb where the saint rests in furrowed marble. In cap. 12 it is twice referred to as being hollowed out in stone and in cap. 13 it is said to be at, or in *(quo)* the altar of the main church (which is itself pictured, *passim,* in some rhetorical magnificence). The tenor of all this is clear. The stone sarcophagus, hollowed to receive a body, is far from common at this time—Bede cites a few instances[48] of royal or very holy persons being so buried, one of them in a re-used Roman marble sarcophagus, which may have inspired the Whithorn poet—but the composite stone shrine, set above an original grave, containing the exhumed remains of a saint and thus available for inspection or veneration, is a common feature of the 7th century and is almost certainly what is here described.

Cap. 3 speaks precisely of the many monasteries "which now flourish with an excellent swarm of monks, and in which servants of Christ truly keep the monastic rules"; though it is uncertain where these should be located. Cap. 7 refers to a meal taken communally with the brethren, and to a brother who had charge of a vegetable-garden. Cap. 14 comments on his hospitality to all guests, to Nynia's prowess as a teacher, and to his retreat in a cave (Physgyll?).

Whether all or any of this really refers to the Nynia and the Whithorn of sub-Roman times may be doubted, but insofar as it reflects either the 8th

45 Excavations by Miss Rosemary Cramp: preliminary reports in **Univ. of Durham Gazette** ("Excavation Committee Reports") over the last five years.

46 In his **St. Nynia** (Edinburgh, 1960) 2-6 (**stemma,** p. 6). In an important recent study ("History and Miracle Stories in the Biography of Nynia," **Innes Review 13** (1962), 115-129), John MacQueen argues that three of the four miracle-stories common to the **Miracula** poem and Ailred's **Vita,** and the two further ones which occur in the **Vita** alone ". . . have features which seem to belong to the Celtic hagiographical tradition" (**op. cit.,** 122); that they are related to history, "not directly but at one remove" (i.e., as "a figural or typological approach to history"), and that they point very strongly to the existence of an original Celtic **Life** of Nynia, composed in the period of Celtic monasticism there.

47 Insular hagiography starts with the life of Brigit attributed to Cogitosus (later 7th?) and to a lesser extent the life of St. Samson of Dol (earlier 7th); it would be difficult to show that this **genre** had developed much before this time.

48 Cf. **H. E.** IV. 11 (king Sebbi—this is a "stock" miracle and not very good material evidence), and **H. E.** IV. 19, the enshrinement of abbess Etheldreda in a white marble sacrophagus with fitting lid, apparently found in the ruins of Roman Cambridge.

century milieu in which it was composed, or the 7th (?) century milieu of any lost pre-Anglian Whithorn *Vita* from which the plots of the actual miracles were borrowed, it reflects monastic life in the sense in which Adomnan pictured Iona in the 690's; and it remains to see when and how this change had taken place.

Early Irish Influence in Galloway: The Evidence

During the fourth and fifth centuries A.D., numerous coastal areas of western Britain were subject to Irish settlement.[49] Whether, anywhere, this constituted large-scale armed invasion is doubtful, but the settlement was intense enough in Argyll and the southern isles, the Isle of Man, and (for some centuries) south-west Wales, to implant the Irish language.

This wholesale emigration, which may have had economic causes, was at first secular in character; dynasties were initiated in both Argyll and Pembroke, and tribes or septs rather than individual families seem to have been involved. At a later date the Church in Ireland sent off-shoots into these colonies. The process is well illustrated in Adomnan's Life of St. Columba, where we learn that the reason for Columba's voyage to Iona in 563 was that he wished to be a pilgrim for Christ,[50] and we may assume that this implied the cure of the existing Dalriadic colonists as well as any projected mission to the pagan Picts.

The initial period of settlement in Dalriada (Argyll and the isles) may have been the later 5th century,[51] with the establishment of Iona a century later, and similiar additional establishments—overshadowed and generally now overlooked—at Lismore and Applecross following after Iona. The sketchy evidence from the Isle of Man implies a rather similar sequence spread over some such central era as the 6th and 7th centuries. The hypothesis to which diverse recent studies have been pointing is that a related secular settlement took place in western Galloway, specifically in the Rhinns, from the 5th or early 6th century, and that in the latter century and perhaps the 7th it was accompanied by that form of Christian worship and organisation then current in the Irish homeland.

The accumulating evidence falls under several headings, and may be briefly reviewed. In the last issue of these *Transactions, XLII* (1965), 99-113, Etienne Rynne drew attention to a bronze ring-brooch from Luce Sands which he regards as probably an Irish product of the 5th or 6th centuries, and to two other small ring-brooches from the same locality which might also be Hibernian. The most recent distribution of the occurrence of an imported domestic pottery group, my "class E",[52] in post-Roman western Britain, includes six sites in eastern Ulster and three in Galloway, one of which represents an E.i or E.iii

49 These are discussed in **The Dark Ages**, ed. Talbot Rice (Thames and Hudson, 1965), 261-2 and map.
50 Adomnan, **Vita Columbæ**, second Preface, and I, 7.
51 N. K. Chadwick, **Celtic Britain** (1963), chap. iii, "The Foundation of the Kingdom of Scotland."
52 **Medieval Archæology** III (1959), 59 ff., with maps; to that of Class E add now the three sites listed **ibid.**, p. 110, a further four in southern Scotland, one in Ulster and three in Wales.

rim from Luce Bay[53]; the distribution of this material, which is by no means uniform even in western Britain, implies a common trading area apparently controlled from the Rhine or some Channel port westward (e.g., Quentovic). Class E ware belongs to the 6th and 7th centuries. The small coastal fortlet of the Mote of Mark, Kirkcudbright,[54] a realistic estimate for whose post-Roman occupation would now be from the 5th to early 8th centuries, yielded a good deal of Class E ware, and numerous clay moulds for small bronze objects including early expanded-terminal penannular brooches (and ring-brooches?). The closest parallels to this "cottage industry" are to be found at Dunadd, Argyll,[55] a Dalriadic stronghold of very similar date whose Irish origins are amply attested. In the field of Christian rather than domestic archæology, we have already seen that the Ardwall Isle Phase I slab-shrine, the putative Phase II corner-post shrine, and the bronze angle-strip from some small container or reliquary, no less than the Phase III gable-finial in stone and the forms of both the timber and stone chapels, all indicate (on our present knowledge) an Irish rather than a mainland British origin.

The evidence from place-name study tells much the same story as that from archæology. MacQueen,[56] followed by W. F. Nicolaisen,[57] has argued that the distribution of certain names for natural features—the earlier forms of *carraig,* "rock," and *sliabh,* "mountain" (but in the sense of hill)—which are centred in the Rhinns, represent Irish introductions "several hundred years before the main body of Gaelic-speaking settlers arrived in Galloway."[58] Nicolaisen shows the generally restricted extent of *sliabh* in Scotland as a whole, and points out[59] that apart from the Rhinns it is found "in a very limited area more or less identical with that of the Dalriadic settlement and the first few centuries of expansion which followed it on the mainland." He adds: "Its survival in the Rhinns of Galloway . . . therefore apparently bears witness of another early Irish colony outside the Scottish Dalriada (and the Isle of Man) . . ."

Besides this evidence, archæological and toponymic, for a secular colony, we may place that for Irish Christianity. The apparent references to Whithorn in early Irish literature have recently been analysed by P. A. Wilson *(TDGNHAS XLI* (1962-63), 156-185). In a careful and far-reaching paper, he casts very real doubt on some of the traditional identifications; in particular, his argument that *Rosnat* may be, not Whithorn, but some place in the region of St. David's, Pembroke, cannot be ignored. None the less he concludes it possible, in the case of three of the various Irish clerics for whom some educational or special connection with pre-Anglian Whithorn has been claimed, that this may reflect

53 Surface find, 1964: I am grateful to Mr J. G. Scott, Glasgow Museums and Art Galleries, for bringing this to my notice. There are various unpublished pins in Mr Scott's museum stores from the Luce Sands area which may also be of Irish type, collected (I think) by the late Ludovic Mann.
54 **P.S.A.S. L** (1915-16).
55 **P.S.A.S. LXIV** (1929-30), 111-146.
56 **St. Nynia** (1961), 45-47.
57 **Scottish Studies 9.i** (1965), 91-106, with list and maps.
58 MacQueen, **op. cit.,** 46.
59 Nicolaisen, **op. cit.,** 103.

some such actual connection. Wilson's ingenious thesis of *two* persons of the same (Ninia, Nynia, Ninian) name—a *Nennio sen* or " old(er of two people called) Nynia," the Nynia of Bede, of the first episcopate, and of the possible links with Martin and Tours; and a *Nennio* who presided over a monastery in south-western Scotland in the 6th century and bore the same name—is at first reading rather breath-taking but is strongly argued. The general Christian links with Ulster have been re-examined by E. S. Towill,[60] in a much-needed discussion of St. Mochaoi of Nendrum. Whether or not one accepts all his identifications, for example with the eponym of Maughold, Man, Towill makes out a good case for the cult of Mochaoi in both Ulster and Galloway. Similar topics, for example the identity of the saint Medana whose cult appears to be located in the Rhinns (the eponym of Kirkmaiden), have yet to be explored along modern lines. The links between early Christianity in Galloway and the same in the Isle of Man also require further study. It was pointed out earlier that the grave-markers of Ardwall Isle, Phases I or II, finds their closest counterparts at Cronk yn How, Lezayre, and a cult of Nynia, best known to Man under his medieval guise of " Trinian,"[61] may have spread to Man at an early date. Whether such Christian intercourse took place as a facet of some broader secular connection—for example, whether the king Tudwal mentioned as an opponent of Nynia in the *Miracula* poem was a Manx (British) king whose sovereignty included the Galloway coast, or a king in Galloway in whose dominion the Isle of Man lay—need not be further explored here; but, as MacQueen summarises it[62] " . . . a dynasty based on Man, but with connections both with North Wales and Galloway, seems the most convincing way to re-assemble the scattered shards of evidence which have survived."

It is within this framework of Irish secular and religious influence in Galloway that we can place, not only Ardwall Isle, but something like fifty similar sites—developed cemeteries or *cills,* hermitages, and isolated enclosed chapels—in the modern counties of Wigtownshire and Kirkcudbright. Their overall resemblance to the counterpart sites up and down the west and north of Scotland, originating in the Dalriadic colony and its extension, and in Ireland itself, becomes more and more striking as they are subjected to detailed examination. It is also within this framework that we can now explain the picture of Whithorn as a monastery in Bede's and Pecthelm's day. The provision of some major monastic centre in a primary stage of involvement is a consistent feature of the Irish church spreading into Irish-settled areas or into fresh mission-fields—one might cite Iona, Tintagel in Cornwall, Deerness in Orkney, and Lindisfarne—and in the case of western Galloway, Whithorn must have been the inevitable choice. It is impossible to be at all precise but on general historical grounds one would attribute the Whithorn transformation to the sixth century

60 " St. Mochaoi and Nendrum," **Ulster Journ. Arch.** 27 (1964), 103-120.
61 B. R. S. Megaw, " The Barony of St. Trinian's in the Isle of Man," **TDGNHAS XXVII** (1948-9), 173-182.
62 MacQueen, **op. cit.** (1961), 12.

and perhaps not earlier than the mid-6th century. Nynia's Roman-style *ecclesia* would have been perpetuated as the focal point of the Irish monastery and as a final *ballon d'essai* one may perhaps hazard an opinion as to where it stood. The small Christian structure whose eastern end was encountered, below and immediately east of the great medieval church, by the Marquis of Bute, and subsequently explored by Dr Radford (*TDGNHAS XXVII* (1948-49), 106-119: *XXXIV* (1955-56), 178-183) is for several reasons unlikely to be of Nynia's own time. The excavator himself concedes (*XXXIV*, 181) that it was "one of the smaller oratories" and the size—external width of 21 to 22 feet, internal width 15 feet, a little larger than the Phase III chapel at Ardwall Isle—and character of the masonry, suggest a construction of the 8th, less probably the late 7th, century. An internal length of between 23 and (at the outside) 30 feet is likely, and this would carry the west wall to a point well inside the modern crypt. Now only a few feet further west, the early inhumation graves mentioned above were discovered recently. It seems likely that the earliest of these, those which are putatively late- or sub-Roman, antedate this oratory, and their positioning must thus be related to some other feature. Due west of these burials, the ground rises very sharply to form the little hillock on which the medieval Priory Church stands, the bedrock here being encountered a foot or so below surface. If we assume that these early burials were outside the east end of Nynia's *Candida Casa,* which is feasible, then *Candida Casa* would have occupied roughly the area of the medieval quire. Nynia's former grave and subsequent shrine, at the time of the *Miracula* poem, would have stood at the eastern end of this surviving church and the *Miracula* references to "hollowed rock," if they do not refer to an actual shrine, are explicable in that any grave of any depth here would be rock-cut. It is in this position, only a trifle eastward of this putative shrine, that we find not only the High Altar but also the medieval shrine of St. Ninian (*TDGNHAS XXXIV,* 1955-56, fig. 13, p. 195). *Candida Casa* need have been little, if at all, wider than the surviving foundations of the earlier period below the east end of the Priory church.[63] It seems unlikely to have stood south of the line of the medieval quire, since Dr Radford encountered a grave of Early Christian type under the west wall of the South transept and this is likely to have been outside, rather than inside, the early church. It is more likely that the small eastern chapel of early date was aligned on *Candida Casa*—a feature found also at Canterbury, Hexham, and probably Lindisfarne—and the presence of the early inhumations due west of the early foundations, as near as possible to the assumed site of Nynia's original shrine, rather confirms this. Sadly, it

63 There is very little comparative material. The body of the supposed late-Roman church at Cærwent (**Archæologia LXXX** (1930), 235 ff., fig. 1) is internally 17 ft. wide, and has a flattened eastern apse. The dubious Silchester church is also apsidal with narthex and porticus, but is reversed, i.e. the apse points **west**; the nave is externally 14 ft. and internally 9 ft. in width. St. Martin's, Canterbury, the chancel foundations of which can probably be accepted as genuine sub-Roman work (cf. Bede, H.E. I.26), if it was uni-cameral with an eastern apse, was only externally some 18 ft. 6 ins. and internally 14 ft. wide (cf. **Antiquity III** (1929), 68, fig. 2. It is just conceivable that the tiny basilican church postulated at Lydd, Kent (**J.B.A.A. 3rd ser. XXII** (1959), 41-52, is sub-Roman—width of central nave, 22 ft. externally, 17 ft. internally (**contra, H. M. and Joan Taylor, Anglo-Saxon Architecture: I** (1965), 405 ff.).

must be doubted whether even total clearance of the hill-top would disclose any trace of *Candida Casa;* Dr Radford's work has made it clear that the 12th-century builders destroyed all traces of earlier construction in levelling off the area for their Priory church.

The Ardwall Isle discoveries serve then to throw a little more light, not only on the sequence of early Christian archæology in the Galloway region, but on the hypothesis—which may now perhaps be advanced to the status of a firm theory—that the Anglians encountered, in the late seventh and early eighth centuries, an ecclesiastic province with monasteries at Whithorn and probably Hoddom, numerous *cills,* and of a broadly Irish character already familiar to them in northern Bernicia; and that extensive Irish influence, involving actual settlement in the Rhinns and considerable modification of Nynia's old episcopal cure over a much wider area, must be held to account for this. It remains to be seen whether further work and fresh discoveries can confirm or modify this theory.

Plate XIII.—Ardwall Isle: The "Cudgar" stone (No. 6).
[Photo: Kenneth White

AN 11th CENTURY WAR-AXE IN DUMFRIES MUSEUM

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The Burgh Museum, Dumfries, is fortunate in possessing a very fine axehead, of "Viking" type, which may with some certainty be dated to the 11th century (fig. 1). The axehead was formerly in the possession of Thomas Scott, R.S.A. (1854-1927), the well known Scottish water-colour painter, who latterly resided in Selkirk, and who collected Border antiquities. He had evidently acquired this axehead by 1901, for it may be recognised in fig. 315 on p. 242 of *Scottish History and Life,* ed. J. Paton (1902), which drew upon material shown in the Glasgow International Exhibition of 1901.[1] The axehead is there described, along with two dissimilar axeheads also figured, as "dug out of peat-mosses on the borders"; it is further individually described as "a Norwegian type of the Viking period." Scott probably also lent the axehead to the Scottish Exhibition of National History, Art and Industry held in Glasgow in 1911, though the record in the catalogue of that exhibition—"Seven Early Axe Heads, found at various places on the borders"—is unfortunately not specific.[2] The axehead may have been seen by Sigurd Grieg in 1925, when he was recording Viking antiquities found in Scotland. Grieg describes the axehead—probably wrongly, in view of the provenance given by Scott—as "found in Dumfriesshire."[3] By 1948 it was in the cellar of Dumfries Museum, packed along with a mediæval carpenter's axe from Lochmaben Castle, an early 19th century lathe-splitting axe, and other 19th century tools. Wrapped with it was, on a pencilled slip of paper, "Found in a bog in the Borders."

The axehead is 8$\frac{9}{16}$ ins. long and 7$\frac{7}{8}$ ins. in breadth across the cutting edge, which has lost one extreme tip. The body of the axehead is now only about $\frac{1}{16}$ in. in thickness, the cutting edge about $\frac{1}{8}$ in. The weight is fractionally less than 1 lb. The body is deeply pitted and corroded, yet even so gives a satisfactory ring when struck. Parts of the cutting edge retain their original bright surface on which grinding marks are visible. The cutting edge now has an average depth of 1$\frac{1}{2}$ ins., and, as has been pointed out, is approximately twice the thickness of the body, no doubt to give strength where it was needed, without adding unduly to the weight, and to provide an edge for grinding. Perhaps this thickening was achieved by fire-welding a sleeve, folded over, on to the base of the body; the conformation of the metal, as revealed by corrosion, suggests this. The reheating and hammering necessary to this process, along with the admixture of carbon each time the metal was returned to the smith's fire, would have had

1 Probably the axehead is one of "Six Antique Iron Axes" lent by Scott to the exhibition: item no. 322 on page 41 of the **Official Catalogue of the Scottish History and Archæology Section** (1901).

2 **Palace of History: Catalogue of Exhibits** (1911), I, 324, no. 105.

3 **Viking Antiquities in Great Britain and Ireland, ed. H. Shetelig, II, Viking Antiquities in Scotland (1940), by S. Grieg, 153 and 155, fig. 70.**

the effect of converting the surface of the metal into steel. The socket was formed simply by turning the metal over at the top and fire-welding it into the body. The line of the join can be clearly traced (fig. 1 lower). The socket is flattened at the top and tapers slightly from rear to front. This would help to secure the haft, and to ensure that it would not turn when the axe was in use. Two spurs on each side of the socket provide an additional means of securing the haft (fig. 1).

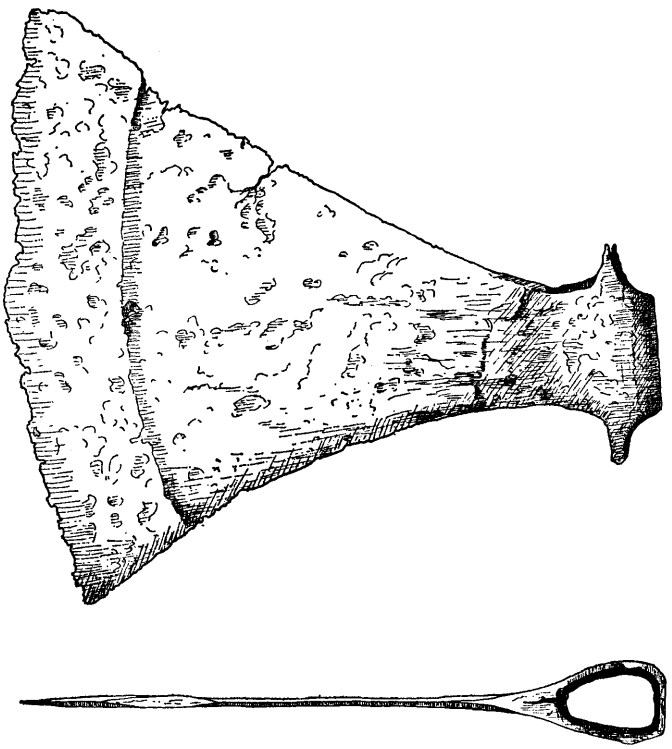

Fig. 1 11th century axe in Dumfries Museum (x 2/5ths).

The axehead was assigned by Grieg to Rygh's Type 560.[4] More recently Viking weapons in Britain have been classified by Sir Mortimer Wheeler.[5] The Burgh Museum axehead falls quite clearly into Wheeler's Type VI, which he assigns to the 11th century. In this type each side edge runs in a smooth concave curve, and the rearward-projecting "beard," or blade extension, which characterises Wheeler's Types III to V, of the 8th to 10th centuries, has disappeared. The evidence for assigning these Type VI axes to the 11th century is not merely typological, however. Wheeler draws attention to a group of seven war-axeheads, a woodman's axehead, six spearheads, a pair of tongs and a grap-

4 **Ibid.**, 153, quoting O. Rygh, **Antiquités Norvégiennes** (1885).
5 London Museum Catalogue No. 1, **London and the Vikings**, by R. E. M. Wheeler (1927), 18-37.

pling iron, found not far from the north end of Old London Bridge; these he suggests may have been lost during one of the attacks which, in the days of St. Olaf and King Cnut, centred round the old timber bridge.[6] One of these axe-heads has a brass sleeve inserted between the socket and the haft. The sleeve has an intricate incised pattern in the *Ringerike* style which developed in the Scandinavian world in the first half of the 11th century.[7] The type evidently continued in use into the second half of the 11th century, for it is frequently shown on the Bayeux Tapestry.[8]

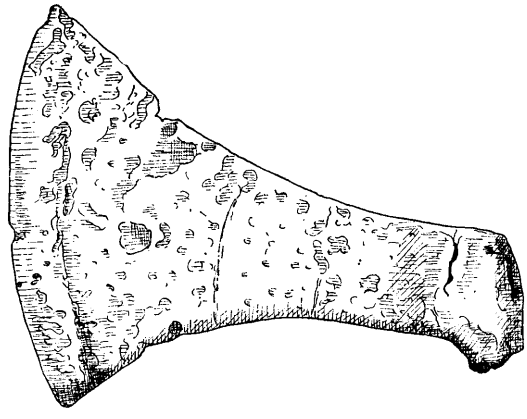

Fig. 2 Axe from Alford, Aberdeenshire, now in Nat. Mus. of Antiquities of Scotland (x 2/5ths).

It is noticeable that the spurs on the Burgh Museum axehead are not inturned. If they were not considered merely as a decorative feature, this might suggest that this axehead, too, originally had a metal sleeve.

There seems little doubt that the axe as used in war in Britain in the 9th to 11th centuries was in origin a Scandinavian weapon. In England it probably came into general use among men-at-arms during the wars which led to the establishment of Cnut and his house upon the throne. It was, of course, a foot soldier's weapon and, in the skilled hands of the huscarle, a deadly one even against mounted men. Sir James Mann, on the evidence of the Bayeux Tapestry, points out that the haft seems to have been about 3 ft. 6 ins. long, and that the axe could be wielded either in one hand or in both. He further draws attention to the evidence on the Tapestry of the dire effect of the axe, as shown in the severed heads and limbs in the lower border.[9] Perhaps its chief weakness was that the axe head might be hewn from the haft by a sword cut. Indeed, this is actually depicted in one of the scenes on the Tapestry.[10]

6 **Ibid., 18.**
7 **Ibid., 18, 19 (fig. 3).**
8 **The Bayeux Tapestry, ed. Sir Frank Stenton (1957), passim.**
9 **Ibid., 66.**
10 **Ibid., Pl. 66.**

It is often considered that the Battle of Hastings is the classic demonstration of the superiority of the mounted man over the foot soldier, but as Sir Charles Oman has pointed out, it was William's archers which turned the day.[11] At Dyrrachium, in 1081, the Varangian Guard of the Byzantine Emperor, Alexius Comnenus, consisting of foot soldiers armed largely with axes, and many of them perhaps English, advanced in column and drove a division of the enemy force, horse and foot, into the sea. Subsequently the Guard was surrounded by superior numbers and cut to pieces, but this was the result of faulty tactics rather than the inferiority of its weapons and formation in actual battle.[12]

Certainly despite the dominance of the mailed horseman on the battlefields of both England and Scotland in the 12th and 13th centuries, the axe did not die out. Indeed, before 1200 it must have begun that long typological evolution which transformed the axe, originally meant for cutting, into the halberd, intended almost entirely for thrusting, though the halberd blade's resemblance to an axe blade can clearly be seen. The Border version of the halberd was, of course, the Jeddart axe.

The first stage in this evolution can be seen in an axehead formerly in Haughton House, Alford, Aberdeenshire, and no doubt found in the neighbourhood (fig. 2).[13] In this weapon the development of the forward tip into a thrusting point can clearly be seen. Such axeheads really go beyond Wheeler's scheme of classification; he suggests that one found in the Thames, near Barnes Railway Bridge, is probably of post-Conquest date.[14] These weapons are, in fact, likely to belong to the 12th rather than to the 11th century. There is one example from the borders of Galloway. This is the axehead found in Loch Doon in 1823 and now in the Stewartry Museum, Kirkcudbright.[15]

In summary, then, it may be said that the Burgh Museum axehead represents the war-axe which in the 11th century was probably second in popularity only to the spear in the greater part of England and in southern Scotland. In the writer's opinion it probably dates from the second rather than the first half of the century. It may well have belonged to a member of that "substantial Northumbrian aristocracy native to the soil of Tweeddale, Teviotdale and Lothian" which even the 12th century feudalisation begun by David I "did not eliminate."[16]

11 Sir Charles Oman, **A History of the Art of War in the Middle Ages** (2nd ed. 1924), I, 165-6.
12 **Ibid.**, 166-7.
13 Now in the National Museum of Antiquities, Edinburgh: reg. no. IL727. I am indebted to the Keeper, Mr R. B. K. Stevenson, for a photograph of this axehead, and for permission to publish it.
14 Wheeler, **op. cit.**, 26.
15 Grieg, **op. cit.**, 153 and 154, fig. 69.
16 Professor G. W. S. Barrow, "The Beginnings of Feudalism in Scotland," in **Bull. Inst. Hist. Research XXIX, No. 79 (1956), 3.**

THE MOATED MANOR AT DUNROD, KIRKCUDBRIGHT

By Lieut. Colonel E. F. BURDON DAVIES

General

The New (i.e. Second) Statistical Account of the Stewartry of Kirkcudbright, referring to DUNROD CHURCH (Dun—a hill, sometimes a "fort"; rudd—red), puts it "nearly 3½ miles from the town of Kirkcudbright" and states that "it seems to have been about 30 ft. long and 15 ft. broad." "The churchyard is of circular form and continues to be used (1845). The population here was once considerable though now few houses remain in the neighbourhood (1845). In the end of the 17th century the heritors of DUNROD opposed the minister's application for an augmentation of stipend, because the parish was a mere waste."

In 1966 the churchyard, enclosed by a dry stone wall in the form of a rough circle, is still in use. The headstones of the 75 or so recognisable graves cover the whole of the top of a small hill, the ground-level remains of the church, overgrown and intermingled with graves, being easily discernable on the highest point. The majority of the inscriptions on the gravestones are readable; the earliest date that can be deciphered is 1757, the particular stone bearing this date and the grave being located within the ruins of the nave of the tiny church.

The Site before excavation

At a distance of between 200 and 300 feet south-east of this churchyard are clearly visible the weathered remains of an almost rectangular moated site (Nat. Grid Ref.: NX 64-699459), grassed overall except in the south-west corner where part of the moat appears to have been cut out of the rock outcrop.

On almost all maps where this moated site has been named, it has been labelled ROMAN CAMP. (The 1955 edition of the O.S. 1 inch map published by the Director of Survey, the War Office and Air Ministry, in 1961, marks the site EARTHWORK.) In view of its position, overlooked from all sides except the south, where even here the outer ramparts merge into or are formed by outcrops of greywacke, this rectangular site is unlikely ever to have been ROMAN and is much more akin to that of a MOATED MANOR of the MIDDLE AGES.

Located, with the church and yard, in the mid-course of a burn running from MILTON farm to the sea, the area is called MILTON PARKS, a name probably given to it after some clearance had been effected.

With a view to establishing its date of construction and to acquiring knowledge of its occupation, particularly so in view of its location in relation to the many other historical sites in south-west Scotland, it was decided to carry out a planned excavation. Started in 1964, the first phase was completed in 1965.

The platform, surrounded by the moat, is roughly 120 feet from north to south and 110 feet from east to west, the moat having been fairly consistently about 20 feet wide. Generally this grass-covered platform is level and on all

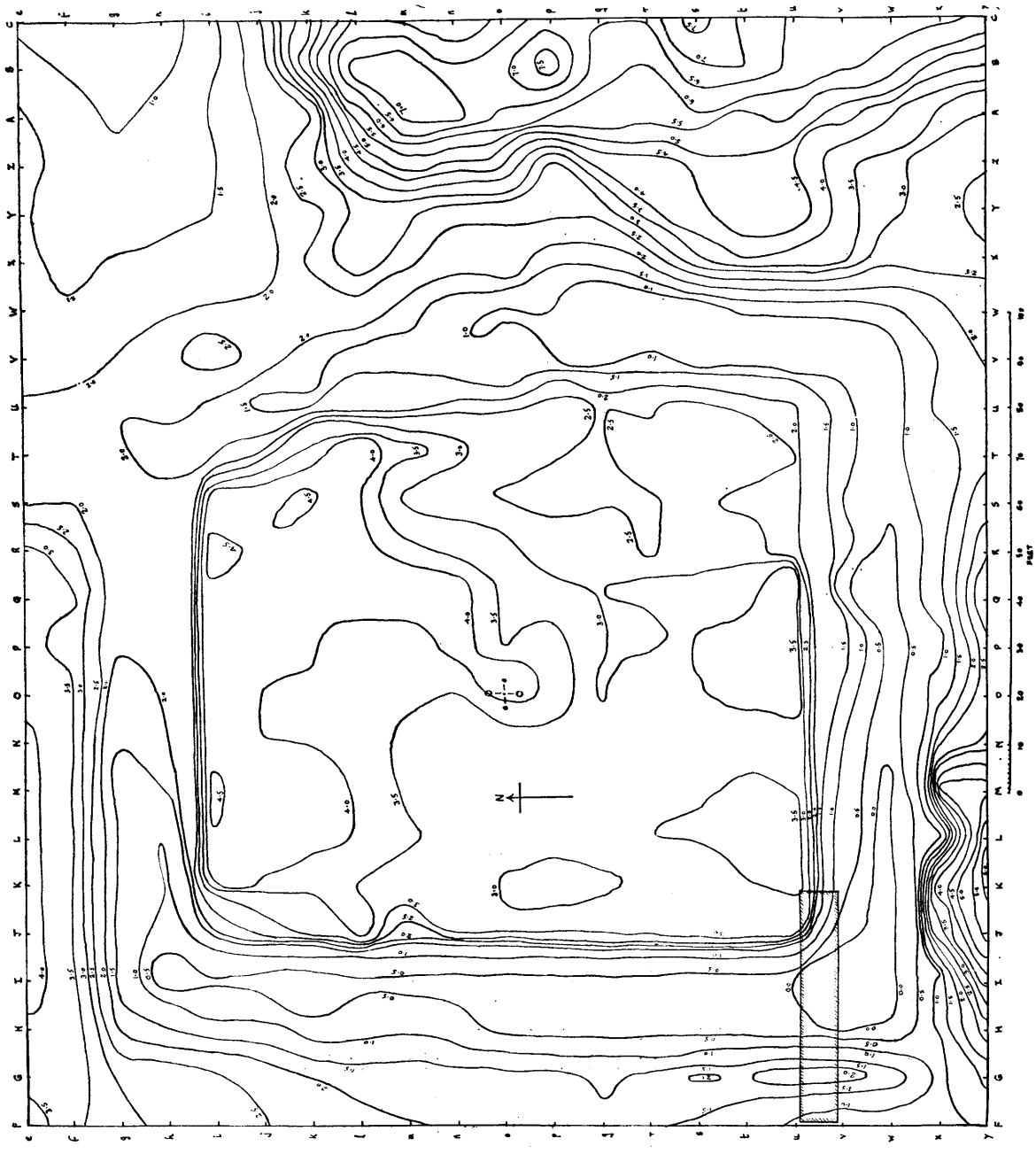

Fig. 1. Dunrod: A relief plan of the site prior to excavation. The contours, at 0.5 foot intervals, are based on the lowest part of the site in the S.W. Corner. The heights were taken at the intersections of the 10 foot grid, and are shown on the higher side of each contour line, in feet.

sides except the east, its edge—the inner rampart—is fairly well defined. The eastern side, though as consolidated as the others, is now difficult to trace both towards the north and especially towards the south; in the centre it is cut into by several hollows and flats.

The grass-covered surface of the platform, within the four sides, shows signs of a building plan especially in the north-eastern quarter, the south-western quarter being singularly flat over most of its area. Over the whole of the platform (over 13,000 square feet) the present ground surface level does not vary by more than 30 inches.

The moat, clearly defined in the west and south and at the western end of the north side, is elsewhere now rather "open," it being difficult to discern where the line between the moat and the rampart—both inner and outer, should be drawn. At the extreme southern end of the outer rampart on the west side, a distinct gap exists forming a spill-way towards lower ground, the level of the mouth of this spill-way being only 14 ins. above the present level of the grass-grown earth in the moat at this S.W. corner. This spill-way is likely to have been cut at a date later than the construction of the outer rampart, presumably in an effort to drain the water off the moat. The place where the spoil thus removed was deposited is not apparent; it is likely to have been carried away by the flow of water through the spill-way. The fact that the soil-level in the moat is lowest at this same corner and that therefore, when water begins to lie in the now almost completely filled-in moat, it appears first in this area, supports the theory that the flow of water at this point has been fast and that at other points its speed caused slightly heavier deposits of the sediment that it carried.

The Excavations

The excavations carried out in 1964 and 1965 were in the nature of a reconnaissance dig. An 8 foot wide trench 48 feet long was opened running east-west parallel to the south inner rampart, including within it the south-west corner of the inner rampart and cutting across the moat on the west of the site at right angles and also across the inner and outer ramparts. This trench was carefully excavated to various depths depending upon the labour force available, the nature of the ground, the "finds" and the weather. The grass-sown topsoil, very thin on both the inner and outer ramparts, was found to cover in the first case (inner rampart) a stone and earth "rampart" which had been retained by a "wall" of laid stones at the moat-water's edge and in the second case a mound which appeared similarly to have been retained, where necessary, by a wall or rough stone barrier at the water's edge and by two piled ridges of large stones, forming a "backbone" and a barrier on its outer side.

The Moat

The grass-grown topsoil in the moat, deep trodden by cattle and sheep, in no place exceeded a depth of six inches. Below this soil and continuing to a

depth of 2 feet the moat was found to be filled with very large stones, several of these bearing unmistakable signs of having been worked, and several of them of having been used as sharpening stones. Undoubtedly, some of these stones had formed the retaining walls, mentioned above, before being toppled into the moat. Others had been used in the lower part of what must have been mainly wooden buildings occupying the platform.

Below this depth, in that side of the moat nearest to the platform, a 6 inch layer of dark sandy clay and black silt was found to rest upon another layer of large stones, far less numerous than in the upper layer and not more than 12 inches thick. This, in turn, rested upon a very much blackened sandy-clay bed. All of these layers contained vegetable matter, e.g. twigs, short lengths of stalks of grasses and one or two hazel nut half-shells, the quantities increasing with depth.

While some 13th and possible 14th century sherds were found within the upper layer of large stones right across the width of the moat, these were concentrated near to the sides, by far the largest concentration being near the site of the outer retaining wall and within 3 feet of it. There was no find of any pottery below the upper layer of large stones, i.e. nothing below 2 feet of the present grassed surface of the moat.

While animal remains such as bones, teeth and skin (leather) were found in all of the layers other than the upper layer of large stones, right across the width of the moat, by far the largest concentration was in an area between 8 and 10 feet out from the inner retaining wall and in the very black sandy clay bed at the bottom, i.e. at a depth of between 3 and 4 feet from the present grassed surface of the moat.

In the centre of the moat, the large stones in the upper and lower layers were less numerous and lying, often isolated from each other, in a coarse grey silt which extended from 6 inches below the surface to a depth of about 3 feet where there was a layer of black sandy-clay containing much vegetable matter and which rested upon a bed of sandy gravel at the bottom.

In that side of the moat nearest to the outer rampart, below the 18 inches to 2 feet thick upper layer of large stones, there was a coarse dark brown clayey layer containing the softened remains of the yellow, red, green and purple stones that occur in the whole of the area of the site. This layer, between 12 and 18 inches thick, rested upon the black sandy-clay which in turn rested upon the bed of sandy gravel at the bottom.

The Inner Rampart (or *The Platform*)

The inner rampart, originally retained by stone walls, had been eroded to the surviving levels of these walls—up to 2 feet 6 inches on the length of the west wall uncovered and up to only 10 inches on the south wall.

These dry stone walls, between 12 and 16 inches thick, rested on a coarse sandy bed below a 6 inches thick layer of naturally deposited black soil. This

black layer, thus contained within the walls and forming in this location the foundation of the platform, was of consistently fine texture with very few stones other than at its well-defined boundaries with the layers above and below. It contained many 13th century sherds, isolated and randomly dispersed and at all levels within its 6 inches of depth. It also contained many finds of small pieces and traces of burnt bone (white), especially in the areas just behind the wall, i.e. on the dry side.

Above the natural layer of deposited black soil, several overlapping layers of fill made up the area of the corner of the platform that was excavated.

Firstly there was a layer or mound of stony, sandy rubble with a high clay content in parts and resting on several randomly placed water-worn stones. This mound, running parallel to the south wall, was about 6 feet wide, varying between 6 inches and about 12 inches high along its contact with the south wall and between 1 foot and 2 feet high along its "ridge," about 2 feet in from the south wall. One find of animal teeth was made in this layer; there was no pottery.

Above this layer, a pile of coarse clay, gravel and small stones, with here and there odd large stones, was banked to the top of the west wall and taking a natural slope to the east until, at 8 feet from the west wall, its thickness had diminished from about 2 feet 6 inches at the west wall to 2 inches. This layer contained several 13th century sherds and a piece of raw iron, all of these being near its junction with the layer below.

Above this layer, to make up some of the height at its eastern end, a fill of dark soil containing some small and medium sized stones was deposited from a source from the direction of the platform area. In the area of excavation, this fill did not reach the south wall; at the north-east corner of the excavated trench it was not more than 18 inches thick. It contained no finds.

Above this subsidiary layer and in the same area a layer of rubble was banked to the top of the south wall. This was almost 3 feet thick at the south wall at the extreme eastern end of the excavation, diminishing to 2 inches at not more than 4 feet north of the south wall and producing, with the layer banked against the west wall, a saucer-shaped depression in the platform area, ready to receive the final levelling-off layer of fill. Nothing was found in this rubble subsidiary layer.

The final levelling-off layer consisted of dark soil, very stony and with several large stones here and there. At the north-east corner of the excavated trench it was 18 inches thick. It contained one 15th or 16th century sherd 11 inches below the present surface, near to the top of the rampart (Find No. 51), two 13th century sherds (Find Nos. 52, 64) at a low level, with some pieces of stoneware (Find Nos. 6, 7, 8), alone, almost at the present surface level and within 9 inches of the original surface. It is likely that the fill for this layer was obtained from areas of the site other than the nearby stretch of moat.

Outside the platform's retaining walls, within the boundaries of the excavated trench, a 2 foot wide pavement ran along the base of the west wall. Made of very large slabs of stone, two to three stones thick and interlocking with the stones at the base of the retaining wall, this pavement rested upon the bed of coarse sand which also supported the walls and which appeared as a sharply sloped beach beyond this pavement and on this inner shore of the moat. There was no sign of such a pavement along the excavated part of the outside of the south wall or on the other side of the moat, on the shore of the outer rampart.

The west inner wall was undercut on the inside, i.e. at its base, only the outer courses of stones were laid, its full thickness being achieved between 1 foot and 2 feet above these foundations. The south inner wall appeared to have been built to its full width at the base.

The Outer Rampart

The outer rampart, almost certainly retained by a stone wall on its shore-line with the moat and by a barrier of large stones on its outer edge, was also reinforced by a "backbone" of large stones. Erosion, particularly within the boundaries of the "Dunrod One" excavation, had removed a great deal of the fill originally—and possibly, subsequently—used in its construction and though it has been possible to locate the likely position of a shore-line retaining wall and to compute its height, few if any of its stones as laid were found in their original positions.

Within the boundaries of the excavation, the outer rampart was built almost entirely upon an uneven bed of shale (greywacke), this bed running in a line north-west/south-east—assuming the west moat and the west ramparts to be running precisely north-south. The total width of this shale bed was about 7 feet, its depth varied up to 15 inches and it rested upon a bed of water-worn stones and coarse sandy-silt.

On the outer edge of the outer rampart, on top of the shale bed, i.e. at about 12 inches below the ground surface, there was a retaining barrier of large stones and outside this, in the SW corner of the dig, an uneven layer of good black soil, almost free of stones, rested upon a bed of black coarse sand and gravel, with occasional small stones, some of these being water-worn. Towards the NW corner, the good black soil gave way to wet clay and very fine shale-gravel resting upon the shale bed. There were no finds in the shale bed of any sort, but the good black soil, wet clay and very fine shale areas, at the outer edge of the outer rampart, contained one 15th or 16th century (Find No. 40) and several 13th century sherds (Find Nos. 46, 49, 72, 131), some slag, some small pieces of charcoal and also some traces of baked clay. The bed of coarse sand and gravel below this, in the SW corner, contained charcoal and also what appeared to have been knobs of baked clay and traces of vegetable matter.

Above the uneven bed of shale underlying most of the outer rampart there

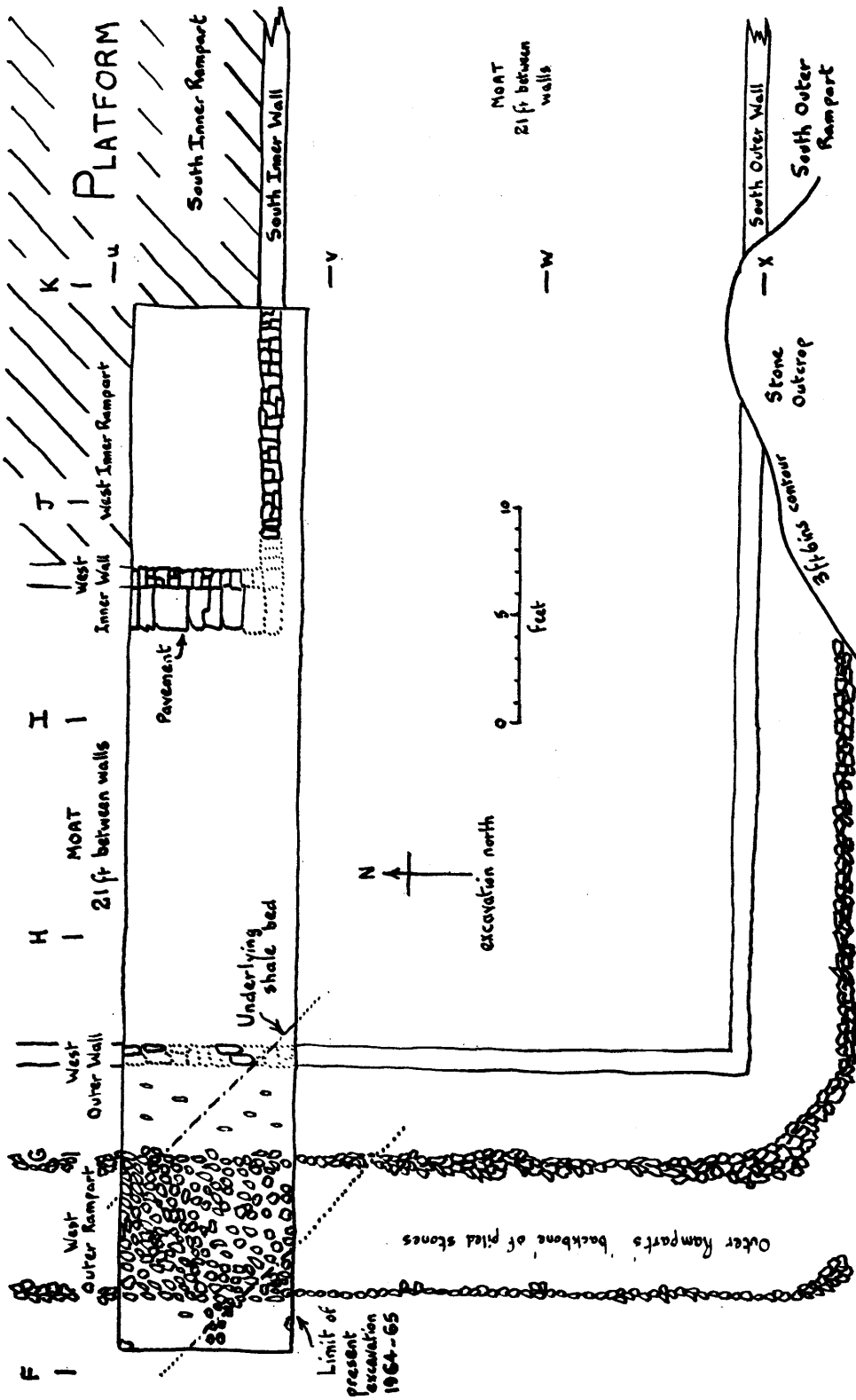

Fig. 2. Dunrod: General Plan showing excavated area and suggested lay out of the south-west corner during the late 13th Century.

was a thin, uneven layer of coarse black/brown sand and above that, a 6 inch bed of sandy gravel.

On the inner edge of the outer rampart, beneath the site of the retaining wall, moving from south to north, the shale layer gave way to a layer of clay containing the colours of many water-softened stones and resting upon a bed of coarse red/orange sand and grit. This layer, merging into the material in this side of the moat, contained many 13th century sherds, and some small pieces of incinerated bone.

Above this and running parallel with the line of the shale bed, i.e. NW-SE and keeping to the east of it, there was an area which, at its lower level, on top of the shale or sandy gravel, consisted of hard black and brown coarse clay with, above it, a low mound of good black soil with some clay mixed in. Above this there was a layer of hard black/brown rubble. This complex area, less than 18 inches thick, is likely to have been the site of repairs or improvements to the system controlling the level of water in the moat. Several 13th century (Find Nos. 22, 28, 35, 56, 58), late 13th and possibly 14th century (Find Nos. 31, 32, 33, 34, 41) and one 15th or 16th century (Find No. 42) sherds and some slag were found in this area.

Above these overlying and uneven lower layers covering the whole of the excavated area of the outer rampart, a "backbone" of large stones was piled. One 13th century (Find No. 38) sherd was found under the centre of this pile, resting in the thin layer of sandy gravel on top of the shale bed. There were no finds of any sort within this "backbone" of large stones.

Above this base and merging into the subsidiary layers of the complex area, a pile of dark brown rubble was banked to the top of the shore-line retaining wall, taking a natural slope to the west until, at the north side of the excavated trench, at between 3 and 4 feet from the wall, it was held by the pile of stones forming the "backbone" of the rampart. Thus broad and deep in the north, the depth of this diminished as its centre-line moved SE and therefore towards and past the line of the retaining wall.

Above the base and this pile a substantial layer of coarse sandy gravel was deposited, completing the cross-sectional shape of the outer rampart. There were no finds of any sort within this top layer.

On the outer side of the west outer rampart, material eroded from the top of the outer rampart has produced a subsidiary layer which naturally slopes away into the lower-lying ground of the field beyond. At this point this material consists of dark soil mixed with a little coarse sandy gravel.

In order to drain some of the water from the excavated moat, a long trench was cut from the west end of the excavation, at the outer edge of the outer rampart, to a point roughly in line with the longer axis of the excavation, i.e. towards the west. This trench, of depth starting at 18 inches and decreasing gradually (at about 70 feet) to zero, was everywhere cut through good deposited black soil. There was the occasional isolated large stone and surprisingly, for

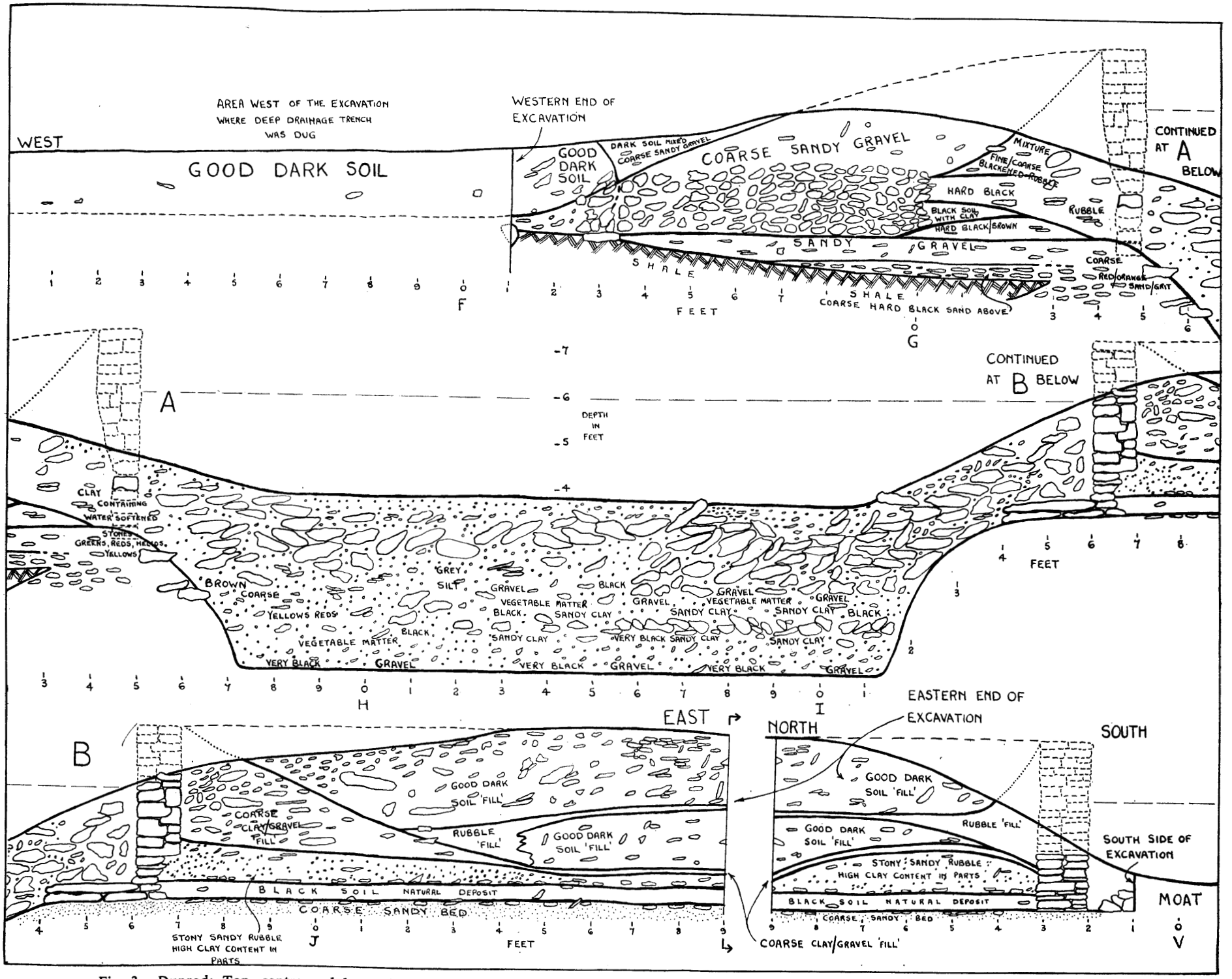

Fig. 3. Dunrod: Top, centre and lower left—Section along N. side of excavated trench. Lower right—Section at east end of excavated trench.

it was a narrow trench, several sherds and pieces of stoneware. These occurred at 8, 16, 22 and 51 feet from the west end of the excavation (Find Nos. 80, 82, 83, 84, 90).

Finds

This reconnaissance dig produced 134 numbered finds and some animal and vegetable material (its superficial area being less than one eightieth of the moated manor site). The finds are all in Dumfries Museum, accompanied by a detailed list indicating the exact find spots.

Reports by Mr Truckell of the Dumfries Burgh Museum on the pottery and small finds and by Dr Clarke of the Royal Scottish Museum on animal-bone finds during 1964 follow the discussion.

DISCUSSION

The site selected for the construction of the moated platform—and manor—appears to have been that of a fairly sharp bend in the course of the burn running from the north. Originally running through a bed of coarse sand, early in its life, in the area of the site, it had eroded the outcrops of greywacke which were the obstacles in its path and the cause of its change of course. Having achieved this and with its widened bed strewn with shale (greywacke), its now slower moving waters began to flood and to deposit a layer of grey and black material which it carried from the hillside further up its course.

In summer, the site must have been overgrown and though wet underfoot, the ground on each side of the burn or between the courses into which it may have been divided, must have been reasonably firm.

In winter, the site is likely to have been extremely wet, the eroded outcrops of greywacke being islands in a morass.

The Construction of the Moated Platform

During the construction of the platform, whereon the manor was later to be built, the builders must have been ever mindful of the effects upon the work of even a short period of rain, the onset of longer periods of bad weather bringing all work to a halt.

Working from the greywacke " islands," some of which were to be contained within the platform, the builders are likely to have been able, in some measure, to divert the flowing waters from one channel to another, so that they would have had only seepage to contend with in the area of the site where they were working.

Having marked out with stakes the four corners of the platform and the straight sides between, the builders then began the excavation of what was to be the surrounding moat and to throw and carry the spoil into the area which was to be the platform. At the same time they began methodically to build a stone wall which was to contain the platform, this being necessary to retain the wet spoil as it was thrown up out of the moat. It is likely that, in certain places,

e.g. on the south side of the platform, the moat was simply a deepening and possibly a widening of the burn.

The width of the moat was set at about 20 feet. As digging progressed the wet spoil from its outer edge was also thrown outwards to form an outer rampart, a stone wall or barrier being built along the shore-line to retain it—as mentioned elsewhere, some or all of this part of the work might have taken place at a later date.

As work proceeded, a great deal of stone was carried to the site, to be used for the retaining walls and in the case of the outer rampart to act as a reinforcing core or "backbone" in those parts of it where there was the danger of it being eroded away by the water seeping either through or under the retaining wall. These stones were gathered from the surrounding area, there being a plentiful supply, the course of the burn at and above the site providing a good source.

During the later stages of the work, after closing the final gap in the outer rampart, the control of the flow of water into and out of the moat must have presented a problem. The part of the bed of the burn that lay beneath the stones and spoil of at least part of the outer rampart on the west side of the site (greywacke shale) remained pervious and therefore acted as an underground outlet for the water. Though it is possible that this was sufficient to deal with even the highest rate of intake of water into the moat, during a prolonged dry spell it would have allowed the moat to run dry. Accordingly, the size of this outlet was regulated, at least partly, by the use of lumps of baked clay which were pushed into the holes made by the escaping water.

It is evident that construction of the moated platform was started and completed during the 13th century, probably during the early part of the latter half — say, during the 1260's — and that the area of the site had been inhabited from at least the early 1200's.

Both of the retaining walls appear to have been up to 3 feet 6 inches high from their bases on or at the level of the bed of the burn. The moat having been constructed to a depth of 3 feet 6 inches below the level of the bed of the burn, it was therefore possible that a depth of water approaching 7 feet could have been achieved in the moat between these walls.

Occupation of the Site

Though it may be considered likely that such a moated site would be occupied for two or three hundred years, the preponderance of 13th century pottery, dating from about 1230, points to a period of occupation of less than 100 years, from early in the second half of the 13th century until sometime during the 14th. A small amount of pottery of later date (14th Find Nos.: 31, 32, 33, 34, 41—and 15th or 16th century. Find No.: 42) was found in the complex area on both sides and close to the site of the outer wall, i.e., the wall or barrier built along the shoreline between the moat and the outer rampart.

Two other finds of 15th or 16th century pottery are also recorded — one in the top layer of the platform, the other in the material eroded from the upper layers of the outer rampart. These finds of later date were lying as deep as those of the 13th century, one of the 15th or 16th century pieces being found 6 inches directly below a late 13th or early 14th century piece (Find Nos.: 41 and 42).

It is possible that the site was reoccupied in the 16th century and that improvements in the system used to control the level of water in the moat were then made. Up to this time the outer rampart may have consisted of little more than the "backbone" of piled stones, with some fill and knobs of clay being used to close the gaps between individual stones. During periods of prolonged rainfall, the waters of the moat would then have overflowed in this area. Choosing a dry period, the debris piled up against the "backbone" of piled stones might have been cleared and replaced by material better suited to the purpose of blocking the flow of water; on the other hand, it is possible that the retaining wall was built at this time—or rebuilt—and that the debris was simply left as the base of the fill which was to be piled in behind it.

Destruction of the Moat

Whenever it occurred, the destruction of the moat was accomplished by filling it with stones from the platform's retaining wall and from the wall or barrier on its shore with the outer rampart. It is likely that stones that had been used in the buildings erected on the platform were also used as "fill" when attempts were made to level the site.

Removal of the retaining walls allowed a great deal of the material in both the platform and the outer rampart to fall and later to be eroded into the moat, so that, what was once likely to have been a canal-like cross-section, is now so natural as not to be noticed by the casual visitor.

For many years after its destruction, the site must have been subjected to the seasonal flow of the burn, with water-borne material being deposited amongst the stones tumbled into the moat—particularly in the wet season—and the water eroding the western outer rampart as it overflowed to the lower ground beyond. In parts, up to 24 inches has been eroded from the top of this particular stretch of the outer rampart.

THE POTTERY

By A. E. TRUCKELL

The pottery forms a very homogeneous group, form and decoration and fabric in all but a few cases sitting nicely within the period from around 1230 to around 1300: the proportion of apparently imported types is rather lower than at the hall on Ardwall Island, some miles west near the mouth of Fleet Bay, where occupation began about 1250, and rather higher than at Lochrutton Crannog, where occupation seems to have started about 1230: the nearest site geographically to have yielded a good assemblage of pottery is, of course, Castledykes, Kirkcudbright, where occupation seems to have begun about the 1230's: though this is only about five miles away the proportion of imported, probably French,

ware in the collections of the Stewartry Museum, Kirkcudbright, and in the unpublished collection in Dumfries Museum seems a little higher; though, of course, too much weight cannot be placed on a random sample from the small area exposed at Dunrod: the lustrous pale-green glaze so common in the Dunrod sample is plentiful also in the Castledykes material: the patchy glaze can be paralleled there also: the ornament of rows of rectangular notches occurs at both sites: there is no close parallel in our area to the rich ornamentation of Dunrod 22 (fig. 4-1): Dunrod 58 (fig. 4-9), an elegant jug-neck, is closely paralleled by No. 26 in the Dunning, Hodges and Jope report on Castledykes: Dunrod 85 (fig. 4-12) part of the neck and shoulder of a jug, is similar in form to numbers 26 and 9 in the above report, but even closer to No. 27 in that report.

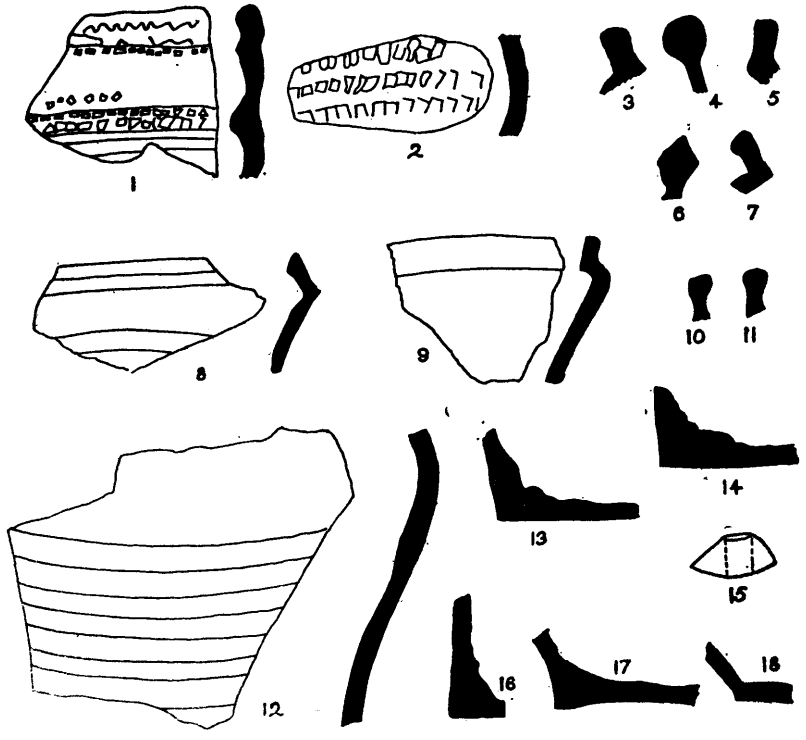

Fig. 4. Dunrod: Lead spindle whorl (No. 15) and pottery (all x ½).

The few pieces of late-mediæval black or grey fabric could well be strays, or, of course, there may still have been occupation of the manor: the absence of 14th early 15th century forms in this small sample does rather suggest at the least a break in occupation: there was a village somewhere near, though its precise site has not been identified, and pottery could stray from there.

As for the few small finds, the small dome-shaped lead whorl (fig. 4-15) is a common type, several specimens of which were found at the Lochrutton Crannog site, and pieces of Ayrshire lignite are not uncommon.

MEDIÆVAL POTTERY FROM DUNROD MOATED MANOR

1 Fragment of neat small outward-turned rim, fine thin rather hard pink ware, thin glaze showing reddish against pink: 13th cent.

2 Corroded fragment of thin pink ware: may show edge of base: likely from fabric to be 13th cent.

3 Rather corroded pinkish-grey medium-thickness ware with dark core: rather hard: a 16th-century date is likely.

4 Similar to above.

5 Two small pieces pinkish-grey medium thickness ware, dark core: probably same pot as 2 above.

16 (fig. 4-5) Piece of rim: rather hard medium-hard pink ware, sharply upward and outward tilted: splashes of thin glaze showing orange-brown against the pink ware: 13th cent.

17 Another piece of same ware as preceding.

18 Piece of rather hard pink ware very similar to 19, 20 and 21, but with a neat line of thin glaze showing red-brown: 13th cent.

19 (fig. 4-7) Rim, sharply outward and upward turned, in thickish rather hard coarsely gritty pink ware: 13th cent.

20 Piece of softish pink ware, medium thickness, strong wheel-marks externally: no surviving glaze: small grits; 13th cent.

21 Piece of rather thin softish pink ware, may have fine pink slip: medium-strong wheel marks externally: 13th cent.

22 (fig. 4-1) Piece of rim and neck of rather large jug in medium-hard pink ware, showing edge of spout: two poorly-impressed rows of stamped ornament just below actual edge of rim: a lustrous pale-green glaze begins on a third line of poorly-stamped ornament just below this, at which point there is an angular moulding with a strong hollow between it and a much bolder moulding, the upper surface bearing one row of impressed ornament, the lower surface bearing two strongly-impressed rows. The upper edge of another row is just visible at the fracture. A mass of hard slaggy iron-impregnated material adheres to the inner side of the sherd. This striking jug would in England fit the last quarter of the 13th century.

23 Piece of soft rather thin pink ware, patch of sooty discolouration on outer surface and clearly-defined patch of rather dark-green glaze: 13th cent.

24 Piece of very hard grey-pink ware, finely gritty surface, no glaze; prob. late 13th cent.; may be an import.

25 Thin softish fragment, pink ware, very similar to 27 but retains traces of pale-green thin glaze on outer face. 13th cent.

26 Tiny piece very thin soft pink ware, ornamental groove showing externally: very thin pale-green glaze: late 13th cent.: possibly imported.

27 Worn fragment of thin finely gritty rather soft pink ware—shows strong wheel-marks internally: likely by texture and thinness to be 13th cent.

28 Small fragment of similar ware to above but slightly thicker.

29 (fig. 4-14) Part of base and foot of wall, very hard rather thick pink ware, strong ornamental wheel-mark just above base: thin green glaze on base but not on surviving part of wall: late 13th century.

30 (fig. 4-10) Fragment of neat small rim: medium-soft ware: late 13th cent.

31 (fig. 4-17) Part of base and foot of wall of large jug or jar: hard slightly gritty pink ware: wall has had slightly darker slip; slightly sagging base; late 13th to mid 14th cent.

32 Small piece of thin medium-hard pink ware, heavy rather dull dark green glaze: late 13th-early 14th century.

33 Smaller fragment of same vessel as 32.

34 Small piece of rather thin hard white ware, no glaze: imported French? late 13th-early 14th cent.

35 Two pieces of thin pink hard ware, flat, with dense black sooty skin on outer face revealing orange glaze in places: 13th cent.

36 Small fragment of rather gritty ware, fairly thin, medium hard: 13th cent.

37 Piece of wall of vessel, thin soft pink ware, thin blackish-green glaze: 13th cent.

38 Small piece of much-corroded soft pink ware: late 13th cent.

40 Small piece of wall of jug or jar, very hard ware: dark grey outer skin, pink inner face: medium thickness: prob. 15th-16th cent.

41 (fig. 4-2) Part of shoulder of a jug, lustrous medium-green glaze, pinkish-buff ware, ornament of three closely-spaced stabbed rows: end of 13th or early 14th cent.

42 (fig. 4-18) Edge of base and wall in very hard rather thin grey ware: no glaze: black coating on inner face: date uncertain; prob. 16th cent. or after.

43 (fig. 4-8) Rim of cooking-pot or jug, pinkish-buff rather thin hard ware; upstanding rim: probably 13th cent.: could be well back in century.

44 (fig. 4-6) Upward-curved angular rim in pale pinkish-buff hard ware: no apparent glaze: prob. 13th century: could be as far back as 1230's.

45 Piece of medium-thickness and hardness and has a green glaze of varying thickness and medium colour: has had an ornamental ridge in low relief: second half of 13th century.

46 Piece of rather soft pink ware, grooves as if combed on outer face, patchy rather dull green glaze, medium-thin ware: surface blackened by soot where not glazed: fine scratches visible there too: 13th cent.

47 Small worn fragment, medium-hard ware: may be part of a rim; 13th cent.

48 Two pieces of soft pinkish-grey ware, raised wheel-ridges on one face: medium thickness: 13th cent.

49 (fig. 4-13) Base and edge of wall in bright pink soft ware, flat base, ware thickish, worn traces of glaze showing red on wall: 13th cent.

50 Piece of very thin very hard pale-pink ware, no glaze remaining: 13th cent., prob. import.

51 Piece of hard black rather thin ware, outer face mainly flaked off: no glaze visible: date uncertain: could be 15th-16th cent.

52 Piece of grey-pink very hard ware, rather thick, bright-red discolouration on inner face: clear pale-brown glaze; shows smoothing-traces on face: unlike any other piece from this site: could be a late 13th-cent. import if not modern.

53 Tiny piece of very thin bright pink ware: 13th cent.

54 Slightly larger piece similar ware, outer face corroded: 13th cent.

55 Strongly curved small piece of medium-thick medium-hard pink ware, thin glaze showing brown-green on outer face: 13th cent.

56 Piece of buff ware, thin, with dark core: traces of pale-green glaze: very hard: possibly imported: 13th cent.

58 (fig. 4-9) Neck of vessel, whitish thin hard ware, outer surfaces reddish-buff, rim vertical and set out from neck: elegant: prob. imported; 13th cent.

64 Piece of medium-hard grey-pink ware, medium thickness, outer face corroded: 13th cent.

65 Small flat piece of similar ware, may have been trimmed to rectangular shape: one face apparently smoothed: 13th cent.

67 Piece of rather soft pink ware, dull green rather thick glaze: 13th cent.

69 Piece of hard rather thin grey-pink ware, ornamental ridges, lustrous medium-green glaze: probably from shoulder of jug: 13th cent.

70 Eroded piece, pale-pink softish ware: 13th cent.

71 Piece of pink ware, heavy wheel ridges internally, slight grooving externally, rather hard and gritty; no glaze visible: 13th cent.

72 Thin greyish-pink softish ware, pale-green glaze; 13th cent.

76 (fig. 4-11) Rim in fine thin very hard pink ware: no glaze: 13th cent.

80 (fig. 4-4) Rim, similar profile to 76: rather hard gritty bright-red ware: 13th cent.

85 (fig. 4-12) Large piece of shoulder and neck of jug, pink ware slightly greyer in centre: lustrous pale-green glaze: ornamental wheelmarks: 13th cent.

87 Small piece of softish bright-pink ware: 13th cent.

88 Tiny fragment of rather hard pink ware, thin brownish glaze, 13th cent.: with

another small unglazed piece of same ware, 13th cent.

89 Worn piece, pink ware, mica grit showing, strong wheel-marks internally: pale-green glaze: 13th cent.

95 Small piece soft rather thin pink ware: 13th cent.

96 Thin flake of hard grey ware, thin pale-green glaze: 13th cent.

97 Small piece bright pink ware, no glaze, fairly thin, soft: 13th cent.

98 Small piece of bright pink ware, as 97: 13th cent.

99 Piece of thin hard buff ware, no surviving glaze, possibly imported: 13th cent.

100 Soft ware, mica grits, pink, medium thickness: no surviving glaze, eroded: 13th cent.

101 (fig. 4-16) Wall and edge of base, thin hard brick-red ware, soot externally, traces of thin pale-green lustrous glaze: 13th cent.

102 Brick-red very hard rather thin piece: no visible glaze: may be imported: 13th cent.

109 Piece of medium-thin bright pink ware, lustrous very pale green glaze, medium-hard ware: 13th cent.

110 Piece of bright pink ware, similar to 111: very pale green lustrous glaze: 13th cent.

111 Bright pink ware, lustrous pale-green glaze: probably same vessel as two preceding items.

112 Piece of bright pink ware: outer face a dark red but much burnt and blackened: 13th cent.

113 Small flake bright pink ware, only one piece of outer face remaining, of a slightly darker red: rather soft: 13th cent.

114 Piece of very thin greyish-pink ware, medium-hard, soot on outer face: 13th cent.:

115 Tiny chip of bright-pink softish ware, outer face a little darker: 13th cent.

121 Piece of thin soft bright-pink ware: 13th cent.

122 Flake of medium-hard pink ware: 13th cent.

123 Tiny piece of soft bright pink ware: 13th cent.

131 Pieces of soft thin bright-pink ware, much decomposed, embedded in silt: 13th cent.

Finds other than pottery:

119 Flake of white-patinated flint.

120 (fig. 4-15) Neat small domical lead spindle-whorl, white-patinated. Closely paralleled by 13th-century examples from Lochrutton Crannog some twenty miles away.

94 Flake of brown-grey flint showing part of bulb of percussion.

108 Large piece of glossy Lignite. Pieces of "jet" are quite common on mediæval sites and a neat small pendant cross in jet with an inscription of 13th-cent. type was among the Lochrutton Crannog finds.

Note: All finds are in the Burgh Museum, Dumfries. The foregoing numbers correspond with the excavation find serial numbers.

THE ANIMAL BONES

By Dr A. S. CLARKE

(1) HV 6575; HV 6580—Incisor tooth of **horse;** rib of small **ox.**

(2) HV 6090—Unerupted upper molar of **sheep;** half shell of hazel nut.

(3) HV 6662—Left ramus of mandible of foetal or neonatal **ox;** flake of bone, ?from ox rib; other small fragments; toe bone of immature bird—**perhaps goose.**

(4) HV 9080—Proximal ⅔ left front cannon bone of small **ox** with blue patches of vivianite.

(5) HV 8070—Incisor of **ox;** distal ⅔ - ¾ immature femur, less epiphysis, possibly from smallish **cat;** distal end of rib of **ox.**

(6) HV 6090—Right scapula of medium sized **dog,** compare retriever; indeterminate lumps of spongy bone, probably from ox limb bones; distal tip of right ramus—part of the symphysis—of mandible of **ox.**

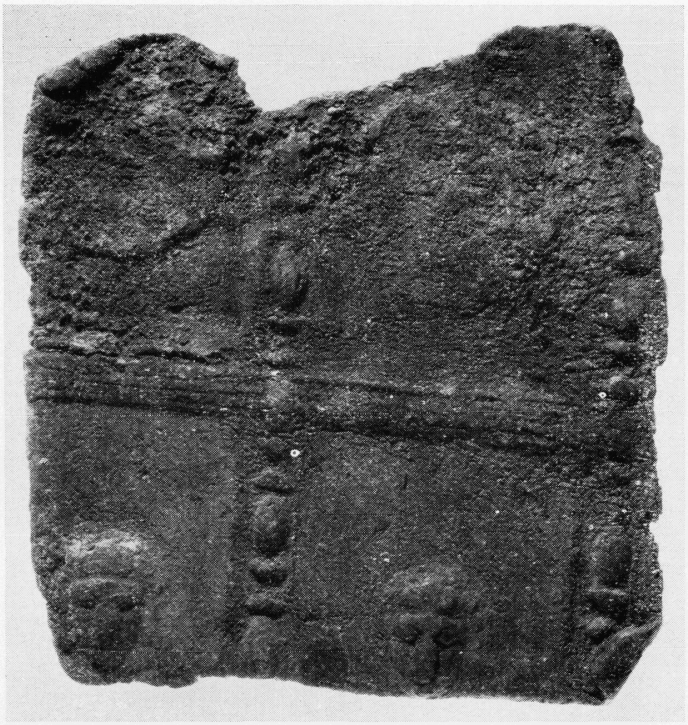

Plate XI.—Roman Sarcophagus, fragment IV ($x\frac{1}{2}$).

Plate XIV.—Dunrod: Inner Rampart—South retaining wall base with natural black soil layer visible behind and at end of excavation.

MOFFAT SPA IN THE SEVENTEENTH AND EIGHTEENTH CENTURIES

By W. A. J. PREVOST

For many years Moffat Spa was a national institution. The Well[1] up Birnock Water was initially the chief attraction and its mineral waters were recommended by seventeenth and eighteenth century physicians for treating a variety of ailments. Latterly it was confidently prescribed for affections of the skin, rheumatism and gout while serving as a bait to attract visitors to the town which is now advertised as a holiday resort.

There are many variations in the stories respecting the "discovery" of the Well which is of little consequence. It is now generally attributed to Rachel, the daughter of Mr Walter Whitford, minister of Moffat from 1610 to 1630. She is said to have been the first person to recognise the remarkable properties of the water and she is first mentioned in 1733 by Dr Milligan[2] who quotes the old people as saying that the wells were used long before Miss Whitford's day. The earliest reference to this discovery is recorded by Matthew Mackaile who, writing in 1659 in his *Fons Moffetensis,* credits a *rusticus valetudinarius* with the honour, *ante annos sex.* Mackaile goes on to say that within a year, in 1654, all sorts of sick persons began to resort to the Well. This is partly confirmed by an order, signed at Edinburgh by General Monk and three others of Cromwell's council in August 1657, for a grant from the vacant stipends of the parishes of Moffat and Kirkpatrick-Juxta to improve the Well and enclose it with a wall.[3]

In 1664 Mackaile, encouraged by the success of his *Fons Moffetensis,* published an English translation entitled *The Moffet Well,* from which it may be assumed that the medical fraternity in Scotland had by then recognised the valuable curative properties of the Moffat sulphureous water. That this was so seems evident from the following cases when seventeenth century surgeons recommended courses of treatment at the Well.

The first concerns Lady Mary Scott (1647-1661), Countess of Buccleuch, a wealthy but very delicate child who suffered from "a running sore in her arme," which ten "physicains and chyrurgeons," consulting together on 26 April 1660, attempted to cure by prescribing a long list of remedies which included bleeding, a formidable list of drugs and "Moffat Wells, taken according to the direction of the physician."[4] Secondly, and five years later, Margaret Bryson, aged eleven, who had been enticed away from a tutor's care by her uncle William Bryson, was the subject of a successful claim for her return, which had been brought before the Privy Council and wherein it was stated that William Bryson had

1 There are two different springs which are only a few feet apart.
2 Dr George Milligen (sic), "An Account of the Virtues and Use of the Mineral Waters near Moffat." **Edinburgh Medical Essays** (1733), i, 62.
3 Sir William Fraser, **The Annandale Family Book,** i, p. ccxxii.
4 Sir William Fraser, **The Scotts of Buccleuch,** i, 351, 375.

" sent her to the Wells of Moffat under pretence of receaving cure and recovery of health, notwithstanding her disease be a hectick fever which the best phisitians agrie the saids wells are nothing helpfull but rather hurtfull . . ."[5] Lastly, three Covenanting ministers, Mr John Wilkie in 1668,[6] Mr George Johnston in 1670[7] and Mr Alexander Hamilton in 1672,[8] all of whom were " confined " for not submitting to Episcopacy, were granted leave by the Privy Council to repair to the " Wells at Moffat " on account of their ill health. Mr Wilkie and Mr Johnston were very sick men, and Mr Hamilton, minister of Dalmeny, had been " much troubled with gravel and otherwise indisposed."

Between 1673 and 1723 the very occasional references to Moffat as a spa show that its popularity as a resort for people who genuinely required treatment had in no way abated. The journals of early travellers through Annandale usually contain unflattering remarks about the mineral waters and about the unpleasant lodgings in the town which one man described as a " knot of hovels."[9] The accommodation, good or bad, was limited and it seems that visits to the Well were in the main confined to the wealthy. At any rate the nobility and gentry were becoming accustomed to resort to a watering place or to " the goat whey " during part of the summer, and for the purposes of health Moffat was in every way suitable.

A number of distinguished men in Edinburgh had great faith in the Well water. Sir John Clerk (1649-1722), the first baronet of Penicuik, was not only accustomed to go to Moffat for the summer but treated himself at home with his " own Moffat water," made up according to a prescription which he sent to certain of his friends. James Erskine, Lord Grange (1679-1754),[10] used it as a substitute for the real thing in April 1720 when he wrote from Edinburgh to Sir John at Penicuik as follows.[11]

" Sir, I am asham'd to trouble you again when my own forgetfullness only is the occasion of it. I neglected to send to Moffat by the carryers when in Town, and I hear they do not return for a whole week. Your preparation of Moffat Water, which you were so kind as to make up in such aneother strait for your little patient,[12] is just done; and I have found several times, when for some nights it has not been applyed to his eyes, the humour returns to them; and therefor I have reason to fear that they will be very bad before I can get any of that preparation from Master Baillie at Moffat . . . I have no way to supply it in the mean time, but by having recourse to you; and if you can send me a little of it, though it were half a Mutchkin, it will do the business and be a great

5 **Register of the Privy Council**, 3rd series (RPC), ii, 75, 76.
6 Minister of Twynholm. **Fasti Ecclesiae Scoticanae**, ii, 428, and **RPC**, ii, 536, 558.
7 Minister of Lochrutton, **Fasti** i, 333, and **RPC**, iii, 253.
8 Minister of Dalmeny, **Fasti** i, 201, and **RPC**, iii, 508.
9 Joseph Taylor, **A Journey to Edenborough in Scotland** in 1705.
10 James Erskine was raised to the Bench, as Lord Grange, on 18 Oct 1706. Received a commission as Lord Justice-Clerk on 22 July 1710. **Dictionary of National Biography (DNB).**
11 Scottish Record Office, Clerk of Penicuik Muniments (GD 18), No. 5286/3.
12 Lord Grange's son who had been " cared for " by Sir John in Moffat the year before. He had five sons (1) Charles, 1709. (2) John, 1711 d. young. (3) James, 1713. (4) Francis, 1716 d. young, and (5) John, 1720.

favour . . ." Sir John replied and sent Lord Grange the prescription with full instructions for making up the concoction. (See Appendix I.)

In years to come doctors insisted that the sulphur water was best taken fresh at the Well and that it lost much of its character if kept too long. Nevertheless it was bottled and sent to invalids who were unable to afford a visit to Moffat. In 1724 Mr Thomas Boston (1676-1732), the minister of Ettrick, records in his memoirs how he took a course of the water in his own home, to which he attributed his subsequent ill health. His daily dose was three chopins or three English quarts, and "very weary," he notes, "of the time the drinking of it took up."[13]

The prosperity of Moffat largely depended on its visitors who were of two sorts, the genuine "Wellers" and those who came only to enjoy themselves. For a long time the Wellers were in the majority but eventually they were outnumbered and swamped by the other visitors. It seems that the peak of popularity of the Well proper was reached about the end of the century and by 1833 John M'Diarmid[14] was constrained to write that it was then a great mistake to suppose that Moffat was chiefly frequented by invalids, and in fact it was the whole, rather than the sick, that peopled the different inns and lodging houses. The change over was very gradual and it began after 1723 when John Macky[15] published an undated letter from Berwick[16] in which he describes "the famous Wells of Moffat, that purge like those of Scarborough and are much frequented; but there is no Raffling, Walking and Dancing; An universal Quietness reigns in the place." Had Macky passed through Moffat a decade later his recorded impressions must have been very different, for by then the spa was a fashionable resort and patronised by a distinguished clientele in spite of the fact that lodgings and accommodation were strictly limited.

It is said that Lady Stair,[17] a leader of society and the wife of John Dalrymple, the second Earl, popularized the spa by her example in coming to Moffat every year to drink the waters. Certain it is that the Dalrymple family,[18] their relations[19] and other members of the peerage began to stay there in the "season" which opened officially on 1 June and closed at the end of August.[20] The most constant visitor was Baron Sir John Clerk (1676-1755), the second baronet of Penicuik, who went to Moffat nearly every year for the last fifty years of his life.[21] Other interesting persons were William Hamilton of Bangour,

13 T. Boston, **Memoirs of his Life, Time and Writings** (1776).
14 **A Guide to Moffat,** by a Visitor (John M'Diarmid) (1833).
15 John Macky, **A Journey through Scotland** (1723), 13.
16 Macky's journey has never been dated. R. H. Coates, **"Travellers' Tales of Scotland,** 89.
17 Lady Stair married secondly in 1707/08, John Dalrymple (1673-1747), 2nd Earl of Stair, of Castle Kennedy and Newliston. She died 1759. **DNB.**
18 Lady Stair's brother-in-law, George Dalrymple of Dalmahoy, one of the five Barons of Exchequer, died in Moffat 29 July 1745. William Anderson, **The Scottish Nation,** iii, 506 a.
19 Anne Dalrymple (b. 1727) when only 22 years of age, married at Edinburgh in 1749 James Lindsay, 5th Earl of Balcarres (1691-1769), when he was almost 60. They had met for the first time in Moffat. Anderson, **op. cit.,** i, 204 b.
20 **Old Statistical Account, Moffat,** 297.
21 **Clerk of Penicuik's Memoirs** 1676-1755 (Scottish Hist. Soc., 1892), 133 and other sources.

the poet,[22] and his friend, John Dalzell, brother of the sixth Earl of Carnwath,[23] who stayed "in that hard-drinking and health-bringing district" in 1727. Lord Linton[24] and Lady Galloway[25] found good lodgings there in 1729, but "some strangers obliged to take up their quarters in low rooms and these but very indifferent."[26] Lady Galloway, who had a scurvy, returned to Moffat in 1731, accompanied on this occasion by her two grandsons.[27] Charles Mackie, the first Professor of History at Edinburgh University, stayed there in September 1735 when his friend Professor John Stevenson wrote that Mackie was perhaps "playing with ladies at Quadrille or talking politicks in your club, nay perhaps directing at a ball. . . ."[28]

During 1738 Mr James McEwen, the minister of Moffat,[29] had cause to correspond with Sir John Clerk about the building of a loft for the Duke of Queensberry in the parish church. He took the opportunity when writing of keeping Sir John abreast of the news. On 22 May, "Mr Rose of Killravock,[30] his Lady and son are here. Earl of Lauderdale[31] and Countess of Stair are expected. . . . Lord Johnstone[31a] returns hither on ffriday nixt from Glasgow on his way to Comlongang. . . ."[32] On 29 May, "My Lady Glasgow and Lady Margaret Boyl came hither last Friday, and my Lord[33] comes this week from Edinburgh, being detained there by my Lady Garnock's[34] death. . . ."[35] On 5 June, "My Lord Glasgow, his lady, his son Mr Patrick and Lady Margaret, Lady Strathnaver[36] [sister of Lady Glasgow] and her two daughters are now here, and have sent their chariots to your coachhouse [at Dumcrieff]. . . . Our company this year does not promise to be so frequent or at least so considerable

22 William Hamilton (1704-1754) whose full sister had married, in 1728, the Earl of Carnwath for which see note 23. Hamilton's "Latin Inscriptions" commemorate a very lively celebration in Moffat. He was very friendly with the Dalrymple family. Nelson S. Bushnell, **William Hamilton of Bangour** (1957), 23-26, 30, 48.

23 Sir Robert Dalzell, 6th Earl of Carnwath, succeeded to the earldom in 1702. He married thirdly, on 15 Nov 1728, Margaret, daughter of John Hamilton of Bangour. **Scots Peerage,** ii, 417.

24 Charles Stewart, 5th Earl of Traquair. He was styled Lord Linton till 1741 and did not marry till 1745/46. G.E.C. **Complete Peerage,** xii, 12.

25 The Dowager Lady Galloway, widow of Alexander, 3rd Earl of Galloway who had died in 1690.

26 Clerk of Penicuik No. 5373/2. Letter 2 Aug 1729 from Mr Boe, schoolmaster in Moffat, to Baron Sir John Clerk.

27 Clerk of Penicuik No. 5246/5/166. Letter 25 May 1731 from Brigadier Stewart of Sorbie to Baron Sir John Clerk in Edinburgh. Lady Galloway's two grandsons were the sons of Alexander Stewart, who was Lord Garlies from 1694-1746, when he became the 6th Earl of Galloway.

28 Dr L. W. Sharp, "Charles Mackie, the First Professor of History at Edinburgh University," **Scottish Historical Review, xli,** (1962). John Stevenson was Professor of Logic.

29 James McEwen was minister of Moffat from 1734 to 27 Dec 1741 when he was deposed, on his own confession, for adultery, and afterwards committed suicide. **Fasti,** ii, 216b. On 30 Nov 1741 George Clerk wrote to his father that McEwen "is now given up by all and nobody seems to pity him, except some he is said to drink with every night in Moffat." George wrote again on 14 April 1742 to say that McEwen had been excommunicated by the Presbytery of Lochmaben "for his extraordinary behaviour." Clerk of Penicuik No. 5396/45 and /49.

30 Hugh Rose, 16th baron of Kilravock in Nairnshire, sheriff of Ross 1729-31, M.P. 1735-41. Died 1755 and succeeded by his son Hugh (1705-1772). Burke's **Landed Gentry** (1952),2200 a.

31 Charles Maitland, sixth Earl of Lauderdale (1688-1744). **Scots Peerage,** v, 311.

31a Lord John Johnstone (1721-1742), whose death deranged the mind of his brother, the 3rd Marquis of Annandale. Sir W. Fraser, **Annandale Family Book,** i, p. cccxxvi.

32 Clerk of Penicuik No. 4076 d.

33 John Boyle (1688-1740), second Earl of Glasgow. He married at Edinburgh in 1707 Helenor Morison and succeeded to the peerage in 1733. Their son Patrick (1717-1798) and their daughter Lady Margaret Boyle (1712-1772). **Scots Peerage,** iv, 206.

34 Margaret Stewart, widow of John Crawford of Kilburnie, afterwards Viscount Garnock. She died before 7 May at Edinburgh. **Scots Peerage,** iv. 175.

35 Clerk of Penicuik No. 4076 c.

36 Lady Strathnaver, widow of William, Lord Strathnaver (1683-1720). She was Katherine, eldest daughter of William Morison of Prestongrange and afterwards sister of Helen, Lady Glasgow. She survived till 1765. Her two daughters were Helen (1717-1791) and Janet (1720-1795). **Scots Peerage,** viii, 256.

as it has been formerly. My Lord and Lady Lauderdale are to be at Corstorpin . . .,"[37] where another sulphureous spring was becoming very popular and a fashionable resort for the people of Edinburgh.

Mr McEwen had established Lord Glasgow and his family in Craigielands, one of the few "gentlemen's seats" mentioned by Garioch in his description of Annandale.[38] Frenchland, another "seat," was let in 1730 to Sir John Clerk, whose agent in Moffat on this occasion was Provost Johnstoun.[39] The Provost had written to the baronet recommending Frenchland, which he thinks "will serve you very well, though My Lady should come with your daughters, for there are four rooms, two above in very good order, one of them with a box bed in it, and the two low rooms has two very good feather beds in one and a tolerable bed in the other. All the losses you will be at is the want of the sight of gleakry[40] of the town, of which I fancy you would soon stau,[41] but you will have that advantage of being free from the noise of drum, a howboy and half a duz; of fidlers the whole night.[42] I have spoken to John Dudgon to season the rooms with fires, and fancy you will not doubt our inclinations to make you as easie as possible. . . ."

Provost Johnstoun had very good reason for making the baronet "as easie as possible," for as one of the Duke of Queensberry's trustees Sir John was a man of considerable local importance. The baronet's memoirs contain many references to his interests in Dumfriesshire and it is to be regretted that his "Proposals for the Improvement of Moffat Well, done at the desire of some of the inhabitants"[43] is missing from his family archives. It is, however, more important to consider his association with the Philosophical Society in Edinburgh, for in 1739 Sir John and his cousin, Dr John Clerk,[44] were vice-presidents and Dr Plummer was one of its two secretaries.[45] This society, the Clerks, Dr Plummer and two other doctors, Sinclair[46] and Milligan,[46a] played a very big part in the story of the Well.

Dr Andrew Plummer[47] was the first person to analyse the Well water and his "Experiments on the Medicinal Waters of Moffat" was published by the

37 Clerk of Penicuik No. 4076 b.

38 W. Garioch, **Description of Annandale** (1723), **The MacFarlane Geographical Collection** (Scottish History Society), i, 365.

39 In September 1729 George Skene "put up at Provost Johnston's, a man of good sense, in Moffat, the Landlady ugly to horror and an English woman eternally drunk." "George Skene's account of a journey to London in 1729," **Miscellany of the Third Spalding Club,** ii.

40 **Glaikery, light-headed-ness.**

41 **Staw, to tire.**

42 After the "Forty Five" the celebrated John Bruce from Braemar was invited to lead the band at the assemblies at Moffat. He at first walked from Braemar every year for the season but eventually settled in Dumfries. John Mayne, **The Siller Gun** (1808).

43 Clerk, **Memoirs,** 100. Written in 1732.

44 Dr John Clerk (died 1755) was President of the Royal College of Physicians in Edinburgh in 1740 and "the most celebrated physician that has appeared in Scotland since Dr Pitcairn." Clerk, **Memoirs,** 193, note 5.

45 Clerk, **Memoirs,** 165.

46 Dr Sinclair was Professor of the Theory of Medicine in Edinburgh. **The Autobiography of Dr Alex. Carlyle of Inveresk** 1722-1805, ed. J. H. Burton (1910), 55.

46a See note 50.

47 Andrew Plummer M.D. Fellow of the Royal College of Physicians and Professor of Medicine in the University of Edinburgh. Died in 1756. Alex. Bower, **History of the University of Edinburgh** (1817), ii, 215-216.

Philosophical Society in 1733.[48] He has been credited with being the sole cause of so many patients resorting to Moffat for a long series of years but this statement must be qualified, for Dr Clerk and Dr Sinclair, both Edinburgh men, had great faith in the water and frequently prescribed it. Moreover both Clerk and Sinclair went to Moffat every season in their turn and by their example encouraged many of their patients to do likewise.[49]

Another paper entitled "An Account of the Values and Use of the Mineral Waters of Moffat" was published at the same time and in the same volume of *Medical Essays* which contains Dr Plummer's analysis. This account was the work of Dr George Milligan, the son of a Moffat minister,[50] who practised as a surgeon in his father's parish, where he had ample opportunity of studying the effects in different diseases of a trial of drinking the waters. Milligan died in 1736 and it is probably more correct to say that it was mainly due to the three Edinburgh doctors that by 1745 more visitors than ever before were frequenting Moffat.[51] In fact, in three years time, the popularity of the place increased still more, due to the discovery of the Hartfell Spa by that extraordinary man, John Williamson.[52]

Williamson was the son of a hill farmer on the Annandale Estates and when his father died he inherited his sheep stock and the tenancy of the farm. In due course he came to believe that humans should not eat the flesh of animals and when selling his sheep and lambs stipulated that on no account were they to be butchered. This was not practical farming and Williamson was deprived of his farm by the Earl of Hopetoun[53] who from kindness of heart gave him a small annuity which enabled Williamson to devote his time to the study of mineralogy. It was when prospecting and mining for copper on the lands of Newton that he recognised that a spring up the Auchencat Burn had unusual properties. The water from this Hartfell Spa was chalybeate or impregnated with iron and doctors were not long in recommending it for chest complaints, ulcers and so forth. In 1750 its "medicinal virtues" were investigated and tested by Dr Horseburgh whose "Experiments and Observations . . ." was afterwards published by the Philosophical Society.[54] Horseburgh affirmed that this water when bottled would keep for a long time if it was well corked and waxed. In fact "Williamson's Water," as it was called, could "be sent in bottles to any quarter of the world." The doctor cited the remarkable cures of Mrs Glendinning, the wife of a Moffat schoolmaster, and of Mrs Halliday in Barntimpen as proving

48 **Medical Essays and Observations,** i, 82, which was first published in 1733 by a Medical Society in Edinburgh, afterwards the Philosophical Society. A third edition of 5 Vols, 1747, is in the National Library of Scotland.

49 **Autobiography of Dr Alex. Carlyle,** 119.

50 Dr George Milligan was the son of Mr George Milligan, M.A., minister of Moffat 1695-1723. **Fasti,** ii, 216 b, and P. W. L. Adams, **A History of the Douglas Family of Morton,** 127, 128 and appendices.

51 **Autobiography of Dr Alex. Carlyle,** 119.

52 John Ramsay, **Scotland and Scotsmen in the Eighteenth Century,** ii, 327-333.

53 John Hope (1704-1781), 2nd Earl of Hopetoun.

54 William Horseburgh, M.D., "Experiments and Observations upon the Hartfell Spaw, made at Moffat 1750," published in **Essays and Observations, Physical and Literary** (1771), i, 384-419. Horseburgh's paper appeared first in 1754. Extracts from the Edinburgh Society's essays were published in **The Scots Magazine, August 1754, 373-375 and entitled "An account of the medicinal virtues of the Hartfell Spaw."**

the efficacy of the recently discovered "spaw." Mrs Halliday had suffered for over two years from a chest complaint upon which a course of drinking goats and ewes whey had failed to make an impression. She started drinking Williamson's Water in January 1752 and after six weeks she could walk, "or rather run," three Scotch miles in an hour without ill effects.

Williamson was the first person to make the spa accessible by carying out a few improvements but Charles Duke of Queensberry, the proprietor of the lands of Newton, made a proper carriage road to the place[55] and was almost certainly responsible for protecting the well "by a low building" which has not received the notice which it deserves[56] (Plate XVI.). It is constructed of local stone and the keystone of the vaulted roof has been chiselled to show the "human heart" of the Douglas family, their motto "Forward," the year 1754 and the letters C...D...Q which represent the Duke's initials (Plate XV.). The figures and lettering are carved in mirror writing. The inscriptions could then be viewed reflected in the water below. As the doorway provided the only source of light, and as the door was originally always kept locked, it is unlikely that this novelty was a great success. The Duke was interested in spas, for both he and his wife patronised Bath and, as the following letter shows, also went to Bristol. Dated 12 September 1755 at Hot Wells, Captain Henry Fletcher writes to his friend George Clerk at Dumcrieff.[57]

". . . I am extremely pleased to hear you've had so agreeable a company at Moffat, and am sorry they were not more numerous on acct of my good, kind Dr Hunter to whom please offer my best wishes . . . I forgot to apply to the Queensberry family before they left the Hot Wells to have a house built at Hartfield for the more convenient bottling the D: Destiled spaw water near Moffet. Jokes apart, I wish 3 or four dozen of Williamson's water could be sent to London by sea. I would gladly repay the master of the ship for all charges . . ."

Fletcher's kind Dr James Hunter, a physician practising in Moffat, was one of the many members of that profession who have done so much for the town. In 1758, along with his brother, the doctor took a lease of the lands of Archbank and Clairfoot,[58] now all known as Archbank, where he kept a flock of goats to supply the invalids drinking the water with milk.[59] The following year he built the Long Room at the Well which has been described as "a lank-looking building which was once used as a ball-room and for public breakfasts."[60] At the same time the road to the Well was repaired, and it appears from the account of monies spent by the road trustees that most of the work was done by "the Highlanders" who were paid £3.2.0 for their labour.[61] It was probably Dr

55 R. Pococke, **Tours in Scotland** (Scottish Hist. Soc. 1887), i, 39.
56 Dr Singer, **General View of the Agriculture . . .**, 50.
57 Clerk of Penicuik No. 5482.
58 Both lands shown on Roy's Map.
59 J. T. Johnstone, "Moffat and Upper Annandale . . ." **T.D.G.A.S.**, Third Series, i, 195.
60 J. M. Wilson, **Imperial Gazetteer of Scotland** (1854), iii, 429. The date 1759 is carved on a corner stone of the building, still standing in 1964.
61 Clerk of Penicuik No. 5396/74.

Hunter who provided the tub in which that licentious James Boswell, younger of Auchinleck, bathed for his health when a lad aged twelve,[62] and again in 1766 when he had come " to Moffat to wash off a few scurvy spots which the warmer climate of Europe had brought out on my skin."[63] Finally, in 1760, a stone bridge to carry the road was built over the Hindsgill at Archbank which was paid for out of the vacant stipends of the parish[64] with the approval and help of the Earl of Hopetoun, who was then in possession of the Annandale Estates as tutor in law of his uncle the third Marquis of Annandale.[64a]

Lord Hopetoun was a most progressive nobleman who made many improvements to the properties which were in his charge. About the middle of the century the laird owned over 100 houses in Moffat[65] which in 1760 were referred to as " ruinous," and which had hitherto afforded very poor accommodation for the " persons of all ranks and conditions " who resorted to Moffat " for the benefit of using the mineral water." In fact, there were " very few lodging houses in Moffat at that time, except stone and feal huts . . ." and the town was still incapable of absorbing more than a limited number of visitors and J. T. Johnstone describes in *Moffat and Upper Annandale* . . . , how that within the next decade Moffat was almost rebuilt.[66]

The Earl made many visits to Moffat in connection with the management of the estate. His Lordship did not drink the mineral waters, " though he might sometimes ride to the Well, by way of keeping it in fashion; for by the advice of his physicians he was in use to go regularly every year to Buxton."[66a] From 1763 till July 1767[67] he stayed in a small house to which his family retired " for some weeks " in August 1766[68] after the marriage of the Hon. James Hope, his second son.[69] After July 1767 Lord Hopetoun was able to stay in Moffat House which was then ready for occupation and which was his very fine contribution towards the making of the new town. (See Appendix 2.) He is also credited with initiating the building of two houses for the purpose of inns,[70] one of which was the *Kings Arms* which afforded very superior accommodation for a considerable number of invalids. It was the " capital inn " referred to in the *Statistical Account* in 1792 when it was being managed by James Rae who was the mail coach contractor for the " ground " between Moffat and Abington. The Reverend William MacRitchie[70a] halted at *Rae's Inn* on 26 June 1795. There was then a representative company staying in Moffat and MacRitchie noted,

62 James Boswell (1740-1795). **Boswell in Holland,** 1763-1764, ed. F. A. Pottle (1952), 44.
63 **Boswell in Search of a Wife,** 1766-1769, edd. F. Brady and F. A. Pottle (1957), 9. Published by William Heinemann Ltd.
64 J. T. Johnstone, **op. cit.,** 195.
64a Appointed curator in June 1758.
65 W. Robertson Turnbull, **History of Moffat** (1871), 107.
66 J. T. Johnstone, **op. cit.**
66a Signet Library, Session Papers, 374: 43. **The Petition of James Hope Johnstone, Earl of Hopetoun,** 31 May 1797.
67 Scottish Record Office, Window Tax Schedules, Dumfriesshire (E. 326/1/33-4).
68 Sir W. Fraser, **Memorials of the family of Wemyss of Wemyss,** iii, 223.
69 James Hope (1711-1816), afterwards 3rd Earl of Hopetoun, a title which he never assumed. Succeeded to the Annandale Estates in 1792 on the death of his grand-uncle the Marquis of Annandale.
70 **New Statistical Account,** Moffat, 113.
70a Rev. William MacRitchie, **Diary of a Tour through Great Britain in 1795.** (1897) 9.

amongst other visitors, "Lady Lockhart Ross[70b]; Mr Irvin, West Indian; Mr Dalzel of Glenae[70c] . . . and Mr Carruthers of Howmains etc."[70d]

There is no doubt that the setting up of the Mail-coach system and the construction of good turnpike roads were factors which contributed more than anything else to the growth and prosperity of Moffat. In 1797 there were the two inns which accommodated, and which are still accommodating, a considerable number, "and some very good lodging houses which are let to invalids who resort to this place during the summer."[71] A "hotel" in the High Street, which contained two bathing machines, was owned by the enterprising Dr James Johnstone who used to send the Hartfell Spa water to many towns in England and to the West Indies.[72] It was this Dr Johnstone who wrote an account of the mineral waters for Dr Garnett who visited Moffat that year.

Garnett was a Professor of Natural Philosophy and Chemistry and a member of the Royal Society of Edinburgh which now included all the members of the old Philosophical Society.[73] He published in the early nineties a book on the mineral waters of Horley Green Spa near Halifax and two books on the waters of Harrogate. His obvious interest in spas caused the doctor to stay in Moffat for some months in 1797 when he carried out various experiments, analysed the waters and recorded the results in his *Observations on a tour . . .* which was published in 1800. There is no doubt that Dr Garnett formed a very high opinion of the place and so it appears had others, for it is said that on one occasion, in the summer of 1804, there were 250 invalids in the town who had come "to enjoy the salubrious air, and to drink a mineral water."[74]

APPENDIX 1

Sir John Clerk sent Lord Grange "the Receit and the calcin'd stone" to make the preparation, but Lord Grange was not sure "as to making Moffit well water stone" and Sir John sent further instructions.

"Any of those 6 or 7 pieces of stone which I sent your Lordship after calcination and being put red hot into 4 or 5 mutchkins of water will answere your expectations with this difference only that the better it be calcind and the bigger the stone be, the water will be the stronger and tinge water the more speedely. Therefore quhen I question the strenth thereof I either calcine the stone a second time and immerse it into the same water, or take another stone and after calcination therof do immerse it, but I dar not say that I was ever

70b Elizabeth, daughter of Robert Dundas of Arniston, who married 6 Sept 1762 Sir John Lockhart-Ross, Baronet of Balnagowan in Ross-shire. He died 9 June 1790 G.E.C.. **Complete Baronetage**, iv 287.

70c Robert Dalzell of Glenae, succeeded his father Alexander, styled Earl of Carnwath, in 1787. Died at Glenae 13 Feb 1808. **Scots Peerage** ii 417.

70d John Carruthers (1731-1809), twelfth and last Laird of Holmains. A. Stanley Carruthers and R. C. Reid, **Records of the Carruthers Family** (1934) 114.

71 T. Garnett, M.D., **Observations on a Tour through the Highlands . . .** (2nd Edition, 1811), ii, 240.

72 John Brown, **Moffat Past and Present** (1873), 77, 84. The hotel was pulled down in 1832, and a building, now occupied by Hetherington the chemist, was erected on the site.

73 **DNB**, article on T Garnett, 1766-1802.

74 J. Mawman, **An Excursion to the Highlands of Scotland and the English Lakes** (1805), 195.

forcd thereto. But I shall come and wait on your Lordship at Edr. about the sitting doun of the assembly or sooner if you please and answere all your doubts all to my power, I am etc. . . ."[75]

The old baronet's journal for 1721 contains a number of entries concerning his health and notes on how he treated various ailments. Of particular interest is his entry for Friday 16 June which holds the clue to the calcined stone used in his prescription.[76]

"I visited the Lady Cowll and applyed the pouder of Moffat merchasite[76a] calcind to the cancer of her breast, and above a compress wett with my Moffat water which gave her great ease. Left a part of both these with her with directions. . . ."

Lady Coul was Henrietta, the wife of Sir Colin Mackenzie, 4th Baronet of Coul, who was Clerk of the Pipe in the Scottish Exchequer and clearly on intimate working terms with Baron Clerk, the son of the first baronet of Penicuik.[77]

APPENDIX II

The plans of Moffat House, dated 1762, are in Hopetoun House, and I am indebted to Mr Basil Skinner for this information. He also informs me that in the "General disbursement for building, finishing and furnishing . . ." the house from 1760 to 1768 appears the entry, "To Mr Adam for his trouble and plans £100." By a process of elimination it is evident that John Adam was the architect for Moffat House and this is corroborated by J. T. Johnstone in Dumfriesshire Trans. Third Series, i, 199.

The association of the Adam family, the Clerks of Penicuik and the Earl of Hopetoun with one another and with Moffat is well illustrated by John Fleming in *Robert Adam and his Circle.* Mr Fleming writes that the Adam family were frequent visitors to the spa. Robert, his mother and sisters were there in 1752, and again in 1755 when Robert hoped that, between them, they might make at least one "catch." He was intrigued to hear in September that Nelly had found an admirer in Sir William Dalrymple (1704-1771) whose first wife had died earlier that year. His sister Peggy had also been making some matrimonial progress that summer. "Your situation at Moffat," he told her, "and your intimacy and familiarity with genteel and, as you tell me, good company, make me mighty happy."

75 Clerk of Penicuik No. 5286/5 and /6. These instructions were rough drafted on Lord G's letter.
76 Clerk of Penicuik No. 2092/7.
76a Marcasite, iron pyrites.
77 G. E. C., Complete Baronetage, iv. 297.

Plate XVI—Hartfell Spa: View from exterior in 1964.

Plate XV.—Hartfell Spa: The freestone keystone, photographed by Mr Kenneth Ross.

A "BANN POINT" FROM DUMFRIESSHIRE

By Dr JOHN M. COLES

The Burgh Museum, Dumfries, has recently acquired a flint point from the top of the old coast-line at Annan (Nat.Grid Ref. NY198658). The point is in a fawn coloured flint with red-brown intrusions; it is 66 mms. long and 29 mms. wide at its maximum (figure 1). Flat flaking on the right edge of the upper part of the flake, allied with generally steeper re-touch on the upper left edge has reduced the width of the original flake to form a tapering point. No attempt has been made to thin the flake by removing the central keel, formed by the intersection of previous flake scars on the original core. This dorsal surface also shows a small triangular scar left by a previous unsuccessful attempt to remove a flake from the core. The lower parts of both left and right edges of the flint have been damaged by recent action, most of the minute scars showing a paler colour than the original flake surface exhibits. The slightly inclined striking platform is wide and unfaceted, and the bulb on the ventral face is diffuse; probably a soft hammer was used.

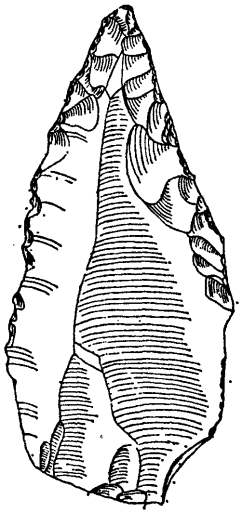

Fig. 1. Full size.

The flake exhibits most of the characteristics of a "Bann point," particularly in its leaf-shape, its re-touch near the tip and its rudimentary tang. This last feature, however, was not produced by flaking but by snapping or squeezing off a flat chip beside the platform; the previous hollow flake scar had ensured that the flake would be extremely thin at this point. As far as is known, this flint is the first "Bann point" from the Solway area. Others, less well-defined than this one, have been found in Scotland at the Woodend Loch site near Coatbridge, Lanarkshire (P.S.A.S. lxxxiii. 1948-9, 87, no. 25-26), and on the "raised beach" at Ballantrae, Ayrshire (P.S.A.S. lxxix. 1944-5, 93, no. 34-36). Others are known from the Isle of Man. The Bann point is one of the type fossils of the Bann River culture of Ireland. The prototype of this point is believed to lie in the Mesolithic Larnian industries, but the evolved Bann point in its form as seen in the Annan example is of Neolithic and later date, and is quite widely distributed in Ireland (P.R.I.A. xliii., 1936, 17-40; P.P.S. xii., 1946, 150; J.R.S.A.I. xciii., 1963, 105; J.R.S.A.I. xciv., 1964, 131).

TYNRON DOON, 1964-65

By A. E. TRUCKELL

Tynron Doon (Nat.Grid Ref. NX820939) is a steep hillock rising to 960-odd feet, a promontory from a large mass of higher ground, and lies between Penpont and Tynronkirk. The summit bears a multivallate Iron Age fort of considerable size: this has been later modified by the addition of a "courtyard" on the north-east side: the whole has then been modified as a motte: and the foundations of a tower-house stand within the entrance.

About the summit and on the slopes are several patches of nettles, indicating organic rubbish. The largest of these lies on the very steep south slope above Clonrae Farm and is roughly 100 feet wide by 200 feet down the face: the screes below it contain bloomery waste, slag and "vitrifaction." Local residents have long known that this large nettle-patch contains archæological material: acting on this knowledge, Mr Wilson of Tynron has been collecting in the rabbit warren which, apparently for a century at least, occupied the large nettle-patch until the coming of myxomatosis (there is again

increasing rabbit population on the hill face but no resumption of the warren) for over forty years and, in 1927, found a fragment of a 7th-century gold filigree bracteate. He has also found several pounds of animal bone, while he collected a number of pieces of bloom from the scree. One inevitably thinks of this site as a likely one for the finding of the possibly 7th-century gold foil helmet fittings in the National Museum of Antiquities and described in P.S.A.S. XCIV. by Liam de Paor, found "somewhere in Dumfriesshire."

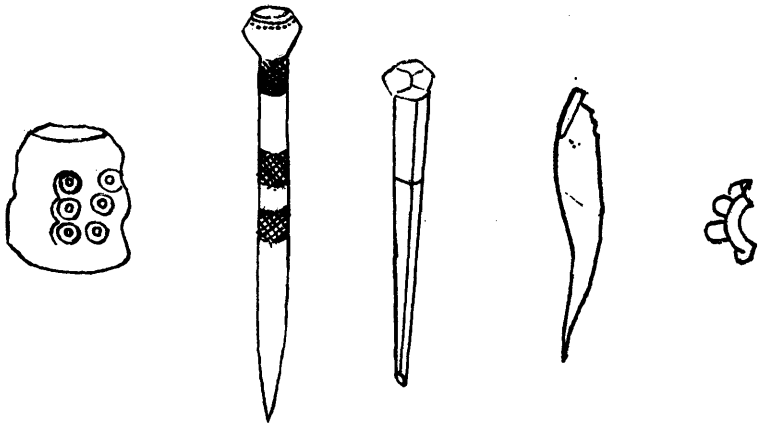

Fig. 2. Finds from Tynron Doon. (All × 1/1). Left to right. Curved piece of bone ornamented with circles. Bone pin. Unfinished bone pin. Tooth worked as an awl. Fragment of dark-blue glass bead.

At the desire of the Thornhill Extra-Mural Class in Archæology a section was opened in late May, 1964, three feet wide and ultimately 48 feet long, and excavation to the subsoil continued until late September, a total of some 20 hours being worked on the site. Soil depth ranged from some 18 inches at the top of the cut to over four feet at the bottom: the sticky nature of the black organic soil made this possible on the steep slope. Depths along the cut varied greatly owing to the stepped face of the rock and subsoil: the bulk of the material had come to rest in natural pockets. The black soil was, next the subsoil, full of animal-bone and several stones weight was recovered: pieces of iron bloom were found occasionally from top to bottom of the cut: small finds were made almost entirely in the top 15 feet of the cut.

The Bone: Among the abundant bone material small ox is dominant, with pig next in order of abundance, sheep less plentiful, and possible horse and deer teeth present. Dr Clarke of the Royal Scottish Museum is to study the bone material and make a full report. Long bones, vertebrae, jaw and teeth predominate and a good deal can be gleaned on the method of cutting up the animals. One horn core was found.

Small Finds: (Fig. 2) At the beginning of the season a piece of ribbed blue glass bead of early Dark Age type was found: this was followed later by two bone pins, one unfinished, one with a thistle-head with dots round the edge and bands of cross-hatching on the stem, and a curved piece of bone — part of a toggle ? — decorated with incised circles. All these pieces have close parallels in the Buston Crannog material. An awl had been worked, rather exceptionally, from a tooth: another tooth seems to have been modified as a chisel; a piece of long-bone had been cut as a spatula. A thin spatulate piece of iron might have been inserted in a wall: a conical lump of iron like a plumb bob is probably modern, but a small iron wall-hook and a nail seem ancient.

One lead object was found, a tubular sinker or weight. Twelve pieces of flint and chert were found: several had been roughly worked — chipped rather than flaked: all are too small for strike-a-lights. A flat water-worn pebble two in. in diameter with a large hole in it seemed likely to have been worn as an amulet. A good deal of bloomery waste and "vitrifaction" was found in the cut and on the scree below it. A small mass of stone embedded in hot-poured mortar was found: this probably comes from the tower the foundations of which stand just inside the fort entrance. In a rabbit-scrape some 30 feet above the top of the cut was found a fragment of buff unglazed wheel-turned pottery, from the edge of a base: it could be early mediæval or a Dark Age import: it is rather thin ware.

Work in 1965 was on a much smaller scale, owing to lack of labour and the very wet season: but work continued from June till September in a cut of the same breadth as in 1964 some two feet East of the top of the 1964 cut, reaching subsoil or rock over a length of no more than five feet. Despite the small scale of operations a number of finds were made: a neat iron knife, an iron link probably from a chain bit, a neat small playing piece of vitreous paste for a board game, iron bloomery waste, vitrifaction, and animal bones and teeth. Bloomery waste and vitrifaction was also found once more in the scree. The small finds, as in the previous season, were made at the bottom of the black greasy organic soil. It is hoped to continue on the other side of the 1964 cut in 1966.

Thanks are due to Buccleuch Estates, Ltd., the owners of the land, per Major Fox, Mr Rorison of Clonrae, the farmer, whose friendly interest has been a great encouragement, the enthusiastic members of the Thornhill Extra-Mural Class, and to a small band of Dumfries volunteers who made it possible to continue the work through the holiday periods.

SOME SPINDLE WHORLS FROM EARLY ECCLESIASTICAL SITES

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

During May, 1965, a heavy, deeply incised, spindle whorl of fine sandstone, which had been found in the grounds of the Stakeford House, Dumfries, was handed to the writer. Upon comparison with whorls at the Dumfries Museum — including material from the Grierson Collection — it was noted that there existed a small group of highly distinctive whorls (Fig. 3 and Table). Almost all of these had been found in churchyards, e.g., Durisdeer (where a fine late Northumbrian cross head of the 10th century was also found), or from places with ecclesiastical connections in their placenames, e.g., Lannhall, Tynron (the Welsh "lann" = a churchyard enclosure); Kirkfield, Mouswald, and Kirkhill, Dalton. The whorls form a reasonably consistent group in respect to diameters, perforation sizes, thickness and weights. Although the sample from Durisdeer is somewhat light (25.8 grams) and small (diameter = 3.8 cms.) it was felt that it should be included on the grounds of style alone and may therefore represent a slightly more sophisticated type than that normally found within the group.

The stone utilised is consistently a fine-grained, pale pink-white, micaceous sandstone, and this, with a surprising similarity in design from widely separated sites makes one wonder whether or not there has existed a trade or localised industry for this often used commodity.

Returning to the subject of place-names, it is to be noted that none of the sites with ecclesiastical names now possess a church or even a tradition of one that would go back to before the Reformation. Lannhall is especially interesting in that it ties in well with other Welsh place-names in mid-Nithsdale, e.g., Tynron Doon and Penpont, which are thought to have been current some time prior to the seventh

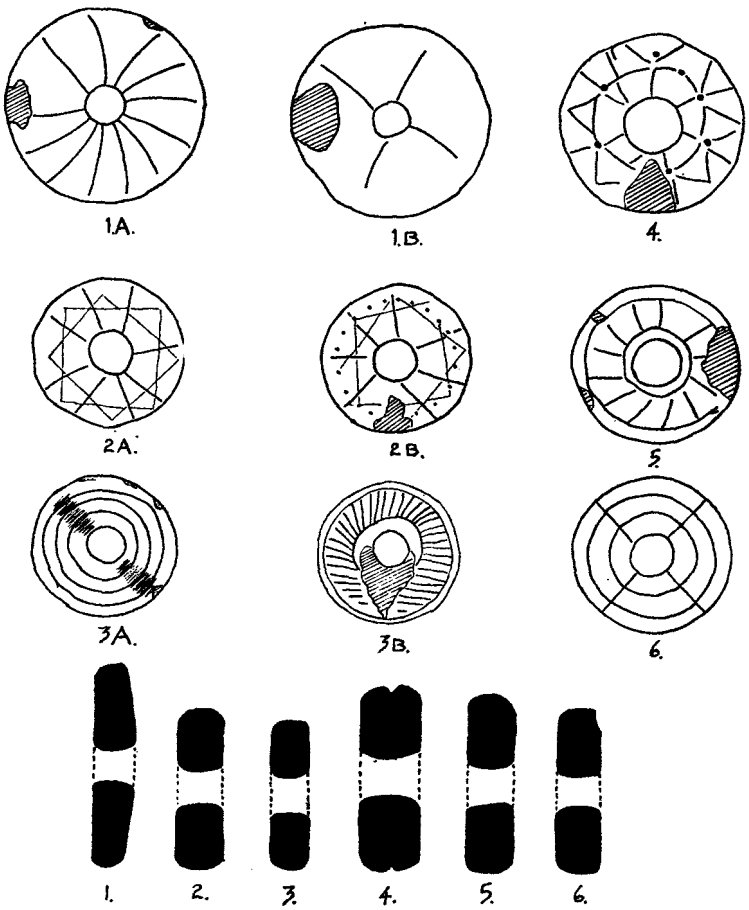

Fig. 3. Spindle Whorls. (All × ½)—1, Lannhall, Tynron; 2, Kirkfield, Mouswald; 3, Durisdeer Churchyard; 4, Provenance unknown; 5, Stakeford, Dumfries; 6, Kirkhill, Dalton. N.B.—Chipped areas shown hatched.

century. Thus, bearing in mind the early Welsh place-name association and the Durisdeer cross fragment, a time range covering the Dark Ages and early Mediæval period could be postulated for the small ecclesiastical establishments that these whorls and place-names seem to indicate.

TABLE OF SPINDLE WHORLS

	Locality	Diameter cms.	Thickness cms.	Perforation Diameter cms.	Weight gms.	Other Information
1.	Lannhall, Tyron ...	5.2	1.1	0.9	46.8	2 sides decorated; side A curved; very slight hour-glass perforation; Ex Dfs. & Gall. Ant. Soc. Collection.
2.	Kirkfield, Mouswald	4.25	1.35	1.0	36.2	2 sides decorated; both sides flat; from Calf-Park Farm, Mouswald; Ex Dfs. & Gall. Ant. Soc. Collection.
3.	Durisdeer Churchyard	3.8	1.15	0.95	25.8	2 sides decorated; both sides flat; 2 areas of wear on side A; Ex Grierson Collection.
4.	Unknown Provenance	5.0	1.4	1.4	50.1	2 sides decorated (same pattern); both sides flat; very heavy incised line around perimeter; very pronounced hour-glass perforation.
5.	Stakeford, Dumfries	4.6	1.2	1.15	40.6	1 side decorated; both sides flat; hour-glass perforation; from the collection of the Writer.
6.	Kirkhill, Dalton ...	4.3	1.1	1.0	30.7	2 sides decorated; both sides flat; hour-glass perforation; decoration same on both sides; Ex Dfs. & Gall. Ant. Soc. Collection.
7.	Dunscore	4.1	1.5	1.4	45.2	2 sides decorated; hour-glass perforation; Ex Grierson Collection.

EXCAVATION AT WAUCHOPE BRIDGE, 1965

By ALEX. McCRACKEN, B.Sc.

LOCATION.—(NY 356843) Wauchope Bridge is situated about 40 yards from the Parish Church manse of Langholm, where the Wauchope Water runs through a narrow gorge some 25 ft. wide. The W. bank of the river is a vertical rock face, 8 ft. high, with the bridge abutment right on its edge. The E. bank, also of solid rock, dips towards the river at an angle of about 45 degrees.

HISTORY.—The first reference to the bridge occurs in the Langholm Kirk Session records. On two Sundays in April, 1721, no services could be held, since the minister was "barred by the waters." (Previous to 1703, the mediæval chapel of Wauchope, in the churchyard near the manse, served as the church for the area. But when the new church was built in Langholm in 1703, the minister had to cross the Esk to reach it. In time of flood, Esk could only be crossed at Skipper's Bridge, a mile below Langholm, and the Wauchope cut off the manse from Skippers.) Accordingly, application was made to the Chamberlain of the Duke of Buccleuch to have Wauchope Bridge repaired, and this must have been done, since no further reference to the bridge occurs.

In 1793, the parish minister demolished the bridge "to prevent the lads of Langholm strolling that way of an evening, disturbing the peace of mind and pious meditations of his female domestics." (By this time a new bridge had been built across the Esk in Langholm, so that he no longer needed to cross the Wauchope, even in time of flood). This same minister records, in the Statistical Account, that an aureus of Otho, and two other denarii aurei, were found "near Wauchope Bridge" about the year 1783. Perhaps because of this find, the bridge has long had the reputation of being Roman.

In 1932, a large tree was uprooted by a gale, exposing the remains of the W. abutment. This abutment was excavated in August, 1965.

THE EXCAVATION.—Little trace of the bridge could be seen on the surface before excavation, except for a low mound on the brink of the river, with only a few stones breaking the turf.

On excavation, the abutment was found to consist of two well-built walls, each 18-24 inches thick, with earth and stones packed between them. The walls were not parallel, the space between them narrowing from 11 feet to about 6 feet as they approached the river. A layer of cobbles was laid on top of the packed earth, to form the road surface.

The S. side of the abutment was well-preserved, standing some five courses high. It was carefully built of river-washed stones, and mortared throughout. Most of the boulders used were of greywacke, but two were of red sandstone, and one was of granite (commonly found in the bed of the Wauchope).

The N. side was not so complete, standing only two courses high, with many of the stones displaced. It was constructed solely of greywacke boulders, and most of the mortar was missing. Much of the disturbance could have resulted from the fall of the tree in 1932.

On neither side of the abutment was any evidence for a parapet found.

The layer of cobbles forming the road also consisted of river-washed stones, but much of it has vanished even in the last 10 years (due probably to the temptation of hearing them splash into the deep pool below).

No trace of a corresponding abutment exists on the E. bank of the river. It has probably been washed down the steeply-dipping rocks at that side, after the collapse of the arch.

FINDS.—From the mixed earth between the retaining walls, several pieces of iron slag, and a large piece of lead were recovered. At the base of the S. wall of the abutment, a single sherd of pottery, dateable to the late 13th-early 14th centuries, was unearthed.

CONCLUSIONS.—By its appearance and mode of construction, the bridge is almost certainly a pack-horse bridge, of 17th century date. (A complete example still exists in the parish of Minnigaff. See Inventory of Ancient Monuments, Kirkcudbrightshire, p. 199. It also is locally believed to be Roman).

The Roman coins found nearby suggest that it was built on the line of an ancient route, and in fact there is a tradition of a Roman road running through the Wauchope valley from Broomholm to Birrens.

The finds made during the excavation indicate the existence of an early mediæval settlement (associated with the nearby Wauchope Castle?) close to the bridge. Unfortunately, landscaping during the building of the manse in the late 18th century has probably covered up all traces of this settlement.

A SAMPLE OF BOG BUTTER FROM LOCHAR MOSS, DUMFRIESSHIRE

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

During the disposal of Dr T. B. Grierson's Museum at Thornhill, the sample of Bog Butter described below was found after much search in the now well-known display of the old museum. The sample, the find conditions of which are unknown, was approximately 30 grams in weight and had obviously been cut from a far larger mass as the surface showed many knife marks. The label, in Dr Grierson's hand, reads, "Adipocere from the Locharmoss," but the material is more likely to be a Bog Butter because, although the two materials are very similar in composition (compare analyses given in P.S.A.S. 1881-2, 1884-5, 1888-9, 1940-1) one would not expect to find fragments of dried grass and birch leaves scattered throughout the mass—cow hairs are a common contaminant but none were found in the sample described—had it been formed by the decomposition of animal fats. The remainder of the sample is now in the Burgh Museum, Dumfries.

Analysis

Water	1.47
Fats, fatty acids, etc. (ether soluble material)	98.32
Casein, milk-sugar, ash, and mineral matter	0.21
Total ...	100.00

Appearance of the Sample.—White cheese-like solid. Powdery on surface but more compact towards the centre—the colour also changes from white to a very pale yellow towards the centre. Surface occasionally stained yellow and smudged black by (?) charcoal dust.

Application of heat (100°C.) to Sample.—Melts to a pale yellow liquid with a small amount of "curd" and a faint smell of rancid butter.

Appearance of solid after purification by ether.—Hard yellow solid.

Action of heat on purified solid.—Melts to a clear golden-yellow liquid.

Melting point of purified solid.—46°C.

Phosphoric acid in ash.—Not determined due to small amounts available.

Origin and Time-scale of the Practice.

The burial of butter in bogs occurs notably in Ireland and the Highlands and Islands

of Scotland, but also in Iceland, Finland, and, strangely, Kashmir and Morocco. The butter was normally buried—in water-filled bog holes rather than the liquid peat itself—in wooden kegs or tubs but more rarely was merely wrapped in skin or bark—wicker-work baskets have also been used. The reason for the practice is obscure but that most generally held is that the butter was deposited in bogs during the spring and summer, when there were abundant supplies of milk, to preserve it for winter use and also to mellow the flavour which would tend to be rather harsh due to the poor herbage available to the cattle. When Sir William Petty was describing the food of the Irish, about the middle of the seventeenth century, he included "butter made rancid by keeping in bogs"—the flavour thus produced was made more pungent by the addition of garlic, as we learn from the "Hesperi—neso—Graphia" (published towards the close of the seventeenth century) where bog butter is alluded to as one of the household stores of a native Irish gentleman of the period:

"He in his house great plenty had
Of burnt oat bread, and butter found
With garlic mixt, in boggy ground,
So strong, a dog with help of wind,
By scenting out with ease might find.
And this they count the bravest meat
That hungry mortals e'er did eat."

The time-range of the practice is not known exactly but it continued in use in Ireland until the late eighteenth century (a keg of butter in the National Museum of Ireland bears the date 1789) and to the 1890's in Kashmir and Morocco where it was still considered a delicacy at that late date. The early origins of the practice are now lost but there is good literary evidence in Ireland that it existed in late mediæval times. A triangular wooden vessel, now in the National Museum of Ireland, is thought to date to about 400 A.D., and the sample associated with cauldrons of Iron Age type found at Kyleakin, Skye—see P.S.A.S., 1884-5, p. 309—puts the custom back to prehistoric times.

Summary

The sample described and analysed above is of interest in being the only one of its kind recorded for the South-West of Scotland, which is surprising when it is remembered that Ireland—the classical home of bog butter—lies just across the narrow North Channel.

My thanks are due to Mr Etienne Rynne of the National Museum of Ireland, and Mr Alexander Fenton of the National Museum of Antiquities of Scotland for their help and encouragement in the preparation of the above notes.

"South-West Scotland," Jack G. Scott, Regional Archæologies; Cory, Adams & Mackay, London, 1966; 16s.

It is very pleasant to find this, the fifth volume in this excellent series, dealing with our own area: it includes Ayrshire, Renfrewshire, Lanarkshire, Dumbarton, Argyllshire, Bute and Arran, too, so that it provides a useful chance of seeing how our Dumfries and Galloway sites and finds fit into a wider context.

Mr Scott, who is no stranger to our Society, writes simply and clearly, using the latest information, and illustrating his text with well-chosen maps, line-drawings and photographs: inevitably, one notices a few things missed out, but it is remarkable how fully Mr Scott manages to deal with our area, to give a better picture of it, from Mesolithic to Roman times, than anyone has done so far: he is particularly clear on the complex Bronze Age sequence.

Naturally, the work of this Society's members figures quite prominently: the Mesolithic map shows Mr Cormack's sites dotted round the Wigtownshire coast, for instance: further on in the book his Beckton site with its Rinyo-Clacton pottery is also mentioned. Not only are a great many sites, excavations and finds in the Society's area mentioned, but many local sites—Fleuchlarg Cairn, Holywood Stone Circle, Mullach Fort, Burnswark and Birrens, for instance — figure in the very useful "Sites to Visit" appendix, and Stranraer, Kirkcudbright, Dumfries and Annan Museums receive good mentions in the "Museums to Visit" section.

A. E. T.

"The Young Field Archæologist's Guide," John X. W. P. Corcoran, London; G. Bell & Sons, Ltd., 1966; 17s 6d.

Dr Corcoran, of the Department of Archæology at Glasgow University, is well known to the Society and excavates in its area at Mid-Gleniron: it is all the more pleasant, therefore, to find this very useful little handbook from his pen. Very lucidly he explains the various classes of field monuments — cairns, mottes, hill-forts, henges, and the like — with good photographs and line-drawings to help — showing the interested youngster — or indeed the interested amateur of any age — what these things look like in the field, and how to find them. This is a most interesting book, and must be warmly recommended to the members of a Society in whose area so many of the kinds of monument he deals with must still remain to be discovered.

A. E. T.

"The North Britons," the Prehistory of a Border People, Richard Feachem; Hutchinson of London, 1965; 45s.

Dr Feachem, now in charge of the archæological side of the Ordnance Survey, is well known to members of this Society, and his friendly visits to excavations by its members were always looked forward to during his many years with the Royal Commission on Ancient Monuments in Edinburgh. His work with the Commission has given him the immense knowledge of field sites, and of the cultural development of the area covered in this book — from North of Stirling to Cumberland and Northumberland — which makes this book so important and so full of information. It is pleasant to notice how largely this Society's area bulks, and how often excavation by its members, as at Kirkburn and Whitestanes Moor, by University parties as at Cairnholy, Bargrennan, or Milton Crannog, or by the Commission and its helpers — as at High Land near Thornhill or Mollance near Castle-Douglas — figures in the text. Literally scores of sites and finds in our area, ranging from the Mesolithic to the Iron Age, are very fully covered, and much enlightenment given on the way of life of our ancestors.

This book, fully illustrated by line-drawings, maps, plans and photographs, is a compendium of information; if it has a fault, it is the tendency to mis-spell our place-names — but that is a minor matter. A very good buy!

A. E. T.

15th October, 1965.—The Annual General Meeting of the Society was held in the Ewart Library at 7.30 p.m. The Accounts of the Hon. Treasurer were adopted and the list of Office bearers recommended by the Council was confirmed. Twenty adult members were elected. Major-General J. Scott-Elliot then vacated the Chair and installed Mr J. D. S. Martin as the new President of the Society. Mr Martin then called on the retiring President to deliver his Presidential Address, the subject of which was "A Visit to the Sahara."

29th October, 1965.—Dr W. F. H. Nicolaisen of the School of Scottish Studies of Edinburgh University lectured on "Place Names in Dumfriesshire and Galloway."

12th November, 1965.—Dr E. Perkins of the Department of Applied Microbiology and Biology of the University of Strathclyde spoke on "Some General Considerations of the Solway Firth," illustrating his talk with diagrams and colour slides.

26th November, 1965.—Mr Charles Thomas of the Department of Archæology of Edinburgh University lectured on his excavations over the past two summers at Ardwall Island, his lecture being illustrated with colour and black and white slides and diagrams (see Article p. 84 supra).

10th December, 1965.—Mr Alan Small of the Department of Geography of the University of Aberdeen lectured on his excavations carried out with the help of the R.A.F. personnel of Iron Age and Viking sites in Unst. His talk was illustrated with colour and black and white slides.

14th January, 1966.—Sir Arthur Duncan lectured on "The Ecological Approach to Game Preservation."

28th January, 1966.—Dr Peter S. Maitland of the Department of Zoology of the University of Glasgow lectured on "The Vendace," his lecture being illustrated with colour slides and a number of specimens, including a live specimen of a Loch Lomond Powan (see Article p. 31 supra).

11th February, 1966.—Mr A. Curtis Wolffe lectured on "The Architectural Heritage of Galloway," his talk being illustrated with colour slides.

25th February, 1966.—"Inquisitive Camera Among Insects" was the title of a talk by Mr William Aitken, whose colour slides showed his combination of the talents of a pictorial artist and an expert micro-photographer. Members of Dumfries Camera Club were invited to join us for this meeting.

11th March, 1966.—Mrs Grace Hickling, Honorary Secretary of the Natural History Society of Northumberland, Durham and Newcastle-upon-Tyne, in a talk entitled, "Grey Seals and the Farne Islands," told us of the work of surveying, counting and marking the seals of the Farne Islands carried out over the past 15 years by herself and other members of her Society, and illustrated her lecture with colour slides.

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Records of the Western Marches, Vol. III., The Upper Nithsdale Coalworks from Pictish Times to 1925, by J. C. I. McConnel, 1962. 15s.

Notes on the Birds of Dumfriesshire, by Hugh S. Gladstone, 1923*.

A Bibliography of the Parish of Annan, by Frank Miller, F.S.A.Scot.*.

REPRINTS

Bronze Age Metalwork in Dumfries and Galloway, by Dr John M. Coles (1965), 38 pp., with 11 figs., 1 plate, and inventory of 233 finds; 4s, post free.

Food Vessels in S.W. Scotland, by D. D. A. Simpson (1965), 26 pp., 76 vessels illustrated, described and fully discussed; 3s 6d, post free.

* Indicates out of print.

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