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Editorial

Contributions are invited on the Natural History, Antiquities, Archaeology, or Geology of South-West Scotland or the Solway Basin and preference is always given to original work on local subjects. Intending contributors should, in the first instance, apply to the Hon. 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 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.

The Society is indebted to the University of Newcastle-upon-Tyne for a grant towards the cost of Mr Jobey's article.

ASPECTS OF THE GEOLOGY OF THE SOUTH-EASTERN PART OF THE CRIFFELL INTRUSION AND ITS ASSOCIATED DYKES

by

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INTRODUCTION

The Criffell granodiorite is one of the major "Newer Granite" intrusions in Galloway. It is intruded into Llandovery and Wenlockian strata. The local upper age limit is indicated by detritus from the intrusion in the Upper Old Red Sandstone of the Kirkbean area (14). Brown et al (3) determined the isotopic ages of two specimens from the intrusion using the potassium-argon method and reported ages of 391 ± 8 and 397 ± 8 million years. These various considerations indicate an early Devonian age for the emplacement of the pluton.

Macgregor (10) first established the composite nature of the intrusion and west of the Urr Water defined an earlier more basic member (GI), an intermediate member (GII) and a later, more acid member (GIII). Phillips (14) found that over the major outcrop east of the Urr Water the intrusion was composed of the equivalent of GI and could be divided into a marginal, foliated granodiorite (main granodiorite) and a central porphyritic granodiorite, the contact between the two being gradational rather than sudden.

A large number of dykes were intruded into the country rock as a consequence of this plutonic activity. These are divided by Phillips (15) into porphyrite-porphyry, spessartite and kersantite groups. The former group is most abundant and represents the time equivalents of the various granodiorite members. The latter groups are much less common and were intruded mostly before the porphyrite-porphyry dykes (15).

This contribution arises from a B.Sc. thesis submitted at the University of Durham on the geology of the Kirkbean area as a whole. The part of the intrusion examined covers about five square miles around the peaks of Criffell and Millour and falls entirely within the main granodiorite (Fig. 1).

FIELD RELATIONS AND PETROGRAPHY

(a) *Granodiorite*

At no locality in the area is a clear, non-tectonic contact between the intrusion and the country rock exposed. Between Drumbuie Hill and Millour a prominent col in contact metamorphosed Wenlockian rocks immediately adjacent

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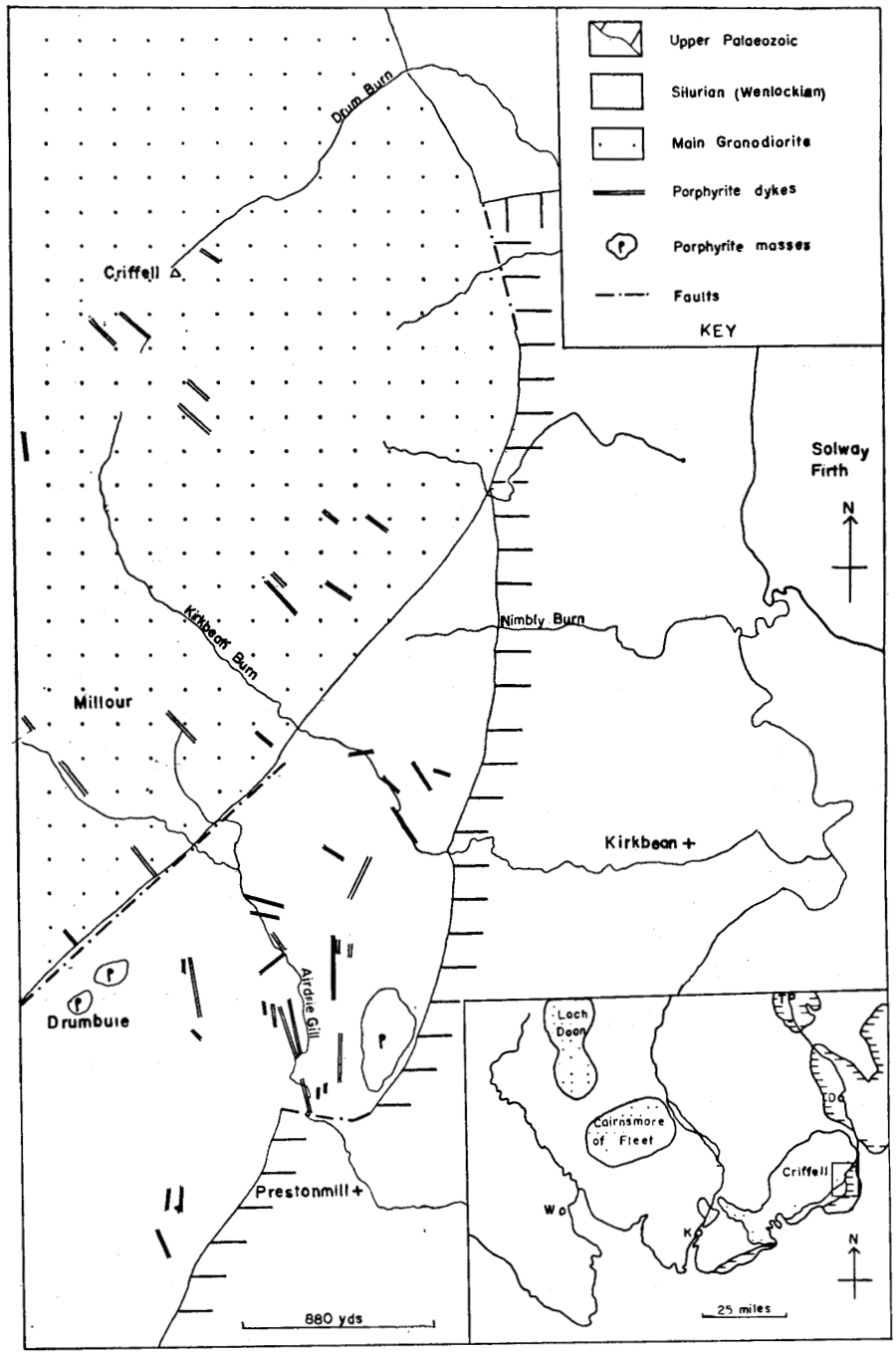

Figure 1.—The geology of the south-eastern part of the Criffell intrusion around Kirkbean, Kirkcudbrightshire. The contact metamorphic aureole is omitted for clarity. Inset shows the area of the map in relation to the other major Caledonian plutons in Galloway

to the main granodiorite margin is interpreted as a large fault trending NE-SW (Fig. 1). This represents the north-easterly termination of a major structural line bordering the North Solway Firth and may be traced as a persistent line of faulting to Rerrick shore, some 15 miles to the SW (4, 8, 11). The faulting seen at Rerrick and Colvend shores affects Lower Carboniferous strata and the last movements must, therefore, post-date the age of these rocks. In the former area, at the Door of the Heugh near Balcary Pont, Craig and Nairn (4) record a maximum down-throw of 2000 feet to the south. From the magnitude and lateral persistence of the whole structural line and from other geological and geophysical considerations it is likely that a crustal feature of some importance has governed its position (9). The fault bounding the granodiorite north of Drumbuie Hill is probably of the same age as those parts of the fault-line where Lower Carboniferous rocks are seen to be directly affected (i.e. broadly Hercynian). The fault, as seen at present outcrop, is not thought to have originated at the time of intrusion of the granodiorite by the evidence above, although its position is obviously influenced by the southern boundary of the granodiorite.

In a small stream at the northern end of Cushat Wood (NX 973619) a normal fault trending NNW-SSE brings micritic limestone and dark shales of the ?Lower Border Group (Cementstones) into juxtaposition with the granodiorite. The latter is extensively kaolinised adjacent to the fault and a thick, steeply dipping vein of barite occurs within this zone. Elsewhere the outer contact of the granodiorite with the country rock may be mapped as a well-defined feature line. The nature of the contact aureole, occasional small migmatite bodies and assimilation of sediments in the pluton as a whole are fully discussed by Phillips (13, 14).

The occurrence of abundant xenoliths in the outer part of the main granodiorite is of great interest. Bott and Masson-Smith (2), in a gravity survey of the intrusion, record that the gravity gradient in this area is remarkably constant for about two miles on either side of the contact and conclude that this cannot be explained by a conventional, simple density contrast at the contact. They propose that a large volume of country rock has been assimilated, thus raising the ferromagnesian mineral content and so increasing the density of the outer part of the main granodiorite. This is well supported by the occurrence of xenoliths in the Criffell-Millour area and their decrease in number away from the contact. Additionally, Bott and Masson-Smith (2) present a model for the structure of the intrusion having " a batholithic shape probably reaching more than seven miles in depth and with contacts sloping outwards at a moderately steep angle."

In hand specimen the main granodiorite is grey coloured, coarse-grained and has a foliated, almost gneissose appearance. In thin section, oligoclase, hornblende, alkali feldspar, quartz and biotite make up the bulk of the rock. Accessory minerals include sphene and magnetite. The foliation is parallel to the elongate xenoliths and the contact but neither the hornfelses of the contact aureole nor the inner porphyritic granodiorite are affected (14). The foliation

is thought to be due to " the upward expansion of the already partly consolidated granodiorite pluton " (14, p. 228) and is expressed through the elongation and less common fracturing of the plagioclase and hornblende crystals. The quartz commonly shows undulose strain extinction, the formation of which is probably connected with the development of the shear foliation.

(b) *Dykes*

A total of over 40 dykes have been mapped. Many outcrops are seen in Airdie Gill and on the rocky slopes of Criffell and Millour. Here the contacts of the dykes with the country rocks are well exposed, enabling accurate orientations to be taken. In the fields of Airdrie and Torrorie Farms dykes may be mapped from lines of discontinuous unploughed bluffs standing a few feet

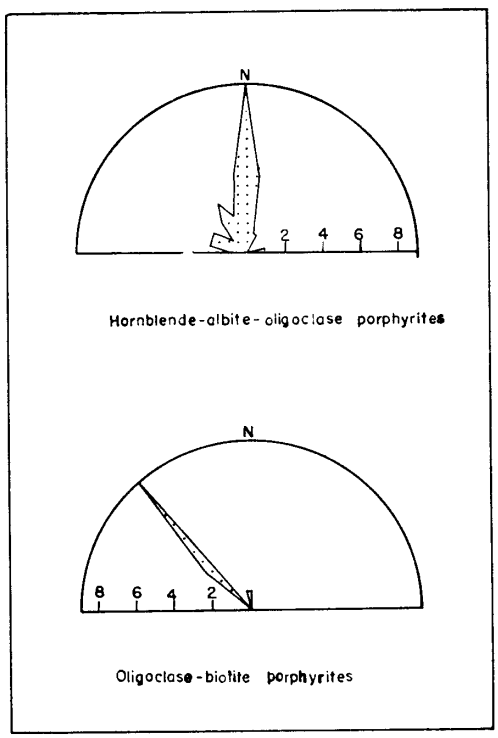

Figure 2.—Rose diagrams to show the trends of the two groups of dykes recognised within the area.

high. Here the type of dyke rock may be easily identified but contacts with the country rock are never exposed and consequently orientations are less accurate. The well exposed dykes have sharp contacts and show evidence of chilling at their margins. The dykes vary in thickness from 5-20 feet and are generally vertical or steeply dipping.

Two distinct groups of dykes belonging to the porphyrite-porphyry group of Phillips (15) may be recognised:

(i) Hornblende-albite-oligoclase porphyrites

These are restricted to the Wenlockian country rock and trend dominantly N-S (Figs 1, 2). They commonly have a characteristic pink colour, which in thin section and under plane polarised light is seen to be a property of the fine-grained matrix. The phenocrysts are not affected and the coloration is thought to be due to the dispersion of ferric oxides within the groundmass. Plagioclase and alkali feldspar, green hornblende, quartz and rare biotite make up the bulk of the rock. Plagioclase occurs as phenocrysts of oligoclase composition ($An_{25}/_{30}$) and is usually altered to a cloudy mass of sericite and kaolinite so that twinning is obscured. Compositional zoning is rare in the less altered phenocrysts. Albite is the other common feldspar phenocryst. Hornblende occurs as euhedral phenocrysts containing streaky inclusions of magnetite and other alteration products. Quartz occurs less commonly as sub-rounded phenocrysts, often showing strain extinction. The relative abundance of all these phenocrysts is highly variable when several slides from different dykes are examined. The groundmass is a fine-grained intergrowth of oligoclase, albite and quartz.

The dykes are cut by tiny (up to 2 mm. wide) shear or tension joints which may be filled with a mosaic of quartz crystals. Blyth (1) has described sheared porphyrite dykes of the same general age as these Criffell dykes from around Gatehouse-of-Fleet, some 25 miles to the WSW of Criffell. These show mineral foliation and late-stage shear joints. The Criffell porphyrites do not show foliated fabrics but the quartz-filled shear joints are similar to those described by Blyth and provide evidence for stresses operating in the country rock at a stage subsequent to dyke injection.

Two larger masses of this composition occur around Airdrie Cottage (NX 967587) and Drumbuie Hill (NX 954587), but contacts with the country rock are not exposed (Fig. 1).

(ii) Oligoclase-biotite porphyrites

These have a light grey colour and are restricted to within the main granodiorite outcrop where they trend dominantly NW-SE (Figs. 1, 2). They contain abundant phenocrysts of euhedral plagioclase of general composition $An_{20}/_{25}$ which often show pronounced oscillatory zoning. Much of the feldspar is clear and unaltered but some sericitisation and kaolinisation can always be seen. Less common microperthite phenocrysts are also present. Biotite and rounded, partly resorbed quartz crystals make up the remainder of the phenocrysts. The groundmass consists of an intergrowth of quartz, feldspar and biotite. The quartz and feldspar may form graphic intergrowths but characteristically quartz occurs as distinct "pools" of anhedral crystals and is much commoner than in the hornblende-albite-oligoclase porphyrites. These dykes are not affected by late-stage shear joints.

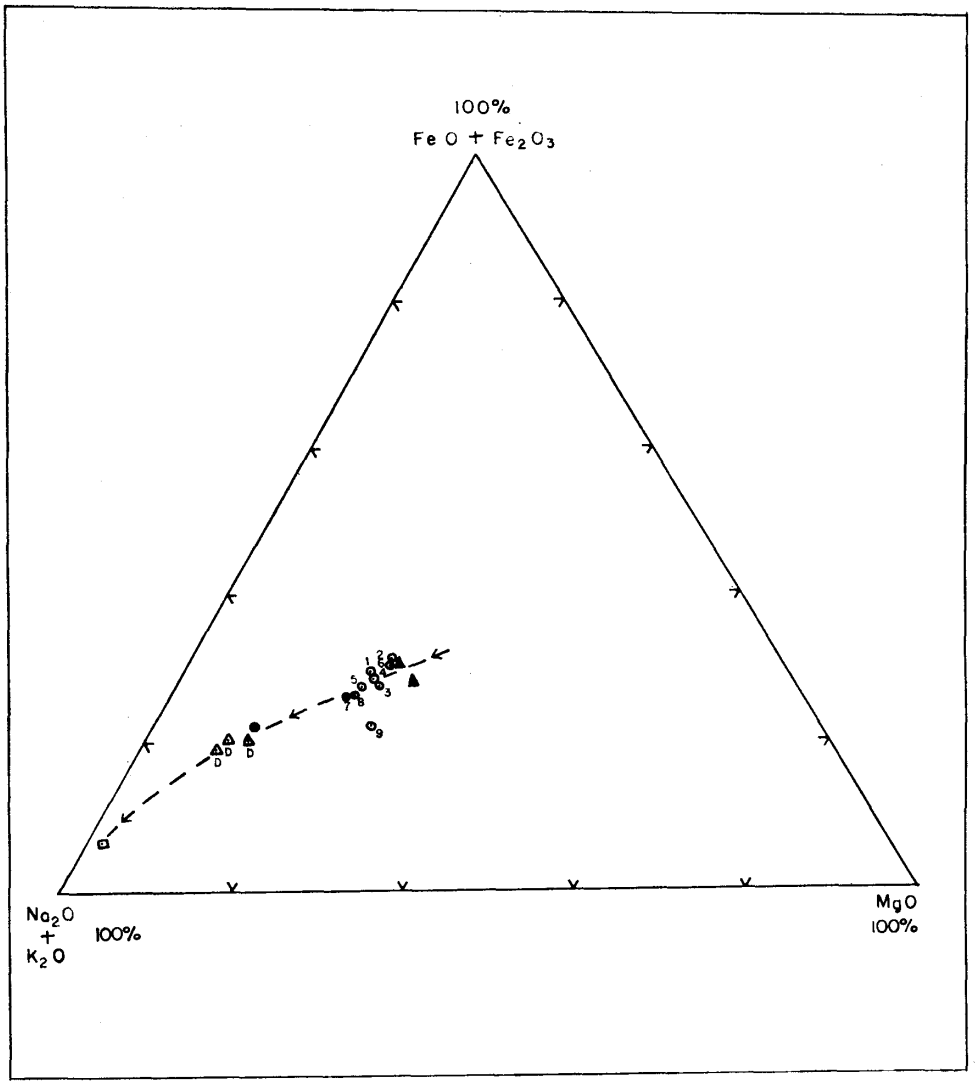

Figure 3.—AMF diagram (total alkalies-MgO-total iron) for the Criffell Granodiorite and associated dykes, illustrating the supposed path of differentiation (calc-alkaline trend). Open circles and triangles—new analyses of the main granodiorite and oligoclase-biotite dykes respectively; closed triangles—analyses of albitised porphyry dykes from King (8); closed circle and open square—analyses of GIII and an aplite vein respectively from Macgregor (10).

GEOCHEMISTRY

Nine specimens of granodiorite and three of oligoclase-biotite porphyrite dykes were collected in a traverse across the area. Unweathered samples, each weighing 2-3 lbs., were extracted from outcrops, care being taken not to sample

near xenolithic bodies or crosscutting veins. The samples were passed through a roll-jaw crusher and a quartered portion of the resulting fragments was reduced to a very fine powder in a tungsten-carbide disc mill. Each sample was pelletised and then analysed, using a Phillips PW 1210 X-ray fluorescence spectrometer in order to determine a full range of major elements and selected trace elements using accepted international standards.

From the analyses presented in Table 1, the main granodiorite is seen to have a range of compositions lying roughly between a typical granodiorite and the average tonalite of Daly (5). The oligoclase-biotite dykes have an adamellitic composition and show an increase in SiO_2, K_2O, Na_2O, Rb and Ba and a decrease in total Fe, MgO, CaO, TiO_2, P_2O_5 and Sr relative to the granodiorite. The position of each analysis on an AMF diagram is shown in Figure 3. They are seen to follow the differentiation trend established by Nockolds and Mitchell (12) for Caledonian calc-alkaline plutonic rocks. The position of the dykes towards the more differentiated part of this trend suggests that they were derived from a further differentiate of the magma which crystallised out initially to form the main granodiorite. This process led to the broad chemical changes outlined above. An analysis of an aplite vein from Macgregor (10) is also shown on the diagram and its position is consistent with an origin from the last available magma to have crystallised out in the intrusion. The similarity in position between the two analyses of albitised porphyrite dykes from King (8) and the main granodiorite and between the oligoclase-biotite dykes and the analysis of GIII from Macgregor (10) should be noted.

Rubidium is strongly enriched in the dykes and the K/Rb ratio falls from about 300 at the margin of the main granodiorite to about 195 in the dykes (Fig. 4). Strontium is strongly depleted in the dykes and the K/Sr ratio increases from 29 at the margin of the main granodiorite to about 90 in the dykes (Fig. 4). These systematic trends follow well established geochemical routes during progressive differentiation of a magma (6, 7) and provide further evidence for this process in the Criffell intrusion.

From the AFM diagram and the K/Rb ratios shown in Figures 3 and 4, there is some indication of systematic variation in composition within the main granodiorite itself. Thus samples 5, 7, 8 and 9 are generally distinct from samples 1, 2, 3 and 4 and lie further along the path of differentiation towards the dykes. Since samples 1-9 were collected progressively further from the contact, out to the margin of the area mapped, this is taken as evidence that the main granodiorite was itself changing in composition along the differentiation trends as crystallisation proceeded. Sample 6 shows anomalous chemistry relative to all observed trends, probably due to faulty samplying near an unsuspected xenolithic body. Unfortunately, the lack of statistical control and rigorous sampling methods prevent full acceptance and understanding of the differentiation processes operating within the main granodiorite but there seem to be two possibilities if the process is accepted to have occurred:

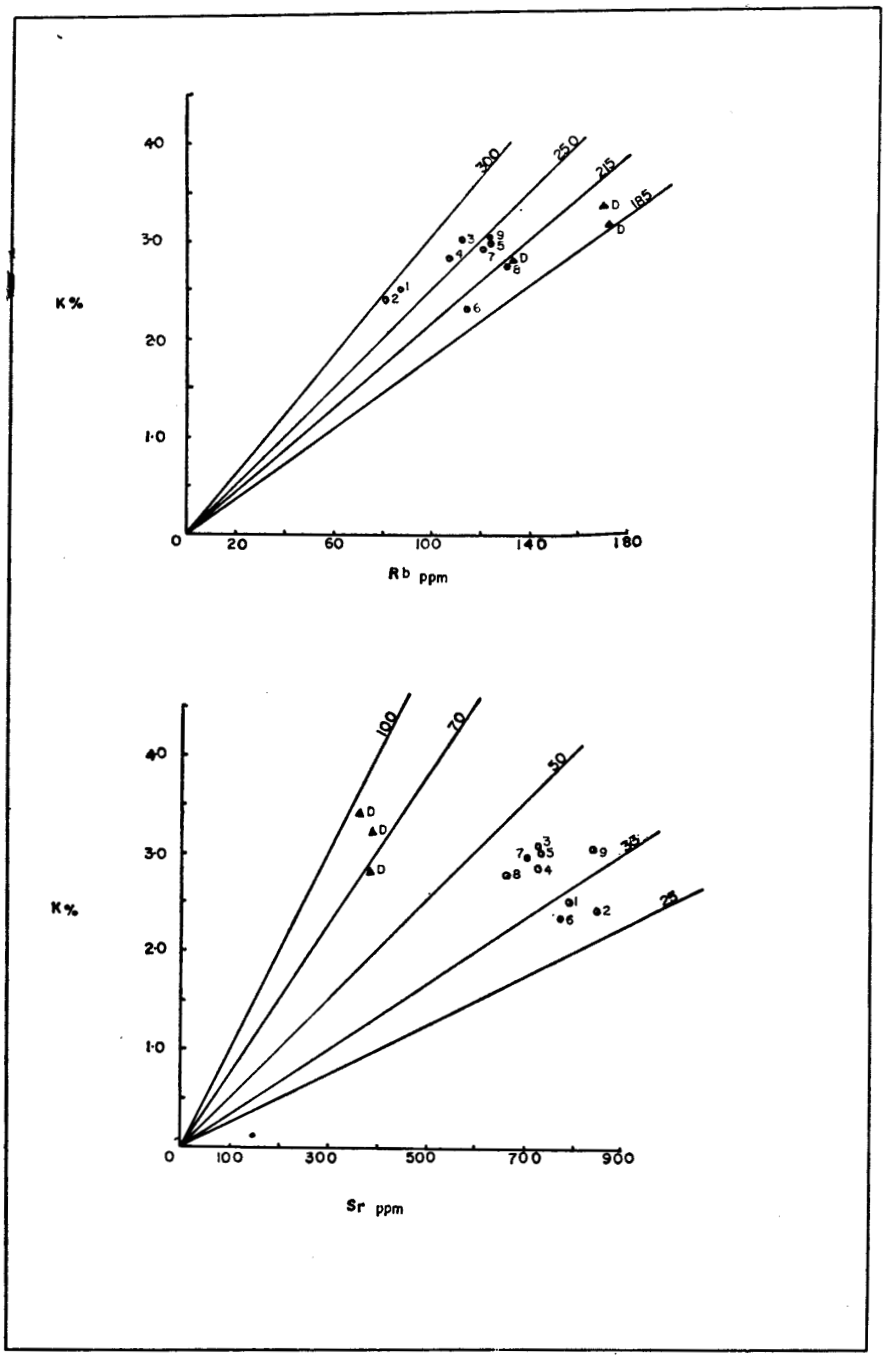

Figure 4.—K/Rb and K/Sr ratios for the main granodiorite (1-9) and oligoclase-biotite dykes (D), illustrating the changes of these ratios between the two members.

(*a*) Intrusion of the whole main granodiorite magma and subsequent differentiation in situ as crystallisation proceeded towards the centre of the intrusion.

(*b*) Successive intrusions of main granodiorite magma whose compositions differed only slightly. In an intrusion which appears internally homogenous such contrasts may be detected only by statistical analysis of geochemical results (7).

Origin of the Dyke Swarms

The hornblende-albite-oligoclase dykes were not analysed but they are similar in mineralogy to the albitised porphyry dykes described by King (8). Their occurrence in the Wenlockian country rock and the position of the analyses of the albitised porphyry dykes in the AMF diagram (Fig. 3) indicates that they were derived from the main granodiorite magma at an early stage in the evolution of the pluton. It is proposed that the compressive stresses of Caledonian orogeny were still in operation during the intrusion of these dykes, thus accounting for the shear joints described above. Of great interest is Weir's observation (16) that porphyrite dykes on the coast west of Gatehouse-of-Fleet, presumably related to the Cairnsmore-of-Fleet intrusion at depth, were intruded between f_1 and f_2 structures and again between f_2 and f_3 structures. This indicates the availability of magma during the various phases of the late Silurian/Early Devonian orogeny. The status of the Criffell and Cairnsmore-of-Fleet plutons as post-orogenic in the classical sense cannot thus be regarded as automatic in the light of this evidence.

The biotite-oligoclase dykes show petrographic similarities to the inner and later porphyritic granodiorite of Phillips (14) and chemical similarities to GIII of Macgregor (10, Fig. 3). It is proposed that all three phases have similar magmatic parents. The position of the dykes within the earlier, main granodiorite is consistent with this idea. At present it is difficult to say why these dykes do not penetrate the country rock in this area.

ACKNOWLEDGMENTS

I thank Professor G. M. Brown for the use of facilities in the Department of Geology, University of Durham, and Dr C. H. Emeleus and Dr G. A. L. Johnson for help and encouragement in many ways. Mr M. J. Russell gave initial suggestions to undertake the small geochemical study of the intrusion whilst Mr J. G. Fitton kindly undertook the analyses and gave advice on the uses and limitations of the data so obtained. Dr Emeleus and Mr Fitton kindly read the manuscript and give suggestions for its improvement in several ways.

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Typescript received Spring, 1970.

Table 1.—Major and trace element analyses of the Criffell Granodiorite and associated oligoclase-biotite porphyrite dykes.

Sample	1	2	3	4	5	6	7	8	9	Dyke	Dyke	Dyke
	%	%	%	%	%	%	%	%	%	%	%	%
SiO_2	62.79	61.98	63.17	63.83	63.73	62.10	64.50	65.01	64.90	69.79	69.48	70.04
Al_2O_3	16.88	16.62	16.44	16.19	16.12	16.60	16.37	16.45	16.29	16.20	16.15	16.13
Fe_2O_3	1.20	1.27	1.18	1.16	1.19	1.33	1.01	0.97	1.03	0.59	0.64	0.59
FeO	3.09	3.39	3.00	2.89	3.00	3.39	2.69	2.59	2.29	1.69	1.79	1.59
MgO	3.07	3.47	3.61	3.21	3.26	3.65	2.96	2.95	3.54	1.15	1.29	0.96
CaO	4.66	5.10	4.02	4.40	4.05	4.62	3.92	3.83	3.50	1.97	2.48	1.62
Na_2O	3.99	3.77	3.62	3.61	3.78	4.06	3.89	3.80	3.70	3.95	4.03	4.22
K_2O	3.03	2.95	3.68	3.44	3.62	2.83	3.57	3.34	3.69	3.89	3.39	4.09
TiO_2	0.84	0.94	0.81	0.79	0.84	0.92	0.70	0.68	0.65	0.46	0.47	0.44
P_2O_5	0.31	0.36	0.33	0.33	0.33	0.34	0.25	0.24	0.27	0.17	0.16	0.19
MnO	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.05	0.05	0.05
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Rb	87	81	112	107	124	114	121	131	123	172	132	170
Sr	790	844	727	726	732	772	705	660	834	394	388	260
Zr	196	236	209	184	223	205	170	163	197	218	223	223
Cu	21	25	18	15	20	60	29	14	38	15	16	12
Ba	1083	1140	1104	982	900	770	1005	1205	909	874	1205	842
Ni	37	39	41	37	41	43	35	41	45	19	17	15
Total %	100.14	100.13	100.15	100.13	100.10	100.12	100.13	100.13	100.13	99.91	99.93	99.92

THE MARINA FAUNA AND FLORA OF THE SOLWAY FIRTH AREA

(Part III)

By E. J. PERKINS

Department of Biology, University of Strathclyde

In general no attempt has been made to give a quantitative estimate of the abundance of the species recorded, although where this information is available and can be compared with that from other areas it is quoted. Where possible an assesment of abundance has been made based upon the criteria of present, common, abundant and very abundant. No attempt has been made to relate this to actual numbers present, but where cross checks have been possible the assessment has been remarkably consistent. No such assessment has been attempted with the flowering plants except in a few cases. In general, record of the dead valves of molluscs have been avoided because the Solway sediments contain many of a great age, e.g. oyster-shells, and most lamellibranch shells are subject to considerable reworking and transportation.

RECORDS BY OTHER AUTHORITIES

The lists of other authorities are, for completeness sake, included in this work. In many cases, these authorities have given assessments of abundance which, to avoid possible confusion, are not included, since their indices will rarely have a value equivalent to ours.

The following authorities are quoted and the corresponding initial is used in the text to indicate the author.

A. Birrell	AB
H. Barnes and M. Barnes	BB
W. Duckworth	WD
J. G. Gordon	JGG
P. J. Goodman, E. M. Braybrooks and J. M. Lambert	G, B and L
H. S. Gladstone	HSG
E. Hardy	EH
W. Hodgson	WH
A. D. McIntyre	ADM
J. R. Marshall	JRM
J. Mauchline	JM
M. N. Mistakidis	MNN
W. L. Morss	WLM
B. B. Rae	BBR
G. F. Scott Elliot	GFSE
R. Service	RS
J. A. Steers	JAS
D. Sutherland	DS

The date of the publication is included, and not the actual date of the record although it may be a considerable time earlier. The following is an example of use of the notation:—

CYCLOPTERUS LUMPUS L. 'Lump-sucker, Sea Hen, Hen Fish, Lump.'
W.D. 1886 — Inner Solway to the mouth of the Eden; R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Luce Bay and Wigtown Bay; A.B. 1930 — Cree estuary.
E.J.P. 1964 — taken in poke nets at Seafield (35206644); trawled at Stenor Scar and thrown up at Balcary Bay (25821493).

In general the invertebrate records are for a shorter time span. For conciseness the authorities have been grouped after the notes thus:—

EUPAGURUS BERNHARDUS (L.) 'Common hermit or soldier crab'
Widespread and often abundant throughout the Solway Firth area, including the Bay of Luce, downstream of Newbie. Often taken in association with **Hydractinia echinata** and **Nereis fucata** (A.D.M. 1955, E.J.P. 1964, 1970).

The work performed in the period 1961-1970 falls into two parts, viz., that carried out with the U.K.A.E.A. at Chapelcross Works from 1961-1964, and that carried out with the University of Strathclyde from late 1965 until the present. Records for these two periods are referred to as E.J.P. 1964, and E.J.P. 1970 respectively; although where records are for the latter period only no authority is given. In the period 1961-1964, i.e. E.J.P. 1964, the species recorded were found by the author, B. R. H. Williams and A. Hinde. In the period 1965-1970, i.e. E.J.P. 1970, the species recorded were found by the author K. Neilson, D. J. S. Robinson, J. R. S. Gilchrist, J. W. M. Logan.

NOMENCLATURE

Fauna — nomenclature is that of the Plymouth Marine Fauna (Marine Biological Association, 1957), except for bivalve molluscs which is that of 'British Bivalve Seashells' by N. Tebble (1966).

Algae, excluding diatoms — nomenclature is that of 'British Seaweeds' by C. I. Dickinson (1963).

Diatoms — nomenclature is that of Ingram Hendey (1954).

Flowering Plants — nomencdature is that of 'Flora of the British Isles' by Clapham, Tutin and Warburg (1962).

Wherever possible synonyms are given as an aid to those working with older works of identification.

All place names are spelled according to the Ordnance Survey Maps No. 75, Dumfries and Gretna; No. 76, Carlisle; No. 79, Stranraer; No. 80, Kirkcudbright; No. 81, Dalbeattie; and No. 82, Keswick; and the Admiralty Charts — No. 45, Clogher Head to Burrow Head; No. 1346, the Firth of Solway and No. 1826, Burrow Head to Liverpool.

Phylum PORIFERA
Class CALCAREA

SYCON CILIATUM (Fabricius)
[SYCON CORONATUM Ellis and Solander]

Abundant, on the lower shore, attached to the algae and stones at Maryport, Drummore, Bay of Luce (R200)

Class DEMOSPONGIARIA
Order TETRACTINOMORPHA
Sub-order ASTROSCLEROPHORA

CLIONA CELATA Grant 'Boring sponge'
Common and widespread occurrence throughout the Solway Firth and Luce Bay, attacks all calcareous materials including rock and mollusc shells especially old oyster valves, whelk and littorinid shells.

SUBERITES DOMUNCULA (Olivi) 'Sulphur sponge'
Encrusting the shells of **Eupagurus** sp. on Three Fathom Bank.

SUBERITES sp.
Encrusting the shells of **Eupagurus** sp. in the Bay of Luce (A.D.M. 1955).

Order CERATINOMORPHA
Sub-order HALICHONDRINA

HALICHONDRIA PANICEA (Pallas) 'Crumb of bread sponge'
Widely distributed in the Outer Solway and Bay of Luce, wherever a suitable substratum is available (E.J.P. 1964, 1970)

Phylum COELENTERATA
Class HYDROZOA
Order HYDROIDA
Sub-order ANTHOMEDUSAE

TUBULARIA INDIVISA L.
Recorded around St Bees Head.

TUBULARIA LARYNX Ellis and Solander 'Yellow flowerhead, oaten pipe hydroid'
On stony ground, in association with **Delesseria sanguinea,** in Moss Bay.

HYDRACTINA ECHINATA (Fleming)
Of widespread, and sometimes abundant, occurrence in the Outer Solway area, upon shells occupied by the hermit crab, **Eupagurus.** (E.J.P. 1964, 1970.)

Sub-order LEPTOMEDUSAE

OBELIA sp.
On stony ground in Moss Bay.

LAOMEDEA sp.
At 7 fm. depth off Whitehaven.

DYNAMENA PUMILA (L.) 'Sea-oak'

[SERTULARIA PUMILA]
On **Fucus** in the Outer Solway and the Bay of Luce, where it may be abundant. (E.J.P. 1964, 1970.)

SERTULARELLA POLYZONIAS (L.)
Inhabits stony grounds in the Outer Solway.

ABIETINARIA ABIETINA (L.) 'Sea-fir'
Of widespread distribution in the Outer Solway, wherever a stony or shell

substratum provides a suitable habitat. (E.J.P. 1964, 1970.)

HYDRALLMANIA FALCATA (L.) 'Coral moss, sickle coralline'
On sandy bottoms with shell and stones off Whitehaven.

SERTULARIA sp.
Recorded from the Bay of Luce (A.D.M. 1955.)

NEMERTESIA ANTENNINA (L.)
[ANTENNULARIA ANTENNINA]
On stony ground in Moss Bay.

Class SCYPHOMEDUSAE
Order SEMAEOSTOMAE

CHRYSAORA HYSOSCELLA (L.) 'Compass jelly-fish'
[C.ISOSCELES]
Of widespread occurrence in the Outer Solway during the summer months. (E.J.P. 1964, 1970.)

CYANEA CAPILLATA (L.) 'Yellow sea-blubber, Lion's Mane'
Of widespread occurrence in the Outer Solway during the summer months; occasionally recorded as late as September. (E.J.P. 1964, 1970.)

AURELIA AURITA (L.) 'Common jelly-fish'
The most widely distributed of these large jellyfish during the early summer months. In some years it may extend upstream to the north-east of Silloth. (E.J.P. 1964, 1970.)

Order RHIZOSTOMAE

RHIZOSTOMA OCTOPUS (L.)
Of widespread and abundant occurrence in the Outer Solway during September and October, some penetration of the Inner Solway may occur towards the end of the period. (E.J.P. 1964, 1970.)

Class ANTHOZOA
Sub-class OCTOCORALLIA (ALCYONARIA)
Order ALCYONACEA

ALCYONIUM DIGITATUM (L.) 'Dead Man's Fingers, Dead Man's Hand; Alcyonarian or Soft coral'
Widely distributed in the Outer Solway on the firmer substrata; the white form predominates, but the orange form is found occasionally. (E.J.P. 1964, 1970.)

Sub-class HEXACORALLIA
Order ACTINARIA

ACTINIA EQUINA L. 'Beadlet anemone'
Occurs, throughout the Solway Firth from the Bay of Luce to Powfoot (R75), in rock pools and pools in scar grounds. Red, brown, green and blue-green varieties occur either together or in clones of a single colour. (E.J.P. 1964, 1970.)

ANEMONIA SULCATA (Pennant) 'Snakelocks anemone'
Occurs abundantly attached to rocks in the Bay of Luce.

TEALIA FELINA (L.) 'Dahlia anemone'

Of widespread, but not common occurrence, among sand and shell in rock pools and on offshore bottoms; furthest penetration upstream recorded from a sea bed sample taken at Newbie. (E.J.P. 1964, 1970.)

METRIDIUM SENILE (L.) 'Plumose anemone'

Large grey and yellow forms attached to oyster valves are taken commonly on Workington Bank, Three Fathom Bank, and on the grounds between these banks and St Bees Head. (E.J.P. 1964, 1970.)

SAGARTIA TROGLODYTES (Price)

Recorded from Moss Bay (R111) and north of Workington Harbour (R115).

Phylum CTENOPHORA
Class TENTACULATA

PLEUROBRACHIA PILEUS (O. F. Müller) 'Sea-gooseberry.'

Widespread and abundant occurrence throughout the whole Solway Firth area from autumn to early summer. (E. J. P. 1964, 1970).

Phylum ANNELIDA
Class POLYCHAETA

APHRODITE ACULEATA L. 'Sea mouse'

Widespread but not abundant occurrence in sand and mud in the Outer Solway, including Wigtown Bay and the Bay of Luce (A.D.M. 1955, E.J.P. 1964, 1970).

LEPIDONOTUS SQUAMATUS (L.) 'Scale worm.'

Widespread distribution, in small numbers, in the Outer Solway. (E.J.P. 1964, 1970.)

PHYLLODOCE MACULATA (L.)

Its green jelly egg-cocoons are commonly found attached to stones in April and May. Its known distribution extends on the north shore, from Wigtown Bay east to Borron Point and on the south shore from Moss Bay to Beckfoot (E.J.P. 1964, 1970).

ETEONE LONGA (Fabricius)

This species is known to penetrate as far upstream as a line drawn from Howgarth (R74) on the north shore to Cardurnock (R93), on the south shore. (E.J.P. 1964, 1970.)

Holme (1949) recorded it intertidally, between H.W.M.N.T. to L.W.M.N.T., in sand and mud, at the mouth of the Exe estuary where a maximum number of 72/sq.m. were observed; the average was significantly less than this. Smidt (1951) recorded 100/sq.m. in the Danish Waddensea. Stopford (1951), who worked on the Cheshire foreshore of the Dee estuary, stated that **Eteone longa** and **Pygospio elegans** were the most abundant polychaetes in the estuary and could occur in numbers exceeding 2000/sq.m.

In the Solway Firth, the maximum number recorded was 192/sq.m. at Powbank. As in the Exe estuary, this species was widely distributed across the shore.

NEREIS DIVERSICOLOR (O. F. Müller)
Recorded from the Outer Solway. (E.J.P. 1964, 1970.)
NEREIS FUCATA (Savigny)
Associated with **Eupagurus berhardus** taken from the mouth of the Lochar and especially off the Cumberland coast between Workington and St Bees Head. (E.J.P. 1964, 1970.)
PLATYNEREIS DUMERILI (Audouin and Milne Edwards)
Recorded from Cross Canonby (R62) and Allonby South (R63).
NEPHTYS spp. (including **N.caeca** O. F. Müller and **N. hombergi** (Lam.)
Widespread and common occurrence throughout the Firth downstream of the Solway viaduct. (E.J.P. 1964, 1970).
SCOLOPLOS ARMIGER (O. F. Müller)
Recorded from Wigtown Bay, Kirkcudbright Bay, Auchencairn Bay, the Rough Firth, Beckfoot and Allonby Bay and ranged in abundance from present to abundant. Its egg cocoons were found commonly on the shore from March to May. (E.J.P. 1964, 1970).
PYGOSPIO ELEGANS (Claparède)
It has been found in various grades of soils from a number of estuaries, viz. Allen and Todd (1900) — Salcombe; Percival (1929) — River Lynher; Bassindale (1938)—upper Mersey estuary; Beanland (1940)—Dovey estuary. Holme (1949) recorded a maximum of 1280/sq.m. at the mouth of the Exe estuary. Stopford (1951) recorded a maximum number in excess of 2000/sq.m. Smidt (1951) stated that they were very common in the Danish Waddensea. In the Solway Firth, no numbers recorded, the impression gained was that despite a widespread distribution it was nowhere abundant, although as Holme (1949) warned, this species can readily escape notice due to its small size (E.J.P. 1964, 1970).
POLYDORA sp.
Recorded from Wigtown Bay and Luce Bay.
STYLARIOIDES PLUMOSA (O. F. Müller)
Recorded from Allonby Bay (E.J.P. 1964)
ARENICOLA MARINA (L). 'Lug worm'
Widespread and abundant throughout the Solway Firth downstream of a line drawn from Torduff Point (R82) to Port Carlisle (R90) (E.J.P. 1964, 1970)
This species forms a characteristic belt on a shore which Schulz (1937) called the **Arenicola-watt.** Typically it reaches its greatest density below mid-tide level in clean, poorly-drained sand with marked thixotropic properties. The importance of the thixotropic nature of such soil to the burrowing of **Arenicola marina** was stressed by Chapman (1949) and Chapman and Newell (1947).
Distribution of **Arenicola** in the Solway Firth conformed closely to these conditions; although a maximum density was reached in the zone noted, a wide, but scattered distribution across the shore was often observed. This species reached a limit to its distribution upstream in the Solway at Bowness; there was no evidence of its occurrence in the island banks.

OWENIA FUSIFORMIS Delle Chiaje and **LANICE CONCHILEGA** (Pallas)
It is convenient to consider these two species together since at certain situations along the Scottish shore, and particularly to the west of Southerness they fit the same part of the zonation pattern as that occupied by **Branchiomma vesiculosum** in the Wash (Kindle 1930), viz. at the bottom of the shore near the channel. (E.J.P. 1964, 1970.)
Owenia fusiformis fulfilled this role only in the area between Port o'Warren (Port Ling) (R55) and Balcary Bay (R32). At Port o'Warren it reached a maximum density of 96/sq.m.
Lanice conchilega
It was shown by Spooner and Moore (1940) that this species occurred near low water in the gravelly edges of muddy banks in the lower estuary of the Tamar. On the Scottish shore, of the Solway Firth, it was widely distributed between Maryport, Bay of Luce and Powfoot (R75). On the English shore it was distributed between Saltom Bay and Dubmill Point.
Its distribution was normally in the more coarse sediments at L.W.M., but at Ardwall Island (R16) and Balcary Bay (R32), an intense, but circumscribed colonisation was found in coarse sand near the mid-tide level. In the Inner Solway, stunted forms only were found.
The general distribution of **Lanice conchilega** and **Owenia fusiformis** agrees with that in the Mersey estuary (Bassindale, 1938).

SABELLARIA ALVEOLATA (L.)
This reef-forming polychaete had a widespread distribution in the Solway Firth. The furthermost point of its colonisation upstream was Southerness Point (R65) where stunted forms only were found. However, in former times this species had colonised a large area of channel here, but the continued processes of sedimentation have overwhelmed it, and to a very large extent dead reef only remains. Generally it occurs near L.W.M. or in the sublittoral, but at Port o'Warren (R55) it was found in coarse sand among the rocks and caves at mid-tide level. It was probably most abundant on the English side off Maryport where it formed a hard, uneven bottom; it seems possible that, on this shore, it fulfils the role played in the zonation pattern by **Owenia fusiformis** and **Lanice conchilega** on the Scottish shore; an expression perhaps of the significantly smaller silt content of the soils on the English shore. It is known locally as "Ross". (E.J.P. 1964, 1970.)

PECTINARIA sp.
Widespread, but never abundant, below L.W.M. in the Outer Solway area. (E.J.P. 1964, 1970.)
SABELLA PAVONINA Savigny 'Peacock worm'
[S. PENICILLUS (L.)]
Recorded from Moss Bay.
POMATOCEROS TRIQUETER (L.)
Widespread, but rarely abundant, both on the shore and below the L.W.M.

wherever suitable substrata are available in the Outer Solway and Luce Bay. (E.J.P. 1964, 1970.)

HYDROIDES NORVEGICA (Gunnerus)
Widespread, but not common, in the Outer Solway.

SPIRORBIS BOREALIS Daudin.
Recorded from Wigtown Bay and Luce Bay. (E.J.P. 1964, 1970.)

Phylum SIPUNCULOIDEA

[**GOLFINGIA ELONGATA**] (Keferstein).
[**PHASCOLOSOMA ELONGATA**]
Recorded from below L.W.M. at Newbie (E.J.P. 1964.)

PHASCOLION STROMBI (Montagu)
Common to abundant in the vacated shells of **Turritella,** in the area south from Workington Bank to St. Bees Head.

Phylum ARTHROPODA
Sub-Phylum CRUSTACEA
Class COPEPODA
Order EUCOPEPODA
Sub-Order HARPACTICOIDA

TIGRIOPUS FULVUS (Fischer)
In rock pools, at E.H.W.M.S.T. at Rockcliffe (R52).

Sub-Order CYCLOPOIDA

NICOTHOE ASTACI Audouin and Milne Edwards.
On the gills of a female lobster taken in Wigtown Bay.

Sub-Order CALIGOIDA

CALIGUS sp.
Widespread and abundant in the Inner Solway, and from the waters off the coast from Southerness (R65) to Balcary Point (R32) in the summer of 1962. (E.J.P. 1964.)

Sub-Order LERNAEOIDA

LERNAEENICUS SPRATTAE (Sowerby)
Attached to the eye of **Clupea harengus** taken at the foot of the Nith. (E.J.P. 1964.)

Class CIRRIPEDIA
Order THORACICA

LEPAS sp.
On drift wood thrown up on the Mersehead Sands (R59). (E.J.P. 1964.)

CHTHAMALUS STELLATUS (Poli)
Distribution widespread, from common to abundant in the Outer Solway area including Wigtown Bay and Luce Bay (E.J.P. 1964, 1970.)

BALANUS CRENATUS Brugière.
Widespread throughout Solway area, downstream of Old Gretna (R85). (E.J.P. 1964, 1970.)

BALANUS BALANOIDES (L.)
Widespread and abundant throughout the Solway Firth, wherever suitable substrata are available for settlement: its upstream limit is about Port Carlisle (R90). (E.J.P. 1964, 1970.)
ELMINIUS MODESTUS Darwin.
Widespread and abundant throughout the Solway area, downstream of Westfield (R89) (see also Perkins, Williams and Hinde, 1961). (E.J.P. 1964, 1970.)

Order RHIZOCEPHALA

SACCULINA CARCINI Thompson.
Parasitic upon **Carcinus maenas** and **Portunus depurator** taken off Hestan Island and upon **Carcinus maenas** in Brighouse Bay (R17) and Saltom Bay, near Whitehaven. (E.J.P. 1964, 1970.)

Class MALACOSTRACA
Sub-Class PERACARDIDA
Order CUMACEA

DIASTYLIS RATHKEI (Krœyer)
Recorded off the western edge of the Barnhourie Sand. (E.J.P. 1964).

Order ISOPODA
Sub-Order FLABELLIFERA

EURYDICE PULCHRA Leach
Widespread in well drained sandy shores of the Outer Solway and Luce Bay; it penetrates the Inner Solway to Beckfoot. Maximum abundance recorded 224/sq.m. (E.J.P. 1970.)

Sub-Order VALVIFERA

IDOTEA BALTICA (Pallas)
Taken from the Powfoot Channel between Barnhourie Sand and Dumroof Bank, and off Hestan Island. (E.J.P. 1964.)
IDOTEA LINEARIS (L.)
Recorded from the Scotch Deep and Workington Bank. (E.J.P. 1964, 1970.)

Sub-Order ONISCOIDEA

LIGIA OCEANICA (L)
Records are available for the north shore only. Here it is known to be common to abundant in suitable situations from Ravenshall Point (R9) to Cottage, Auchencairn Bay (R33). (E.J.P. 1964, 1970).

Order AMPHIPODA
Sub-Order GAMMARIDEA

AMPELISCA TYPICA (Bate)
Recorded from Allonby Bay in 1960 (MNM 1960).
BATHYPOREIA spp.
Caspers (1958) showed the importance of salinity in the distribution of the species of this genus.
In the Solway Firth, the **Bathyporeia** spp. characteristically occupied the less silty soils of the middle banks, channels and lower shore (E.J.P. 1964, 1970).

HAUSTORIUS ARENARIUS (Slabber)
Widespread, but nowhere abundant, distribution in the better drained sandy sediments.
Holme (1949) stated that this species was apparently nowhere abundant. He recorded five specimens only from the mouth of the Exe estuary. Watkin (1942) recorded 21/sq. ft. near H.W.M.N.T. in Kames Bay. Perkins (1956) found this species in well-drained, damp, but not dry sand, at half tide level, in the mouth of the Dee estuary; its maximum density was 160/sq.m.
In the Solway Firth it was found in situations like those described by Perkins (1956) in the Dee. The maximum density recorded was 48/sq.m. at Powbank. It is of interest to note that at each of these situations the silt content of the soil fell within the range 3-5%. The level occupied on the shore ranged from H.W.M. to L.W.M. depending upon the degree of drainage of the soil. (E.J.P. 1964, 1970).
NOTOTROPIS FALCATUS (Metzger)
Recorded in the Outer Solway, to the west of the major banks. (E.J.P. 1964.)
GAMMARELLUS sp.
Recorded from below L.W.M. in Allonby Bay. (E.J.P. 1964.)
MELITA PALMATA (Montagu)
Recorded from below L.W.M. in Allonby Bay. (E.J.P. 1964.)
GAMMARUS LOCUSTA (L.)
Recorded from the Outer and Inner Solway, from seawards of the main banks, upstream to Newbie.
GAMMARUS sp.
Recorded from the Outer Solway and Dee estuary.
JASSA PUSILLA (G.O.Sars)
Recorded from Luce Bay. (A.D.M. 1955.)
COROPHIUM VOLUTATOR (Pallas)
Of widespread and often abundant distribution in the more silty areas of the Solway Firth area. In the British Isles generally it is of widespread and often abundant occurrence in silty areas near H.W.M.N.T. where it was recorded by Elmhirst (1932), Beanland (1940) and Watkin (1941). It was reported to be unexpectedly patchy in the Tamar by Spooner and Moore (1940) who recorded 11,000/sq.m. at one station on West Muds, but relatively few elsewhere. Rees (1940) recorded 2400/sq.m. at one station near L.W.M. in the Severn estuary. Stopford (1951) who worked in the Dee estuary, stated that while this amphipod was not as widespread as **Macoma** and **Hydrobia,** it was probably the most numerous species in the estuary. It was rare or absent in fine sand, but existed in thousands (to a maximum of 28,000/sq.m.) across the wide expanse of mud and muddy sand below H.W.M.N.T. She considered that silt content was an important factor in its distribution. In the Danish Waddensea, Smidt (1951) recorded mean figures of 1300 and 2170/sq.m. in June, 1946, and July, 1947, respectively; a maximum recorded was 27,800/sq.m.

The importance of silt in the distribution of this species was confirmed

in the Solway Firth where it was widely distributed at the head of the shore in silty areas near H.W.M.N.T. in the Inner Solway, and the tributary estuaries of the Outer Solway. Normally colonisation by this species occurred below the erosion edge (at H.W.M.N.T.) or the accretion edge, but some colonisation of the marsh occurred, particularly of pans, notably in the Urr and at Skinburness. It was not recorded from the island banks. Generally speaking, this species showed the furthest penetration upstream of any invertebrate both in the Solway Firth itself and its tributary estuaries. A maximum density of 7536/sq.m. was recorded at Bowness (R91); elsewhere in the Inner Solway smaller numbers were recorded. Although no quantitative data is available, visual comparison would suggest populations significantly in excess of 7536/sq.m. occurred in the Rough Firth/Auchencairn Bay complex. (E.J.P. 1964, 1970).

Sub-Order HYPERIIDEA

HYPERIA GALBA (Montagu)
Commonly occurring in association with **Rhizostoma octopus**. (E.J.P. 1964, 1970).

Order SCHIZOPODA (= MYSIDACEA)

GASTROSACCUS SPINIFER (Goës)
Of widespread and sometimes abundant distribution downstream of a line drawn from Caerlaverock to Silloth. (E.J.P. 1964).

SCHISTOMYSIS sp.
Recorded from Allonby Bay and off Borron Point. (E.J.P. 1964).

NEOMYSIS INTEGER (Leach)
Widespread and very abundant in the Inner Solway downstream from Torduff Point to Port Carlisle. (E.J.P. 1964).

Order DECAPODA
Sub-Order NATANTIA
Tribe CARIDEA

PANDALUS MONTAGUI Leach ' Aesop prawn '
Taken on sand and shingle grounds in the Outer Solway. (E.J.P. 1970).

HIPPOLYTE VARIANS (Leach) ' Chameleon prawn "
Recorded from the main channel, to the east of Robin Rigg (E.J.P. 1964).

PALAEMON SERRATUS (Pennant) ' Common prawn '
Recorded off Hestan Island and Port Ling, and from the channel between Barnhourie Sand and Dumroof Bank. (E.J.P. 1964).

PALAEMON ELEGANS Rathke ' Glass prawn.'
Recorded from the edge of the main channel in Allonby Bay; from Wigtown Bay and Luce Bay. (E.J.P. 1964.)

PALAEOMONETES VARIANS (Leach)
In the brackish water of pools and pans in the salt marshes at Carsencarrie (R6), Southwick Merse (R58) and at Biglands (R92) — abundance variable. (E.J.P. 1964, 1970.)

CRANGON VULGARIS Fabricius 'Shrimp.'
[CRANGON CRANGON]
Widespread, very abundant and the object of a major fishery. The distribution of this species is affected by seasonal movements. Like the plaice and other fish, its locus of distribution has undergone a marked shift downstream as a result of continued sedimentation in the Inner Solway area. (A.D.M. 1955. E.J.P. 1964, 1970.)
PHILOCHERAS SCULPTUS (Bell)
Recorded from Luce Bay (A.D.M. 1955.)

Sub-Order REPTANTIA
Tribe ASTACURA

HOMARUS VULGARIS Milne-Edwards 'Lobster.'
Taken on rocky grounds as far upstream as Hestan Island on the Scottish shore, and Siddick on the English shore. On the latter, it was taken in Saltom Bay formerly, but is no longer taken there. In general, it is fished by potting, but at Workington the archaic method of hoop fishing is still used.

Tribe ANOMURA

GALATHEA sp. 'Squat-lobster.'
Taken south of the Burrow Head.
PORCELLANA PLATYCHELES (Pennant) 'Hairy or broad-clawed porcelain crab.'
Occasional specimens recorded from Abbey Burnfoot (R30) and Luce Bay.
PORCELLANA LONGICORNIS (L.) 'Minute or long-clawed porcelain crab.'
Off the Cumberland coast, recorded downstream from Allonby Bay to St Bees Head, occurrence sporadic but may be very abundant on occasion. Off the Scottish coast, occasional specimens have been recorded off Hestan Island and from Luce Bay (A.D.M. 1955, M.N.M. 1960, E.J.P. 1964, 1970.)

Tribe PAGURIDEA

EUPAGURUS BERNHARDUS (L.) 'Common hermit or soldier crab.'
Widespread, and often abundant, throughout the Solway Firth area, including Luce Bay, downstream of Newbie. Often taken in association with **Hydractinia echinata** and **Nereis fucata.** (A.D.M. 1955, E.J.P. 1964, 1970.)
EUPAGURUS PRIDEAUXI (Leach)
Recorded from Luce Bay. (A.D.M. 1955.)
ANAPAGURUS HYNDMANNI (Thompson)
Recorded from Wigtown Bay. (A.D.M. 1955.)

Tribe BRACHYURA

CORYSTES CASSIVELAUNUS (Pennant) 'Masked crab'
Widespread throughout the Outer Solway area and Luce Bay; upstream limit at Beckfoot (R103) recorded 13.4.66. (A.D.M. 1955, E.J.P. 1964, 1970.)
CANCER PAGURUS L. 'Edible crab.'
Occurs on fishing grounds associated with the lobster on all rocky shores downstream of Hestan Island to the Mull of Galloway on the Scottish shore; here

too it has been found upstream as far as Newbie Mains. On the English shore, it is fished for and taken from Siddick to St Bees Head ; it is taken occasionally on Workington and Three Fathom Banks. (A.D.M. 1955, E.J.P. 1964, 1970.)

PORTUNUS PUBER (L.) 'Fiddler or velvet crab.'

Taken from Wigtown Bay, the Bay of Luce—under the Mull of Galloway—and from off St. Bees Head. Occurrence in lobster pots, frequent. (A.D.M. 1955, E.J.P. 1970.)

PORTUNUS HOLSATUS Fabricius 'Blue swimming crab.'

Widespread and common in the Outer Solway Firth. (A.D.M. 1955, E.J.P. 1964, 1970.)

PORTUNUS DEPURATOR (L.) 'Cleanser or wrinkled swimming crab.'

Widespread distribution in the Outer Solway area, including the Bay of Luce. (A.D.M. 1955, E.J.P. 1964, 1970.)

CARCINUS MAENAS (L.) 'Shore crab or green shore crab.'

Widespread and abundant throughout the Solway Firth area. (E.J.P. 1964, 1970.)

GONEPLAX ANGULATA (Pennant)

[GONOPLAX RHOMBOIDES]

Taken on muddy sand off St Bees Head and Saltom Bay (E.J.P. 1970)

PINNOTHERES PISUM (Pennant) 'Pea crab"

In mussels taken at Hestan Island, Craig Roan and Balcary Point (E.J.P. 1964.)

HYAS COARCTATUS Leach 'Spider crab'

Recorded from the Bay of Luce. (A.D.M. 1955.)

HYAS ARANEUS (L.) 'Spider crab'

Widespread and common in the Outer Solway Firth and the Bay of Luce. (A.D.M. 1955, E.J.P. 1964, 1970.)

INACHUS DORSETTENSIS

Recorded from Workington Bank.

INACHUS DORYNCHUS

Recorded from Workington Bank and Moss Bay.

MACROPODIA ROSTRATA (L.) 'Long-legged spider crab.'

Widespread occurrence in the Outer Solway Firth and the Bay of Luce. (A.D.M. 1955, E.J.P. 1964, 1970.)

Sub-Phylum INSECTA
Class APTERYGOTA
Order COLLEMBOLA

ANURIDA MARITIMA Laboulbène

[LIPURA MARITIMA]

Recorded from Brighouse Bay (R17) and Abbey Burnfoot (R30). (E.J.P. 1964, 1970.)

Phylum MOLLUSCA
Class GASTROPODA
Sub-Class PROSOBRANCHIA
Order ARCHAEOGASTROPODA

PATELLA VULGATA L. 'Common limpet.'
Of widespread distribution on rocky shores downstream of Port o' Warren (R55) on the north shore and Allonby (R62) on the south shore. Abundance very variable.
PATINA PELLUCIDA (L.) 'Blue-rayed limpet.'
[**HELCION PELLUCIDUM** L.]
Recorded from the Bay of Luce. (A.D.M. 1955, E.J.P. 1970.)
ACMAEA TESSULATA Müll. 'Tortoiseshell limpet.'
[**ACMAEA TESTUDINALIS** Müll., **COLLOSELLA TESSULATA** (Müll).]
Recorded from Maryport, Drummore, the Bay of Luce. (R200). (E.J.P. 1970.)
ACMAEA VIRGINEA (Müll.) 'White tortoiseshell limpet.'
[**TECTURA VIRGINEA** (Müll.)]
Recorded from Philip and Mary, the Bay of Luce (R204), and Siddick (R111).
CALLIOSTOMA ZIZYPHINUM (L.) 'Common or painted Top-shell.'
[**TROCHUS ZIZYPHINUS** L., **CALLIOSTOMA ZIZYPHINUM CONULOIDE** (Lamck)]
Dredged from below the L.W.M. in Moss Bay where it occurs commonly in association with **Flustra foliacea** and **Delesseria sanguinea.** Empty shells which are thrown up at Cross Canonby from time to time probably originate from this source. Recorded also from Luce Bay. (A.D.M. 1955, E.J.P. 1964, 1970.)
GIBBULA MAGUS L.
[**TROCHUS MAGUS** L.]
Abundant on the lower shore at Maryport, Drummore, Luce Bay, (R200).
GIBBULA CINERARIA (L.) 'Grey Top-shell.'
[**TROCHUS CINERARIUS** L.]
Recorded from the middle and lower shore at Abbey Burnfoot (R30) and Maryport, Drummore, Luce Bay (R200), where it was abundant. (E.J.P. 1964, 1970.)
GIBBULA UMBILICALIS (da Costa) 'Flat or purple top-shell.'
[**TROCHUS UMBILICATUS** Mont]
Recorded from the middle shore levels at Abbey Burnfoot, Brighouse Bay, Isle of Whithorn and Luce Bay, in variable abundance (A.D.M. 1955, E.J.P. 1964, 1970.)

Order MESOGASTROPODA

LITTORINA LITTORALIS (L.) 'Flat periwinkle.'
[**LITTORINA OBTUSATA** (L.) **NERITOIDES LITTORALIS** (L.)]
Widespread, but never abundant distribution, on brown seaweed downstream of Southerness Point (R65) and including Luce Bay on the Scottish shore. It has not been recorded from the Cumberland coast of the Solway (E.J.P. 1964, 1970.)
LITTORINA LITTOREA (L.) 'Common or edible periwinkle.'
Widespread and often abundant at middle and lower levels on all suitable shores downstream of Port Carlisle and including Luce Bay. Although abundant, this mollusc rarely occurs in amounts upon which a commercial fishery could be based. (E.J.P. 1964, 1970.)

LITTORINA SAXATILIS (Olivi) 'Rough periwinkle.'
[LITTORINA RUDIS Maton, **LITTORIVAGA SAXATILIS** (Olivi)]
Widespread and often abundant at high levels on all suitable shores downstream of Westfield (R89) and including Luce Bay. (E.J.P. 1964, 1970.)
LITTORINA NERITOIDES L. 'Small periwinkle.'
A frequent, and often abundant resident of the splash zone from Siddick to St Bees on the Cumberland coast.
HYDROBIA ULVAE (Pennant)
[SUBANAEA ULVAE (Pennant)]
A characteristic inhabitant of estuaries. Spooner and Moore (1940) and Holme (1949) considered that it reached a maximum of abundance in beds of **Zostera.** However, as Nicol (1935) and Spooner and Moore (1940), themselves, showed intense colonisation of salt marshes by this species frequently occurs. As these authors and others have shown **Hydrobia ulvae** is concentrated in the upper shore on muddy sand or mud.
Wilson (1963) stated that it was common on the inshore mud flats of the Solway, where densities of up to 15,000/sq.m. occurred.
In the current work, a density of 11,000/sq.m. was recorded at Howgarth, but population densities on the fringe banks of the Solway Firth were generally very much less than those quoted from a wide variety of sources by Spooner and Moore (1940), and by Rees (1940), Holme (1949), but comparable with the Dee at Heswall, Stopford (1951). None were recorded from the island banks in the Solway, and unfortunately no quantitative estimates were made in the Rough Firth/Auchencairn Bay area where this species was clearly abundant. Here, too, marked colonisation of the marshes occurred. (E.J.P. 1964, 1970.)

TURRITELLA COMMUNIS Risso 'Tower shell.'
Although this species may be abundant in muddy sand off the Irish Sea coast of Cumberland (Jones, 1952), and dead shells may be abundant or very abundant in the Outer Solway area, no living animals have been taken so far. (E.J.P. 1964, 1970.)

APORRHAIS PES-PELICANI (L.) 'Pelican's Foot shell.'
This inhabitant of sublittoral, muddy gravel has been recorded from Luce Bay (A.D.M. 1955). Dead shells occur abundantly at Ravenshall Point (R9), Auchenlarie, Wigtown Bay, and off St Bees Head, but the living population has not so far been located. (E.J.P. 1964, 1970.)

NATICA CATENA da Costa. 'Large necklace shell.'
[LUNATIA CATENA]
Widespread distribution in small numbers, on sandy bottoms below the L.W.M., in the Outer Solway area. (E.J.P. 1964, 1970.)

NATICA ALDERI (Forbes) 'Common necklace shell.'
[POLYNICES ALDERI]

Like **N.Catena** this species is sparsely, but widely distributed on sandy bottoms, below the L.W.M., in the Outer-Solway area.

TRIVIA MONACHA da Costa. 'European cowrie'

[CYPRAEA EUROPAEA Mont., **TRIVIA EUROPEA]**

Fresh dead shells are found commonly on the shore at Maryport, Drummore, Luce Bay (R200).

SIMNIA PATULA (Pennant) 'Poached egg shell.'

[OVULA PATULA Pennant]

Recorded from Maryport, Drummore, Luce Bay (R200).

Order STENOGLOSSA

THAIS LAPILLUS L. 'Common Dog-Whelk.'

[NUCELLA LAPILLUS (L.), **PURPURA LAPILLUS** (L.)]

Widespread distribution, in variable abundance, on suitable substrata downstream from Newbie Mains (R77), and including Luce Bay. It may be associated with either mussels or barnacles upon which it preys. (E.J.P. 1964, 1970.)

NASSARIUS RETICULATUS (L.) 'Netted dog-Whelk.'

[NASSA RETICULATA (L.), **HIMA RETICULATUS** (L.)]

Freshly dead shells recorded at Maryport, Drummore, Luce Bay (R200).

NASSARIUS INCRASSATUS (Ström) 'Thick-lipped dog Whelk.'

[NASSA INCRASSATA (Ström); **HIMA INCRASSATUS** (Ström)]

Freshly dead shells recorded at Maryport, Drummore, Luce Bay (R200).

NEPTUNEA ANTIQUA (L.) 'Red whelk, Spindle shell.'

[FUSUS ANTIQUUS (L.), **CHRYSODOMUS ANTIQUA** (L.)]

Occurs commonly on muddy gravel and sand off the Cumberland coast, south from Workington. Dead shells recovered at Cross Canonby (R62) and Allonby (R63) are propably derived from this source.

BUCCINUM UNDATUM L. 'Common Whelk or buckie.'

Widespread distribution, in variable abundance, on the lower shore and sublittoral of the Outer Solway area and Luce Bay. Even at individual stations catches may be very variable. (A.D.M. 1955, E.J.P. 1964, 1970.)

Sub-Class OPISTHOBRANCHIA

Order BULLOMORPHA

PHILINE QUADRIPARTITA Ascanus Lobe shell; helmet bmubble shell.'

[PHILINE APERTA L]

An inhabitant of sandy and muddy bottoms off the Cumberland coast from Workington Bank to St Bees Head; abundance of this species is variable.

Order NUDIBRANCHIA

Sub-Order DENDRONOTACEA

DOTO CORONATA (Gmelin) 'Crowned Sea-nymph.'

Recorded on fucoids of the lower middle shore at Maryport, Drummore, Luce Bay (R200). This species of nudibranch mollusc characteristically feeds upon the hydroids e.g. **Sertularia dynamena** which grows upon fucoids.

Class LAMELLIBBRANCHIA (=BIVALVIA)
Order PROTOBRANCHIA

NUCULA SULCATA (Bronn) 'Furrowed Nut-shell.'
Occurred abundantly in the silty areas of the sub-littoral of the Outer Solway area. It was associated with **Abra alba** and **Nephtys** sp., an association simliar to that described by Sanders (1956, 1958) in Long Island Sound and Buzzards Bay where **Nucula proxima** and **Nephtys incisa** inhabited muddy areas of the sub-littoral. The maximum number recorded was 66 per 1/200 cu. m. in soil off the Scottish coast. (E.J.P. 1964, 1970)

Order FILIBRANCHIATA

GLYCYMERIS GLYCYMERIS (L.) 'Dog-cockle.'
[PECTUNCULUS GLYCYMERIS L.]
Dead shells are thrown upon the shores of Luce Bay. (A.D.M. 1955, E.J.P. 1964, 1970)

MODIOLUS MODIOLUS (L.) 'Horse-mussel.'
On stony bottoms below the L.W.M. where it occurs with **Dendrodoa grossularia.** Its known distribution is Allonby Bay, but the stranding of freshly dead shells elsewhere suggest that it occurs elsewhere in the Outer Solway area. (E.J.P. 1964, 1970.)

MYTILUS EDULIS L. 'Common mussel.'
Widespread and abundant downstream of Barnkirk Point, wherever a suitable substratum is available. This species is not the subject of a fishery at the present time, although in the Auchencairn Bay/Rough Firth area, the stocks are such that they could be exploited with profit. (E.H 1949, E.J.P. 1964, 1970.)

Order OSTREIFORMES

OSTREA EDULIS L. 'Common European oyster; flat or native oyster.'
Dead shells occur widely throughout the Solway Firth. Many of these dead shells are clearly very old, some of the smaller ones, however, appeared not to be of a great age and a large freshly vacated pair was taken north of Maryport in 1963. Until recent times, a small oyster bed was present on Hestan Island and Mr T. Willacy, of Annan, trawled alive, a large old oyster at the Urr Waterfoot during 1962. Overall one gets the impression that while the oyster is largely extinct in the Solway Firth a scattered population remains. (E.J.P. 1964.)

Order PSEUDOLAMELLIBRANCHIA

ANOMIA EPHIPPIUM L.
Distribution widespread on hard substrata in the Outer Solway. (E.J.P. 1964, 1970.)

PECTEN MAXIMUS (L.) 'Great scallop or escallop.'
Reported from 1 mile west of the Little Ross, December 1964, by Mr T. Willacy of Annan. (E.J.P. 1964.)

CHLAMYS OPERCULARIS (L.) 'Queen scallop, queenie, quin.'

[PECTEN OPERCULARIS L., AEQUIPECTEN OPERCULARIS (L.)]
Recorded from Luce Bay and to the south of Burrow Head. An intense fishery based on Kirkcudbright, and carried out off the Burrow Head was pursued in the later months of 1969 and the early months of 1970, and with the avowed intention of fishing out the resource in the shortest possible time. (A.D.M. 1955, J.M. 1963, E.J.P. 1970.)

CHLAMYS VARIA (L.) 'Variegated Scallop.'
[PECTEN VARIUS L.]
Recorded from Allonby Bay (M.N.M. 1960, E.J.P. 1964, 1970.)

CHLAMYS DISTORTA (da Costa) 'Hunchback scallop.'
[PECTEN PUSIO L., HINNITES DISTORTA (da Costa)]
Dead valves recovered at Skyreburn Bay (R10), the Fleet estuary. (E.J.P 1964.)

Order EULAMELLIBRANCHIA

CYPRINA ISLANDICA (L.) 'Iceland-cyprina; Black-clam.'
[ARCTICA ISLANDICA (L.)]
On a sandy bottom to the south-west of Three Fathom Bank. The presence of dead shells at Ravenshall Point (R9), Wigtown Bay, and Balcarry, Luce Bay, suggest that this species has a more widespread distribution than the single, living record indicates. (E.J.P. 1964.)

MONTACUTA SUBSTRIATA (Montagu)
Attached to the anal spines of the sea urchin, **Spatangus purpureus** taken south of the Burrow Head at 54° 33'N 4° 26'50"W. (E.J.P. 1964.)

MONTACUTA FERRUGINOSA (Montagu)
A commensal of the heart urchin **Echinocardium cordatum** taken off the Cumberland coast between Workington and St Bees Head. (E.J.P. 1964.)

ACANTHOCARDIA ECHINATA (L.) 'Prickly cockle.'
[CARDIUM ECHINATUM L.]
On muddy bottoms off the Cumberland coast between Workington and St Bees Head. (E.J.P. 1964, 1970.)

CERASTODERMA EDULE (L.) (=CARDIUM EDULE) 'Common edible cockle.'
This species inhabits the superficial layers of clean sand, muddy sand, mud or muddy gravel from mid-tide level to just below the L.W.M. It is a common inhabitant of sandy bays and estuaries around the British Isles in which it extends upstream to a salinity limit ca.20g./Kg., at salinities below this populations formerly identified as **Cardium edule** are probably **Cerastoderma lamarcki** (Reeve) which favours more brackish conditions.

Cerastoderma edule is fished commercially in the Wash, the Thames estuary, the Burry inlet, the Dee estuary, Morecambe Bay and in the Outer Hebrides.

In the Solway Firth, this species is of a widespread occurrence; however, it only reaches a sufficient abundance to be described as cockle beds in Sandyhills Bay, the Rough Firth and Auchencairn Bay. (E.J.P. 1964, 1970.)

DOSINIA EXOLETA (L.) 'Rayed artemis.'
[VENUS EXOLETA L.]
Dead valves recovered in Luce Bay. (E.J.P. 1964.)
VENUS STRIATULA (da Costa). 'Striped venus.'
[VENUS GALLINA L., **CHAMELEA STRIATULA** (da Costa); **CLAUSINELLA STRIATULA]**
Widespread distribution on clean and muddy sand from the low water downwards in the Outer Solway area. (E.J.P. 1964, 1970.)

VENERUPIS PULLASTRA (Montagu) 'Pullet carpet shell.'
[TAPES PULLASTRA L., **PAPHIA PULLASTRA]**
Living specimens have been taken from Allonby Bay; however the widespread distribution, especially in Brighouse Bay (R17) and Luce Bay, of vacated valves in good condition suggests that this animal which favours hard bottoms is more widespread in distribution than the records of living animals indicate. (E.J.P. 1964, 1970.) Indeed, the stony sediments which it inhabits may be narrow in width, but range from the mid-tide level to 20 fm. and abundant populations may be difficult to locate.
SPISULA SOLIDA (L.) 'Thick trough-shell.'
[MACTRA SOLIDA L.]
Widespread, but not abundant, distribution on sandy bottoms in the Outer Solway area. (E.J.P. 1964, 1970.)
SPISULA ELLIPTICA (Brown) 'Elliptical trough-shell.'
[MACTRA ELLIPTICA Brown]
Taken on a muddy bottom off the Cumberland coast at Workington.
MACTRA CORALLINA (L.) 'Rayed trough-shell.'
[MACTRA STULTORUM L.]
Widespread, and sometimes common, in sandy bottoms of the Outer Solway area. (E.J.P. 1964, 1970.)
GARI FERVENSIS (Gmelin). 'Faroe sunset shell.'
[PSAMMOBIA FERROENSIS Ch.]
Dead valves, in good condition, recovered in Luce Bay and Workington Bank. (E.J.P. 1964, 1970.)

ABRA ALBA (Wood). 'White abra.'
[SYNDOSMYA ALBA (Wood)]
This inhabitant of substrata composed of mud, silty sand and soft muddy gravel is of widespread and often abundant distribution in the Outer Solway wherever such substrata are present below the low water mark. (A.D.M. 1955. E.J.P. 1964, 1970.)

SCROBICULARIA PLANA (da Costa). 'Peppery furrow shell.'
[SYNDOSMYA PIPERATA, SCROBICULARIA PIPERATA]
This species is generally abundant in estuaries in the south and east of England, but scarcer and more local in the north, Spooner and Moore (1940). It is

characteristically found in muddy soils known as " Scrobicularia clay or butter " (Skertchley, 1877).

It was of widespread distribution in the Solway Firth prior to the winters of 1961-62 and particularly of 1962-63 when very large numbers died, and it disappeared from former habitats particularly in the Inner Solway. This species was most abundant in the more silty areas associated with the Scottish coast between Castlehill Point and Wigtown Bay. No estimate of density can be offered. The observed limit of its distribution upstream in the Solway Firth was Browhouses (R83). (E.J.P. 1964, 1970).

MACOMA BALTHICA (L.) ' Baltic Tellin; Hen-pen.'

[TELLINA BALTICA L., **MACOMA BALTICA** L.]

Spooner and Moore (1940) stated that this species was greatly outnumbered in the south-west of England, by **Scrobicularia plana.** In the Solway Firth, however, the reverse is true.

In the Tamar, it was widely distributed, but never exceeded a density of 36/sq.m., although a density of 76/sq.m. was recorded for sizes below 1 cm. in length. Rees (1940) recorded densities between 140 to 800/sq.m. in the Severn estuary. Holme (1949) recorded a maximum of 24 adult/sq.m. in the Exe. In the Dee estuary, Stopford (1951) recorded a maximum of 640/sq.m. in muddy soil, whereas on clean sand this fell to 90/sq.m. Perkins (1956) who worked on a bank at the mouth of the Dee estuary recorded a maximum density of 96/sq.m.

In the Inner Solway Firth, the density of adult **Macoma** ranged from 16-624/sq.m.; however, the density of brood **Macoma** ranged from 16 to 3148/ sq.m. For the fringe banks a mean density of 260/sq.m. and 660/sq.m.was recorded for adults and brood respectively. The population of the island banks was poor. Wilson (1963) recorded population densities exceeding 100/sq.m.

TELLINA FABULA Gmelin ' Bean-like Tellin.'

[FABULINA FABULA Gmel.]

Below the low water mark, at the outer edges of the main banks. (E.J.P. 1964, 1970.)

TELLINA TENUIS (da Costa)

[MACOMA TENUIS da Costa.]

Holme (1949) stated that this species has been found in a number of sandy estuaries and shores where there is some shelter from wave action, and quoted Rees (1939) who found that the extent of its range up the beach from L.W.M. was variable. Holme considered that this was probably related to drainage, although he later showed an association with soils of a low silt content. He recorded 184/sq.m. in the lower half of the tidal zone, an average figure for this zone. He quoted figures by Stephen (1928, 1929 and 1931) who found population in Kames Bay ranging from 250 to 1897/¼sq.m.

On a sand bank at the mouth of the Dee estuary, Perkins (1956) recorded a maximum density of 192/sq.m. in fine sand with a low silt content. Since it

reached a maximum density where a constant flow of surface water occurred, drainage does not seem to be the most important factor in its distribution.

In the Solway Firth, this species penetrated as far upstream as Howgarth (R74) where it occurred near L.W.M., the greatest density recorded was 64/sq.m. Further downstream at the Barnhourie Sand and Beckfoot a wide zone of this species occurred upwards from L.W.M. Typically its distribution was confined to soils having a low percentage of silt (less than 10%) along the English shore seawards from Beckfoot, and along the Scottish shore from the Barnhourie Sands to the Bay of Luce, at the mouths of the tributary estuaries, bays and wherever low silt contents were found in the soil. The contention by Holme (1949) that shelter from wave action is essential to the distribution of this organism is not borne out in the Solway Firth. To sum up, it seems that **Tellina tenuis** must be considered as an organism which prefers situations in which the soil has only a small silt content, and occurs typically in the exposed banks at the mouths of estuaries and bays having a comparable soil grade structure.
A contention which is supported by the results of Spärck (1935) who stated that, on the coasts of N.-W. Europe, **Tellina tenuis** was typically found in pure sandy bottoms subject to heavy surf action. Alexander, Southgate and Bassindale (1935)—Tees and Tay estuaries—and Stopford (1951) and Perkins (1956)—Dee estuary—obtained a similar result. (E.J.P. 1964, 1970.)

DONAX VITTATUS (da Costa) 'Banded wedge shell.'
[DONAX ANATINUS]
This species is an important component of the zonation around and below low water mark, on the sand banks in the Outer Solway, particularly on their western edges and including Workington Bank and Three Fathom Bank. (E.J.J. 1964, 1970.)

PHARUS LEGUMEN L. 'Jack Knife clam.'
[SOLEN LEGUMEN L., **CERATISOLEN LEGUMEN** L.]
Once considered to be near its northern limit in Anglesey and to be confined to S.-W. England, the coasts of Wales and all but the north coasts of Ireland; it has not been recorded from the Isle of Man (Yonge, 1959, Crisp, 1964, Tebble, 1966).

In the Solway Firth, this species is widely distributed, below the L.W.M., to the west of the main sand bank system. (E.J.P. 1964, 1970).

CULTELLUS PELLUCIDUS (Pennant)
[PHAXAS PELLUCIDUS (Pennant)]
Recorded in the Outer Solway; sometimes abundant.

ENSIS ARCUATUS (Jeffreys)
Freshly dead valves recovered in Skyreburn Bay (R10), Fleet estuary and Balcarry (R2) Luce Bay. (E.J.P. 1964.)

ENSIS SILIQUA (L.) 'Pod razor shell.'
[SOLEN SILIQUA L.]
Freshly dead valves recovered over wide areas of the Outer Solway including

Luce Bay, Wigtown Bay, the Fleet estuary, Workington Bank and Three Fathom Bank, Allonby Bay and Siddick (R110). (E.J.P. 1964, 1970.)

HIATELLA ARCTICA (L.)

[SAXICAVA ARCTICA L.]

This bivalve which may assume either the boring or the nestling habit has been recorded from stony ground in Luce Bay, Moss Bay and Three Fathom Bank. (A.D.M. 1955, E.J.P. 1964, 1970).

MYA ARENARIA L. 'Sand gaper, soft shelled clam.'

[ARENOMYA ARENARIA L.]

Widespread distribution, with a variable abundance, in a variety of sediments from stiff muddy sand, e.g., Glen Isle Marsh (R41), to scar ground, e.g., Powfoot Scar (R75). It penetrates as far upstream as Dornockbrow (R81) and has a wide distribution downstream of this; it occupies a similar position in the tributary estuaries of the Solway, and has been trawled at Port Ling and Hestan Island. (E.J.P. 1964, 1970.)

MYA TRUNCATA L. 'Blunt gaper.'

Dead valves trawled at Port Ling. (E.J.P. 1964.)

Class CEPHALOPODA

Order DECACERA

SEPIA OFFICINALIS (L.) 'Common cuttlefish.'

Very many cuttlebones were stranded around Cardurnock (R93) in 1961. (E.J.P. 1964.)

SEPIOLA ATLANTICA d'Orbigny 'Little cuttle'

[HETEROSEPIOLA ATLANTICA d'Orbigny]

Distribution widespread, but not abundant; during the summer months it may penetrate as far upstream as Newbie. (E.J.P. 1964.)

Phylum POLYZOA

Order GYMNOLAEMATA

Sub-Order CHEILOSTOMATA

MEMBRANIPORA MEMBRANACEA (L.)

Although the calcified cuticles of the zooecia occur widely throughout the Solway Firth area as far upstream as Torduff Point (R82), living colonies are found much less frequently; they have been recorded from Luce Bay, Three Fathom Bank, Workington Bank, Moss Bay, Allonby Bay, Abbey Burnfoot (R30) and Ravenshall Point (R9). (E.J.P. 1964, 1970.)

FLUSTRA FOLIACEA (L.) 'Hornwrack'

Widespread, and often abundant, on bottoms of stones or stony sand, e.g. Allonby Bay, Moss Bay and Workington Bank. (E.J.P. 1964, 1970.)

Sub-Order CTENOSTOMATA

FLUSTRELLA HISPIDA (Fabricius).

Widespread in the Outer Solway, sometimes common.

ALCYONIDIUM GELATINOSUM (L.) 'Sea Ragged-staff'

Widespread distribution upon hard substrata, e.g. Luce Bay, Allonby Bay,

Workington Bank and east of Southerness Point. (A.D.M. 1955, M.N.M. 1960, E.J.P. 1964, 1970.)

ALCYONIDIUM PARASITICUM (Fleming)

Recorded upon sertularian hydroids in the Outer Solway Firth.

Phylum ECHINODERMATA
Class ASTEROIDEA
Order PHANEROZONIA

ASTROPECTEN IRREGULARIS (Pennant)

Widespread, and sometimes abundant, inhabitant of the fine and muddy sands of the Outer Solway to the west of the bank system, but also present on Workington Bank. (A.D.M. 1955, E.J.P. 1964, 1970.)

Order SPINULOSA

SOLASTER PAPPOSUS (L.) 'Common Sunstar'
[CROSSASTER PAPPOSUS L.]

Recorded from Luce Bay, Wigtown Bay, Moss Bay, Allonby Bay and Workington Bank, in small numbers. (A.D.M. 1955, E.J.P. 1964, 1970)

HENRICIA SANGUINOLENTA (O. F. Müller)

Recorded from Wigtown Bay and Siddick (R110). (A.D.M. 1955, E.J.P. 1970).

Order FORCIPULATA

ASTERIAS RUBENS L. 'Common Starfish'.

Widespread, and sometimes very abundant, throughout the whole Solway area downstream of Powfoot; where suitable substrata are available this species colonises the lower shore, but it is most widely distributed below the L.W.M. (A.D.M. 1955, M.N.M. 1960, J.M. 1963, E.J.P. 1964, 1970.)

Class OPHIUROIDEA
Order OPHIURAE

OPHIOTHRIX FRAGILIS (Abildgaard) 'Brittle Star'

Common on sandy and stony substrata to the west of the main bank system. (E.J.P. 1964, 1970.)

AMPHIURA FILIFORMIS (O.F. Müller)

Recorded from the sea bed south of the Little Ross. (E.J.P. 1964, 1970.)

OPHIURA TEXTURATA Lamarck.

Widespread, and sometimes common, on substrata of fine and muddy sand to the west of the main bank system. (A.D.M. 1955, E.J.P. 1964, 1970.)

OPHIURA ALBIDA Forbes.

Widespread, and sometimes common, on substrata of stones, fine and muddy sand to the west of the main bank system. (A.D.M. 1955, E.J.P. 1964, 1970.)

Class ECHINOIDEA
Order DIADEMATOIDEA

PSAMMECHINUS MILIARIS (Gmelin) 'Green urchin.'
[PARECHINUS MILIARIS]

Recorded from below the L.W.M. in Luce Bay, Allonby Bay and Maryport Roads. (M.N.M. 1960, E.J.P. 1964, 1970.)

ECHINUS ESCULENTUS L.
Recorded on stony ground, below L.W.M., in Luce Bay, Moss Bay and Allonby Bay. (A.D.M. 1955, E.J.P. 1964, 1970.)

Order SPATANGOIDEA

SPATANGUS PURPUREUS O.F. Müller. 'Purple heart-urchin.'
[SPATANGUS MERIDIONALIS]
Recorded from 54° 33'N 4° 27'W. (E.J.P. 1964.)
ECHINOCARDIUM CORDATUM (Pennant) 'Sea potato.'
Widespread, and sometimes common, on substrata of sand and muddy sand in the Outer Solway area; the upstream limit of its distribution appears to be the western edge of Robin Rigg and Workington Bank. Although most records are from the sublittoral it occurs at L.W.M. in Ross Bay (R18), Kirkcudbright Bay. (E.J.P. 1964, 1970.)

Phylum	CHORDATA
Sub-Phylum	TUNICATA
Class	ASCIDIACEA
Order	ENTEROGONA
Sub-Order	PHLEBOBRANCHIATA

ASCIDIELLA ASPERSA (O. F. Müller)
Recorded from stony ground below L.W.M., just east of a line drawn from Southerness Point to Dubmill Point, i.e., a slight penetration of the Inner Solway. In the Outer Solway, it has been recorded from stony ground in Allonby Bay and Moss Bay. (E.J.P. 1964, 1970.)
ASCIDIELLA SCABRA (O. F. Müller)
Recorded from stony ground, below L.W.M., in Moss Bay.

Order	PLEUROGONIA
Sub-Order	STOLIDOBRANCHIATA

DENDRODOA GROSSULARIA (Van Beneden) "Pock; Gooseberry Sea squirt"
Widespread, and sometimes abundant, on stony ground around and below L.W.M. in the Outer Solway area. This sea-squirt, which may be cherry-red, brownish or a dirty yellow in colour, squirts a fine jet of "water" upon handling. Care should be taken to prevent this liquid reaching the eyes, to which it is an irritant. (E.J.P. 1964, 1970.)

BOTRYLLUS SCHLOSSERI (Pallas) "Star ascidian; Star sea squirt"
[BOTRYLLUS STELLATUS]
Recorded from stony ground, at and below L.W.M., in the Outer Solway, vig., Luce Bay, Moss Bay and Allonby Bay.

BOTRYLLOIDES LEACHI (Savigny)
Recorded from L.W.M. at Maryport, Drummore, Luce Bay. (R200).

Sub-Phylum VERTEBRATA
Class MARSIPOBRANCHII
Order HYPEROARTIA

PETROMYZON MARINUS L. 'Sea-lamprey; Lamprey.'
R.S. 1896, H.S.G. 1912; J.G.G. 1921—Cree estuary; A.B. 1930—Cree estuary.
PETROMYZON sp.
Recorded at Newbie and Port Ling. (E.J.P. 1964.)
LAMPETRA FLUVIATILIS (L.) 'Lampern; River Lamprey.'
J.G.G. 1921—Cree estuary.
LAMPETRA PLANERI (Bloch) 'Brook lamprey; Planer's lamprey.'
[PETROMYZON BRANCHIALIS]
J.G.G. 1921—Cree estuary.

Class SELACHII
Order PLEUROTREMATA

SCYLIORHINUS STELLARIS (L.) 'Nurse Hound; Large-spotted Dogfish; Bull Huss; Catfish Bounce; Huss.'
[SCYLLIUM CATALUS]
B.B.R. 1955—this species was listed by Gladstone and Gordon, but both regarded it as doubtful. It is not a common species in Scottish waters.
SCYLIORHINUS CANICULUS (L.) 'Dogfish; Lesser-spotted dogfish; Sandy dog; Rough hound.'
[SCYLLIUM CANICULA]
R.S. 1896; H.S.G. 1912; J.G.G. 1921, E.J.P. 1970—Luce Bay and off Whitehaven.
GALEUS MELASTOMUS Rafinesque-Schmalz. 'Black-mouthed dogfish.'
[PRISTIURUS MELANOSTOMUS]
J.G.G. 1921—Wigtown Bay, Mull of Galloway, B.B.R. 1955.
LAMNA NASUS (Bonnaterre) 'Porbeagle'
R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Luce Bay, Wigtown Bay; A.B. 1930 — Cree estuary; E.H. 1949 — off the Cumberland coast; B.B.R. 1955 — Considered that the absence of recent records indicated that this fish is probably scarcer than it once was.
CETORHINUS MAXIMUS (Gunnerus) 'Basking Shark'
[SELACHE MAXIMA]
J.G.G. 1921 — Wigtown Bay; B.B.R. 1955 — stragglers from the annual invasion of British waters occasionally reach the Solway: strandings have occurred in Wigtown Bay, in Clanyard Bay, Kirkmaiden and at Gretna.
ALOPIAS VULPINUS (Bonnaterre) 'Thresher, Fox Shark'
[ALOPIAS VULPES]
R.S. 1896 — one in Wigtown Bay; J.G.G. 1921 — Wigtown Bay; A.B. 1930, B.B.R. 1955 — three in Salmon nets at Carsluith, Wigtown Bay and one in nets at the Cally fishings, Gatehouse-of-Fleet, August, 1926; B.B.R. 1955; W.A.K.-W. 1964 — one 12 ft. specimen was taken at Innerwell, Wigtown Bay, the first record for some years.
PRIONACE GLAUCA (L.) 'Blue Shark'
[CARCHARINUS GLAUCUS]
R.S. 1901 — one at Innerwell, Wigtown Bay, 17.8.1900; J.G.G. 1921 — two in

Salmon nets, one on 4.5.1900, the other at Innerwell, 4.8.1863; B.B.R. 1955 — specimens of varying sizes are taken from time to time.

GALEORHINUS GALEUS (L.) 'Tope; Sweet William.'
[EUGALEUS GALEUS, GALEUS VULGARIS, G.CANIS]
R.S. 1896; H.S.G. 1912; J.G.G. 1921—Luce Bay and Wigtown Bay; E.J.P. 1964—Port Ling, Barnhourie, Dumroof Channel and Lochar Foot.

MUSTELUS MUSTELUS (L.) 'Smooth Hound, Sweet William.'
[MUSTELUS VULGARIS]
R.S. 1896; J.G.G. 1921 — Mull of Galloway, Wigtown Bay; B.B.R. 1955 — this species is rare in Wigtownshire and Scottish waters generally.

According to Wheeler (1969) **M.mustelus** and **M.asterias** have been so consistently confused by European workers that information concerned with the individual species cannot be accepted as referring to that species with certainty.

SQUALUS ACANTHIAS (L.) 'Spur-dog; Picked dogfish.'
[ACANTHIAS VULGARIS]
R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Luce Bay, Wigtown Bay.

SQUATINA SQUATINA (L.) 'Monkfish; Angel Fish; Angel Ray.'
[RHINA SQUATINA]
R.S. 1896; J.G.G.—Wigtown Bay; A.B. 1930—Luce Bay, Cree estuary; B.B.R. 1955—Cree estuary.
Trawled at Hestan Island by Mr T. Willacy, 17.7.64.

Order HYPOTREMATA

TORPEDO NOBILIANA Bonaparte 'Electric Ray; Torpedo.'
B.B.R. 1955—this species is represented by a single animal captured off the Isle of Whithorn.

RAJA OXYRINCHUS L. 'Long-nosed Skate.'
J.G.G. 1921—Wigtown Bay; A.B. 1930—Cree estuary.

RAJA BATIS L. "Common Skate, Blue or Grey Skate"
R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Luce Bay, Wigtown Bay and the Cree estuary.

RAJA FULLONICA L. "Shagreen Ray, Fuller's Ray"
J.G.G. 1921 — Wigtown Bay.

RAJA NAEVUS Müller and Henle "Cuckoo Ray"
Widespread distribution in the Outer Solway. This species was misidentified as **R. circularis** in Williams, Perkins and Hinde (1965) due to an error in Jenkins (1936). I am indebted to Dr B. B. Rae, who called attention to this error.

RAJA MONTAGUI Fowler "Homelyn Ray; Spotted Ray"
R.S. 1896; J.G.G. 1921; A.B. 1930; A.D.M. 1955; E.J.P. 1964—widespread,

RAJA CLAVATA L. "Roker, Thornback Ray"
R.S. 1896; J.G.G. 1921; A.B. 1930; A.D.M. 1955; E.J.P. 1964, 1970—widespread,

and sometimes common, in the Outer Solway area; in the Inner Solway it has been taken at the Lochar Foot and off Borron Point. This species seems to have declined in recent years.

RAJA BRACHYURA Lafont. "Blonde Ray."

B.B.R. 1955 — Luce Bay and Wigtown Bay.

DASYATIS PASTINACA (L.) "Sting Ray"

[TRYGON PASTINACA]

R.S. 1896a — at the foot of the Nith; B.B.R. 1955 — Single specimens captured at Carsluith, Wigtown Bay and Cassencarrie, Cree estuary; W.A.K.-W. 1964 — it is taken occasionally at Innerwell, Wigtown Bay.

Class PISCES

Sub-Class PALAEOPTERYGII

Order CHONDROSTEI

ACIPENSER STURIO L. 'Sturgeon.'

W.D. 1885-86—Eden estuary; R.S. 1892, 1896—Nith and Dee estuaries; H.S.G. 1912—in nets at Newbie and in the Nith estuary; A.B. 1930—near Annan and in the Cree estuary; B.B.R. 1955—off the foot of the Nith and the Silloth Channel: this species has disappeared from the Solway, unlike the Scottish west coast grounds where it is still taken.

Sub-Class NEOPTERYGII

Order ISOSPONDYLI

ENGRAULIS ENCRASIOLUS (L.) 'Anchovy.'

R.S. 1902, H.S.G. 1912, J.G.G. 1921, B.B.R. 1955—Recorded from the Inner Solway, to the east of Annan, the Cree estuary and the Fleet estuary, W.A.K.-W. 1964—a specimen was taken at Innerwell, Wigtown Bay in May, 1961.

ALOSA ALOSA (L.) 'Allis Shad.'

[CLUPEA ALOSA]

R.S. 1896; H.S.G. 1912; J.G.G. 1921—Wigtown Bay, Cree estuary; B.B.R. 1955—this species is seldom taken in Scottish waters, but is considered to be fairly common, particularly during the summer.

ALOSA FALLAX (Lacépède) 'Twaite Shad.'

[A.FINTA, CLUPEA FINTA]

H.S.G. 1912; J.G.G. 1921—Cree estuary, Wigtown Bay; B.B.R. 1955—not as common as **A.alosa,** but probably slightly more numerous than elsewhere on the Scottish coast.

SPRATTUS SPRATTUS (L.) 'Sprat.'

R.S. 1896; H.S.G. 1912; J.G.G. 1921—Cree estuary; A.B. 1930—Wigtown Bay. E.J.P. 1964—widespread occurrence with young herring in the Outer Solway and Inner Solway as far upstream as Newbie.

CLUPEA HARENGUS L. 'Herring.'

Widespread distribution, throughout the Solway, downstream of Annan. R.S. 1896; H.S.G. 1912; J.G.G. 1921; A.B. 1930; E.H. 1949; E.J.P. 1964.

Occurrence is sporadic. During 1962, marketable herring were more plentiful

than at any time since 1941 (T. Willacy, private communication); at this time numbers were again abundant at the former fishing ground off Southerness Point. Since 1962, numbers in this area declined once more.

SALMO SALAR L. 'Salmon.'

R.S. 1896, 1905; H.S.G. 1912; J.G.G. 1921; A.B. 1930; E.J.P. 1964, 1970.

Stake net fisheries are worked in appropriate areas of the Solway Firth itself and in all the tributary estuaries on the Scottish side. Drift netting, or whammelling, was carried on extensively in the Inner Solway, formerly: after the troubles related to the Berwick fishery, it was reduced to a few boats working on the English side.

SALMO TRUTTA L. 'Sea Trout, Brown Trout.'

R.S. 1896; H.S.G. 1912; J.G.G. 1921; E.J.P. 1964, 1970.

OSMERUS EPERLANGUS (L.) "Smelt; sparling"

R.S. 1896; H.S.G. 1912; J.G.G. 1921; A.B. 1930 — Cree estuary. E.J.P. 1964 — of widespread, but not common, occurrence downstream of Newbie.

Order APODES

ANGUILLA ANGUILLA (L.) "Common Eel"

R.S. 1896; H.S.G. 1912; A.B. 1930 — Cree estuary. E.J.P. 1964, 1970 — trawled off Moricambe, Borron Point and Whitehaven.

CONGER CONGER (L.) "Conger or conger eel"

[CONGER VULGARIS]

H.S.G. 1912; J.G.G. 1921 — Luce Bay, Wigtown Bay; Mr T. Skinner (private communication) — Craig Roan; E.J.P. 1964 — trawled at Newbie; E.J.P. 1970 — Luce Bay.

Order SYNENTOGNATHI

SCOMBERESOX SAURUS (Walbaum) "Skipper; Saury Pike"

R.S. 1896 — Kirkcudbright Bay; H.S.G. 1912; J.G.G. 1921 — Wigtown Bay; B.B.R. 1955 — foot of the Nith estuary; the scarcity of records for this species may be due to the ease with which it can pass through the meshes of a net.

BELONE BELONE (L.) "Garfish; Garpike"

R.S. 1896 — foot of the Nith estuary and Kirkcudbright Bay; H.S.G. 1912 — the Nith estuary and off Bowness; J.G.G. 1921 — Wigtown Bay; B.B.R. 1955; Mr T. Skinner (private communication) this fish is taken at Powfoot from time to time.

Order SOLENICHTHYES

SYGNATHUS ACUS L. "Great Pipefish"

R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Luce Bay, Cree estuary; E.J.P. 1964 — common off Hestan Island; E.J.P. 1970 — taken off St Bees Head.

SYGNATHUS TYPHLE (L.) 'Deep-snouted Pipefish; Broad-nosed Pipefish.'

[SIPHONOSTOMA TYPHLE]

Taken off St. Bees Head.

ENTELURUS AEQUOREUS (L.) 'Snake Pipefish; Ocean Pipefish.'

H.S.G. 1912—Taken in the Nith estuary to the north of a line drawn from Airds Point to Scar Point, in 1903.

NEROPHIS LUMBRICIFORMIS (Jenyns) 'Worm-Pipefish.'

R.S. 1896; H.S.G. 1912; J.G.G. 1921—Luce Bay.

E.J.P. 1964—Common off Hestan Island.

HIPPOCAMPUS RAMULOSUS Leach. 'Sea-horse.'

[H.GUTTULATUS, H.LONGIROSTRIS, H.ANTIQUORUM]

H.S.G. 1912 and J.G.G. 1921—recorded the presence of **H.hippocampus**. However, the work of Wheeler (1969) indicates that **H.hippocampus** is unlikely to occur north of the coast of Brittany and that those found in the Solway are probably **H.ramulosus,** however, confirmation is required. According to Mr T. Skinner, sea horses are stranded from time to time at Castlehill Point.

Order ANACANTHINI

MICROMESISTIUS POUTASSOU (Risso) 'Blue Whiting; Couch's Whiting or Poutassou.'

[GADUS POUTASSOU]

J.G.G. 1921.

MERLANGIUS MERLANGUS (L.) 'Whiting.'

[GADUS MERLANGUS]

R.S. 1896; H.S.G. 1912; J.G.G. 1921——Wigtown Bay; A.D.M. 1955—Wigtown Bay and Kirkcudbright Bay.

E.J.P. 1964. Widespread and sometimes abundant occurrence in the Solway Firth downstream of Newbie.

E.J.P. 1970. Frequently taken, sometimes in large numbers off the Cumberland coast south of Maryport.

TRISOPTERUS LUSCUS (L.) 'Bib; Whiting Pout; Pout; Pouting.'

[GADUS LUSCUS]

R.S. 1896; J.G.G. 1921—Luce Bay, Wigtown Bay.

E.J.P. 1970—Widespread in small numbers off the Cumberland coast of the Outer Solway.

TRISOPTERUS MINUTUS (L.) 'Poor-cod.'

[GADUS MINUTUS]

J.G.G. 1921—Luce Bay.

E.J.P. 1970—taken off St Bees Head; young fish only.

POLLACHIUS POLLACHIUS (L.) 'Pollack.'

[GADUS POLLACHIUS]

R.S. 1896; H.S.G. 1912; J.G.G. 1921—Luce Bay.

E.J.P. 1964—taken, but not common at Ellison Scar, 54° 50′N 03° 31′W.

POLLACHIUS VIRENS (L.) 'Saithe; Coalfish; Coley.'

[GADUS VIRENS]

R.S. 1896; H.S.G. 1912; J.G.G. 1921—Luce Bay.

GADUS MORHUA (L.). 'Cod; Codling.'

[GADUS CALLARIAS]

R.S. 1896, 1905; H.S.G. 1912; J.G.G. 1921—Luce Bay, Wigtown Bay.
A.B. 1930—Wigtown Bay; A.D.M. 1955—Luce Bay, Wigtown Bay, Kirkcudbright Bay.
E.J.P. 1964, 1970—Widespread distribution, though rarely common in occurrence, downstream of Newbie.

MELANOGRAMMUS AEGLEFINUS (L.) 'Haddock.'
[GADUS AEGLEFINUS]
R S. 1896; H.S.G. 1912; J.G.G. 1921, A.B. 1930, Wigtown Bay; E.H. 1949 — off the Cumberland coast; A.D.M. 1955 — Wigtown Bay and Kirkcudbright Bay.
E.J.P. 1964, 1970 — despite extensive trawling surveys around and to the west of the main banks of the Outer Solway, this species has not been recorded.

PHYCIS BLENNOIDES (Brunnich) "Greater Fork-beard; Forked-Hake"
R.S. 1896; B.B.R. 1955 — Cree estuary.

MERLUCCIUS MERLUCCIUS (L.) "Hake"
R.S. 1896; B.B.R. 1955 — Wigtown Bay.

MOLVA MOLVA (L.) "Ling"
H.S.G. 1912; J.G.G. 1921 — Luce Bay, Wigtown Bay.

RANICEPS RANINUS (L.) "Tadpole-fish; Lesser Forkbeard"
J.G.G. 1921 — Luce Bay, Wigtown Bay; B.B.R. 1955 — it appears to be scarce generally off the Scottish coasts.

GAIDROPSARUS MEDITERRANEUS (L.) "Shore Rockling"
[MOTELLA TRICIRRATUS, ONOS TRICIRRATUS]
J.G.G. 1921 — Wigtown Bay.

RHINONEMUS CIMBRIUS (L.) "Four-bearded Rockling"
E.J.P. 1970 — taken off St Bees Head in small numbers.

CILIATA MUSTELA (L.) "Five-bearded Rockling"
R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Luce Bay.
E.J.P. 1964 — widely distributed, but never common, throughout the Solway downstream of Newbie.

Order ALLOTRIOGNATHI

LAMPRIS GUTTATUS (Brunnich) "Opah; Moon fish; King fish"
[LAMPRIS LUNA, L. PELAGICUS]
R.S. 1896 — taken in Wigtown Bay in June, 1861.

Order ZEOMORPHI

ZEUS FABER L. "Dory; John Dory; St Peter's fish"
R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Wigtown Bay.

Order PERCOMORPHI

DICENTRARCHUS LABRAX (L.) "Bass"
[MORONE LABRAX, LABRAX LUPUS]
H.S.G. 1912; J.G.G. 1921 — Wigtown Bay; B.B.R. 1955 — a frequent visitor to the Solway during the spring and summer.

POLYPRION AMERICANUS (Bloch and Schneider) "Wreckfish; Stone Basse"

B.B.R. 1955 — a single specimen was taken in Wigtown Bay; there are no details of its capture.

TRACHURUS TRACHURUS (L.) "Scad; Horse Mackerel"

R.S. 1896 — Dee estuary and Kirkcudbright Bay, and off the coast to the east; H.S.G. 1912; J.G.G. 1921 — Wigtown Bay; A.B. 1930 — Wigtown Bay and Cree estuary; E.H. 1949 — off the coast of Cumberland.

TRACHINOTUS OVATUS (L.) "Derbio; Glaucus"

[LICHIA GLAUCA, TRACHINOTUS GLAUCUS]

W.A.K.-W. 1964 — one individual of this species, normally sub-tropical in distribution, was taken at Innerwell, Wigtown Bay, August, 1961.

ARGYROSOMUS REGIUM (Asso) "Meagre"

[SCIAENA AQUILA]

R.S. 1905 — taken in nets at Port Ling, 11.7.1905.

MULLUS SURMULETUS L. "Red Mullet"

[MULLUS BARBATUS]

R.S. 1906 — several taken in a paidle at Southerness, August, 1905; H.S.G. 1912—taken in the Inner Solway between Annan Waterfoot and the foot of the Nith; B.B.R. 1955 — taken in the Cree estuary, 15.6.43.

PAGELLUS BOGARAVEO (Brunnich) 'Red Sea Bream; Common Sea Bream.'

[PAGELLUS CENTRODENTUS]

R.S. 1896 — Kirkcudbright coast between Balcary Point and Port Ling; H.S.G. 1912; J.G.G. 1921—Wigtown Bay.

SPONDYLIOSOMA CANTHARUS (L.) 'Black Sea Bream; Old Wife.'

[CANTHARUS LINEATUS]

R.S. 1896 — Cree estuary; J.G.G. 1921—Wigtown Bay, Cree estuary; W.A.K.-W. 1964—a single specimen was taken at Innerwell, Wigtown Bay, in 1963.

CRENILABRUS MELOPS (L.) 'Corkwing; Conner.'

[SYMPHODES MELOPS]

J.G.G. 1921—Luce Bay, Wigtown Bay.

CTENOLABRUS RUPESTRIS (L.) 'Goldsinny; Jago's Goldsinny.'

J.G.G. 1921—Mull of Galloway; M.N.M 1960—off Maryport, Cumberland.

LABRUS MIXTUS L. 'Cuckoo Wrasse.'

[LABRUS OSSIFAGUS, L.BIMACULATUS]

H.S.G. 1912.

LABRUS BERGYLTA Ascanius 'Ballan Wrasse.'

[LABRUS MACULATUS]

R.S. 1896; H.S.G. 1912; J.G.G. 1921—Wigtown Bay, Cree estuary.

CENTROLABRUS EXOLETUS (L.) 'Rock Cock; Small-mouthed Wrasse.'

J.G.G. 1921—Wigtown Bay.

AMMODYTES TOBIANUS L. 'Sand eel; Lesser sand eel.'

AMMODYTES LANCEA [Cuvier].

J.G.G. 1921.

E.J.P. 1964 — widespread and abundant occurrence throughout the Solway

Firth. It occurs with, but is very much more abundant than, **Hyperoplus lanceolatus.**

HYPEROPLUS LANCEOLATUS (Le Sauvage) "Greater Sand Eel"
H.S.G. 1912; J.G.G. 1921 — Luce Bay.
E.J.P. 1964 — occurs with **Ammodytes tobianus.**

TRACHINUS VIPERA Cuvier. "Weever; Lesser Weever; Sting-fish"
R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Wigtown Bay and Cree estuary; A.B. 1930 — Wigtown Bay; M.N.M. 1960 — off Maryport, Cumberland.
E.J.P. 1964, 1970 — widespread, but not common, occurrence downstream of Moricambe. Venom from glands on the first dorsal fin and the gill cover may be injected into the unwary by the spines with which these organs are equipped. This fish is taken most readily in Shrimp trawls; as a result shrimp fishermen are most likely to receive these agonising stings from a fish concealed in the contents of the trawl. Occasionally the unwary swimmer may tread on a weever and be stung in consequence.

TRACHINUS DRACO L. "Greater Weever"
R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Mull of Galloway, Wigtown Bay.
E.J.P. 1964 — occasional specimens taken on Two Feet Bank.

AUXIS THAZARD (Lacépède) "Frigate Mackerel; Plain Bonito"
W.A.K.-W. 1964 — an individual taken at Innerwell, Wigtown Bay, in June, 1962, was the first taken for a long time.

SCOMBER SCOMBRUS L. "Mackerel"
H.S.G. 1912; J.G.G. 1921 — Luce Bay, Wigtown Bay; A.B. 1930 — Wigtown Bay and Cree estuary; E.H. 1949 — off the Cumberland coast.

SCOMBER COLIAS Gmelin. "Spanish Mackerel"
R.S. 1896 — Wigtown Bay; H.S.G. 1912; J.G.G. 1921 — Wigtown Bay; A.B. 1930, B.B.R. 1955 — Wigtown Bay and Cree estuary.

KATSUWONUS PELAMIS (L.) "Oceanic Bonito; Bonito"
[THUNNUS PELAMYS, T.PELAMIS]
R.S. 1896 — Dee estuary and Nith foot; H.S.G. 1912 — Nith foot; J.G.G. 1921 — Luce Bay; E.H. 1949 — off Cumberland coast; B.B.R. 1955 — taken in stake net at Newbie and off Silloth.

SARDA SARDA (Bloch) "Bonito; Belted Bonito; Pelamid; Short-finned Tunny"
[PELAMYS SARDA]
R.S. 1896; H.S.G. 1912 — off Annan and Cummertrees; A.B. 1930 — off Creetown, 13.6.29; B.B.R. 1955 — off Newbie, 20.6.1896, and off Creetown, 17.6.37.

THUNNUS ALALUNGA (Bonnaterre) "Tunny; Long-fin Tunny; Albacore"
[GERMO ALALUNGA, ORCYNUS GERMO]
B.B.R. 1955 — off Silloth, 25.10.1897.

THUNNUS THUNNUS (L.) "Tunny; Blue-fin Tuna"
[ORCYNUS THYNNUS]
R.S. 1896 — in Dumfriesshire waters and at Port Ling; H.S.G. 1912 — off

Newbie; J.G.G. 1921 — Innerwell; B.B.R. 1955 — off Silloth, 24.2.1896.

EUTHYNNUS ALLETTERATUS (Rafinesque-Schmaltz) "Marbled Tunny; Little Tunny; False Albacore"

B.B.R. 1955 — taken at Garlieston, Wigtown Bay, 11.7.51; W.A.K.-W. 1964 — taken at Innerwell, Wigtown Bay.

XIPHIAS GLADIUS L. "Swordfish"

R.S. 1896 — Outer Solway off Southerness Point, 1.7.1883; H.S.G. 1912 — off Newbie and Annan, and between Silloth and Annan; B.B.R. 1955.

CHAPARRUDO FLAVESCENS (Fabricius) "Two-spot Goby; Spotted Goby"

[GOBIUS FLAVESCENS, G.RUTHENSPARRI]

H.S.G. 1912; J.G.G. 1921 — Luce Bay.

POMATOSCHISTUS (POMATOSCHISTUS) MINUTUS (Pallas) "Sand Goby; Common Goby; Freckled Goby"

[GOBIUS MINUTUS]

H.S.G. 1912; J.G.G. 1921.

E.J.P. 1970 — widespread and common off the Cumberland coast from Workington to St Bees.

GOBIUS (GOBIUS) NIGER L. "Black Goby"

J.G.G. 1921 — Wigtown Bay.

GOBIUS sp.

A.D.M. 1955 — Luce Bay and Wigtown Bay.

E.J.P. 1964 — due to problems of identification on the survey to 1964, identifications are limited to genus. This was recorded to the east of a line drawn from St Bees to Balcary Point, upstream as far as Newbie.

CALLIONYMUS MACULATUS Rafinesque-Schmaltz "Spotted Dragonet"

B.B.R. 1955 — Luce Bay.

CALLIONYMUS RETICULATUS Valenciennes

E.J.P. 1970 — recorded from Workington Bank.

CALLIONYMUS LYRA L.

R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Wigtown Bay.

E.J.P. 1964, 1970 — widespread distribution in the Outer Solway area, occasionally abundant at Hestan Island.

BLENNIUS (LIPOPHRYS) PHOLIS L. "Shanny; Common Blenny"

J.G.G. 1921; E.J.P. 1970 — Luce Bay.

PHOLIS GUNNELLUS (L.) "Butterfish; Gunnel"

[CENTRONOTUS GUNNELLUS]

R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Luce Bay and Wigtown Bay.

E.J.P. 1964, 1970—Recorded below L.W.M. at Hestan Island. and on the shore at Maryport, Luce Bay where it was common.

CENTROLOPHUS NIGER (Gmelin) 'Black-fish'

[C.POMPILUS]

R.S. 1896—Nith estuary; B.B.R. 1955—Wigtown Bay but confirmation of both records is lacking.

CRENIMUGIL LABROSSUS (Risso). 'Thick-lipped Mullet.'
[MUGIL CHELO, M.LABROSUS, M.PROVENSALIS]
H.S.G. 1912; J.G.G. 1921; B.B.R. 1955.
LIZA RAMADA (Risso) 'Thin-lipped Mullet.'
[MUGIL CAPITO]
H.S.G. 1912; J.G.G. 1921—Luce Bay and Cree estuary; B.B.R. 1955.
MUGIL spp.
A.B. 1930—Wigtown Bay; E.J.P. 1964—One taken at the mouth of the Lochar water.

Order SCLEROPAREI

SEBASTES MARINUS MARINUS (L.) 'Red-fish; Norway Haddock.'
[SEBASTES NORVEGICUS]
B.B.R. 1955—A single specimen was taken off Whitehaven, August, 1894.
EUTRIGLA GURNARDUS (L.) 'Grey Gurnard'
R.S. 1896; H.S.G. 1912; J.G.G. 1921—Luce Bay, Wigtown Bay.
E.J.P. 1970—Workington Bank.
TRIGLOPORUS LASTOVIZA (Bonnaterre) 'Streaked Gurnard; Polperro Bull.'
[T. LINEATA]
R.S. 1896; H.S.G. 1912; J.G.G. 1921—Luce Bay.
ASPITRIGLA CUCULUS (L.) "Red Gurnard; Cuckoo Gurnard"
[TRIGLA PINI]
R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Luce Bay, Wigtown Bay.
E.J.P. 1964 — widespread, occasionally common, around the banks of the Outer Solway area.

TRIGLA LUCERNA L. "Tub Gurnard; Yellow or Saphirine Gurnard"
[TRIGLA HIRUDO, T.CORAX]
R.S. 1896; H.S.G. 1912; J.G.G. 1921; B.B.R. 1955 — Wigtown Bay; A.D.M. 1955 — Wigtown Bay.
E.J.P. 1964 — Workington Bank; E.J.P. 1970 — on ground between South Workington Buoy and Whitehaven.
MYOXOCEPHALUS SCORPIUS (L.) "Bull Rout; Short-spined Sea Scorpion; Father Lasher"

[COTTUS SCORPIUS]
J.G.G. 1921 — Luce Bay.
E.J.P. 1964 — trawled widely in the Inner Solway, downstream of Newbie; trawled at Hestan Island, in Allonby Bay and on the south side of Robin Rigg in the Outer Solway. Generally taken in small numbers only.
TAURULUS BUBALIS (Euphrasen) "Sea Scorpion; Long-spined Sea Scorpion"
[COTTUS BUBALIS]
R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Wigtown Bay, Luce Bay.

AGONUS CATAPHRACTUS (L.) "Hook-nose; Armed Bullhead; Pogge; Hardhead"

R.S. 1896; H.S.G. 1912; J.G.G. 1921; A.D.M. 1955 — Luce Bay, Wigtown Bay; M.N.M. 1960 — off Maryport.
E.J.P. 1964, 1970 — widespread distribution, downstream of Newbie; sometimes abundant.

CYCLOPTERUS LUMPUS L. 'Lump sucker; Sea Hen; Hen-fish; Lump.'
W.D. 1886—Inner Solway to the mouth of the Eden; R.S. 1896; H.S.G. 1912; J.G.G. 1921—Luce Bay, Wigtown Bay; A.B. 1930—Cree estuary.
E.J.P. 1964—Taken in poke-nets at Seafield (35206644), trawled at Stenor Scar and thrown up at Balcary Bay (25821493).

LIPARIS LIPARIS (L.) 'Sea Snail.'
[LIPARIS VULGARIS]
H.S.G. 1912; J.G.G. 1921—Cree estuary; E.J.P. 1970—taken off St Bees Head.

LIPARIS MONTAGUI (Donovan) 'Montagu's Sea Snail.'
H.S.G. 1912.
E.J.P. 1964, 1970—Taken at Robin Rigg, Workington Bank and off St Bees Head.

SPINACHIA SPINACHIA (L.) 'Sea Stickleback; Fifteen-spined Stickleback.'
[GASTEROSTEUS SPINACHIA]
R.S. 1896; H.S.G. 1912 — taken at the foot of the Nith; J.G.G. 1921 — Cree estuary.
E.J.P. 1964—Taken by trawl off Borron Point.

Order HETEROSOMATA

SCOPHTHALMUS MAXIMUS (L.) 'Turbot.'
[RHOMBUS MAXIMUS]
R.S. 1896; H.S.G. 1912; J.G.G. 1921—Luce Bay.
E.J.P. 1964—trawled in small numbers, off Borron Point, off Robin Rigg, at Port Ling and Workington Bank.

SCOPHTHALMUS RHOMBUS (L.) 'Brill.'
[RHOMBUS LAEVIS]
H.S.G. 1912; J.G.G. 1921—Luce Bay.
E.J.P. 1964, 1970 — trawled, in small numbers, off Silloth, at Ellison Scar, Port Ling, Workington Bank and Two Feet Bank.

ZEUGOPTERUS PUNTCTATUS (Bloch) "Topknot; Common Topknot"
H.S.G. 1912; J.G.G. 1921 — Wigtown Bay.

ARNOGLOSSUS LATERNA (Walbaum) "Scaldfish"
B.B.R. 1955 — Luce Bay.

LIMANDA LIMANDA (L.) "Dab"
R.S. 1896; H.S.G. 1912; J.G.G. 1921; A.B. 1930 — Cree estuary.
A.D.M. 1955 — trawled in Kirkcudbright Bay and off the coast east to Balcary Point.
E.J.P. 1964, 1970 — widespread, and often abundant distribution, downstream from Newbie.

PLATICHTHYS FLESUS (L.) "Flounder; Fluke"
H.S.G. 1912; J.G.G. 1921 — Luce Bay and Wigtown Bay; A.B. 1930 — Cree

estuary; E.H. 1949 — off the Cumberland coast; A.D.M. 1955 — Kirkcudbright Bay, and offshore east to Balcary Point.
E.J.P. 1964, 1970 — widespread and often abundant distribution, from the Inner Solway to the Bay of Luce. It has been observed, in the R.Annan, in fresh-water above the tidal limit.

PLEURONECTES PLATESSA L. "Plaice"
R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Luce Bay, Wigtown Bay; A.B. 1930 — Cree estuary; E.H. 1949 — off the Cumberland coast; A.D.M. 1955 — Luce Bay, Wigtown Bay, Kirkcudbright Bay and offshore east to Balcary Point.
E.J.P. 1964, 1970—Widespread and often abundant distribution, downstream of Newbie. This species probably more than any other has responded to the influence of the continued sedimentation in the Inner Solway, formerly it was taken in commercial quantities at Dornock Scar, i.e. to the east of the old Bowness-Seafield viaduct, but is now only taken in such quantities in the winter fishery off Borron Point and Southerness Point, and in the Outer Solway.

MICROSTOMUS KITT (Walbaum) 'Lemon Sole; Smear Dab; Merry Sole.'
R.S. 1896; H.S.G. 1912; A.D.M. 1955—Luce Bay and Wigtown Bay.
M.N.M. 1960—off Maryport.
E.J.P. 1964—Occasional specimens taken in Allonby Bay.

GLYPTOCEPHALUS CYNOGLOSSUS (L.) 'Witch; Pole Dab.'
[PLEURONECTES CYNOGLOSSUS]
J.G.G. 1921—Wigtown Bay.
E.J.P. 1964, 1970—Occasional specimens taken on Workington Bank, Three Fathom Bank and Two Feet Bank.

HIPPOGLOSSOIDES PLATESSOIDES (Fabricius) 'Long Rough Dab; Rough Dab.'
J.G.G. 1921—Luce Bay, Wigtown Bay.

HIPPOGLOSSUS HIPPOGLOSSUS (L.) 'Halibut.'
R.S. 1896; J.G.G. 1921—Luce Bay.

PEGUSA LASCARIS (Risso) 'Sand Sole; French Sole.'
[SOLEA LASCARIS]
H.S.G. 1912; B.B.R. 1955—rare in the Solway, taken off the Wigtownshire coast.

SOLEA SOLEA (L.) 'Sole; Dover Sole.'
[SOLEA VULGARIS]
H.S.G. 1912; J.G.G. 1921 — Luce Bay.
E.J.P. 1964 — The younger stages were of widespread and common distribution throughout the Solway downstream of Newbie. More adult stages were characteristically associated with more muddy bottoms off the Kirkcudbright coast around the Abbey Head.

BUGLOSSIDIUM LUTEUM (Risso) 'Solenette.'
[SOLEA LUTEA, MICROCHIRUS BOSCANION]
B.B.R. 1955 — Locally abundant in Luce Bay; A.D.M. 1955 — Luce Bay and Wigtown Bay.

E.J.P. 1970 — Frequently abundant in trawls taken from Workington Bank to St. Bees Head.

Order PLECTOGNATHI

MOLA MOLA (L.) 'Sunfish.'

[ORTHAGORISCUS MOLA]

H.S.G. 1912; J.G.G. 1921 — Innerwell, Wigtown Bay; B.B.R. 1955 — Port Ling 22.9.1900.

Order XENOPTERYGII

DIPLECOGASTER BIMACULATA (Bonnaterre). 'Two-spot Sucker; Two-spotted Clingfish.'

[LEPADOGASTER BIMACULATUS]

J.G.G. 1921.

Order PEDICULATI

LOPHIUS PISCATORIUS L. 'Angler-fish; Monkfish; Frogfish; Fishing-frog.'

R.S. 1896; H.S.G. 1912; J.G.G. 1921 — Wigtown Bay; A.B. 1930 — Wigtown Bay and Cree estuary; E.J.P. 1970 — occasionally common between Siddick and St. Bees Head.

CHLOROPHYTA

ALGAE

ULVACEAE

ULVA LACTUCA (L.) 'Sea lettuce, Green Laver.'

E.J.P. 1964, 1970 — widely distributed on intertidal rocky substrata downstream of Browhouses (R83); it occurs in greater abundance where fresh water crosses the shore.

ENTEROMORHPHA spp.

The species of this genus are difficult to separate, and the distribution of the genus only is recorded.

G.F.S.E. 1919 — the Nith estuary north of a line drawn from Airds Point, Kirkcudbrightshire to Sea Point, Dumfriesshire.

E.J.P. 1964, 1970 — widely distributed at upper shore levels throughout the Solway area.

CLADOPHORACEAE

CLADOPHORA RUPESTRIS (L.) Kütz.

E.J.P. 1964, 1970 — this species occurs throughout the year in variable abundance, from ca. M.T.L. downwards, on rocky and stony substrata and rock pools downstream of Powfoot (R75).

PHAEOPHYTA

DICTYOSIPHONACEAE

DICTYOSIPHON FOENICULACEUS (Huds.) Grev.

E.J.P. 1970—Recorded from Maryport, Drummore, Luce Bay (R200).

CHORDACEAE

CHORDA FILUM (L.) Stackh. 'Sea lace, Dead Men's Ropes, Mermaids Tresses, Cat Gut'.

E.J.P. 1964, 1970 — This distinctive annual occurs at Maryport, Luce Bay,

Isle of Whithorn, Wigtown Bay and Abbey Burnfoot (R.30). The name 'Dead Men's Ropes' derives from the fact it has been known to entangle swimmers.

LAMINARIACEAE

LAMINARIA DIGITATA (Huds.) Lamour. 'Tangle'

A.D.M. 1955 — Luce Bay

E.J.P. 1970 — Abundant at Maryport, Drummore, Luce Bay, (R.200) and at Beckfoot (R103).

LAMINARIA SACCHARINA (L.) Lamour 'Sea Belt'.

A.D.M. 1955 — Luce Bay.

E.J.P. 1970 — On the north shore this species occurs from the Mull of Galloway to Abbey Burnfoot (R.30) on the south shore around St Bees Head and at Beckfoot (R.103).

The **Laminaria** spp. or 'Oarweeds' have long been known for their usefulness. In earlier times they were used as a source of iodine and in the present century their derivatives have found a wide variety of uses, e.g. in making ice-cream.

FUCACEAE

FUCUS SERRATUS (L.) 'Toothed Saw or Serrated Wrack'.

E.J.P. 1970 — It occurs in variable abundance on the lower levels of rocky shores downstream from Southerness Point on the north shore. On the south shore suitable substrata are rarely present in the zone normally occupied by this species: it is therefore distributed intermittently from Maryport to St. Bees, wherever sand is replaced by rocky substrata near the low water mark.

FUCUS VESICULOSUS L. 'Bladder wrack.'

E.J.P. 1964, 1970 — Widespread and variable abundance which depends on the presence of a suitable substratum. It has been recorded in the middle shore downstream from Port Carlisle.

FUCUS SPIRALIS L. 'Spiral or Flat wrack.'

E.J.P. 1964, 1970 — Widespread, and often abundant, distribution which depends on the presence of a suitable substratum ca. M.H.W.N.T. downstream from Browhouses (R83).

FUCUS CERANOIDES L. 'Horned wrack.'

This species requires a brackish water habitat, and is found only where a constant supply of fresh water is mixed with the sea water. Unlike the preceding three species it does not occupy a particular zone. However, it penetrates far upstream both in the Solway and its tributary estuaries where it grows attached to stones in the stream bed. It occurs on the stream bed as far upstream as Browhouses (R83) in the Solway itself, to Glencaple (R70) in the Nith where it also grows on the jetty, to Gardenreach (R44) in the Urr, to Tongland Bridge (R25) in the Dee and to the Fleet Water (R13). On the open shore it occurs in the presence of fresh water run out at Port Carlisle (R90), at Abbey Burnfoot (R30), Manxman's Lake (R29), Brighouse Bay (R17) and Sandhead, Luce Bay (R1).

ASCOPHYLLUM NODOSUM (L.) Le Jol. 'Knotted Wrack.'

E.J.P. 1964, 1970 — Widespread and often abundant distribution which depends

upon the presence of a suitable substratum, around the mid tide level, from Bowness (R91) downstream. The alga grows best upon rocks which are sheltered from heavy wave action. At Balcary Point (R31) which is moderately exposed to wave action, the fronds are reduced to short straps which lack the characteristic egg-shaped bladders.

PELVETIA CANALICULATA (L.) Decne et Thur. 'Channeled Wrack.'

E.J.P. 1964, 1970 — Widespread and often abundant, distribution which depends on the presence of a suitable substratum, ca., M.H.W.S.T., from Seafield (R80) downstream.

CYSTOSEIRACEAE

HALIDRYS SILIQUOSA (L.) Lyngb. 'Sea Oak.'

E.J.P. — Abundant at Maryport, Drummore, Luce Bay (R200), and the Isle of Whithorn (R201).

RHODOPHYTA

BANGIACEAE

PORPHYRA UMBILICALIS (L.) Kutz. 'Purple Laver.'

The alga has a cosmopolitan distribution and is used widely as a source of food. Laver bread, prepared from **Porphyra** collected on the coast of Cumberland, is sold in South Wales where it is coated with oat-meal and fried with bacon. In the Solway Firth, it has a widespread distribution, which depends upon the presence of a suitable substratum, from East Cote, Silloth (R101) downstream.

ACROCHAETIACEAE

RHODOCHORTON FLORIDULUM (Ag.) Näg.

E.J.P. — Recorded from Abbey Burnfoot (R30).

GIGARTINACEAE

GIGARTINA STELLATA (Stackh.) Batt.

This is the only red alga to be harvested in significant amounts in the U.K. During World War II it was used to produce the agar necessary for bacterial cultures: a necessary substitute as supplies previously came from Japan.

In the Outer Solway Firth it has a widespread but scattered distribution; on the south shore it extends as far upstream as Maryport. It seems to be much less abundant on the north shore but it has been recorded from Philip and Mary, Luce Bay (R204), and the Isle of Whithorn (R201) and Auchenlarie, Wigtown Bay (R203).

CHONDRUS CRISPUS (L.) (Stackh.) 'Carragheen'

Whereas **Gigartina stellata** grows on and may cover considerable areas of rock, or bound shingle, around the L.W.M., **Chondrus crispus** grows on stones in pools of the lower shore and sub-littoral. It has been recorded from the north shore only: at Maryport, Drummore (R200); Auchenlarie, Wigtown Bay (R203) and Abbey Burnfoot (R30). Presumably this difference in distribution of these similar species is a reflection of the different habitat privided on the two shores, but clearly further records would help to clarify the position.

DUMONTIACEAE

DUMONTIA INCRASSATA (Müll) Lamour.

E.J.P. — Recorded in successive years, from 1965-1970, attached to stones and pebbles towards the L.W.M. between Flimby (R61) and Siddick (R110). This annual may be abundant here in spring and early summer.

CORALLINACEAE

CORALLINA OFFICINALIS L.

E.J.P. 1964, 1970 — Widespread occurrence in rock pools from M.T.L. downwards on suitable shores in the Outer Solway. In variable abundance, it extends from Maryport, Drummore (R200) to Port o' Warren (R55) on the north shore, and St. Bees Head to Maryport on the south shore.

LITHOPHYLLUM INCRUSTANS Phillipi.

E.J.P. 1964, 1970 — Recorded in rock pools from M.T.L. downwards in the Outer Solway: downstream from Abbey Burnfoot (R30) on the north shore; it has been recorded from Workington (R115) and Flimby (R61).

RHODYMENIACEAE

RHODYMENIA PALMATA (L.) Grev. 'Dulse.'

E.J.P. 1970 — This species grows as an epiphyte upon **Laminaria** and **Fucus serratus** at Abbey Burnfoot (R30) and Isle of Whithorn (R201).

CERAMIACEAE

CERAMIUM RUBRUM (Huds.) Ag.

E.J.P. 1970 — Recorded from Maryport, Drummore (R200), and Flimby (R61).

DELESSERIACEAE

DELESSERIA SANGUINEA (Huds.) Lamour.

E.J.P. 1970 — Abundant on stony ground below L.W.M. in Moss Bay.

RHODOMELACEAE

POLYSIPHONIA LANOSA (L.) Tandy.

E.J.P. 1964, 1970 — Abundant on **Ascophyllum nodosum** only in situations of moderate wave action; absent in sheltered situations — widespread in the Outer Solway area and its tributary estuaries.

Class BACILLARIOPHYCEAE

Order BACILLARIALES

Sub-order DISCINEAE

COSCINODISCUS LINEATUS Ehr.

E.J.P. 1964 — Recorded from Hestan Rack (R38) and Spring Stones (R53).

COSCINODISCUS RADIATUS Ehr.

E.J.P. 1964 — Recorded from Spring Stones (R53).

ACTINOPTYCHUS SENARIUS Ehr.

E.J.P. 1964 — Recorded from Hestan Rack (R38), Kippford (R50) and Spring Stones (R53).

Sub-order ARAPHIDINEAE

RHAPONEIS AMPHICEROS Ehr.

E.J.P. 1964 — Recorded from Hestan Rack (R38).

N.B. Taylor (1880-81) produced a list of fresh-water and marine diatoms found

in the Whitehaven-St Bees area. However, authorities, synonyms and distribution are often uncertain, and these records are not included in the current work.

ANGIOSPERMAE
DICOTYLEDONES
ARCHICHLAMYDEAE
RANALES
RANUNCULACEAE

RANUNCULUS ACRIS L. 'Meadow Buttercup.'
[**RANUNCULUS ACER** anet. plur.]
W.L.M. 1927 — On the merse of the R. Nith.
RANUNCULUS FLAMMULA L. 'Lesser Spearwort'.
W.L.M. 1927 — On the merse of the R. Nith.

RHOEADALES
PAPAVERACEAE

GLAUCIUM FLAVUM Crantz 'Yellow Horned-Poppy.'
[**GLAUCIUM LUTEUM** Crantz, **CHELIDONIUM GLAUCIUM** L.]
W.H. 1889 — Near Workington; G.F.S.E. 1896 — recorded on many shores from Barnkirk Point to Luce Bay; D.S. 1925.
E.J.P. 1970 — This inhabitant of shingle was recorded from Workington (R115) It appears to be less abundant now than in earlier times.

FUMARIACEAE

FUMARIA OFFICINALIS L. 'Common Fumitory.'
D.S. 1925 — recorded from the shores of Luce Bay.

CRUCIFEREAE

RHYNCHOSINAPIS MONENSIS (L.) Dandy. 'Isle of Man Cabbage.'
[**SISYMBRIUM MONENSE** L., **BRASSICELLA MONENSIS** (L.) O.E. Schulz]
W.H. 1886 — the Cumberland coast around Whitehaven, and between Dubmill and Grune Point; G.F.S.E. 1896 — the Dumfries coast between Powfoot and Torduff Point.
RAPHANUS MARITIMUS Sm. 'Sea Raddish.'
W.H. 1886 — the Cumberland coast around Whitehaven.
CRAMBE MARITIMA L. 'Sea Kale.'
G.F.S.E. 1896 — Auchencairn Bay, Kirkcudbright Bay, Cree estuary and Wigtown Bay.
E.J.P. 1970 — this inhabitant of shingle was recorded at Abbey Burnfoot (R30), to the north of Workington Harbour (R115) and around Cunning Point, near Lowca, Cumberland. At the last situation it may be abundant.
CAKILE MARITIMA Scop. 'Sea Rocket.'
[**BUNIAS CAKILE** L.]
W.H. 1886 — from the shores of Allonby Bay and around Whitehaven; G.F.S.E. 1896 — around Newbie, the Nith estuary, around Southerness Point, the Cree estuary, Wigtown Bay and Luce Bay; D.S. 1925 — Luce Bay.
CORONOPUS SQUAMATUS (Forsk.) Aschers. 'Swine-cress, Wart-cress.'

[COCHLEARIA CORONOPUS L.; **SENEBIERA CORONOPUS** (L.) Poir., **CORONOPUS PROCUMBENS; C. RUELLI** All.]
G.F.S.E. 1896 — Luce Bay, Kirkcudbright Bay.
COCHLEARIA OFFICINALIS L. 'Scurvy-grass'.
W.H. 1886 — recorded from St Bees Head to Workington; G.F.S.E. 1896 — recorded between Torduff Point and Barnkirk Point, and the Nith estuary; D.S. 1925 — the Cree estuary; W.L.M. 1927 — the Nith estuary.
E.J.P. 1964, 1970 — widespread and often common especially on the merselands of the Scottish shore and the grass marsh of the English shore downstream from Easton (R88) there are no records available for Rockcliffe Marsh, but in view of its nature it seems unlikely that **C. officinales** is not a resident.
EROPHILA VERNA (L.) Chevall. 'Whitlow Grass'
W.H. 1886 — shores of Allonby Bay.

VIOLALES
VIOLACEAE

VIOLA CANINA L. 'Heath Violet'
D.S. 1925 — Luce Bay.
VIOLA TRICOLOR L. 'Wild Pansy'
D.S. 1925 — Luce Bay.

CENTROSPERMAE
CARYOPHYLLACEAE

SILENE MARITIMA With. 'Sea Campion'
W.H. 1886 — present everywhere on the South shore of the Solway; D.S. 1925 — Luce Bay and Wigtown Bay.
E.J.P. 1964, 1970 — widespread distribution at high water mark on stony shores and where coarser sediments are present near the H.W.M. of salt marshes; recorded limit of penetration is Bowness (R91).
CERASTIUM ATROVIRENS Bab. 'Dark-green Mouse-ear Chickweed.'
[CERASTIUM TETRANDRUM Curt.]
W.H. 1886 — around Whitehaven.
CERASTIUM SEMIDECANDRUM L. 'Little Mouse-ear Chickweed.'
W.H. 1886 — around Allonby Bay.
STELLARIA MEDIA (L.) Vill. 'Chickweed.'
[ALSINE MEDIA L.]
G.F.S.E. 1896.
HONKENYA PEPLOIDES (L.) Ehrh. 'Sea Sandwort.'
[ARENARIA PEPLOIDES L.]
W.H. 1886 — abundant everywhere on the south shore of the Solway; G.F.S.E. 1896 — recorded from the Nith upstream to the east of Torduff Point; D.S. 1925 — Luce Bay.
E.J.P. 1964, 1970 — Widespread distribution throughout the Solway area.
SPERGULARIA RUBRA (L.) J. and C. Presl 'Sand-spurrey.'
[ARENARIA RUBRA L.; **A. CAMPESTRIS** auct.; **BUDA RUBRA** (L.) Dum.]
W.H. 1889 — Distributed along the whole Cumberland coast upstream from

St. Bees Head; G.F.S.E. 1896 — recorded from the Dumfries shore east of Barnkirk Point; Auchencairn Bay, Kirkcudbright Bay, Wigtown Bay and Luce Bay.

SPERGULARIA MARINA (L.) Griseb.

[**S.SALINA** J. and C. Presl]

D.S. 1925 — Luce Bay, Wigtown Bay; W.L.M. 1927 — the Nith estuary.

CHENOPODIACEAE

CHENOPODIUM VULVARIA L. 'Stinking Goosefoot.'

[**C.OLIDUM** Curt.]

G.F.S.E. 1896 — Kirkcudbright Bay.

BETA VULGARIS L. 'Beet.'

W.H. 1889 — around Allonby Bay and Whitehaven; G.F.S.E. 1896 — Cree estuary.

ATRIPLEX LITTORALIS L. 'Shore Orache.'

W.H. 1889 — shores of Allonby Bay and around Whitehaven

ATRIPLEX HASTATA L. 'Hastate Orache.'

[Incl. **A. DELTOIDEA** Bab.]

W.H. 1889 — recorded between Dubmill Point and Harrington.

ATRIPLEX GLABRIUSCULA Edmondst. 'Babington's Orache.'

[Incl. **A.BABINGTONII** Woods.]

W.H. 1889 — recorded between Dubmill and St. Bees Head.

ATRIPLEX PATULA L. 'Iron-root, Common Orache.'

G.F.S.E. 1896 — the Dumfriesshire shore upstream of Barnkirk Point; D.S. 1925 — Luce Bay, Wigtown Bay; W.L.M. 1927 — the Nith estuary.

ATRIPLEX LACINIATA L. 'Frosted Orache.'

[**A.SABULOSA** Rouy; **A.ARENARIA** Woods, non Nutt.]

W.H. 1889 — recorded along the Cumberland shore between Grune Point and St. Bees Head.

HALIMIONE PORTULACOIDES (L.) Aell. 'Sea Purslane.'

[**ATRIPLEX PORTULACOIDES** L.; **OBIONE PORTULACOIDES** (L.) Moq.]

G.F.S.E. 1896 — Wigtown Bay, Luce Bay.

E.J.P. 1964 — confined to the margins of creeks in the merse at Southwick (R58), Glen Isle (R41) and Kippford (R49).

SUAEDA MARITIMA (L.) Dum. 'Herbaceous Seablite'

G.F.S.E. 1896 — recorded along the Scottish Coast from Luce Bay to Southwick Merse; D.S. 1925—Luce Bay, Wigtown Bay; W.L.M. 1927—the Nith estuary.

SALSOLA KALI L. 'Saltwort'.

W.H. 1889; G.F.S.E. 1896 — Luce Bay, Kirkcudbright Bay and from the Nith estuary east to Barnkirk Point; D.S. 1925 — Luce Bay.

SALICORNIA EUROPAEA L. 'Glasswort, Marsh Samphire.'

[**S. HERBACEA** (L.) L., ? **S. STRICTA** Dum.]

W.H. 1889 — Bowness Marshes and around Workington; G.F.S.E. 1896 — recorded from Southwick, the Urr Water, Auchencairn Bay, Kirkcudbright Bay

and Wigtown Bay; G.F.S.E. 1919, W.L.M. 1927 — the Nith estuary; D.S. 1925 — Luce Bay.

SALICORNIA spp. 'Glasswort, Marsh Samphire'

J.R.M. 1962 — Moricambe.

E.J.P. 1964, 1970 — Generally stunted in form and occurs as a distinct zone in a few places only; it appears to be best developed in active areas of deposition e.g. to the west of Southwick Merse at Marbruie (R57). Distribution widespread in the Inner Solway in the outer edges of the grass marshes; in the Rough Firth and Urr Water, in the Dee estuary and the Fleet estuary.

GERANIALES

GERANIACEAE

GERANIUM SANGUINEUM L. 'Bloody Cranesbill'

W.H. 1886 — abundant everywhere on the south shore of the Solway, especially between Dubmill Point and Grune Point, and around Workington.

E.J.P. 1970 — abundant at St Bees Head; found from here north to Parton.

GERANIUM PURPUREUM Vill.

D.S. 1925 — Luce Bay.

ERODIUM MARITIMUM (L.) L', **Herit.** 'Sea Storksbill'

G.F.S.E. 1896 — Luce Bay, Wigtown Bay

ERODIUM CICUTARIUM (L.) L'Hérit.

W.H. 1886; G.F.S.E. 1896 — Luce Bay, Wigtown Bay and from Southwick to Torduff Point.

LEGUMINOSAE

PAPILIONACEAE

ULEX EUROPAEUS L. 'Furze, Gorse, Whin'.

E.J.P. 1964, 1970 — Widespread distribution around E.H.W.M.S.T. on grass marshes and in dune lands.

SAROTHAMNUS SCOPARIUS (L.) Wimmer ex Koch 'Broom'

[CYTISUS SCOPARIUS (L.) Link]

W.H. 1886.

ONONIS REPENS L. 'Restharrow'

[O. ARVENSIS auct.]

W.H. 1886 — found along the whole southern shore of the Solway, most abundant between Dubmill Point and Grune Point; D.S. 1925 — Luce Bay.

ONONIS SPINOSA L. 'Restharrow'

[ONONIS CAMPESTRIS Koch and Ziz]

W.H. 1886 — everywhere on the southern shore of the Solway.

ONONIS RECLINATA L. 'Small Restharrow'

D.S. 1925 — Luce Bay.

ANTHYLLIS VULNERARIA L. 'Kidney-vetch, Ladies' Fingers'.

W.H. 1886.

LOTUS CORNICULATUS L. 'Birdsfoot-trefoil, Bacon and Eggs'

W.H. 1886 — widespread on the south shore of the Solway; G.F.S.E. 1919,

W.L.M. 1927 — Nith estuary.
ASTRAGALUS DANICUS Retz. 'Purple Milk-vetch'
[A.HYPOGLOTTIS auct., non L.]
G.F.S.E. 1896 — Luce Bay, Wigtown Bay.
VICIA SYLVATICA L. 'Wood Vetch'
W.H. 1886 — around Workington and Whitehaven; D.S. 1925 — Luce Bay.
VICIA LUTEA L. 'Yellow Vetch'
G.F.S.E. 1896 — Wigtown Bay.

ROSALES
ROSACEAE

RUBUS CAESIUS L. 'Dewberry'
G.F.S.E. 1896 — Kirkcudbright Bay, the mouth of the Urr and Auchencairn Bay, and the estuary of the Nith.
POTENTILLA ANSERINA L. 'Silverweed'
G.F.S.E. 1896; G.F.S.E. 1919, W.L.M. 1927 — the Nith Estuary; D.S. 1925 — Luce Bay.
E.J.P. 1970 — widely distributed throughout the Solway area.
ROSA PIMPINELLIFOLIA L. 'Burnet Rose'
W.H. 1886; G.F.S.E. 1896 — the Nith estuary; D.S. 1925 — Luce Bay.
E.J.P. 1970 — Brighouse Bay (R17) and between Cross Canonby (R62) and Allonby South (R63) where it grows abundantly.
PRUNUS SPINOSA L. 'Blackthorn Sloe'
D.S. 1925 — Luce Bay.

CRASSULACEAE

SEDUM TELEPHIUM L. 'Orpine, Livelong'
W.H. 1886 — around St Bees Head.
SEDUM ANGLICUM Huds. 'English Stonecrop'
W.H. 1886 — around Allonby Bay and north to Bowness; G.F.S.E. 1886 — around Newbie; D.S. 1925 — Luce Bay; E.J.P. 1964 — Glen Black Stone (R43), Urr Water, and Grune Point (R100), Isle of Whithorn (R201).
SEDUM ACRE L. 'Wall-pepper'
W.H. 1886 — around Allonby Bay and Workington; G.F.S.E. — around Newbie and to the east of Torduff Point; D.S. 1925 — Luce Bay.
E.J.P. 1970 — widely distributed, and sometimes abundant, throughout the Solway area.

SAXIFRAGACEAE

SAXIFRAGA TRIDACTYLITES L. 'Rue-leaved Saxifrage'
W.H. 1886.
SAXIFRAGA GRANULATA L. 'Meadow Saxifrage'
W.H. 1886.

UMBELLALES
UMBELLIFERAE

ERYNGIUM MARITIMUM L. 'Sea Holly'

W.H. 1889 — plentiful everywhere on the south side of the Solway; G.F.S.E. 1896 — around Newbie, Southwick, the Dee estuary and Kirkcudbright Bay, Wigtown Bay and Luce Bay; D.S. 1925 — Luce Bay.
E.J.P. 1964 — Brighouse Bay; E.J.P. 1970 — occurs widely on the south shore of the Solway, especially between Grune Point and Workington, but it cannot be described as plentiful. It may therefore have declined since 1889.

APIUM GRAVEOLENS L. 'Wild Celery'
W.H. 1889—Moricambe, and around Workington.

CRITHMUM MARITIMUM L. 'Rock Samphire'
W.H. 1889—around Whitehaven; G.F.S.E. 1896—the Nith estuary, around the mouth of the Rough Firth, Auchencairn Bay, Kirkcudbright Bay, Wigtown Bay and Luce Bay.
D.S. 1925—Luce Bay.

OENANTHE LACHENALII C.C. Gmel. 'Parsley Water Dropwort'
W.L.M. 1927—the Nith estuary.

LIGUSTICUM SCOTICUM L. 'Lovage'
G.F.S.E. 1896—Wigtown Bay.

ANGELICA SYLVESTRIS L. 'Wild Angelica'
W.H. 1889—around Maryport and Workington.

DAUCUS CAROTA L. 'Wild Carrot'
W.H. 1889—found along the whole south shore of the Solway; G.F.S.E. 1896—around Newbie and to the east of Torduff Point, in Wigtown Bay and Luce Bay.

EUPHORBIALES

EUPHORBIACEAE

EUPHORBIA PARALIAS L. 'Sea Spurge'
W.H. 1889 — around Workington.

POLYGONALES

POLYGONACEAE

POLYGONUM AVICULARE L.
[**P.HETEROPHYLLUM** Lindm., **P.LITTORALE** auct., p.p.]
W.H. 1889.

POLYGONUM RAII Bab. 'Ray's Knotgrass'
W.H. 1889.

POLYGONUM MARITIMUM L. 'Sea Knotgrass'
G.F.S.E. 1896 — Dumfries shore to the east of Barnkirk Point, Wigtown Bay and east Luce Bay.

RUMEX CRISPUS L. 'Curled Dock'
[Incl. **R.ELONGATUS** Guss.]
W.H. 1889 — found along the whole south shore of the Solway; D.S. 1925 — Luce Bay; E.J.P. 1970 — Allonby (R63), Auchencairn Bay.

RUMEX OBTUSIFOLIUS L. 'Broad-leaved Dock'
W.H. 1889 — found along the whole south shore of the Solway.

RUMEX SANGUINEUS L. 'Red-veined Dock'
[**R.CONDYLODES** Bieb., **R.NEMOROSUS** Schrad. ex Willd.]

W.H. 1889 — found between Grune Point and St Bees Head; G.F.S.E. 1896.

SALICALES

SALICACEAE

SALIX REPENS L. 'Creeping Willow'

W.H. 1889; D.S. 1925 — Luce Bay.

E.J.P. 1964 — abundant on the dunes backing Mersehead Sands (R59).

METACHLAMYDEAE

ERICALES

ERICACEAE

VACCINIUM MYRTILLUS L. 'Bilberry, Blaeberry, Whortleberry, Huckleberry'

W.H. 1889 — at many stations along the south shore of the Solway.

PLUMBAGINALES

PLUMBAGINACEAE

LIMONIUM VULGARE Mill. 'Sea Lavender'

[STATICE LIMONIUM L.]

W.H. 1889 — Bowness marshes; G.F.S.E. 1889 — Nith estuary, the Rough Firth, Auchencairn Bay, the Dee estuary and Kirkcudbright Bay, Wigtown Bay and Luce Bay; D.S. 1925 — the Cree estuary and Wigtown Bay.

LIMONIUM BINERVOSUM (G.E. Sm.) C.E. Salmon. 'Rock Sea lavender'

[STATICE BINERVOSA G.E. Sm., **S.AURICULAEFOLIA** auct; **S.OCCIDENTALIS** Lloyd?]

W.H. 1889—around Whitehaven.

LIMONIUM spp.

E.J.P. 1964—recorded at a number of situations downstream from Bowness (R91): these include Skinburness Marsh (R99) and Grune Point (R100); at Glen Isle Marsh (R41), Garden Reach (R44), Craigbrex (R48) and Kippford Merse (R49) on Urr Water; Seaside (R35), Auchencairn Bay; Creetown Marshes and at Brighouse Bay (R17).

ARMERIA MARITIMA (Mill.) Willd. 'Thrift, Sea Pink'

[STATICE ARMERIA L.; **S.MARITIMA** Mill.]

W.H. 1889—along the Cumberland shore upstream of Maryport; G.F.S.E. 1896, 1919—the Nith estuary and upstream along the Dumfries shore; D.S. 1925—Luce Bay, the Cree estuary and Wigtown Bay; J.A.S. 1946—the Bowness shore; J.R.M. 1962—the Nith estuary and upstream in the main Solway Firth.

E.J.P. 1964, 1970—widely distributed in variable abundance, throughout the Solway area.

PRIMULALES

PRIMULACEAE

ANAGALLIS TENELLA (L.) L. 'Bog Pimpernel'

G.F.S.E. 1896—Wigtown Bay, around Castlehill Point and the Nith estuary.

ANAGALLIS ARVENSIS L. 'Scarlet Pimpernel, Shepherd's Weather-glass'

G.F.S.E. 1896 — Luce Bay, the Mersehead Sands and the Nith estuary, and to the east of Barnkirk Point.

GLAUX MARITIMA L. 'Sea Milkwort, Black Saltwort'
W.H. 1889 — Bowness and Moricambe Marshes, and around Workington; G.F.S.E. 1896, 1919, W.L.M. 1927 — Nith estuary; D.S. 1925 — Luce Bay and Wigtown Bay.
SAMOLUS VALERANDI L. 'Brookweed'
W.H. 1889 — Bowness marshes; G.F.S.E. 1896 — Luce Bay, Wigtown Bay, Kirkcudbright Bay, around Castlehill Point and the Nith Estuary; W.L.M. 1927 — the Nith estuary.

TUBIFLORAE

BORAGINACEAE

ANCHUSA ARVENSIS (L.) Bieb. 'Bugloss'
[**LYCOPSIS ARVENSIS** L.]
W.H. 1889 — Cumberland coast from Grune to St Bees; G.F.S.E. 1896 — Dumfriesshire coast between the Nith and the Annan; D.S. 1925 — Luce Bay.
MYOSOTIS ARVENSIS (L.) Hill. 'Common Forget-me-not'
W.H. 1889.
MERTENSIA MARITIMA (L.) S. F. Gray. 'Northern Shore-wort'
W.H. 1889 — from Allonby Bay to St Bees; G.F.S.E. 1896 — Luce Bay and Wigtown Bay; D.S. 1925 — Luce Bay.
ECHIUM VULGARE L. 'Viper's Bugloss'
W.H. 1889 — particularly around Workington.

CONVOLVULACEAE

CALYSTEGIA SOLDANELLA (L.) R.Br. 'Sea Bindweed'
W.H. 1889 — around Whitehaven and Workington; D.S. 1925 — Luce Bay.

SOLANACEAE

HYOSCYAMUS NIGER L. 'Henbane'
G.F.S.E. 1896—Wigtown Bay.

LABIATAE

SCUTELLARIA GALERICULATA L. 'Skull-cap'
D.S. 1925—Luce Bay.
TEUCRIUM SCORDIUM L. 'Water-Germander'
W.H. 1889—around Workington and Whitehaven; G.F.S.E. 1896—around Newbie.

PLANTAGINALES

PLANTAGINACEAE

PLANTAGO MARITIMA L. 'Sea plantain'
W.H. 1889; G.F.S.E. 1896—the Nith estuary and upstream to the east of Torduff Point; D.S. 1925—the Cree estuary and Wigtown Bay; W.L.M. 1927—the Nith estuary.
E.J.P. 1964—widely distributed throughout the Inner Solway, and on the north shore to Cassencarrie (R6), Cree estuary.
PLANTAGO CORONOPUS L. 'Buck's horn Plantain'
G.F.S.E. 1896—the Inner Solway, east of Barnkirk Point (R78); G.F.S.E. 1896, W.M. 1927—the Nith estuary.

CAMPANALES
CAMPANULACEAE

CAMPANULA ROTUNDIFOLIA L. 'Harebell, bluebell'
W.H. 1889.

RUBIALES
RUBIACEAE

GALIUM VERUM L. 'Lady's Bedstraw'
D.S. 1925—Luce Bay.
GALIUM APARINE L. 'Goosegrass, Cleavers, Hairif, Stickie Willie, Sweetheart'
G.F.S.E. 1896

VALERIANACEAE

VALERIANELLA LOCUSTA (L.) Betcke. 'Lamb's Lettuce, Corn Salad'
G.F.S.E. 1896 — Inner Solway to the east of Barnkirk Point and the Nith estuary.

ASTERALES
COMPOSITAE

SENECIO JACOBAEA L. 'Ragwort'
W.H. 1889; G.F.S.E. 1896.
SENECIO VISCOSUS L. 'Stinking Groundsel'
W.H. 1889.
SENECIO VULGARIS L. 'Groundsel'
W.H. 1889.
INULA CRITHMOIDES L. 'Golden Samphire'
G.F.S.E. 1896 — Nith estuary, Cree estuary and Wigtown Bay.
ASTER TRIPOLIUM L. 'Sea Aster'
W.H. 1889 — on the Cumberland coast from Bowness marshes and St Bees; G.F.S.E. 1896 — the Nith estuary, Southwick and Preston Merse, and Luce Bay; G.F.S.E. 1919, W.M. 1927 — Nith estuary; D.S. 1925 — the Cree estuary and Wigtown Bay.
E.J.P. 1964, 1970 — widely distributed in the grass merse downstream of Powfoot on the north shore, and among strong sand at Siddick (R110) on the south shore.
EUPATORIUM CANNABINUM L. 'Hemp Agrimony'
W.H. 1889 — around Workington; G.F.S.E. 1896 — the Nith estuary, around Castlehill Point and Kirkcudbright Bay.
TRIPLEUROSPERMUM MARITIMUM (L.) Koch. 'Scentless Mayweed'
[**MATRICARIA MARITIMA** L.; incl. **M.INODORA** L.]
W.H. 1889—abundant and conspicuous along southern coastline of the Solway; G.F.S.E. 1896—in areas upstream of Powfoot; D.S. 1925—Luce Bay and Wigtown Bay.
E.J.P. 1964, 1970—widely distributed throughout the Solway area.
ARTEMISIA MARITIMA L. 'Sea Wormwood'
G.F.S.E. 1896—the Dee estuary and Wigtown Bay; D.S. 1925—Wigtown Bay.

CARLINA VULGARIS L. 'Carline Thistle'
D.S. 1925—Luce Bay.
CARDUUS TENUIFLORUS Curt. 'Slender Thistle'
W.H. 1889—shores around Allonby Bay, and to the north.
CIRSIUM ARVENSE (L.) Scop. 'Creeping Thistle'
[**SERRATULA ARVENSIS** L.; **CARDUUS ARVENSIS** (L.) Hill.]
D.S. 1925—Luce Bay; W.M. 1927—the Nith estuary.
CENTAUREA NIGRA L. 'Lesser Knapweed, Hardheads'
W.L.M. 1927—Nith estuary.
HYPOCHOERIS RADICATA L. 'Cat's Ear'
W.H. 1889.
LEONTODON TARAXACOIDES (Vill.) Mérat. 'Hairy Hawkbit'
[**L. LEYSSERI** Beck; **CREPIS NUDICAULUS** auct; **THRINCIA HIRTA** Roth; **LEONTODON HIRTUS** auct, non L.]
G.F.S.E. 1896—Rough Firth.
SONCHUS ARVENSIS L. 'Field Milk-Thistle'
W.H. 1889.
SONCHUS OLERACEUS L. 'Milk or Sow-Thistle'
W.H. 1889.
CREPIS CAPILLARIS (L.) Wallr. 'Smooth Hawk's-beard'
[**C.VIRENS** L.]
G.F.S.E. 1919 — Nith estuary.
TARAXACUM LAEVIGATUM (Willd.) DC., sensu lato. 'Lesser-Dandelion'
[Sections **Erythrosperma** Dahlst. and **Obliqua** Dahlst.]
W.H. 1889 — Dune lands south of Silloth.

MONOCOTYLEDONES

NAJADALES

JUNCAGINACEAE

TRIGLOCHIN PALUSTRIS L. 'Marsh Arrow-grass'
W.H. 1885 — Moricambe.
TRIGLOCHIN MARITIMA L. 'Sea Arrow-grass'
W.H. 1885 — Moricambe; G.F.S.E. 1896 — an inhabitant of all grass merses upstream from the Nith estuary; D.S. 1925 — the Cree estuary and Wigtown Bay; W.L.M. 1927 — the Nith estuary.
E.J.P. 1964 — Bowness Marsh (R91), Craigbrex Merse (R48) and Kippford Merse (R49), Kirkchrist (R23), Dee estuary.

ZOSTERACEAE

ZOSTERA MARINA L. 'Eel-grass, Grass-wrack'
G.F.S.E. 1896 — the Dee estuary and Kirkcudbright Bay, the Nith estuary.
ZOSTERA NOLTII Hornem.
[**Z.NANA** Roth, p.p.]
G.F.S.E. 1896.
E.J.P. 1964, 1970 — in these surveys the **Zostera** Spp. have been noted under the general heading Zosterekum, and were recorded from the Rough Firth,

Auchencairn Bay, Sea ward Cottage (R20) and Manxman's Lake (R26, R27) in the Dee estuary, Airds Bay (R14) and Skyreburn Bay (R10), the Fleet estuary.

LILIIFLORAE

LILIACEAE

SCILLA VERNA Huds. 'Spring Squill'
G.F.S.E. 1896 — Kirkcudbright Bay and Wigtown Bay.

JUNCACEAE

JUNCUS COMPRESSUS Jacq. 'Round-fruited Rush'
W.L.M. 1927 — the Nith estuary.
JUNCUS GERARDII Lois. 'Mud Rush'
W.H. 1889 — around Workington.
JUNCUS BALTICUS Willd.
G.F.S.E. 1896 — Nith estuary.
JUNCUS MARITIMUS Lam. 'Sea Rush'
[**J. SPINOSUS** Auct., vix Forsk.]
G.F.S.E. 1896 — the Nith estuary, Southwick Merse, the Rough Firth, Kirkcudbright Bay and Luce Bay; W.L.M. 1927 — the Nith estuary.
JUNCUS SUBNODULOSUS Schrank. 'Blunt-flowered Rush'
[**J. OBTUSIFLORUS** Ehrh. ex Hoffm.]
G.F.S.E. 1896 — the Rough Firth, Kirkcudbright Bay, the Cree estuary and Luce Bay.
JUNCUS ARTICULATUS L. 'Jointed Rush'
[**J. LAMPOCARPUS** Ehrh. ex Hoffm.]
G.F.S.E. 1919, W.L.M. 1927 — the Nith estuary.
JUNCUS Spp.
D.S. 1925 — Wigtown Bay.
E.J.P. 1964, 1970 — widely distributed between Bowness Marsh (R91) and the Cree estuary (R6).

IRIDACEAE

IRIS FOETIDISSIMA L. 'Gladdon; Stinking Iris'
G.F.S.E. 1896 — the Kirkcudbright coast east of Kirkcudbright Bay.
IRIS PSEUDACORUS L. 'Yellow Flag'
W.H. 1889; G.F.S.E. 1896 — the Nith estuary; D.S. 1925 — Luce Bay.
E.J.P. 1964 — Auchencairn Bay (R35) and Southwick Merse (R58).

CYPERALES

CYPERACEAE

SCIRPUS MARITIMUS L. 'Sea Club-rush'
G.F.S.E. 1896 — upstream of Barnkirk Point, the Nith estuary, the Rough Firth and the Cree estuary; D.S. 1925 — Wigtown Bay.
SCHOENUS NIGRICANS L. 'Bog-rush'
G.F.S.E. 1896 — upstream of Torduff Point, Urr Water, Wigtown Bay and Luce Bay.

CAREX ARENARIA L. 'Sand Sedge'
W.H. 1889.

GLUMIFLORAE
GRAMINEAE

PHRAGMITES COMMUNIS Trin. 'Reed'
[**ARUNDO PHRAGMITES** L.]
W.L.M. 1927 — Nith estuary.
E.J.P. 1964, 1970 — widespread distribution at higher salt marsh levels. Recorded from Torduff Point (R82), Browhouses (R83); the Nith estuary; Kippford Merse (R49), where it increased between 1964 and 1970; the Fleet and Cree estuaries.
FESTUCA sp.
J.R.M. 1962—Caerlaverock Merse; the merse to the east of Barnkirk Point and Moricambe.
PUCCINELLIA MARITIMA (Huds.) Parl. 'Sea Poa'
[**GLYCERIA MARITIMA** (Huds.) Wahlberg.]
G.F.S.E. 1919; W.L.M. 1927—Nith estuary; D.S. 1925—the Cree estuary and Wigtown Bay; J.R.M. 1962—Caerlaverock and Nith merse.
AGROPYRON REPENS (L.) Beauv. 'Couch-grass; Scutch; Twitch'
D.S. 1925—Luce Bay; W.L.M. 1927—Nith estuary.
ELYMUS ARENARIUS L. 'Lyme-grass'
W.H. 1889—around Workington.
HORDEUM MURINUM L. 'Wall Barley'
W.H. 1889—around Workington.
AMMOPHILA ARENARIA (L.) Link. 'Marram Grass'
[**A.ARUNDINACEA** Host; **PSAMMA ARENARIA** (L.) Roem and Schult.]
G.F.S.E. 1896—Luce Bay; around Castlehill Point and from the Nith east towards Barnkirk Point; D.S. 1925—Luce Bay; J.A.S. 1946—dune lands between Dubmill Point and Silloth.
E.J.P. 1964/70—around Allonby Bay and the dunes between Dubmill Point and Silloth.
AGROSTIS sp.
G.F.S.E. 1919—Nith estuary; J.R.M. 1962—Nith estuary and upstream in the Inner Solway.
PARAPHOLIS STRIGOSA (Dum.) C.E. Hubbard 'Sea Hard-grass'
[**LEPIURUS STRIGOSUS** Dum.; **LEPTURUS FILIFORMIS** auct.; **PHOLIURUS FILIFORMIS** auct.]
G.F.S.E. 1896—the Nith estuary and east towards Barnkirk Point.
SPARTINA X TOWNSENDII H. and J. Groves 'Cord grass'
G.F.S.E. 1919—planted at unspecified locations, presumably in the Inner Solway; G.B. and L. 1959—the Fleet estuary and Fleet Bay, Auchencairn and Orchardton Bay, the Urr Water and the Rough Firth, Gillfoot Bay and Moricambe.
E.J.P. 1964/1970 — during the period 1961-1970, **S. Townsendii** increased its colonisation significantly in Auchencairn Bay. the Urr Water and Rough Firth.

At Kippford merse. in particular. a considerable invasion of the grass merse occurred. A colonisation first noticed to the west of Southwick Merse, in 1964, continued, and colonisation noted at Skyreburn Bay (R10) had extended considerably by 1970. By 1970, it had become established in a few clumps in the merse at Powfoot (R75).

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ADDENDA

The survey of the Solway Firth has continued since 1970 In this period Mr J. R. S. Gilchrist, Mr O. J. Abbott, Mr O. Ross and the author have recorded the following additional species at sites along the Cumberland coast between Dubmill Point and St Bees Head.

Coelenterata

Bougainvillia ramosa (Van Beneden)—Allonby Bay
Campanularia verticillata (L.)—Allonby Bay
Laomedea flexuosa Hincks—Allonby Bay
Kirchenpaueria sp.—off Whitehaven
Plumularia sp.—off Whitehaven
Bundoactis verrucosa (Pennant)—off Whitehaven

Annelida—Polychaeta

Harmothoë sp. — Allonby Bay
Lagisca extenuata (Grube) — Allonby Bay
Castalia punctata (O. F. Müller)—off Whitehaven
Nereis pelagica (L.)—Siddick (R110)
Glycera lapidum Quatrefages — off Whitehaven
Glycera capitata — off Whitehaven
Glycera sp. — Allonby Bay
Lumbriconereis sp. — off Whitehaven
Magelona papillicornis (O. F. Müller) — Allonby Bay
Ophelia sp. — Allonby Bay
Notomastus latericeus M. Sars — Allonby Bay
Capitella capitata (Fabricius) — Allonby Bay
Arenicola branchialis Audouin and Edwards — off Whitehaven
Amphitrite johnstoni Malmgren — Allonby Bay; Siddick (R110)
Bispira voluticornis (Montagu) — Allonby Bay

Gephyrea

Priapulus caudatus Lamarck — Workington Bank

Arthropoda—Crustacea
Verruca stroemia (O. F. Müller) — Allonby, Parton and Saltom Bays; Siddick (R110)
Orchonella nana (Krœyer) — Allonby Bay
Urothoë sp. — Allonby Bay
Talitrus saltator (Montagu) — sandy substrata at HWM on south shore
According to Dr S. McGrorty **Talorchestia** is present also
Orchestia gammarella (Pallas) and **O. mediterranea** A. Costa. **Orchestia** spp. are present both in the stony substrata and on the salt marshes of both shores of the Solway. Dr S. McGrorty has identified the latter species
Jassa falcata (Montagu) — Allonby Bay
Caprella sp. — off Dubmill Point
Schistomysis spiritus (Norman) — Allonby Bay
Schistomysis ornata (G. O. Sars) — off Dubmill Point
Nephrops norvegicus (L.) — one juvenile taken just south of Whitehaven harbour
Jaxea nocturna (Chiereghin) Nardo — off St. Bees Head
Arthropoda — Arachnida
Nymphon sp. — Allonby Bay
Pycnogonum sp. — off Whitehaven
Mollusca — Gastropoda
Patella aspera Lamarck — Cunning Point
Trivia monacha (da Costa) — Taken alive off St. Bees Head
Archidoris pseudoargus (Rapp) — Parton Bay
Mollusca — Lamellibrachia
Nucula turgida Leckenby and Marshall — off the Cumberland coast
Modiolus barbatus (L.) — Allonby Bay
Musculus marmoratus (Forbes) — Allonby Bay
Mysella bidentata (Montagu) — Allonby Bay
Mysia undata (Pennant) — off Whitehaven
Abra nitida (Müller) — off the Cumberland coast
Tellina fabula Gmelin — Shore at Beckfoot
Ensis ensis (L.) — Allonby Bay
Hiatella arctica (L.) — Allonby Bay; Siddick (R110)
Echinodermata — Ophiuroidea
Acronida brachiata (Montagu) — off Whitehaven

The pressure upon the grassy supra littoral which resulted from increased use for leisure and tourist activities and noted in 1969 has continued. This pressure has been most evident on the south shore where at Allonby South (R63) the short grass sward became replaced by a more open community characterised by yarrow, **Achillea millefolium**; here, by 1971, remedial measures, which included the restriction of car parking and reseeding of eroded areas, had to be undertaken. At Beckfoot, the sea-holly, **Eryngium inartimum,** seems to have declined markedly since 1970, apparently for the same reason.

RECORDS OF HEMIPTERA-HETEROPTERA FROM TYNRON NATIONAL NATURE RESERVE, DUMFRIESSHIRE

by

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Tynron Juniper Wood (NX 827927) has an area of about 12 acres and is situated on a steep south-east slope, between 280 and 440 feet above O.D. It was established to protect the extensive stand of Juniper (*Juniperis communis* L.), which is of special interest because of its density and because it includes both the scrub and tall, erect forms. The vegetation originally consisted almost entirely of Juniper, but in 1959 a two-acre semi-circle from the north-west boundary was accidentally destroyed by fire. Ratcliffe (in Huxley, 1960) recognised three main ground vegetation communities: (1) grassy areas with *Calluna vulgaris* (heath), (2) a bracken (*Pteridium aquilinum*) and bramble (*Rubus fruticosus*) community where there is a moderately dense cover of juniper and (3) a moss community in deep shade. The burnt area has become essentially of the first type. Here and there the presence of a few tall trees of ash (*Fraxinus excelsior*) and gean (*Prunus avium*) has caused the development of something approaching a woodland floor community. There is a small number of oak trees (*Quercus robur*). Huxley (1960) gives a general account of the junipers and their possible origins. Kerr (1968) describes work done on regeneration and management of juniper.

Twenty-five bug species were taken in a few hours' collecting at Tynron, a large proportion of them being associated with wasteland and grassland plants. Presumably, if juniper is permitted to regenerate in the area destroyed in the 1959 fire the number and abundance of such species can be expected to become reduced. This is not likely to be detrimental to the purpose of the reserve, and none of the species is of any exceptional interest. Only two species were found on juniper and neither can be regarded as having more than a casual relationship with the plant. This is not surprising, for the Heteropterous fauna of juniper in Britain is very restricted. The two species were *Loricula pselaphiformis* Curtis, which is associated with lichens on a wide range of trees, and *Atractotomus magnicornis* (Fallen), which occurs principally on spruce (Southwood and Leston, 1959).

In the following species list "the ride" refers to a strip of *Calluna*/grass vegetation running from top to bottom of the reserve about one-third of the way from its south-west end. The nomenclature and the order of species follow Kloet and Hincks (1964).

PENTATOMIDAE

Pentatoma rufipes (Linnaeus)—A single specimen was found resting on a grass stem in an open area at the northern end of the reserve.

LYGAEIDAE

Stignocoris pedestris (Fallen)—Several specimens were found at the top of the ride, and the bug was very common in open grassy areas at the north end of the reserve. In both cases most individuals were found in the cavities around the bases of grass tussocks. A single specimen was swept at the foot of the ride.

TINGIDAE

Tingis cardui (Linnaeus)—Many adults and larvae were found on thistles *(Cirsium)* wherever they grew. All the larvae were amongst the bracts of the inflorescences, whence they were dislodged with difficulty, while adults were seen on most of the upper parts of the plants.

NABIDAE

Nabis flavomarginatus Scholtz—A few specimens were swept from the area of more lush vegetation at the lower end of the ride.

CIMICIDAE

Temnostethus gracilis Horvath—A number were beaten from the lichen-covered lower branches of an oak at the top of the reserve.

Anthocoris confusus Reuter—This species was very common on the oaks.

Anthocoris nemorum (Linnaeus)—A few specimens were found on *Galeopsis tetrahit* at the top of the ride. The bug was also found on the oaks but was very much less common than *A. confusus.*

MICROPHYSIDAE

Loricula pselaphiformis Curtis—A single specimen was found by violently beating lichen-covered juniper branches.

MIRIDAE

Lopus decolor (Fallen)—A single specimen was swept from the middle part of the ride.

Atractotomus magnicornis (Fallen)—Three specimens were taken by violently beating lichen-covered branches of juniper.

Plagiognathus arbustorum (Fabricius)—A few were found by general sweeping at the lower end of the ride.

Plagiognathus chrysanthemi (Wolff)—Found together with the previous species, but in larger numbers.

Dicyphus stachydis Reuter—Adults and larvae were found in large numbers by sweeping a patch of *Stachys sylvatica* at the south-west end of the burnt area.

Dicyphus pallicornis (Meyer-Dur)—A number of larvae and one or two adults were found by looking below the leaves of foxgloves *(Digitalis purpurea)* at the north-west corner of the reserve. A few specimens were swept together with the last species in a mixed patch of woundwort and foxglove at the southern end of the reserve.

Orthotylus ericetorum (Fallen)—A small number were swept in the ride and a few were noticed while searching below *Calluna.*

Lygocoris pabulinus (Linnaeus)—A few were swept from the bottom end of the ride.

Calocoris sexguttatus (Fabricius) s. *insularis* Reuter—A single specimen was found by sweeping in an open area of grasses and bracken at the north end of the reserve.

Phytocoris tiliae (Fabricius)—Two were beaten from oak.

Stenodema calcaratum (Fallen)—This species was common in the damper grassy parts of the reserve.

Stenodema laevigatum (Linnaeus)—A few were swept at the lower end of the ride.

Stenodema holsatum (Fabricius)—Some specimens were found with the last species.

Leptoterna ferrugata (Fallen)—A few were swept at the lower end of the ride.

Leptoterna dolabrata (Linnaeus)—A single specimen was swept with the last

species. *Leptoterna* larvae (species undetermined) were abundant in open, grassy parts of the reserve.

My thanks are due to the Nature Conservancy for giving me the opportunity to visit their reserves in the Dumfries area and to Mr Langley Roberts for taking me to Tynron.

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A REVIEW OF THE STATUS OF THE BIRDS OF KIRKCONNELL FLOW NATIONAL NATURE RESERVE
(as in December, 1970)

by

J. G. YOUNG

The Nature Conservancy

Kirkconnell Flow National Nature Reserve (383 acres) was established as a reserve to safeguard the existing range of vegetation types from bog to pine and birch woodland. A detailed description of the habitat can be found in the management plan approved in January, 1962.

Unconfirmed records have been withheld. Arrangement and nomenclature conform closely with the Check List of the Birds of Great Britain and Ireland, 1952, except where subsequent advancement of knowledge has made revision necessary [see Ibis, 98:157-168 (1956)].

Explanation of terms

Average annual numbers of individuals are estimated thus:—

Abundant :	More than 1000
Common :	500-1000
Moderate numbers :	100-500
Small numbers :	10-100
Scarce :	1-10
Rare :	Fewer than 10 in 30 years

* indicates records pre-dating the declaration of the reserve

To achieve the maximum accuracy and comprehensiveness I would be grateful to have any errors or omissions brought to my notice. Additional records from 1971 onwards would be welcomed for future revision.

CLASSIFIED LIST

Little Grebe : Podiceps ruficollis

P. r. ruficollis. Rare; one found dead in main ditch January, 1963.

Heron : Ardea cinerea

A. c. cinerea. Formerly bred moved to Dalskairth ca. 1940. One pair bred 1969, 13 pairs bred 1970. Regularly present in small but varying numbers throughout the period. Most numerous after local dispersion.

Mallard : Anas platyrhynchos

A. p. platyrhynchos. Breeding resident; in small numbers. Annual winter visitor —up to 130 at times. In the early 1930s before the Carlin Loch became overgrown, food was provided for duck and attracted Mallard in moderate numbers.

Teal : Anas crecca

A. c. crecca. Scarce, though regular; autumn and winter visitor to ditches and pools.

Wigeon : Anas penelope

Rare; one record of 30 in 1969.

Pintail : Anas acuta
Scarce; not infrequent records—of single birds only in main ditch.

Scaup * : Aythya marila
A. m. marila. Rare; an adult drake shot 1934.

Tufted Duck * : Aythya fuligula
Rare; several records of birds being shot pre 1957.

Shelduck : Tadorna tadorna
Regular summer visitor; in small numbers. Breeding proved in 1967, 1969 and 1970 when there were five pairs.

Greylag Goose : Anser anser
The first breeding record for the county was from the Reserve but the species no longer breeds. Regular in varying numbers in late autumn and winter.

Pink-Footed Goose : Anser arvensis
A. a. brachyrhynchus. Regular in moderate numbers during late autumn and winter —at times staying up to 17th May.

Mute Swan : Cygnus olor
Scarce winter visitor. One dead, killed by wires 1969.

Whooper Swan : Cygnus cygnus
C. c. cygnus. Scarce winter visitor. Regularly noted in flight.

Golden Eagle : Aquila chrysaëtos
Rare; one on 14th December, 1969.

Buzzard : Buteo buteo
B. b. buteo. Has bred at least once ca. 1947-49. Scarce visitor, now irregular. Two trapped 1962 had been ringed in Lakeland.

Sparrowhawk : Accipiter nisus
A. a. nisus. Breeding at least by 1932 and continued up to 1940. Regularly shot. Failed breeding attempts in 1967, 1968 and 1969 (2 pairs). 2 broods reared 1970.

Merlin : Falco columbarius
Rare: one record 1970.

Kestrel : Falco tinnunculus
F. t. tinnunculus. At least one pair bred 1969 and 1970, regular visitor at all seasons.

Black Grouse : Lyrurus tetrix
Rare: last seen—2 in 1969.

Partridge : Perdix perdix
Formerly reared artificially, now scarce. Coveys noted in eastern part of reserve 1970 had not necessarily bred there.

Pheasant : Phasianus colchicus
Common breeding resident of mixed origin. Artificially reared in moderate numbers.

Water Rail : Rallas aquaticus
R. a. aquaticus. Rare; one 1969.

Moorhen : Gallinula chloropus
G. ch. chloropus. Has bred; regularly noted but scarce.

Oystercatcher : Haematopus ostralegus
H. o. ostralegus. Breeds nearby in small numbers, not infrequently noted in autumn and winter—at times in moderate numbers.

Lapwing : Vanellus vanellus
Most frequently noted in small numbers following local dispersal.

Snipe : Capella gallinago
C. g. gallinago. Breeds regularly in small numbers. At least 4 pairs 1969.

Woodcock : Scolopax rusticola
S. r. rusticola. Breeds annually in small numbers. Perceptibly augmented by October migrants.

Curlew : Numenius arquata
N. a. arquata. No confirmed breeding records. Regular during local movements.

Redshank : Tringa totanus
T. t. britannica. Breeds nearby and is regular in small numbers. The Icelandic race robusta occurs as a passage migrant and/or winter visitor.

Greater Black-Backed Gull : Larus marinus
Formerly bred, until shot out. No recent records since 1967, although immature birds especially are regular in small numbers.

Herring Gull : Larus argentatus
Non breeding visitor; throughout the year in small numbers the majority being immature.

Lesser Black-Backed Gull : Larus fuscus
L. f. graellsii. Formerly bred; up to 30 pairs in 1938, until shot out. No records since 1967. Non breeding visitor March-late September.

Common Gull : Larus canus
L. c. canus. Abundant throughout the winter.

Black-Headed Gull : Larus ridibundus
L. r. ridibundus. Formerly bred in small numbers; ca. 14-20 nests in 1936. Abundant in winter.

Stockdove : Columbus oenas
Breeds just outwith reserve. In winter small numbers roost regularly.

Wood Pigeon : Columbus palumbus
C. p. palumbus. Breeding annually in moderate numbers. Abundant in winter up to 3000 to roost.

Collard Dove : Streptopelia decaocto
One pair nesting nearby 1970, regularly flew over.

Cuckoo : Cuculus canorus
C. c. canorus. Rare breeding summer visitor. Egg found in nest of Meadow Pipit 1969.

Barn Owl : Tyto alba
T. a. alba. Scarce but regular. Non-breeding visitor.

Tawny Owl : Strix aluco
S. a. sylvatica. Scarce breeding resident. Nests found 1969 and 1970. Reserve extensively hunted by non-breeding pairs.

Nightjar : Caprimulgus europaeus
C. e. europaeus. Rare summer visitor, 4 records. A definite pair present 1967 but breeding not proved.

Swift : Apus apus
A. a. apus. Regularly noted hawking during summer in small numbers.

Green Woodpecker : Picus viridis
P. v. pluvius. Rare; one nest found 1970. Female later killed by Sparrowhawk.

Greater Spotted Woodpecker : Dendrocopus major
D. m. angelicus. Scarce breeding resident; at least 4 pairs 1970, featured in prey of Sparrowhawk.

Skylark : Alauda arvensis
A. a. arvensis. Breeds in decreasing numbers as regeneration covers central bog area. Now confined to eastern fringe.

Sand Martin : Riparia riparia

R. r. riparia. Small numbers not infrequently noted in summer. Like swift and swallow they fly down to exploit insect populations on the nearby mud at low tide.

Raven : Corvus corax

C. c. corax. Rare; one record of 2 birds in winter 1969.

Carrion Crow : Corvus corone

C. c. corone. Breeding resident in small numbers; 14 nests 1969 and 17 1970, despite rigorous keepering. Formerly roosted in moderate numbers.

Rook : Corvus frugilegus

C. f. frugilegus. Sporadic in small numbers, mainly in winter. Formerly roosted until shot out ca. 1948 when roost moved to Dalskairth.

Jackdaw : Corvus monedula

C. m. spermologus. No breeding records. Winter visitor in moderate numbers.

Magpie : Pica pica

P. p. pica. Rare; breeds—one nest 1970. Formerly bred, shot as pest species.

Jay : Garrulus glandarius

G. g. rufitergam. Scarce; breeds annually despite attempts at control. Four pairs in territory 1970. G. g. glandarius, possibly a rare winter visitor. A definite record is lacking.

Great Tit : Parus major

P. m. newtoni. Breeding resident; recorded in every month in small numbers. It is unknown to what extent P. m. major occurs in winter.

Blue Tit : Paras cæruleus

P. c. obscurus. Breeding resident in small numbers. Winter numbers probably augmented by P. c. caeruleus.

Coal Tit : Parus ater

P. a. britannicas. Breeding resident in small numbers.

Willow Tit : Parus montanus

P. m. kleinschmidti. A feature of the reserve; 12 nests in 1969 and 1970. Very dependent on the birch fringe. Probably resident.

Long Tailed Tit : Aegithalos caudatus

A. c. rosaceus. Scarce. Breeds; at least 7 pairs in 1969. Perceptibly augmented in late autumn.

Nuthatch : Sitta europaea

S. e. caesia. Rare; 3 records in 1969—probably with the same individual involved.

Tree Creeper : Certhia familiaris

C. f. britannica. Resident; breeds in small numbers.

Wren : Troglodytes troglodytes

T. t. troglodytes. Breeding resident in small numbers. Possible passage migrant; certainly augmented in winter when population is larger. Completely recovered from crash during winter of 1963.

Mistle Thrush : Turdus viscivorus

T. v. viscivorus. Scarce but breeds annually. Featured in sparrowhawk prey.

Fieldfare : Turdus pilaris

Passage migrant in late autumn. Duration of stay dependent on berry crop. At times roosts in moderate numbers.

Songthrush : Turdus philomelos

T. ph. ericetorum; breeding resident in small numbers.

T. ph. philomelos; scarce annual passage migrant.

Redwing : Turdus iliacus

T. i. iliacus; passage migrant in late autumn. At times moderate numbers and regularly roosts.

T. i. coburni; scarce winter visitor 3 found dead in 1969 referable to this Icelandic race.

Blackbird : Turdus merula

T. m. merula. Breeding resident in small numbers. Also passage migrant and winter visitor. Most frequent quarry of sparrowhawk.

Whinchat : Saxicola rubetra

S. r. rubetra. Scarce. Breeds annually in decreasing numbers.

Redstart : Phoenicurus phoenicurus

Ph. ph. phoenicurus. Breeds annually in increasing numbers as more sites become available in decaying birch. 8 pairs 1970.

Robin : Erithacus rubecula

E. r. melophilus. Breeds. Resident in small numbers. Winter visitors possibly include E. r. rubecula.

Grasshopper Warbler : Locustella naevia

L. n. naevia. Rare. Breeds, 1 pair 1967.

Sedge Warbler : Acrocephalus schoenobaenus

Breeds. Scarce and decreasing since 1968.

Whitethroat : Sylvia communis

S. c. communis. Breeds. Summer visitor in small numbers. Markedly decreased 1969 and 70 to 4 pairs.

Willow Warbler : Phylloscopus trochilus

Ph. t. trochilus. Breeding summer visitor in small numbers. Passage migrant in moderate numbers in autumn.

Chiffchaff : Phyllosopus collybita

Ph. c. collybita. Scarce breeding summer visitor and passage migrant.

Wood Warbler : Phyllosopus sibilatrix

Rare. No recent confirmed records.

Goldcrest : Regulus regulus

Breeding resident in small numbers. At times, especially in autumn, a passage migrant in moderate numbers.

Spotted Flycatcher : Muscicapa striata

M. s. striata. Scarce breeding summer visitor. Passage migrant in small numbers.

Dunnock : Prunella modularis

P. m. occidentalis. Scarce, breeding resident. Possible passage migrant and winter visitor with P. m. modularis involved in uncertain numbers.

Meadow Pipit : Anthus pratensis

A. p. pratensis. Scarce and decreasing breeding visitor (no winter records); (see cuckoo).

Tree Pipit : Anthus trivialis

A. t. trivialis. Scarce passage migrant in spring. No confirmed breeding records.

Pied Wagtail : Motacilla alba

M. a yarrelli. Non-breeding visitor in all seasons—at times to roost in small numbers.

Great Grey Shrike : Lanius excubitor

L. e. excubitor. Rare; one record 1970.

Starling : Sturnus vulgaris

S. v. vulgaris. Breeds annually in increasing numbers. ca. 20-30 pairs 1970. Frequently uses woodpecker holes. At times an abundant passage migrant and winter visitor, when the longer winged birds of continental origin are involved.

Greenfinch : Chloris chloris

C. c. chloris. Scarce. Breeds; one nest found 1967. At times a winter visitor in moderate numbers to roost.

Goldfinch : Carduelis carduelis

C. c. britannica. Scarce breeding visitor; 6-7 pairs 1969. Also noted following dispersal in late autumn.

Siskin : Carduelis spinus

Scarce in summer. Probably bred 1970. Passage migrant and winter visitor in moderate numbers at times.

Linnet : Carduelis cannabina

C. c. cannabina. Annual autumn and winter visitor in moderate numbers.

Redpoll : Carduelis flammea

C. f. cabaret. Breeds in small numbers. Perceptibly augmented in autumn and winter.

Bullfinch : Pyrrhula pyrrhula

P. p. nesa. Breeding resident, formerly scarce, probably increasing. Moderate numbers in winter, especially during snow cover when heather is a food source.

Crossbill : Loxia curvirostra

L. c. curvirostra. Irregular visitor; 2 pairs bred in 1968, when an adult male was found dead.

Chaffinch : Fringilla coelebs

F. c. gengleri. Breeding resident in small numbers. Featured in sparrowhawk prey items 1970. It is not known to what extent, if any, the continental races coelebs and hortensis occur in the larger but varying flocks in winter.

Brambling : Fringilla montifringilla

Scarce winter visitor.

Yellowhammer : Emberiza citrinella

E. c. nebulosa. Formerly frequent, now scarce. No recent breeding records.

Corn Bunting : Emberiza calandra

E. c. calandra. Rare. Breeds; one nest 1967.

Reed Bunting : Emberiza schoeniclus

E. s. schoeniclus. Breeds annually in small numbers. Mainly confined to the main ditch and has probably increased as ditch became overgrown.

Tree Sparrow : Passer montanus

P. m. montanus. Rare; one record.

SUMMARY

Number of full species recorded	96
Number of breeding species	53
(a) regularly	33
(b) spasmodic	20
Number non-breeding summer visitors	24
Number of residents	24
Number of winter visitors	32
(a) regularly	17
(b) infrequent	15
Species increasing during last 5 years	20
Species decreasing during last 5 years	9
Species no change in status detected	24

Note.—Species may be included in one or more classifications.

EARLY SETTLEMENTS IN EASTERN DUMFRIESSHIRE

by

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University of Newcastle-upon-Tyne

INTRODUCTION

The following summary of a recent field-survey represents no more than the initial stage in a programme for the elucidation of certain aspects of early settlements in the area as defined. This region, some nine hundred square kilometres in extent, stretches from Lower Eskdale and Ewesdale in the east to the left bank of the Annan in the west and, for the most part, from the Solway in the south to the northern boundaries of Dumfriesshire, where they lie contiguous with those of Roxburghshire and Selkirkshire (**fig.** 1). Recent **Inventories** exist for the latter counties and for adjacent Peeblesshire,[1] whilst there is but a small area of Cumberland separating this part of Dumfriesshire from the reasonably well documented county of Northumberland.[2] Although a fairly comprehensive **Inventory for Dumfriesshire** was published in 1920, it lacks certain refinements, the recognition of enclosures containing round timber-built houses for one. A more recent marginal land-survey, made by the Scottish Royal Commission, was not intended to remedy an additional defect of the old **Inventory,** which is the virtual absence of plans of the earthworks. Consequently, field-survey appeared to be an essential prerequisite before any further work could be undertaken.

Almost all earthworks recorded in the area, amounting to some one hundred and seventy, have been visited, but only those enclosed settlements which might fall within a Roman native or prehistoric context have been surveyed. Plans have been made by use of the plane-table, generally at a scale of 1:200 and sections arrived at by hand-level. Photographs of site-locations augment the normal written record. Clearly no more than a selection of representative plans can be reproduced here and these have been reduced, so far as is possible, to a scale which allows direct comparison with plans published in recent Scottish **Inventories.** The old **Inventory** place-names and serial numbers have been retained so that direct reference can be made to the original descriptions, since space does not allow full accounts of individual sites. New discoveries have been given the number of the nearest recorded site in the **Inventory,** followed by alphabetical symbols.

I am most conscious of the help given in the field on various occasions by Messrs A. Bankier, I. Jobey, T. Newman, M. Preston and R. Robinson, and am indebted to the Margery Trust and the University of Newcastle-upon-Tyne for financial assistance.

1 R.C.A.M., **Roxburghshire** (1956); **Selkirkshire** (1957); **Peeblesshire** (1967).
2 Jobey, G., **Arch. Ael. 4,** XXXVIII (1960), 1ff.; XL, 31ff.; XLI, 19ff.; XLII, 41ff.; XLIII, 21ff.; XLVI (1968), 51ff.

THE PROBLEM

The question of most immediate concern to the writer arose some time ago in a study of the distribution pattern of native settlements in the Roman frontier area.[3] Early palisaded enclosures, hill-forts and defended settlements could all be seen to be present amongst the recorded sites in Dumfriesshire, seemingly in forms comparable with those found in other Border counties; but non-defensive enclosures containing round stone-built huts, which by and large formed the basis for the pattern of Romano-British settlement in the Tyne-Forth Province further to the east, were apparently notable only for their scarcity or total absence. It was possible that this lack of the eastern type of Romano-British settlement might be due to enforced depopulation, but this seemed to be most unlikely, despite known examples of regulated settlement on Roman frontiers elsewhere. More probably, a changed form of settlement was to be sought in this countryside which was clearly quite capable of supporting earlier agricultural and pastoral communities. The **Dumfriesshire Inventory** did in fact contain records of a large number of undifferentiated "enclosures," often "scooped" in the interior and sometimes referred to as "birrens," to which the seemingly improbable purpose of serving as cattle-shelters in times of Border unrest was tentatively ascribed.[4]

Although it was considered that some of these scooped sites could eventually provide the answer to the problem of Romano-British settlement, it seemed desirable, nevertheless, to obtain a more comprehensive record of all early enclosed settlements in the first instance, not least perhaps because of the increasing blanket of afforestation now spreading across the Dumfriesshire hills.

A. UNENCLOSED PLATFORM SETTLEMENTS

At this junction it should be mentioned that no certain examples of early unenclosed platform settlements have been noted.[5] On the other hand, the search has not been exhaustive and these are sites which, if they occur on cultivable hill-slopes, can succumb easily to ploughing. There are, for example, some indeterminate remains of possible platforms on a steep hill-slope which has been ploughed sometime in the past, above the entry to Mosspeeble Farm on Ewes Water **(215A).** The upper reaches of the Annan and the slopes above Moffat Water, areas not included in the present survey, may prove significant for the surviving distribution pattern of such settlements since, to the north of the intervening high watershed, they are recorded in some numbers by the headwaters of the Tweed in Peebleshire.[6] Their somewhat restricted distribution as known at present is not entirely convincing and could form only part of a more widespread scene of unenclosed settlements.

3 Jobey, G., in **Rural Settlement in Roman Britain** (ed. Thomas, 1966), 1ff.
4 R.C.A.M., **Dumfriesshire** (1920), p. lv.
5 For description of this type of early settlement v. R.C.A.M. **Peeblesshire**, 1, 22ff.
6 **Ibid.**, map p. 22; Feachem, R.W., **P.S.A.S.**, XCIV (1960-61), 79ff.

B. PALISADED SETTLEMENTS

Of the nine certain or possible early timber-built sites known in Dumfriesshire, four fall within the area surveyed to date. Two of these, on Beckton and Broomhouses farms near to Lockerbie in Annandale, have been recorded in a recent volume of these **Transactions**[7] and require no further comment at this stage, except to re-state that in the case of the former site the Late Neolithic material is not necessarily associated.

A third settlement already noted, that on Potholm Hill (**fig. 2, 193A**),[8] high above Eskdale, is the only site known in the area at the moment where the palisade support trenches and timber-built hut-positions are still visible, though doubtless many more similar structures are obscured by later earthworks. Here the distance between the two palisade trenches, though not constant, is at its maximum 8.25 metres, and greatly exceeds the normal range of from 2 to 4 metres for twin palisades in the Border region. If only one constructional phase is represented, rather than two successive palisaded

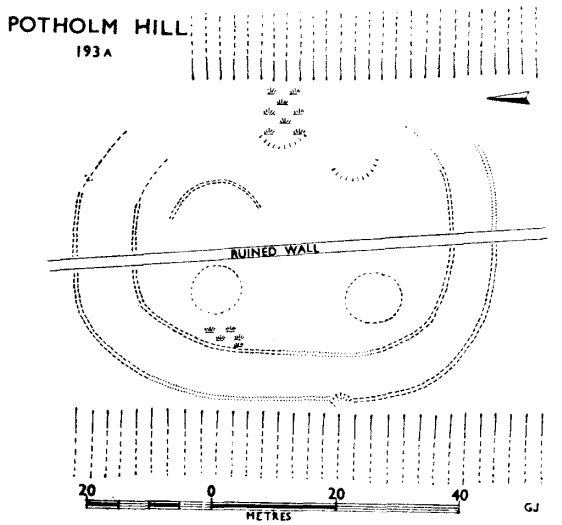

Fig. 2

perimeters, then this site would fall into that category of settlement such as Hayhope, Roxburghshire, or Braidwood, Midlothian, where the palisades are widely spaced, and as at Braidwood and Huckhoe, Northumberland, sometimes connected at the entrance. The enclosed area at Potholm is small, but little more so than that of a number of later fortified sites and merely serves to emphasise the generally small size of the social unit represented in many of

7 Cormack, W. F., XLI (1962-3), 111ff.
8 Information from R.C.A.M. Scotland

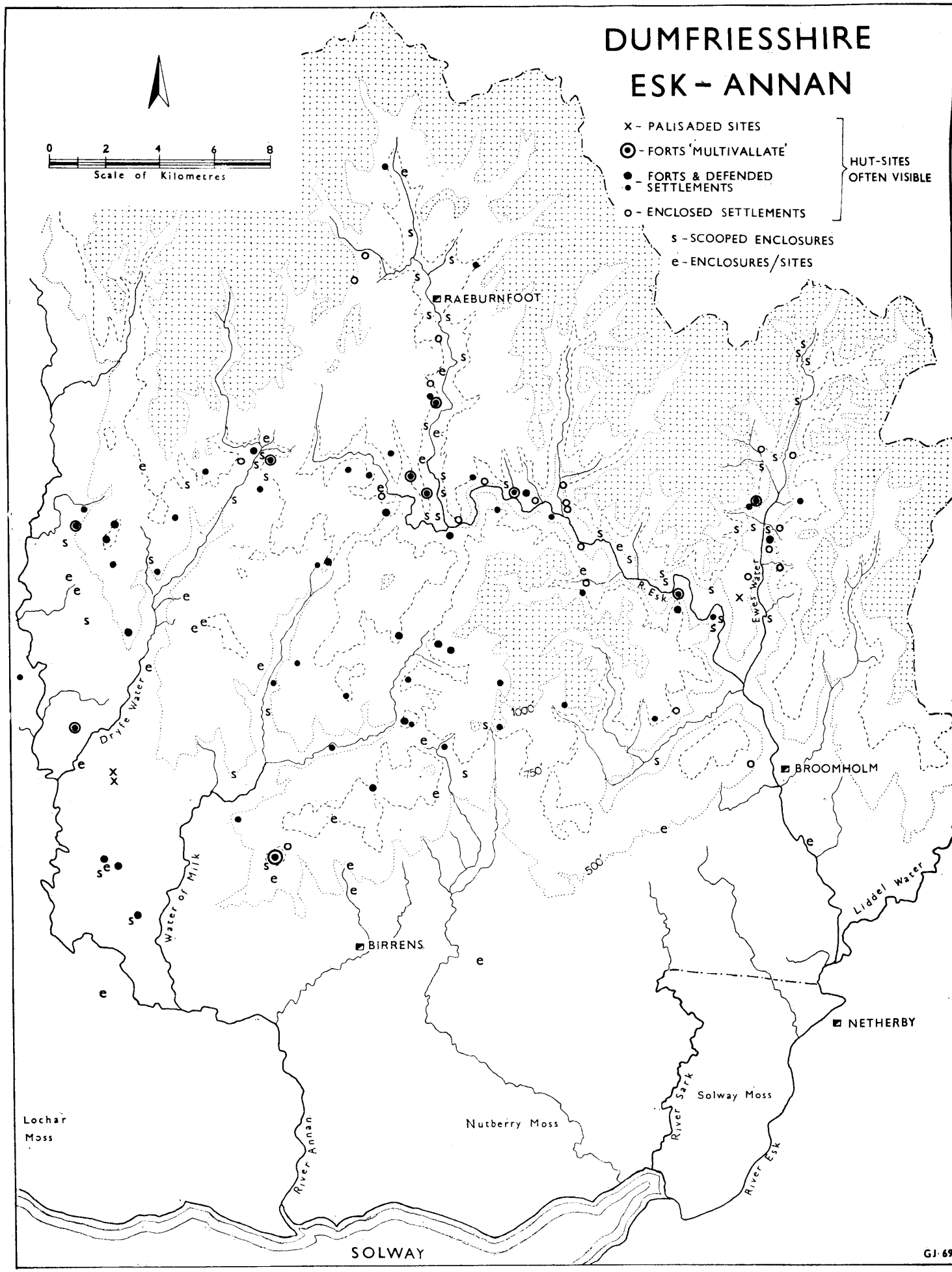
DUMFRIESSHIRE
ESK – ANNAN
X – PALISADED SITES
– FORTS 'MULTIVALLATE'
– FORTS & DEFENDED SETTLEMENTS
o – ENCLOSED SETTLEMENTS
HUT-SITES OFTEN VISIBLE
s – SCOOPED ENCLOSURES
e – ENCLOSURES/SITES
0 2 4 6 8
Scale of Kilometres
RAEBURNFOOT
BROOMHOLM
BIRRENS
NETHERBY
Dryfe Water
Water of Milk
R. Esk
Ewes Water
Liddel Water
River Annan
River Sark
River Esk
Lochar Moss
Nutberry Moss
Solway Moss
SOLWAY
1000
750
500
GJ·69

Fig. 1

the early settlements in North Britain. Of some interest is the fact that this timber-built site, together with some others in the northern area, never merited later more substantial protection. Whilst there can be many reasons for the abandonment of individual settlements it would seem that here, as in some other cases, a contributory factor could be that its location, in another context, would offer only an exposed situation without the advantage of particularly strong and immediate natural defence.

The fourth site, at present no more than a possibility, may serve as a contrast to such small sites as Potholm. Beneath the rampart of Burnswark hill-fort **(272),** recent excavation has revealed twin rows of closely set post-holes, almost 3 metres apart, which do not appear to be supports for an earlier rampart but rather for a form of timber stockade which runs for some considerable distance, and may even encircle the whole area enclosed by the later rampart.[9] A radiocarbon date of 500 ± 100 B.C. **(Gak-2203b,** half-life 5570 years) for material appropriate to this early phase is both in keeping with other sixth to seventh century dates for some palisaded sites in North Britain and with the apparent earliness of some hill-fort and settlement defences. Carbonized wood from one of the hill-fort gateways at Burnswark has yielded another radiocarbon date which is not significantly different at 525 ± 90 B.C. **(I-5314,** half-life 5568).[10]

If such a stockade does indeed encompass the 6.9 hectares (17 acres) enclosed by the later hill-fort, then it is also possible that some of the remaining **'oppida'** in North Britain may well have developed already as substantial centres in an early timber-built phase. At present the largest, palisaded enclosure previously recorded in the Border region is that on White Hill, Peeblesshire, where the internal area is 0.7 hectares (1¾ acres), but attention might be drawn to the larger palisaded enclosure recently found beneath the Breiddin hill-fort in Wales,[11] as well as to others of longer standing further to the south in England.

Excavation in eastern Dumfriesshire has been minimal and by analogy there can be little doubt but that many more timber-built settlements lie beneath the ramparts of later defensive works. In this connection it could be significant that at Castle O'er, the one fort other than Burnswark that has been excavated in the past, a carbonized post was found beneath one of the ramparts.[12] Here no timber-lacing is mentioned and no vitrification of the rampart is observable, so that a palisade is always possible.

C. HILL-FORTS AND DEFENDED SETTLEMENTS

The difficulty of drawing a distinction in these parts between what, on the one hand, may be described as a fort and, on the other, a settlement has often been remarked upon. Even in the most recent **Inventories** the classification has

9 Excavation report forthcoming.
10 On the better half-life the C14 dates will be 573± and 599± B.C.
11 Musson, C., **Current Arch.**, II, no. 8, 215ff.
12 Christison, D., **Early Fortifications in Scotland** (1898), 161.

been understandably and admittedly somewhat arbitrary. In eastern Dumfriesshire the situation is vitiated by the number of settlements which, though small, may yet be enclosed by remains of a substantial ditch with an internal bank or wall and a counterscarp mound.

(a) Larger Forts

The hill-fort on Burnswark Hill[13] above Annandale, to which reference has already been made, greatly exceeds all others in size and to some extent in natural strength. It remains the largest fortified site in south-west Scotland. Unlike the picture presented within many other hill-forts of the Border country, hut-platforms for timber-built dwellings are not readily visible from ground or air-survey. However, recent excavation has shown the presence of superimposed round timber-built houses in the two internal areas so far examined. There would seem to be no reason why large areas of the hill-top should not be covered with similar structures and, by comparison with the visible pattern at, say, Eildon Hill North in Roxburghshire or Yeavering Bell in Northumberland, the possibility of over a hundred hut sites would not be a fanciful estimate.

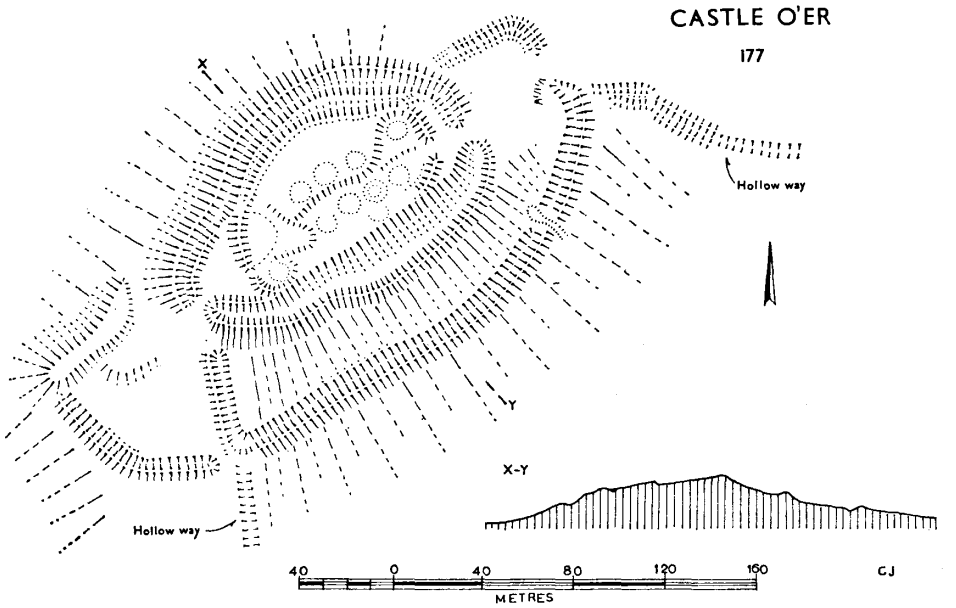

Fig. 3

From the radiocarbon dates so far available it may well be necessary to envisage an earlier date for the initial rampart defences than would have been thought probable some years ago, particularly if these can be shown to follow immediately upon the timber-built phase.[14]

13 R.C.A.M. **Dumfriesshire**, no. 272 (plan in need of revision).
14 e.g., Jobey, G., **Arch. Ael.4**, XLVI (1968), 293ff.

At the moment of writing, the ramparts would not appear to have been upstanding when Roman military missiles were being directed at them, so that, in conjunction with other considerations, the "siege theory" and its relationship with the disturbances of 155-8 A.D. must remain in jeopardy.[15]

The forts at Castle O'er and Baillie Hill **(figs. 3 and 4, 177** and **640),** situated high above the confluence of the Black and White Esk, only merit inclusion

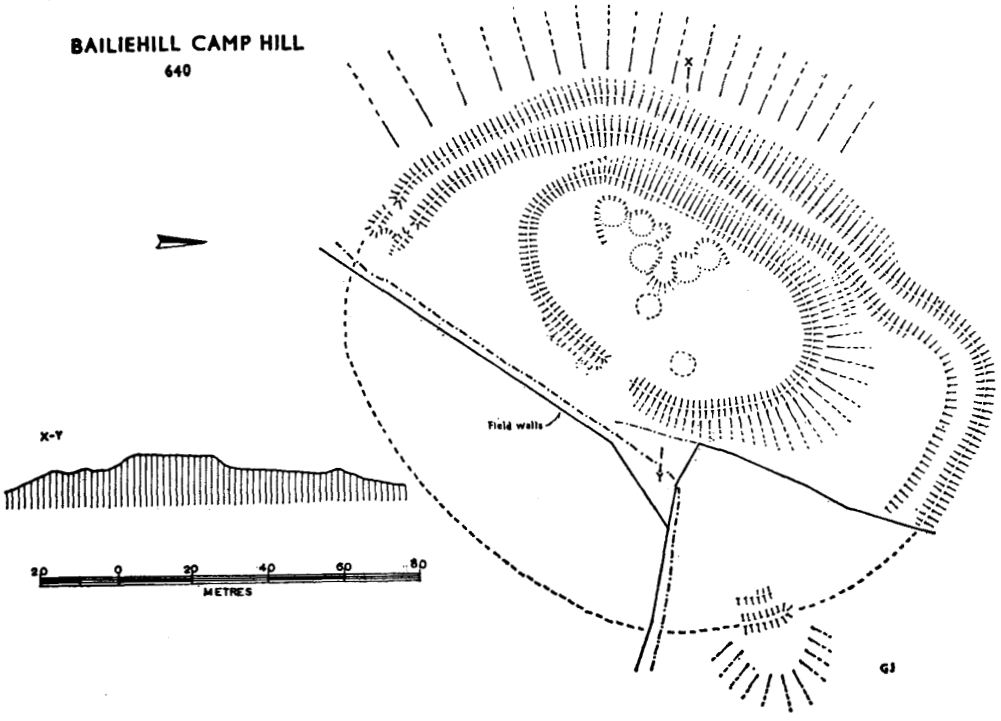

Fig. 4

under this head on account of their overall area. Whatever may be the precise context of the interior enclosures in both cases, the number of visible hut positions in the former does not exceed nine and, if timber-built dwelling are confined to these innermost areas, then neither site can have contained more than a dozen at any stage. There are problems of interpretation common to both which will only be resolved by excavation. Briefly, it is a question of whether, as we now see them, they are both defended settlements with outer annexes, or earlier sites upon which later walled settlements with timber-built huts have been superimposed. There are analogies for sites with annexes in Peeblesshire[16] to

15 If indeed there was a revolt at this time v. Gillam, J., & Mann, J. Arch. Ael.4, XLVIII (1970). forthcoming.
16 op. cit., p. 25 (type C).

the north or Northumberland to the east; on the other hand, in the eastern counties generally, stone-built settlements overlying earlier hill-forts are a fairly common feature and relevant to the problem of Romano-British settlement as a whole (p. 103 below). It has been suggested tentatively elsewhere,[17] presumably with Burnswark or Woden Law,[18] Roxburghshire, in mind, that the outer perimeter at Castle O'er may represent a Roman siege entrenchment, but this would seem to be most improbable.

A third, hitherto unrecorded fort on Little Hill (**fig. 5, 637B**) in Eskdale, could well prove to be the largest unit in that valley. There are eleven visible hut-platforms and habitable space would allow for the presence of another half-dozen or so at the most.

The foregoing are all sites whose perimeters follow the contours of the hill-tops or knolls on which they are situated. As they now appear, all may have more than one line of defence in whole or in part as immediate topo-

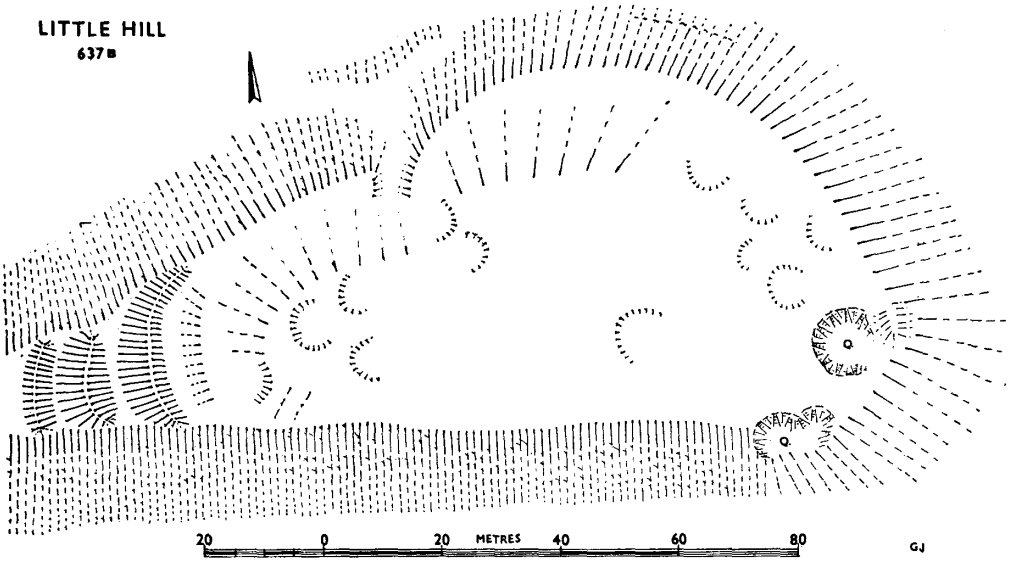

Fig. 5

graphical weakness or strength dictates, but it is not possible to point to any specific build-up or sequence in the defences. Ditches where present would seem to be rock-cut and the now overgrown ramparts probably consist of quarried material. There are no linear-ditches at Burnswark probably because of the unyielding nature of the underlying Burnswark lavas. Nowhere has vitrification been noted in the ramparts of these or, indeed, any other sites in this area, although it is known elsewhere in the county. Timber-built hut or house-positions are marked by single or double 'ring grooves,'[19]

17 Feachem, R. W., **The North Britons** (1965), 182.
18 R.C.A.M. **Roxburghshire**, I, no. 308.
19 For definition of house-types, **ibid.**, p. 19.

as at Castle O'er, or by crescentic scarps of varying depths, as at Baillie Hill and Little Hill. At Burnswark there is in excavation a possible progression from houses of individual post-hole construction, through single 'ring-groove' to final double 'ring-groove' structures, a sequence for which there is some evidence elsewhere in northern England and southern Scotland.[20] The 'ring-ditch' type of house is not anywhere in evidence in eastern Dumfriesshire. There is the possibility of engineered tracks up to the hill-fort entrances at Burnswark and Little Hill, but the 'hollow-ways' at Castle O'er are in all probability of much later context.

(b) Smaller Forts and Defended Settlements.

In common with the majority of defensive sites in the Border region and, indeed, some upland areas elsewhere, these are small units and do not exceed 0.4 hectares (1 acre) in internal area. For descriptive convenience only, they may in this instance be grouped according to their topographical location, as being sited on (1) hill-tops or promontories (2) slightly forward sloping spurs (3) river terraces.

(1) These sites make use of the best naturally defensive situations available, generally well above the main river valleys but consistent with a view down the forward slopes. A preference for this essentially riverine aspect may be one factor in limiting altitude, which hereabouts seldom exceeds two hundred and ninety metres (950' O.D.). Consequently, as often happens elsewhere, once height has been achieved the approach to sites may be comparatively easy from at least one direction.

The perimeter defence in most cases consists of a single ditch of some stature, an internal rampart and a counterscarp bank. In only four instances are there two surviving ditches to give additional defence in depth, these being Bessie's Hill 2 **(fig. 6, 174)** and the Knowe **(178),** both in Eskdale, Brieryshaw Hill **(fig. 7, 210)** in Ewesdale and Dalmakethar 2 **(16)** in Annandale. A fifth contender might be the poorly preserved site, Range Castle **(fig. 6, 290),** high above the Dryfe Water, with its dual terraced defences and some indication of linear quarrying.

As in the case of the larger forts, the ramparts and ditches are sited just below the crests of the slopes so as to increase the difficulties of the natural slope with economy of effort. Counterscarp banks are normally less significant than the remains of the internal ramparts and, on occasions, there are traces of internal quarrying behind the main rampart. Bessie's Hill 2 is unusual in that little semblance of an internal bank remains within the inner ditch and it could be that most of the material from this ditch has been cast forward in the so-called 'downward' method. Occasionally odd facing stones can be seen in the inner ramparts but, by and large, there has been too much robbing and subsequent overgrowth of the well spread mounds to be sure of structural detail. The entrances are apparently uncomplicated.

20 Jobey, G., **Arch. Ael.4, XL (1962), 11ff.**

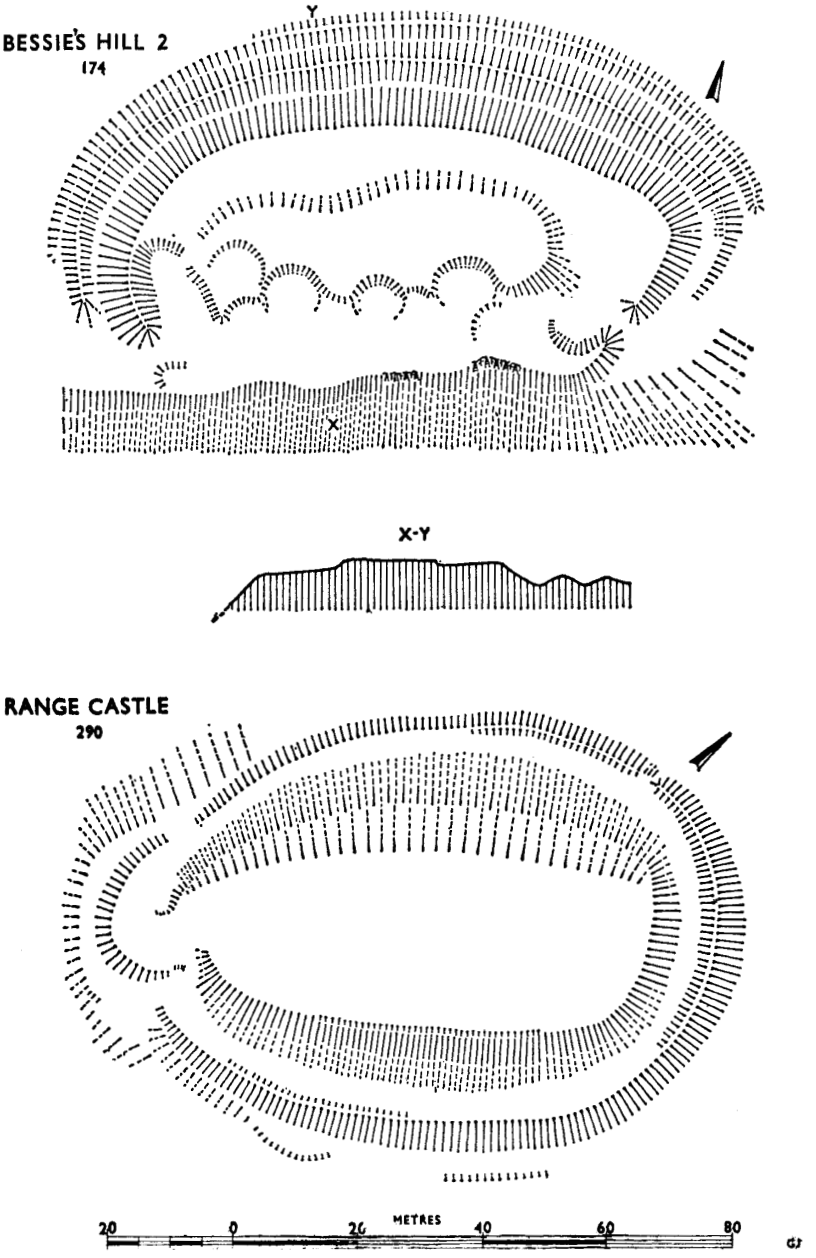
BESSIE'S HILL 2
174
Y
X
X-Y
RANGE CASTLE
290
20 0 20 METRES 40 60 80

Fig. 6

Newlands Hill (**fig. 8, 599**), above the headwaters of the Water of Milk, or Brieryshaw Hill, are indicative of the size of the majority. Although the interior would allow space for timber-built huts additional to the four or five that may now be visible from the surface, it is clear that even if all the enclosed space were so utilized the total complement could never exceed ten. There are indeed a small number of strongly entrenched hill-top sites such as Westside 1 (**fig. 9, 192**) or Blindhill Bush (**fig. 9, 12**) where the four deeply scooped hut-floors, visible in both cases, may represent the total size of the social unit involved. At this stage the general terms used in classification become clearly inadequate if not misleading.

(2) Basically, the artificial defences of this category of site are no different from the foregoing. They would seem to occur in areas where to gain the advantage of a suitable hill-top or crest would entail moving some distance away from the main watercourse and, at the same time, deny a view over the

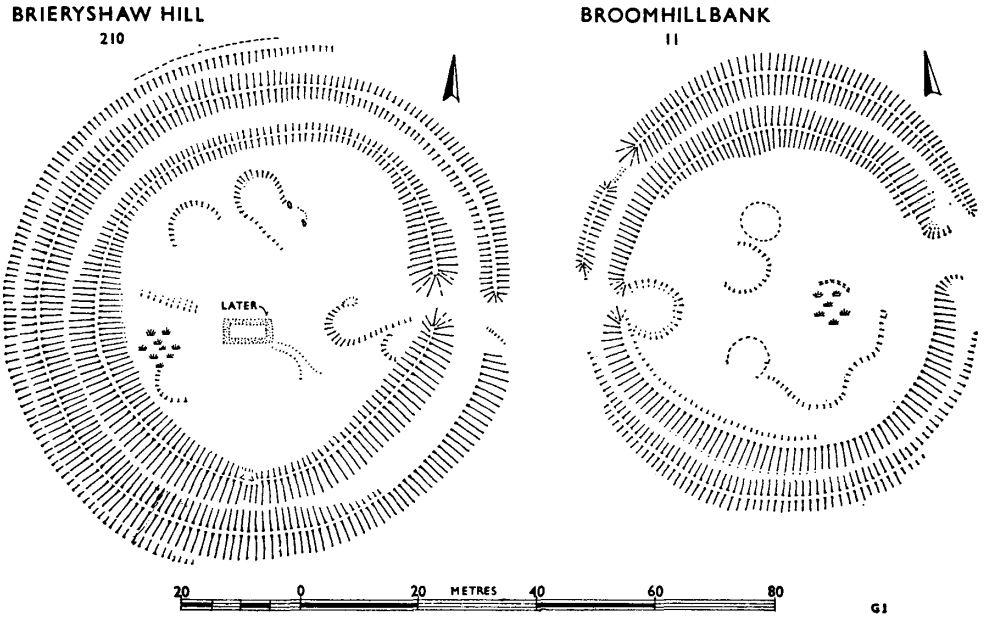

Fig. 7

riverine slopes. Their location on slightly sloping spurs, whilst meeting such **desiderata,** at once involves deliberate and sometimes quite considerable scarping of the rear part of the site in order to provide a more level interior. It could be that the same topographical factor sometimes accounts for the assumption of a more rectilinear form of perimeter by sites such as Shielburn 1, Eskdale, and Newhall Hill 2 above the Water of Milk (**fig. 10, 635, 601A**). All are single ditched sites, but the ditches are commensurable with defence rather than drainage, are often rock-cut, and generally have remains of counter-

scarp banks. For such reasons, these sites would not fall happily into the category of scooped settlements in the sense that it has been used in recent Scottish **Inventories** to describe a specific form of non-defensive settlement (e.g. type E, **Peeblesshire Inventory**).[21] Similar interior scarping can indeed be seen to a lesser extent on small hill-top forts such as Tanlaw Hill (**fig. 9, 191**) above the Black Esk, where some amount of interior levelling has been necessary.

Curved indentations near to the foot of the interior scarps almost certainly mark the sites of some round timber-built huts. Although these may be no more than three or four in number it is evident from some sites of this order, such as Bessie's Hill 1 **(fig. 10, 173)** where there may be up to eight or nine

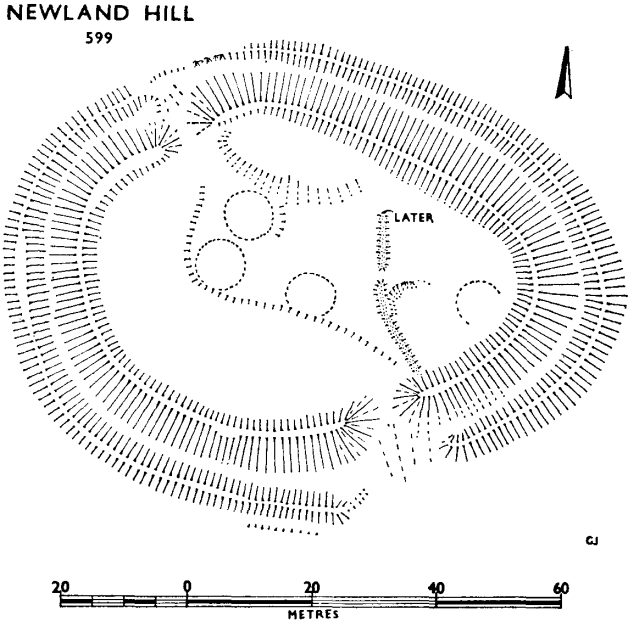

Fig. 8

visible hut-positions, that the greater part of the interior is probably given over to dwellings. Occasionally there may be a slight hollow of very limited extent lying immediately within the entrance, observable for example at Bankhead Hill (**fig. 10, 634**) or Corncockle Plantation (**fig. 10, 449**), but this again is not indicative of a distinct farmyard or forecourt such as occupies a comparatively large area in the non-defensive scooped settlements as defined.

All told, it is difficult to envisage some of these sites as being anything but roughly contemporary with the hill-forts. On Newhall Hill, the rear

21 op. cit., p. 26.

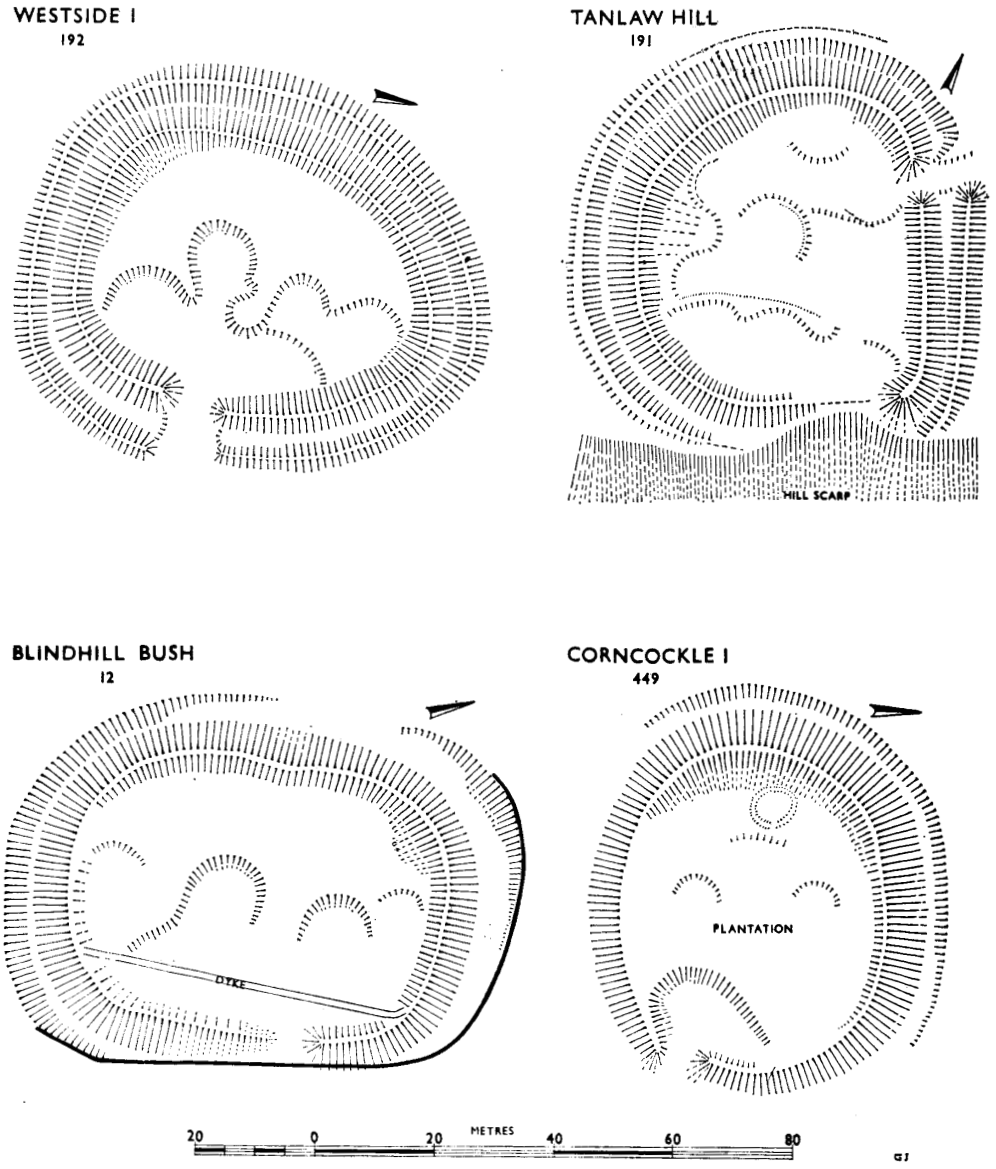
WESTSIDE I
192
TANLAW HILL
191
HILL SCARP
BLINDHILL BUSH
12
DYKE
CORNCOCKLE I
449
PLANTATION
20 0 20 METRES 40 60 80

Fig. 9

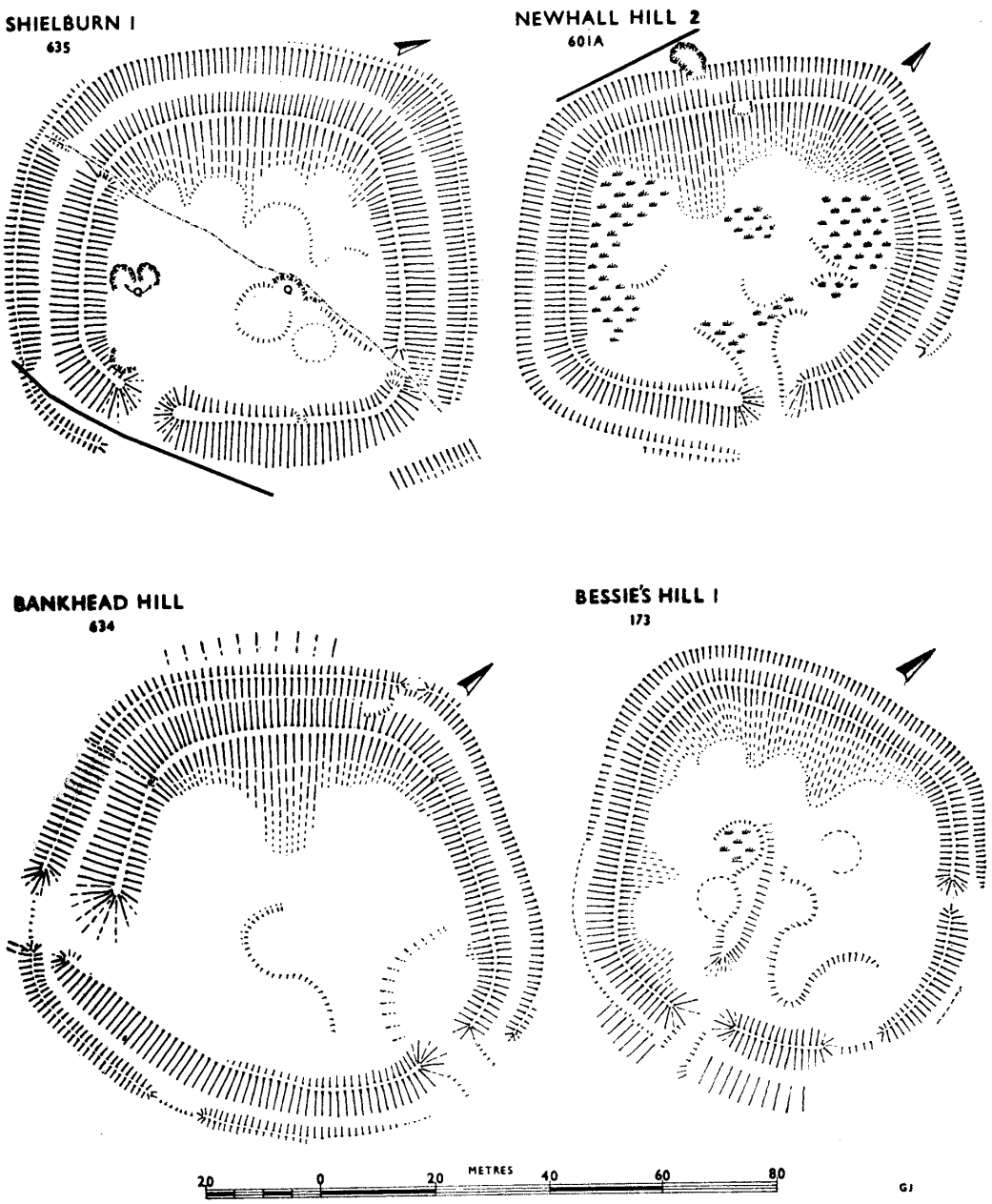
SHIELBURN I
635
NEWHALL HILL 2
601A
BANKHEAD HILL
634
BESSIE'S HILL I
173
20 0 20 METRES 40 60 80
GJ

Fig. 10

perimeter of Newhall Hill 2 (**601A**) is no more than a few metres removed from Newhall Hill 1 (**601**). Whilst the latter occupies a situation providing better natural defence on the top of the spur, the former, if anything, has the more substantial ditch. Bessie's Hill 1 (**173**) is only some one hundred and fifty metres distant above Bessie's Hill 2 (**174**). Although it is not situated in such a good position of natural defence as Bessie's Hill 2, it occupies the next best available in the immediate area, and that occupied by Bessie's Hill 2 would have allowed of no expansion in case of need. It is always possible that these sites were occupied simultaneously at some stage and it could well be that they represent expansion and a hiving off from the original units.

Three sites broadly within this same category merit particular reference in another respect. These are Glentenmont, Doe's Hill and Cauldkinefoot

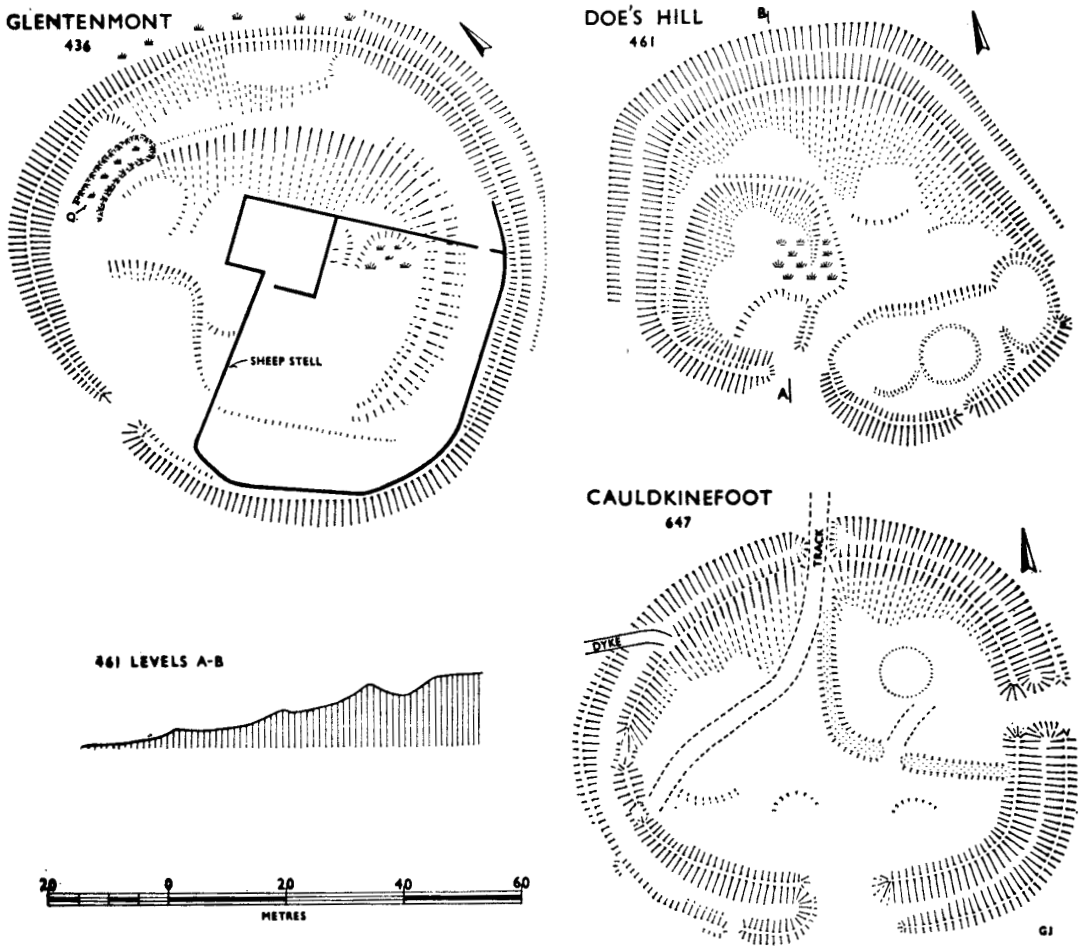

Fig. 11

(**fig. 11, 436, 461, 647**), where in all cases there are faint traces of what is possibly secondary settlement, still with round timber-built huts, lying within the interiors of the original enclosures.

(3) Any search for defended settlements hereabouts cannot leave out of account the prominent river scarps and terraces, particularly in Ewesdale and Eskdale, which, though they lack altitude, do on occasions furnish good positions of immediate natural defence. Unfortunately, the effects of more intensive land utilization sometimes makes it difficult to remove many of these riverine sites from the simple category of 'enclosures.' Even so, three may be quoted as examples of the potential, whatever their true context may ultimately prove to be. A hitherto unrecorded earthwork at Billholm **(272B)** has three closely set ditches and banks which cut off the promontory formed by the high river terraces at the confluence of the Billholm Burn with the Esk. This site, together with a similar multivallate work at Gallaberry **(115)**, situated on a slight rise between the Annan and the Dryfe, are unfortunately overplanted which makes survey difficult. Not so, however, is Bogle Walls[22] **(fig. 12, 638)** in Eskdale, which is typical of some less ambitiously defended sites generally situated at the point of egress of a deeply cut contributory stream through the main river scarp, where a ditch of substantial proportions takes care of the third and most exposed side.

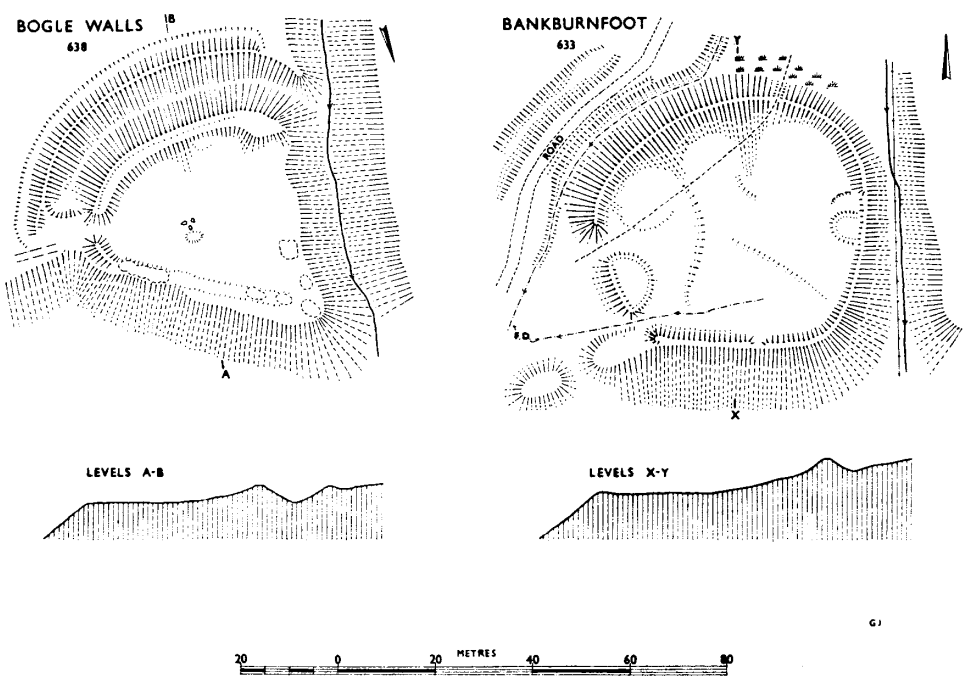

Fig. 12

22 Also 'Enzieholm'='nook,' 'gusset,' something angular (Watson, Celtic Place Names, 180).

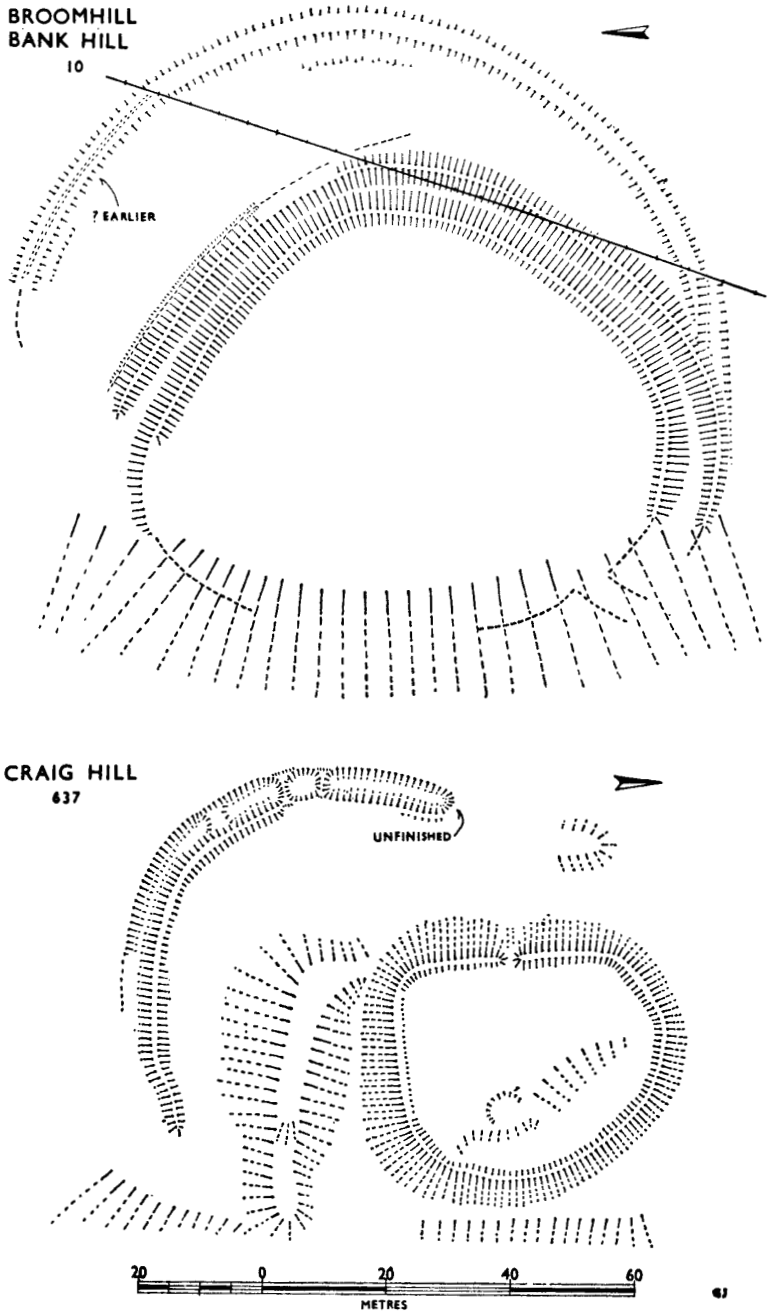
BROOMHILL
BANK HILL
10
? EARLIER
CRAIG HILL
637
UNFINISHED
20
0
20
40
60
METRES

Fig. 13

C. STRUCTURAL SEQUENCE ON DEFENSIVE SITES

Apart from the possibility of earlier palisades and the few examples of secondary settlements already quoted, there is little which calls for mention under this particular head. The function of the low, well spread bank on the east side of the fort on Broomhill Bank Hill **(fig. 13, 10)** is problematical. It could be earlier than the defences of the small hill-fort at the junction of the two perimeters and is possibly a palisade-mound. On Craig Hill (**fig. 13, 637**), immediately behind and above the fort on Little Hill, the remains suggest an unfinished hill-fort, within which there is a secondary settlement enclosed by a stoutly-built stone wall, rather than a detached linear earthwork drawn across the line of approach to the latter. Only one other unfinished work has been encountered, Newland Hill 2 (**599A**). A secondary annexe may have been added onto the west end of the site on Broom Hill (**297**) and there is possibly an enclosure of a later phase within the twin ditched site at Dalmakethar Burn (**20**). The few multi-ditched forts in the area exhibit little if any clear evidence of phased development in their defences.

No detailed study of detached linear earthworks or cross-ridge dykes that could be associated with hill-forts and defended settlements has been made. Indeed, in some areas where they might have been investigated from previous records, such as at Castle O'er, afforestation now makes this impossible. There is a broad bank and ditch some twenty-five metres behind the small defended site at Carterton (**294**), between the confluence of the Corrie Water and Back Burn, which would appear to be associated, but the low bank previously recorded behind Doe's Hill (**461**) is of doubtful validity in such a context.

D. NON-DEFENSIVE SETTLEMENTS WITH ROUND TIMBER-BUILT HUTS

Most of these have some degree of scooping in the interior since they lie on sloping ground, but to refer to them simply as scooped settlements would again conflict with the use of the term in the Peeblesshire **Inventory.** The distinctions as between one and another group in eastern Dumfriesshire are by no means so clear-cut as in some other areas. The following categories are again used purely for descriptive convenience.

(1) There are a number of settlements on the hill-slopes and river terraces, scarped at the rear of the interior and having platforms or floors for round timber-built huts. There is little pretence as to defence in their situation or nature of their perimeters, although they do possess a ditch. However, the ditch is shallow, does not always appear to encircle the site and is often broken at the highest point on the uphill side, all factors indicative of an intention to drain rather than to defend.

Georgefield 1 **(fig. 14, 664A),** one of the two almost adjacent and hitherto unrecorded sites above the Meggat Water in Eskdale, is illustrative of such settlements on steep hillslopes, whilst the unrecorded and now recently over-

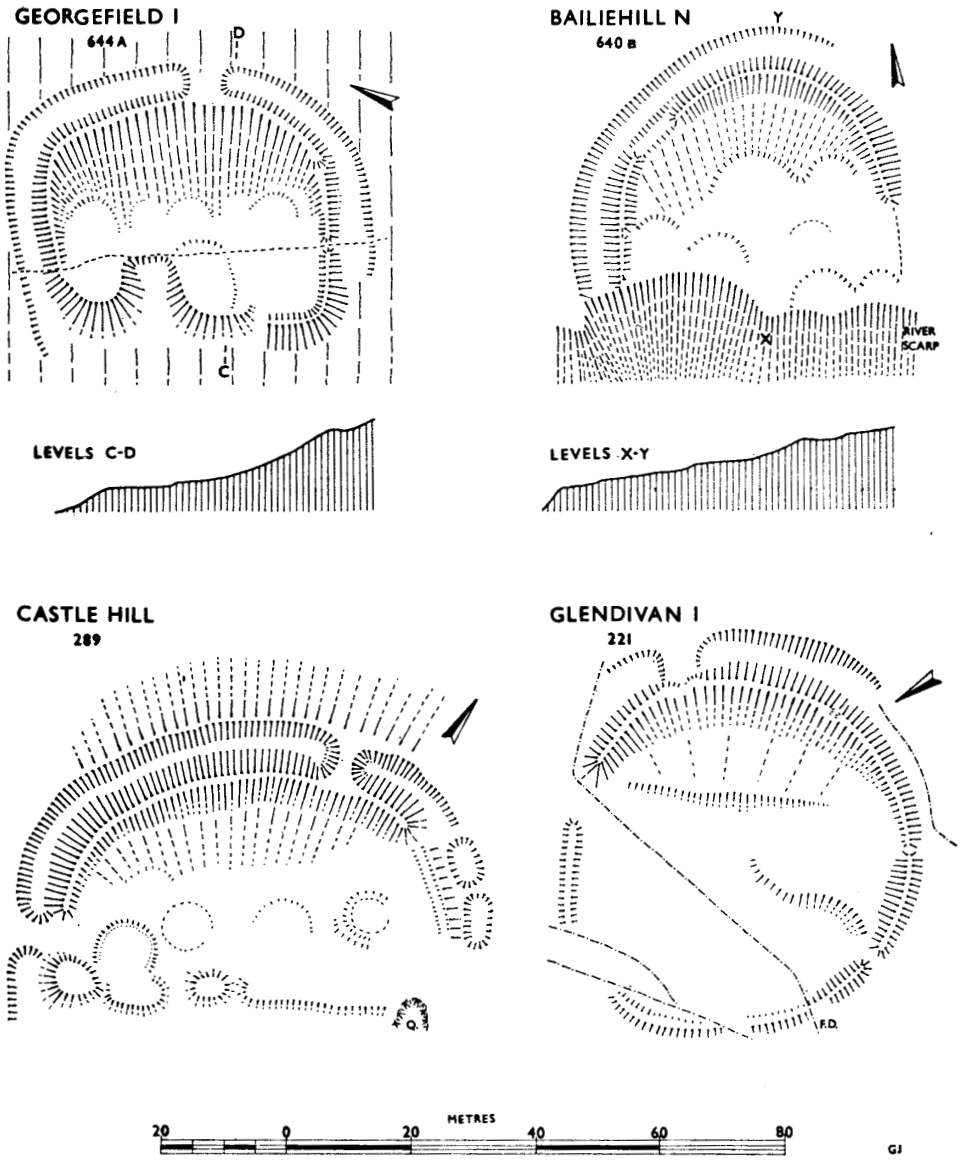
GEORGEFIELD I
644A
D
C
LEVELS C-D
BAILIEHILL N
640B
Y
X
RIVER SCARP
LEVELS X-Y
CASTLE HILL
289
GLENDIVAN I
221
METRES
20 0 20 40 60 80
GJ

Fig. 14

planted site of Baillie Hill North **(fig. 14, 640B)** is located on a steep scarp above the Black Esk. On the other hand, Glendivan 1 **(fig. 14, 221),** situated on a slight slope above the Glendivan Burn in Ewesdale, illustrates the difficulties of rigid classification from surface observation. Although this site is not well preserved, it is clearly scarped at the rear to provide a platform for huts and has an exterior drainage ditch, but there is also the faintest indication of a possible forecourt after the manner of certain settlements discussed below (3). The same might be said for Bankburnfoot **(fig. 12, 633).** Only the occasional drainage ditch is recorded in Peeblesshire, but the interrupted ditch for leading off surface water from the uphill part of the perimeter, as well as presumably to provide some material for an enclosure wall or mound, will be seen to advantage on a number of settlements in Roxburghshire. Experience in Northumberland would suggest that somewhat similar sites may be the forerunners of the stone-built Romano-British settlements, but this does not exclude a strong possibility of a much earlier context for some of them.

(2) A number of small settlements, scooped in various manners in the interior, would appear to be surrounded merely by remains of a stone wall or bank, with perhaps the whole of the interior given over to timber-built huts. For example, Wrae Hagg **(fig. 15, 209A),** occupying a shelf on the slopes of Wrae Hill in Eskdale, contains three pronounced scoops for huts, separated by unquarried ridges. Later quarrying has obscured the true purpose of the remaining space, but it was possibly intended for a fourth hut rather than a small forecourt. The perimeter wall has been robbed of its stone to a large extent, but the frontal apron, consisting partly of material pushed forward on to the natural slope in the process of levelling and added to by some wall tumble, is a distinctive feature of a number of less well preserved sites. The settlement at Calfield **(fig. 15, 435)** has been much interfered with, but is of similar form. Here at least some facing stones remain in the perimeter wall. Some few sites achieve altitude, as in the case of Carthur Hill **(fig. 15, 291)** on a shelf high above Dryfesdale, but if defence was intended there is no real pretence at such in the artificial perimeter.

(3) Amongst the remainder of the settlements in non-defensive situations, there is a group which merit special recognition in that they contain some semblance of a hollowed yard or forecourt in front of the area reserved for huts. Normally no ditch is now apparent, and, if such had ever existed, it is possible that it was of no great stature. The examples illustrated are Hoghill 2 **(fig. 16, 211B)** in Ewesdale, Crooks **(fig. 16, 644)** on an old river terrace of the Meggat Water, and a hitherto unrecorded site on a river scarp above the Boyken Burn **(fig. 15, 647B).** Similar and conjoined sites at Rough Castle **(fig. 16, 180),** although at altitude overlooking the Garwald Water, are nevertheless located in a small saddle between the two knolls and do not seek natural defence. The same applies to other sites in this category and can also be seen to advantage at Westside 2 **(194).**

The indications of what may be excavated yards or forecourts are never so pronounced as in the case of the Peeblesshire scooped settlements (Type E) or entirely stone-built Romano-British type homesteads and settlements of the

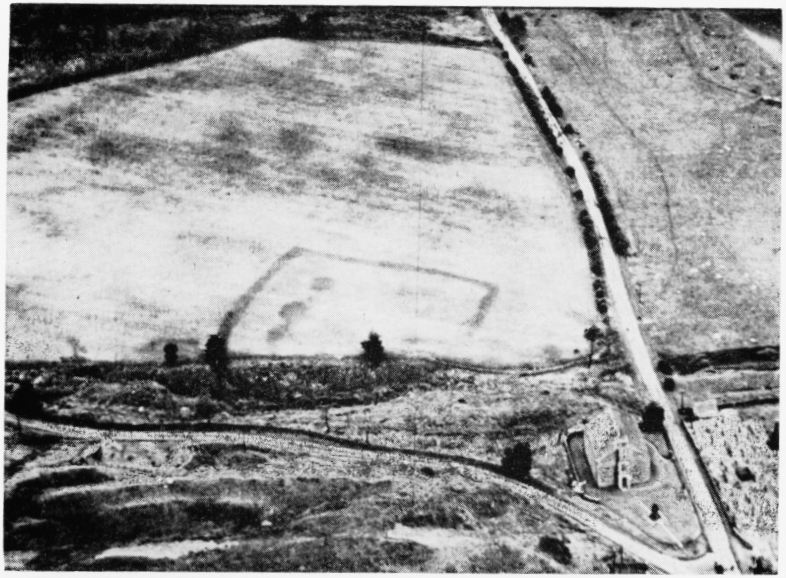

Plate I—Settlement Site adjacent to Eskdalemuir Kirk. Photo by T. K. St. Joseph, Cambridge University Collection. Copyright reserved.

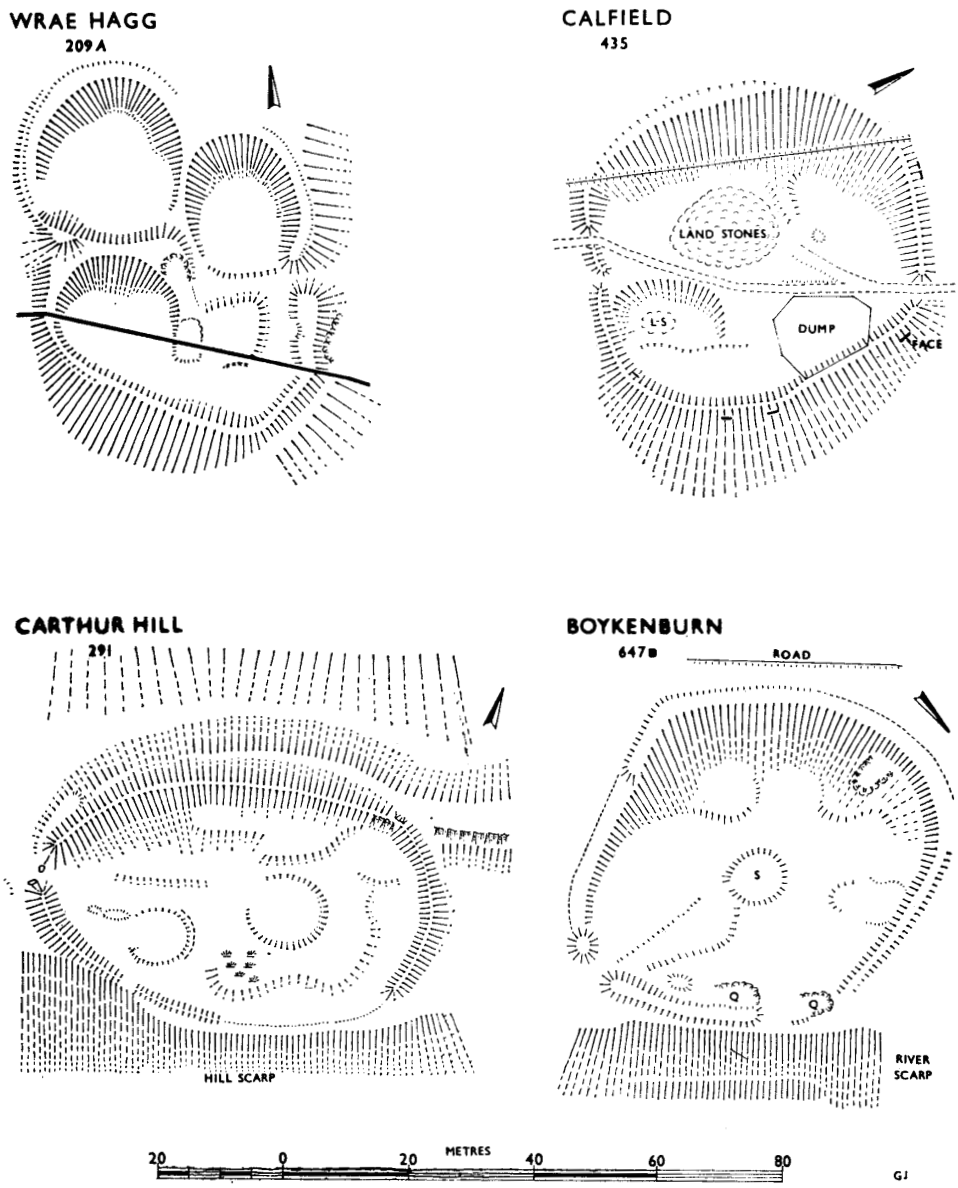
WRAE HAGG
209A
CALFIELD
435
LAND STONES
L·S
DUMP
FACE
CARTHUR HILL
291
HILL SCARP
BOYKENBURN
647B
ROAD
S
RIVER SCARP
20 0 20 METRES 40 60 80
GJ

Fig. 15

Eastern Border counties. Nowhere do these enclosures appear to have contained stone-founded huts, so that for the moment timber-built structures may be assumed to lie behind the forecourts. The one possible exception is the Boykenburn settlement, where a secondary stone feature occupies the centre of the interior, but at best this is still a doubtful example. Only one settlement apparently of this order, Burnswark East **(272)**, has been excavated, but this is inadequately recorded, and, from the 1895 report, appears to have produced no concrete dateable material that can be associated with it.

An interesting aspect of most of the homesteads and settlements in the above categories is not only that they have housed small social units but also that there is little evidence for expansion on individual sites. The dual settlements on Rough Castle Hill, and two much disturbed sites at Hartmanor **(185)** and Burian Hill **(434)** would seem to be the only possible exceptions. Admittedly, where similar sites are in reasonably close proximity to one another, as at Georgefield, a larger linked unit could be envisaged and some expansion may be implied.

E. ENCLOSURES

After the above categories of settlements are abstracted, there still remains a substantial number of enclosures of doubtful function and context, chiefly because they are situated on lower hill-slopes and terraces that have been subject to prolonged cultivation. Although a number are scooped in the interior, there are no certain indications of round hut-platforms, and it is as well to remember that this is terrain where, so far as habitation sites are concerned, some degree of levelling of the ground would be necessary whatever the period of occupation. On the one hand, there are small hollowed enclosures such as Raggiewhate, Shankend, and Boreland of Dryfe (**fig. 17, 116, 306, 299B**), which if intended for dwellings, would be of no more than homestead size. The nature of their hollowed interiors, however, would seem to preclude the whole area having been taken up by a single large round house as was tentatively suggested in the case of the small enclosure at McNaughton in Kirkcudbrightshire, which provided a radiocarbon date of 280 ± 100 B.C.[24] If possibilities may be entertained, the more likely solution would be that of one or two free standing round huts situated at the foot of the rear scarp, for which there is the faintest suggestion at Barrack Hill (**fig. 17, 289A**). In addition, there are large enclosures such as Terrona **(209)** or Henwell, Staple Gordon **(433)**, in Eskdale, which have an interior rear scarp surviving, but the true stature of the perimeter is in doubt and the use of the interiors uncertain. It is perhaps as well to recall that the former has yielded a medieval tripod vessel from the ditch[25] and the latter contains at least one rectangular hut-platform. Even so, neither of these facts need have bearing on the original context of these or similar enclosures, as the air-photograph of the site at

23 R.C.A.M. **Roxburghshire, I.** 48.
24 Scott-Elliot, J., **et. al., Trans. D. & G. Soc.,** XLIII (1966), 73ff.
25 Information from Mr A. Truckell, Burgh Museum, Dumfries.

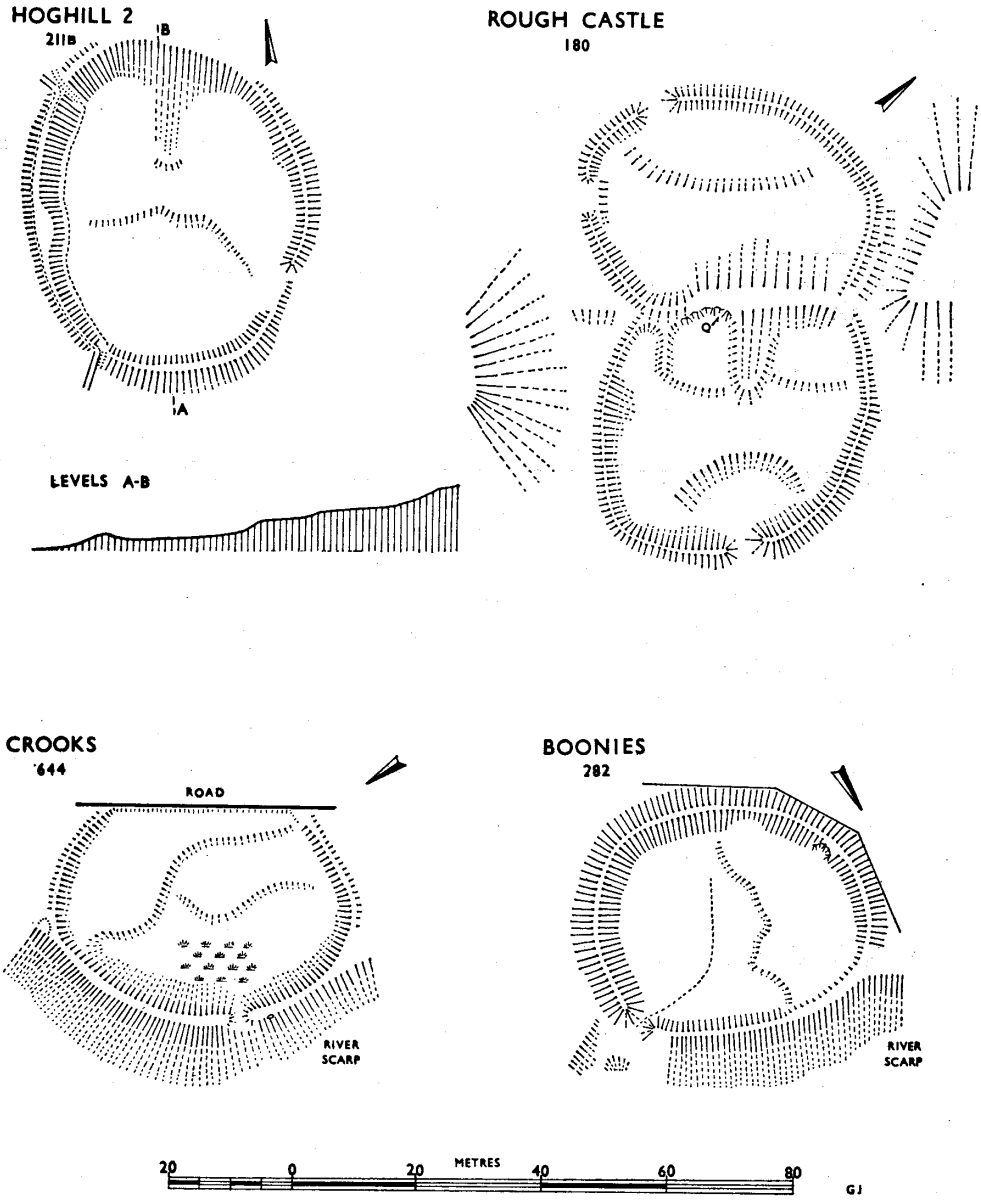
HOGHILL 2
211B
1B
1A
LEVELS A-B
ROUGH CASTLE
180
CROOKS
644
ROAD
RIVER SCARP
BOONIES
282
RIVER SCARP
20 0 20 METRES 40 60 80
GJ

Fig. 16

Eskdalemuir Kirk (**plate I, 204**) well illustrates. This site now appears as no more than a hollow on a previously cultivated slope leading down to the Esk, yet an enclosure ditch and the provision for some round huts towards the rear of the enclosure are obvious from crop-marks. In like manner, the recorded find of a fragment of opaque white glass pendant[26] from the otherwise unclassifiable scooped enclosure at Burnswark West **(272)**, could also be significant as to the possibility of any early date for some of these sites.

The number of hitherto unrecorded enclosures found by the simple process of walking over potentially favourable areas for settlement, where these appeared as small voids in the general distribution pattern of the known earthworks, is sufficient indication that more remain to be found by air-survey, particularly in the more intensively utilized valley of the Annan or the area to the south of Burnswark.

F. SECONDARY OCCUPATION OF MORE RECENT DATE.

Apart from the later rectangular building within the hill-fort on Brieryshaw Hill and the rectangular platform at Staple Gordon, already mentioned, remains of rectangular structures with associated walls or turf dykes have been noted on three sites with scarped interiors. These are Johnstone House and Clerk Hill **(fig. 18, 182 and 172A)**, and Alsia Knowe **(623)**. So far as can be seen all are secondary to the main enclosures so that an early context for the initial occupation is not denied. Secondary occupation of this nature is not uncommon elsewhere in the northern uplands, where suitable building sites are sometimes at a premium because of the steep hill-slopes.[27] Later circular turf-built " pens " sometimes occur, as in and behind the settlement at Bankburnfoot **(Fig. 12)** or, in a clearly secondary situation at Crawthat Cottage **(595)**. These have often been confused with hut-circles; as indeed have some early enclosed cremation cemeteries[28] in the area.

Close juxtaposition of modern farms and scooped enclosures is not uncommon on the river terraces and occasionally the earlier enclosure has itself been used as the site for present-day buildings. The point is well illustrated at Dryfe Lodge **(299)**, Milnholm South **(637E)**, Kirkstyle **(113A)**, Rigfoot **(218)**, and Burnfoot **(641)**. Even a walled ' tatie patch ' preserves the outline of an unrecorded scooped enclosure lying between Dryfe Lodge and Waterhead **(299A)**.

G. EARLY FIELD SYSTEMS

No early field systems have been noted, but air-photographs have not been readily available and the search has not been intensive. A note by Prevost[29] on the divisions of marches and fields in the area in the eighteenth century quotes the use of a ' line of pitts ' as a boundary mark at Miltonhead. Although out

26 Kilbride-Jones, H. E., **P.S.A.S.**, LXXXII (1937-8), 366ff.; Stevenson, R.B.K., **P.S.A.S.**, LXXXVIII (1954-5), 208ff.
27 Jobey, G., **Arch. Ael.4**, XLII (1964), 55ff.
28 R.C.A.M. **Peeblesshire**, I, 16.
29 Prevost, W., **Annals of Three Dumfriesshire Dales** (1954), 82.

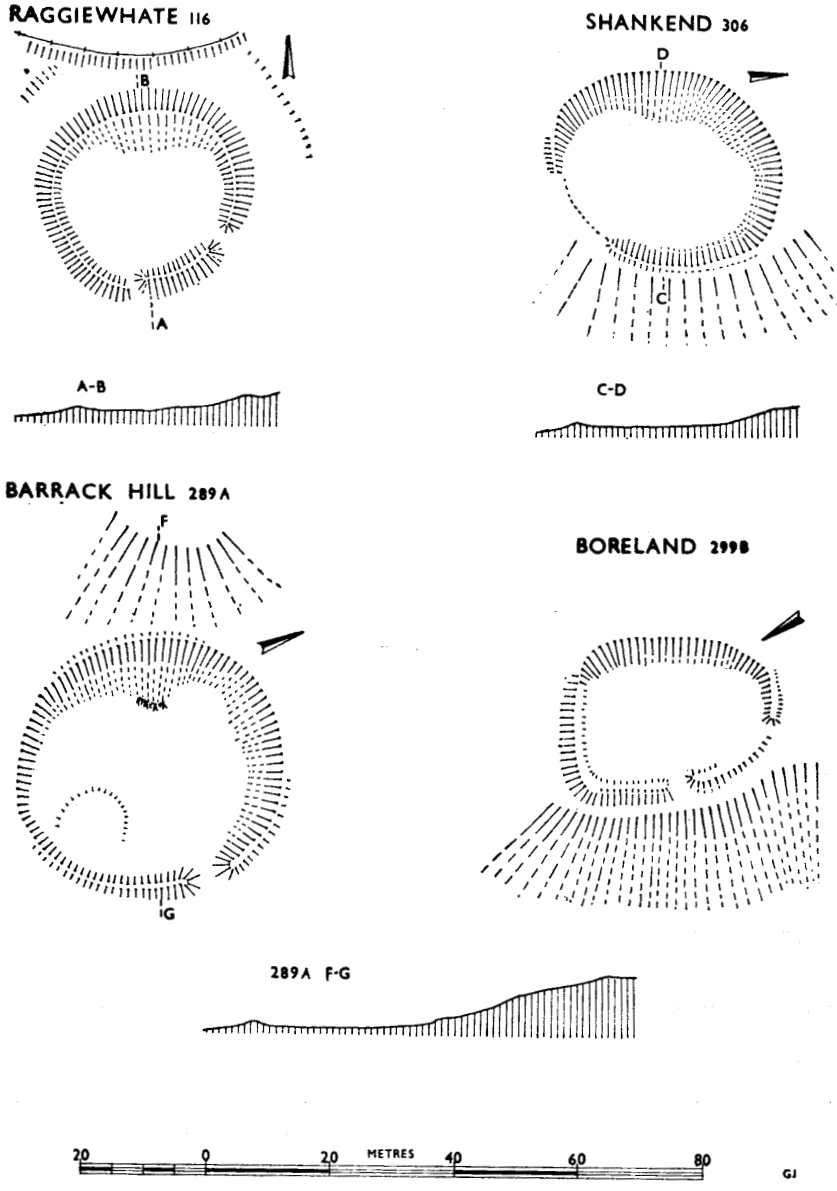
RAGGIEWHATE 116
B
A
A-B
SHANKEND 306
D
C
C-D
BARRACK HILL 289A
F
G
289A F-G
BORELAND 299B
20 0 20 METRES 40 60 80
GJ

Fig. 17

of context in this survey, it is perhaps a timely reminder of the fact that not all pit-alignments which may remain to be found will necessarily have an Iron Age or Romano-British date[30]

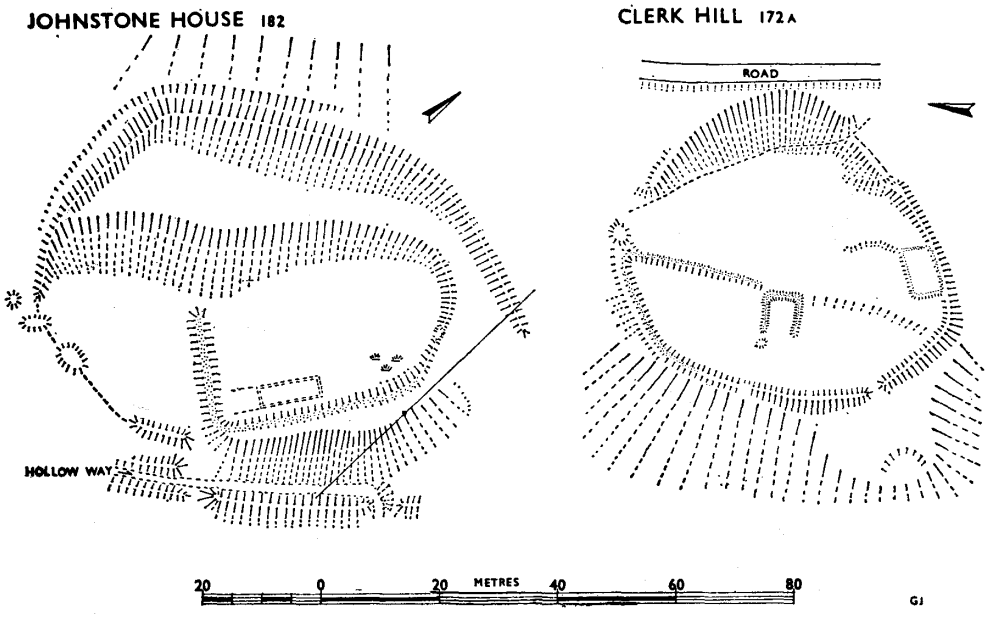

Fig. 18

GENERAL REMARKS

Although the area covered by this survey is not extensive, a few general observations may be allowed.

The earliness of some palisaded works in the sixth and seventh centuries B.C. is probably not now in doubt. Correspondingly it may prove necessary to move up the dates for the initial phase of some hill-fort defences and walled settlements. The fact that this may be so at Burnswark is not only of possible significance for the other so-called **oppida** of the Border region, such as Traprain Law with its Late Bronze Age material, but is also perhaps illustrative of a development of some tribal identity and loose political grouping at an early date. Burnswark apart, however, the comparatively small social unit prevails here as elsewhere.

In addition to Burnswark one may detect a minor show of strength in the Castle O'er area, but beyond this there is only the occasional multi-ditched site having defence in depth to mark it as perhaps being of some local significance amongst the general run of single ditched forts or defended settlements. It is the latter with its internal rampart, broad ditch and counterscarp bank which is distinctive of the area.

30 e.g., Simpson, W. G., **Rural Settlement in Roman Britain**, 15ff.

From the viewpoint of historical geography the region is not without interest in the Roman period, being situated centrally in the land mass immediately to the north of the Tyne-Solway Gap, at a point where Annandale provides a gateway into Scotland. It is territory which has been assigned tentatively to the southern septs of the Selgovae who are sometimes seen as the real recalcitrants of southern Scotland. Possibly with less evidence, its southern parts have also been considered as forming an enclave of Brigantia. Towards here the initial Roman thrust could have been directed, and from here, as one possible area, it has been suggested that outside aid may have come to Venutius. It lies in advance of what may have been the headquarters of Wall Command at Stanwyx, itself not too far removed from the geographical centre of the Hadrianic frontier system as a whole, and in a sector which merited outpost forts for whatever reasons of short or long-range surveillance. The long-standing concentration of Roman forces in or directed towards the north-west has been noted on more than one occasion and, come the troubles of 155-8 A.D., if they ever did exist, Burnswark has been seen as a rallying point for disaffection.[31] It would be fortunate if field survey of non-Roman earthworks could of itself throw much light upon specific historical problems of this nature and the task cannot be attempted in this instance. The area as surveyed appears to be replete with small defensive sites when compared with the present picture for the northern parts of Brigantia immediately to the south, but this comparison may not be altogether valid. And it remains true that there is not any disparity by comparison, say, with the Cheviot foothills to the east. Although the differences are not of great degree, the weight of artificial defence, the apparent complication in the growth of defences, and, in some measure, the size of the social units involved, would all seem to be somewhat more notable in the general area of Greater Tweed-dale to the north-east.

The problems of rural settlement during the Roman period in like manner cannot be solved by field-survey alone, although the potentials of the area may now be seen a little more clearly. The territory is not and never has been considered to be a demographic void for topographical reasons, as in the case of Ettrick, the Bewcastle Fells, or the Wastes to the west of North Tyne. Native enlistment into the Roman army there will have been, but other evidence from the area would not countenance any idea of wholesale depopulation. In a situation where there is virtually a total absence of associated finds from settlements, investigation directed towards the determination of Romano-British settlement must surely start on those non-defensive scooped settlements which have a semblance of a forecourt and can now be seen to be situated mainly on the hill-slopes and river terraces. It is these sites which, apart from the lack of stone-built huts, approximate in all other respects to the Romano-British stone-built settlements of the Tyne-Forth district. If, on the strength of the air-photograph of the site at Eskdalemuir

31 e.g., Birley, E., **Trans. D. & G. Soc.**, XXXI (1954), 9ff.

Kirk, other less well preserved enclosures in similar positions might be added to the number in this category, then a pattern of Romano-British settlement would emerge similar to that of Northumberland to the east. Particularly would this compare with North Tynedale and Redesdale where, unlike some areas in the Cheviots, the units for some reason remain small and if expansion of population did occur then it must have led to establishment of new sites at a distance, since it does not show itself in agglomeration or close juxtaposition of several individual units.[32] There are more than sufficient scooped enclosures in the valleys of eastern Dumfriesshire to give a similar pattern of sites occurring at intervals of 1.0—2.0 kilometres apart on the river frontages.

In like manner, some investigations of those forts or defended settlements of pre-Roman type where there also appears to be the possibility of secondary settlement, comprising round timber-built huts, might conceivably provide a parallel for the stone-built Romano-British settlements which so frequently overlie abandoned hill-forts in the east and, on occasions, in Peeblesshire to the north.

The reason for the absence of stone-built huts in Dumfriesshire settlements would of course still remain problematical as, indeed, would the explanation of the switch from timber to stone in the Tyne-Forth area which, both in survey and excavation, can be seen to take place on Romano-British settlements in the uplands of that province,[33] though not necessarily on the coastal plain.[34] As has been illustrated elsewhere, this form of entirely stone-built settlement can no longer be regarded as confined to the tribal area of the Votadini unless perhaps their influence was expanding into other territory, including the Biggar Gap in Peeblesshire.[35] It was thought by the present writer that the continued use of timber for hut-construction in Dumfriesshire, together with the reduced number of stone as compared with timber-built huts in the Peeblesshire settlements, might have been due to a combination of geographical and geological factors affecting the availability of building materials.[36] But subsequent detailed plots of sites over the whole of the Border area leaves this in some doubt and other factors may be operating. In any event, this and other questions of comparison between geographical and tribal areas can be no more than speculative before the main task has been accomplished, which must now be to establish by excavation the context of those sites selected by preliminary survey as contenders for Romano-British occupation.

NOTES

Plans of sites are at the moment held in Newcastle. Copies will be deposited with R.C.A.M. Scotland, together with map references of newly

32 Jobey, G., **Arch. Ael.4**, XLI (1963), 211ff.
33. Jobey, G., **Arch. Ael.4**, XL (1962), 47ff.; Burgess, C., **Trans. D. & N. A.A. Soc.** (1970), forthcoming.
34 Jobey, G., **Arch. Ael.4**, XLVIII (1964), 95.
35 Steer, K. A., **Arch. Ael.4**, XLII (1964), 17ff.
36 Jobey, G., **Scottish Archaelogical Forum** (1970), forthcoming.

recorded sites. One cannot help but view with some alarm the present threat to minor earthworks by ever increasing afforestation.

This summary was written early in 1970 when dendrochromological calibration curves were not readily available for the periods in question so that all dates quoted are in conventional radiocarbon years.

TYNRON DOON, DUMFRIESSHIRE: A HISTORY OF THE SITE WITH NOTES ON THE FINDS 1924-67

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

INTRODUCTION

Tynron Doon, Nat. Grid. Ref. NX 820939, is a prominent hilltop rising to 946.6 feet O.D., and lies between Penpont and Tynron Kirk villages, to the west of Thornhill, Dumfriesshire. In certain of the ditches surrounding the hill-top Fort and upon the slopes below are several large patches of nettles denoting organic waste. The largest of these patches lies on the very steep south-western slope immediately above Clonrae Farm. The patch of nettles is approximately 100 feet wide and 200 feet in length (down the slope). The large area of scree near the base of this slope contains fragments of vitrefaction and waste from iron-working. In 1924 three small pieces of "yellow metal" were found in a rabbit scrape in the warren that then occupied the nettle patch. These fragments have been identified as portion of a gold filigree panel from a sixth to eighth century bracteate-pendant. In 1964 Mr A. E. Truckell of Dumfries Museum opened a section of this slope at the request of the Thornhill Extra Mural Class in Archaeology. This work continued in 1965 and in 1967 the writer opened several additional trenches within the same area (as well as two small trial sections elsewhere on the hillside): This work revealed several useful Early Mediaeval (Dark Age) objects and yielded evidence regarding the sequence of occupation on the summit of the hill.[1]

ACKNOWLEDGMENTS

I have to thank Buccleuch Estates, Ltd.—the owners of the land, per Major P. D. H. Fox, factor; Mr H. Rorison of Clonrae, the farmer, whose friendly help and interest have been much appreciated; the members of the 1964 Thornhill Extra Mural Class in Archaeology; various Dumfries volunteers and especially Mr A. E. Truckell, who made the finds from 1924-1965 available for study and also gave much assistance with information regarding the site.

CHRONOLOGICAL SEQUENCE OF OCCUPATION

The site is basically a multivallate Iron Age Hill-Fort with an Early Mediaeval (Dark Age) and Mediaeval occupation. The final phases include a [?] sixteenth century Tower-house and an eighteenth to nineteenth century shepherd's bothy. A detailed description of each phase will now be given:

IRON AGE

The Iron Age structures must follow much the same basic plan as the present modified structure, i.e. a central plat defended on the North, East and

1 For a brief description of the work carried out on the site, 1964-65, see "Tynron Doon, 1964-65" by A. E. Truckell. T.D.G.N.H.A.S. Vol. XLIII, p.147-9.

South by steep natural slopes. The West and North-west approaches were defended by a series of two main ramparts and three ditches—several of the ditches are rock-cut. Below the summit on the North-eastern slopes there are prominent remains of a terrace cut into the slope—the terrace is defended by a small rampart but at present its use remains unknown. A plan of the Fort is incorporated in the Site-map (Fig. 1) and sections through the ramparts at various points are given in Fig. 2. The individual sections are now described:

(1) From the edge of the central plat across the North-east terrace: 1. edge of main plat, 2. terrace rampart. X-A on site-map.

(2) From edge of Tower-house across the South-west defences: 1. edge of Tower-house, 2. "well" ditch, 3, Rampart I, 4. central ditch, 5 Rampart II, 6. small outer hornwork to the South of the gate. X-B on site-map

(3) Across the defences at their most prominent, i.e. slightly to the North of the gate: 1. edge of Tower-house, 2. edge of main plat, 3. "well"

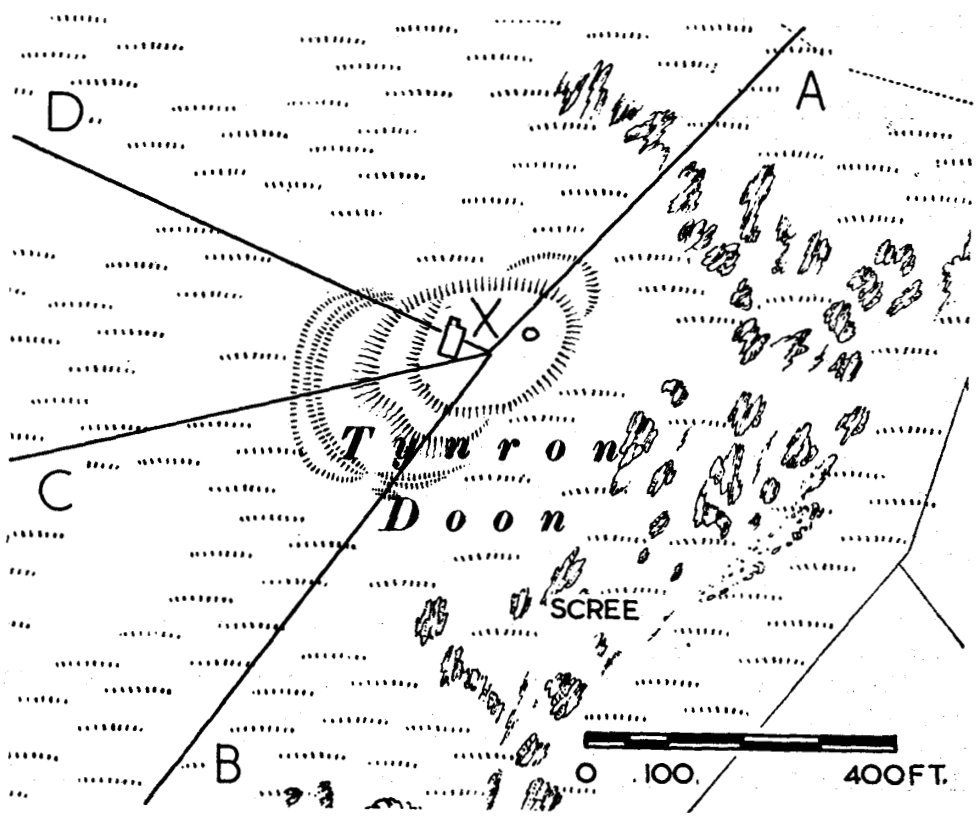

Fig. 1—Site Plan of Tynron Doon (Plan based on O.S. 25 in. sheets).

ditch, 4. Rampart I, 5. rock-cut edge of central ditch, 6. central ditch, 7. rampart 11, 8. rock-cut outer ditch—this ditch still contains a little water. X-C on site-map.

(4) Across North-west defences: 1. edge of Tower-house, 2. edge of main plat, 3. remnant of "well" ditch, and rampart I, 4. central ditch, 5. rampart II, 6. rock-cut outer ditch. X-D on site-map.

The vertical scale on these has been exaggerated by the ratio of 2 : 1 in order to render the profiles in their true perspective—this is necessary due to the large change in vertical height across the sections making changes in height of the order of 1-10 feet relatively insignificant.

EARLY MEDIAEVAL (DARK AGE)

No details of the occupation relating to this period are available but presumably the Iron Age Fort was merely utilised with few or no major changes. The occupation waste from this period lies below the large nettle patch on the South-western slopes. This midden is the only dated occupation waste on the site, although other areas relating to the different phases of occupation on the hilltop must exist elsewhere.

MEDIAEVAL PERIOD

As with the Early Mediaeval period there is no positive evidence regarding structural changes on the site during this period. It was suggested some time ago that the hill-top might have been modified as a Motte and the ditches re-cut some time around the late twelfth or early thirteenth century in order to correspond with general practice elsewhere in the area.

LATE MEDIAEVAL PERIOD

This phase of occupation is represented by the base plan of an L-shaped Tower-house of (?) sixteenth century date. The Tower stood just within the gate at the North-west corner of the central plat. The remaining wall plan measures approximately twenty feet by forty-two feet with an extension at the North-west corner of eight feet by ten feet which very probably represents the wheel-stair of the Tower. The structure was demolished some time around 1700-50 and the stone—apparently sandstone—used to build the predecessor or the present Tynron Kirk. There are indications that the hill-top at this period was enclosed within a barmkin wall with a gateway at the South-western corner of the Tower. Traces of this wall were reported in the R.C.A.M.'s Inventory for Dumfriesshire in 1920[2].

The Tower is remembered in one of the local folk stories in which a young man visited his love who was the daughter of the owner of the Tower. During his visit the young man was disturbed by the girl's brother and dashed out of the building, leapt on his horse, and rode over the very steep slope above

2 Inventory of Ancient Monuments in the County of Dumfries, by the R.C.A.M. See site No. 609. The Old Statistical Account. Vol. XIV, p.279. The Tower-house is marked on Bleau's Atlas. (Published in 1660 on information obtained by a survey by the Rev. Timothy Pont in 1595.)

Clonrae Farm in his confusion. The horse stumbled and upon falling the young man's body became so battered that the head separated from the body and rolled into the Well of St. Bride on the gentler slopes below. The ghost of this young man is reported to have been seen searching for his lost appendage. Although this tale is now fixed in a late Mediaeval context it obviously has its origins in the Iron Age when Celtic religion attached much importance to the inter-association of heads and wells. The fact that this tale has survived shows how much continuity of population there must have been in this inland parish over a period of nearly 2000 years.[3]

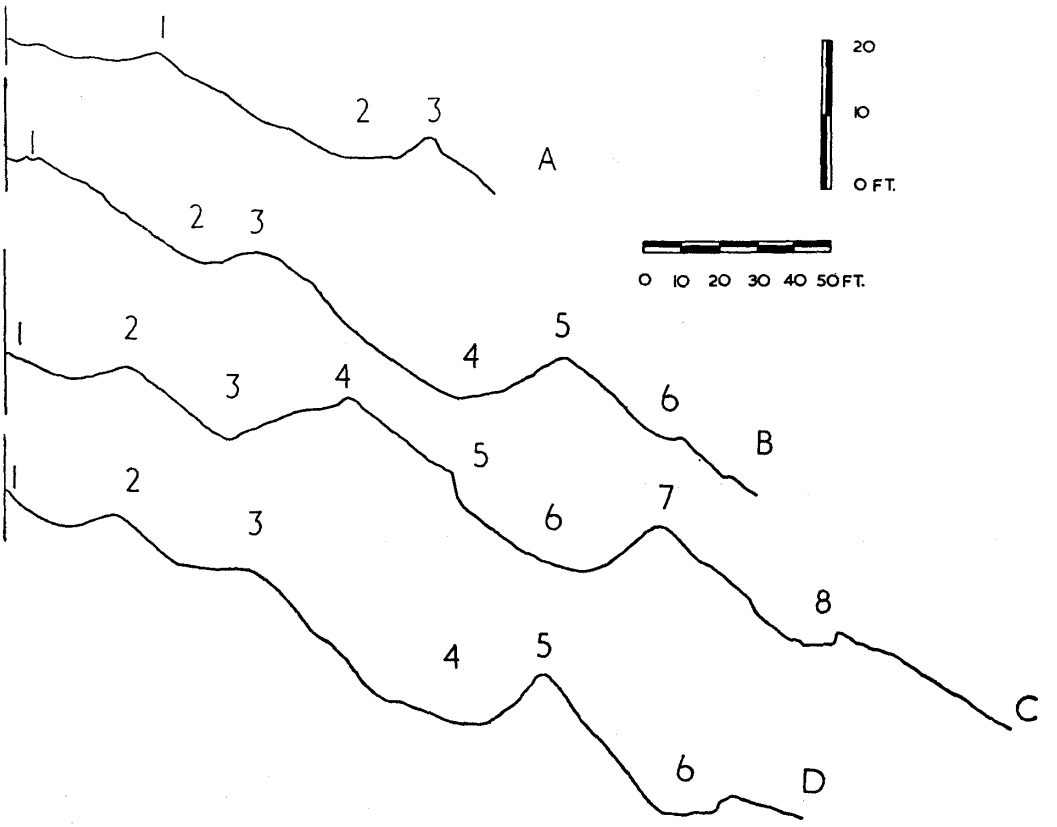

Fig. 2—Tynron Doon—Profile of Ramparts—Note: The vertical scale has been exaggerated to twice the linear scale.

18th-19th CENTURY OCCUPATION

Occupation during this period appears to be represented by a hut circle in the South-eastern corner of the plat—this is very probably the remains of the shepherd's bothy built when the Tower was removed to build Tynron Kirk.

3 "The Headless Horseman of Tynron Doon" — the Gallovidian, 1902, p.184-5.

EXCAVATION TECHNIQUE—THE SECTIONS OPENED

The nature of the ground on the South-western slopes determined the type of excavation technique employed. This slope in many places approaches 70° to the horizontal and consequently produces difficulties in regard to stabilisation of " spoil " and fill. In the first two seasons a straight trench was opened and when this was later refilled the fill merely slid down the slope. During the excavations in 1967 the turves removed from the trenches were built into a retaining wall round the bottom of the trench; the excavated " spoil " was then placed behind the wall as excavation proceeded up the slope—as the work continued upwards additional walls were built. As there is no problem regarding stratigraphy at this area of the site the technique works well as it not only provides an area for " spoil " disposal but also ensures an adequate platform upon which work can take place rather than on the steep, natural slope. It is

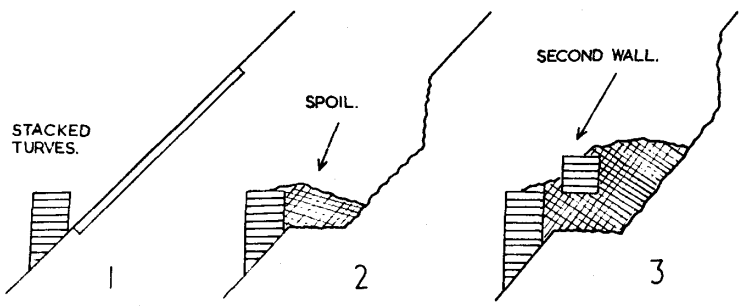

Fig. 4—Tynron Doon—Spoil retention during excavation on a steep slope.

also hoped that these retaining walls will tend to stabilise the refilled trenches and not give rise to the 1964-5 experience whereby the vegetation cover is still minimal. Figure 3 shows the relative positions of the trenches opened, and Figure 4 shows the " retaining wall " technique diagramatically.

THE FINDS. 1924-1967

The finds from Tynron Doon are not many in number but in the main they represent objects from the sixth to eighth centuries and as such are important archaeological material. Almost all the finds from this period can be paralleled from the crannog excavation at Lochlee, Lochspouts, and Buston in Ayrshire.[4] The finds are described where practicable in the order of their finding.

1. 1924

On the 19th of October, 1924, either a Mr D. Donald of Craigturra, Tynron, or Mr William Wilson of Tynron found three small fragments of " yellow metal." These fragments were presented to Dumfries Museum in 1927 (Reg. No. 1936-10). The frag-

4 " Notice of an Excavation of a Crannog at Lochspouts, near Kilkerran." Arch. & Hist. Coll. Ayr & Wigton, Vol. III, p.1-19. " Notice of the Excavation of a Crannog at Buston near Kilmaurs." Arch. & Hist. Coll. Ayr & Wigton, Vol. III, p. 19-51. " Notice of the Excavation of a Crannog at Lochlee, Tarbolton, Ayrshire." P.S.A.S., Vol. XIII, p.175-252.

ments consist of a backing of three to four layers of gold leaf on which are mounted six complete, and portions of two, spectacle or hook and eye-shaped ornaments (Fig. 6). The whole weighs 0.1235 grams and has maximum dimensions (when re-assembled) of 0.76 × 1.01 cms. The spectacle ornament is executed in a fine gold filigree, the wire of which has been 0.244 mm. in diameter before being "nipped" into the filigree—the greatest and smallest diameters of which are 0.266 and 0.168 mms. respectively. There is a hollow, 0.056 mm. across and 0.021 mm. deep, around the raised portions of the wire—see Fig. 5—this hollow is formed during the manufacture of the filigree and does not represent a deliberate detail.

MANUFACTURE OF THE FILIGREE

Gold wire has been taken, in this case, 0.244 mm. in diameter, and pressed into a mould which was probably incorporated in a pliers-type arrangement for the easy application of

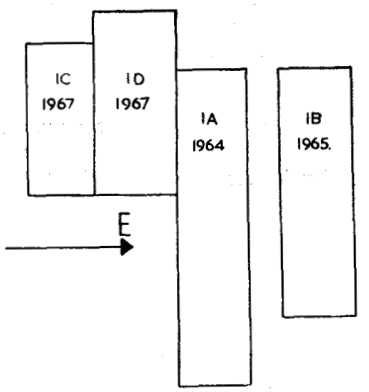

Fig. 3—Tynron Doon—Diagrammatic representation of the S.W. slop showing relative position of the trenches.

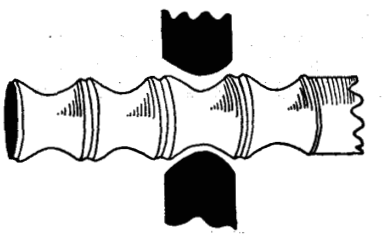

Fig. 5—Tynron Doon — Suggested method of manufacture of gold filigree (magnified 40 times).

pressure. The mould—see Fig. 5—could have been made such that a single or multiple "nip" was applied to the wire. In either case, it is difficult to make and place together two such single moulds in order to obtain a pure Sine curve. On most occasions too wide a space has been allowed and it is this fault that gives rise to the hollow around the raised portions of the filigree. This equatorial cut, or **aquator-schnitt,** as it is known to the Germans, is characteristic of Carolingian filigree work. Mr R. L. S. Bruce-Mlitford feels that this "decoration" first appears in late 7th century work in Britain.

DATE OF THE FRAGMENTS

As mentioned elsewhere in the text, these gold fragments represent a panel from a divided circular bracteate-pendant — Fig. 6. The fragments are closely paralleled in type, and undoubtedly in date, by the three gold bracteates found at Milton Regis, near Sittingbourne, Kent, in 1915 or 1916, and now in the British Museum. These bracteate-pendants were found with six silver "sceatta" coins which can hardly have been deposited much before c. 675 A.D., the generally accepted date for the emergence of the silver "sceatte" currency.

The occurrence of "spectacle," or "Hook and eye" decoration as it is more commonly known, is extremely rare in Anglo-Saxon gold jewellery. The British occurrences, other than the Tynron Doon example, include the following:

1. Two gold clips fitted to the hilt of the Sutton Hoo sword;
2. an unusual gold ornament, of uncertain date, found at Faversham, Kent;
3. the Milton Regis bracteate-pendants;
4. a pendant, in pale gold, with a Celtic cross design from Breach Down, Kent;
5. an ornamental gold pin with a bird design in cloisonné and cabochon garnets from Wingham, Kent;
6. a square-head brooch set with garnet from Stodmarch, Kent[5]; and, finally,
7. the large gold finger-ring with antique onyx intaglio from the Snape Boat Burial, Suffolk (all the above items are now in the British Museum Collections).

In general terms these items may be dated to the 7th-8th centuries and for a fuller discussion of the group as a whole, Mr R. L. S. Bruce-Mitford's paper on "The Snape Boat Burial," in Vol. XXVI, pt. I, of the Proc. Suffolk Inst. of Arch. & Nat. Hist. should be consulted. Of all the British examples cited only the Tynron Doon fragments show the **äquator-schnitt** decoration which, as stated earlier, is thought to have been introduced into Britain by the late 7th century. This feature, therefore, supplies a convenient **terminus ante quem** for the fragments and bearing in mind the indications offered by the S. E. English material suggests a dating to the late 7th-8th centuries.

2. **1964**

The finds in 1964 came from trench IA on the South-western slope. This trench was opened by Mr A. E. Truckell of Dumfries Museum and excavated by him with assistance from the Thornhill Extra Mural Class in Archaeology and volunteers from Dumfries. Objects

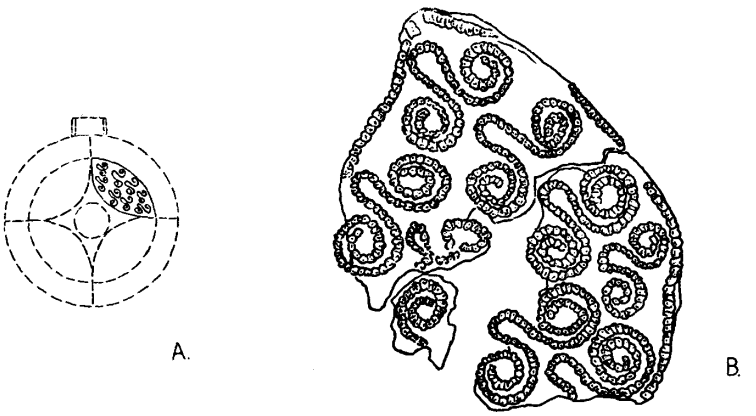

Fig. 6—Tynron Doon—Bracteate fragments, B—as found (magnified 5 times), A—reconstruction of complete pendant (Scale 1/1).

from this trench are retained by Dumfries Museum under the register number 1964-57.

1964-57-1. Ribbed cobalt-blue glass bead (Fig. 7, 2). The original external diameter has been 0.75 cms. with a perforation 0.4 cms. in diameter. Beads of this type are dateable to the 6th-7th centuries and parallels can be found in the material from the early Christian cemeteries at Chamberlains Barn, Leighton Buzzard, Bedfordshire.[6]

1964-57-1. Ribbed cobalt-blue glass bead (Fig. 7, 2). The original external diameter this may be an unfinished example of the "thistle headed" variety described in 1964-57-3 below. Dimensions: Length, 4.3 cms. (originally c. 5.0 cms.); diameter below head, 0.4 cms.; diameter at head, 0.6 cms. Cf. those from Buston Crannog, Ayrshire.

5 Med. Arch. Vol. XI (1967), p.11, Pl. III.
6 "Two Anglo-Saxon Cemeteries at Chamberlains Barn, Leighton Buzzard, Bedfordshire." by M. Hyslop, Archael. Journ., Vol. CXX, 161-200.

1964-57-3. A complete and finely polished bone pin of the "thistle-headed" variety (Fig. 7-11). Dimensions: Length, 5.7 cms.; diameter at top of head, 0.65 cms.; greatest diameter of head, 0.75 cms.; diameter below head, 0.4 cms. The head of the pin is decorated by a finely scribed line around the top of the head; immediately below which there is a row of very small dots. The shaft of the pin is decorated with three bands of cross-hatching. This pin is closely paralleled by some from Buston Crannog, Ayrshire.

1964-57-4. Fragment of a bone (?) toggle which was probably originally about two centimetres in diameter—about a third remains (Fig. 7-4). The fragment measures 1.75 cms. in length by 1.55 cms. and is decorated with a circle and dot design.

1964-57-5. Tooth fragment, 3.5 cms. in length, worked to a fine point at one end—probably used as an (?) awl (Fig. 8-17).

1964-57-6. Small fragment of badly corroded bone or tooth slightly worked at one end to form a (?) chisel (Fig. 8-15). Dimensions: Length, 2.5 cms.; diameter, 0.8 cms.

1964-57-7. Small fragment of bone shaped by a few simple cuts into a (?) spatula. Dimensions: Length, 3.75 cms.; width, 0.85 cms.; thickness, 0.6 cms.

1964-57-8. Slightly corroded iron spatulate object, approximately 10 cms. in length, and flattened at one end. Very probably relates to the Tower-house phase of occupation. Use unknown. Present location unknown.

1964-57-9. Iron object, conical in shape; length, 3.6 cms.; greatest diameter, 0.5 cms. (Fig. 8-13) (? late Mediaeval. Use unknown—possibly either a plumb-bob or fragment of a tanged cross-bow quarrel head.

1964-57-10. Possible iron wall-hook — present location unknown (Fig. 7-8). Very similar in size and shape to 1967-574-24.

1964-57-11. Iron nail—present location unknown. Probably late Mediaeval.

1964-57-12. Lead sinker or weight (Fig. 8-12). This has been formed by simply rolling a thin sheet of lead over a cylindrical former, such as a stick, and then removing the former. Dimensions: Length, 3.5 cms.; diameter, 1.1 cms.; weight, 16.5 grams.

1964-57-13. Flint. Twelve pieces of flint have been recovered over the years—11 from 1964 and 1 from 1965. Of the twelve fragments five show some working, although this is of a fairly primitive nature—probably mere "battering," followed by a minimal amount of retouch (Fig. 18-22).

(a) Fragment of good quality brownish grey flint. One end is roughly worked to a curve. Dimensions: 2.7 x 1.3 x 0.75 cms.

(b) Small fragment of grey flint finely worked along one face as a scraper. Length, 1.9 cms.

(c) Small piece of white flint worked as a curved scraper. Dimensions: 1.7 x 1.5 cms.

(d) Small piece of amber-brown flint worked along one face as a scraper. Length, 2.1 cms.

(e) "Hump-backed" blade of whitish-grey flint worked very roughly on both edges. Dimensions: 3.1 x 1.0 cms.

1964-57-14. Stone (?) amulet formed from a naturally perforated flat greywacke pebble —the perforation is off-centre. Dimensions: 5.0 x 4.5 cms. by 1.2 cms. in thickness; the perforation is an oval measuring 1.8 x 2.2 cms. (Fig. 8-14).

1964-57-15. Small fragment of "Mediaeval hot-poured mortar." This is most probably from Tower-house or the barmkin wall.

1964-57-16. Small fragment, junction of base and edge of wall, of a fine-grained, buff to grey, unglazed, mediaeval pottery. The fragment is probably early but cannot be dated with any certainty. The fragment was recovered from a rabbit scrape some 20 feet above trench IC

1964-57-17. Finely rounded pebble of fine sandstone or coarse greywacke. Dimensions: 4.1 x 4.5 x 2.8 cms. (?) Pot-boiler.

1964-57-18. Fragments of animal bone, bloomery waste, iron cinder and vitrifaction. The bulk of this material was recovered from Trench IA but a reasonable number of

the fragments of cinder and vitrifaction were obtained from the scree on the lower slopes of the hill. The animal bone has been examined and described in the appendix by Dr A. S. Clarke of the Royal Scottish Museum, Edinburgh, to whom I am extremely grateful.

3. 1965

Excavations in 1965 were carried out by Mr A. E. Truckell and a group of Dumfries volunteers in Trench IB, which lies some five feet to the east of Trench IA. The finds

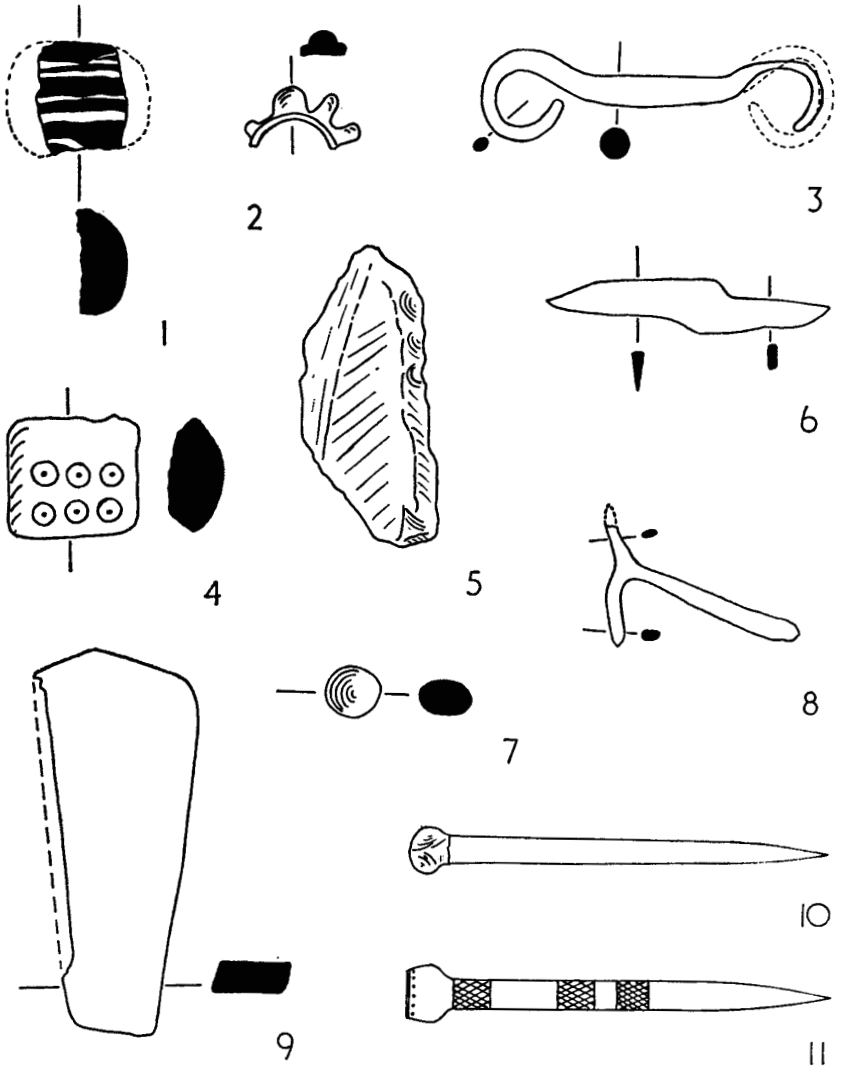

Fig. 7—Tynron Doon—other finds, 1, 2—bead fragment, 3—fragment of chain bit, 4—Bone ? Toggle, 5—Greywacke "scraper," 6—Tanged Knife, 7—"games piece," 8—Wall hook, 9—Whetstone, 10, 11—bone pins (Scales 1 and 2—2/1, 4, 10 and 11—natural size remainder—½.)

are registered under the same number as those from 1964—i.e. 1964-57—and run sequentially with that group of finds.

1964-57-19. Tanged knife blade of iron with a hump-backed form and V-section blade. This knife is closely paralleled by those found at South Cadbury in 1966 and also some of the knives from Buston crannog, Ayrshire (Fig. 7-6).

1964-57-20. Single link from a (?) chain-bit. The metal is relatively free from corrosion but bent to one side. The drawing of this object shows both the present and restored forms (Fig. 7-3).

1964-57-21. Small circular piece of vitreous paste, elliptical in section. Possibly a playing man. Dimensions: 1.45 x 1.35 x 0.95 cms. (Fig. 7-7).

1964-57-22. Collection of animal bone waste, bloomery waste, and vitrifaction. This material was collected under the same conditions as that described under 1964-57-18. This bone material has not been examined, due to its badly corroded condition, but it can probably be taken to be very similar to the material from Trench IA, described in the Appendix.

4. **1966**

During the erection of a deer-fence across the lower end of the midden in 1966 a stone rubber, of uncertain use, was recovered. This find was presented to Dumfries Museum—register number 1966-673.

5. **1967**

Excavations in 1967 were carried out by the writer for a period of one week at the end of August. Two trenches, IC and ID were opened on the Western side of, and immediately adjacent to Trench IA. The excavation of these trenches was carried out as detailed in the introduction, i.e. by a step process. Two trial pits were opened on other parts of the site. Pit A was opened at the southern end of the "Central ditch." Pit B was opened on the South-west slope immediately below the barmkin wall.

All the finds recovered are now in Dumfries Museum—register number 1967-574. The finds 1-11 are from Trench IC and 12-18 from Trench ID.

1967-574-1. Large fragment of cinder mixed with small pieces of tap slag and small pebbles—all fused in one mass and presumably from iron manufacturing processes.

1967-574-2. Fragment of a shaped whetstone—no special features. Length, 10.2 cms.

1967-574-3. An unshaped piece of coarse greywacke utilised on two faces as a whetstone—one corner has also been utilised. Length, 10.8 cms.

1967-574-4. Whetstone of a type similar to 1967-574-3 but only utilised on one face. Length, 12.9 cms.

1967-574-5. Small whetstone, roughly square in section, and worked on four faces. Dimensions: 8.0 x 3.2 x 3.3 cms.

1967-574-6. Small flake of gritty greywacke—one edge of which shows slight utilisation by flaking—(?) scraper. Dimensions: 8.1 x 3.2 cms.

1967-574-7. Pebble, flattened on one side and as such may have been used as a smoother. Dimensions: 6.5 x 5.5 x 0.8 cms.

1967-574-8. Roughly spherical peeble—(?) pot-boiler. Dimensions: 3.3-4.0 cms. in diameter.

1967-574-9. Small water-worn pebble flattened on two faces due to utilisation as a (?) smoother. Dimensions: 3.4 x 4.3 cms.

1967-574-10. Lower portion of a (?) quern in red Permian sandstone—possibly re-used as a hearth stone as one side bears traces of burning. Dimensions: 34 x 18 x 6.5 cms.

1967-574-11. Finds of bone from Trench IC were not many and mainly highly corroded compared to the material from Trench IA.

1967-574-12. Fragment of a glass bead—white stripes on a sky-blue ground. Dimensions: Height, 0.7 cms.; width, 0.6 cms.; original diameter, approximately 0.9 cms.

1967-574-13. Water-worn pebble utilised as a (?) smoother. Dimensions: 6.0 x 4.5 x 2.5 cms.

1967-574-14. Water-worn and slightly utilised pebble used as a (?) smoother. Dimensions: 6.5 x 4.5 x 3.5 cms.

1967-574-15. Two small fragments—both 3-4 cms. in length—of animal long bone showing chop marks.

1967-574-16. Two fragments of olive-green vitrifaction:

(a) Shows twig impressions. Dimensions: 12.0 x 7.5 cms.

(b) Dimensions: 8.5 x 6.5 cms.

1967-574-17. Shaped fragment of tap slag/cinder. This sample, which stands approximately 11.5 cms. high and measures 11 x 8 cms., has a curved base (approximately 13-14 cms. in diameter), suggesting that the furnace waste was run off into a clay basin.[7]

1967-574-18. Miscellaneous fragments (3) of cinder and tap slag.

6. 1967. TRIAL PIT A

As mentioned in the introduction to the 1967 Excavations a trial pit "A" was opened

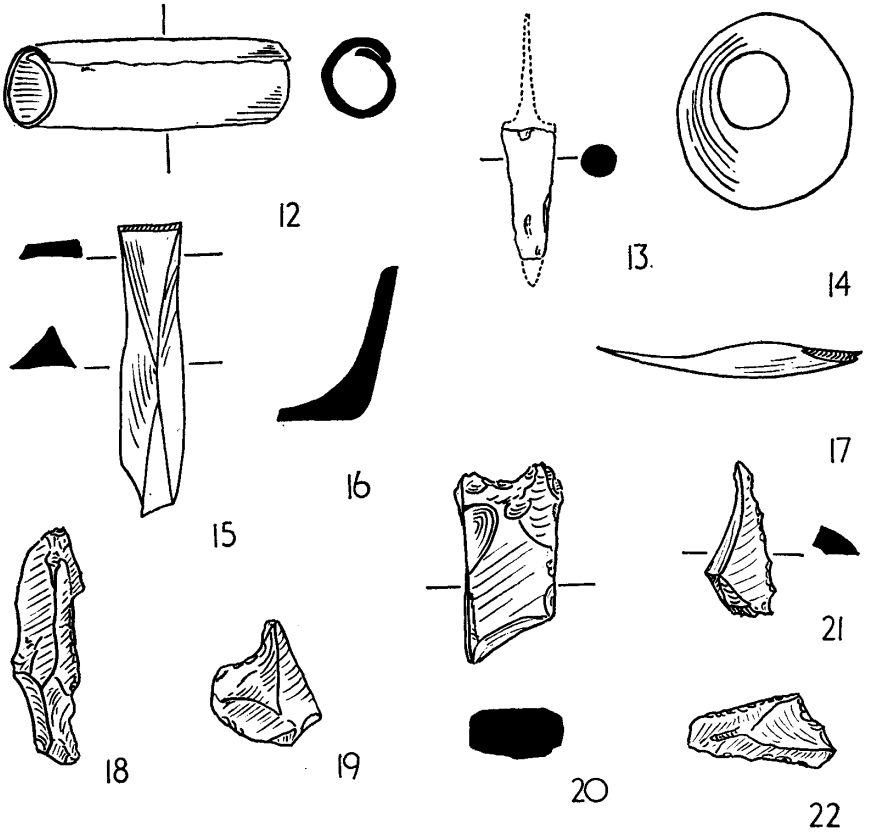

Fig. 8—Tynron Doon—other finds, 12-Lead sinker, 13—Tanged ? quarrel head, 14—Amulet, 15—Bone Chisel, 16— Pottery Fragment, 17—Awl made from tooth, 18 to 22—worked flints (Scales: 13 and 14—½, remainder nat. size).

7 A Mediaeval Iron Smelting Site at Millhill, New Abbey, Kirkcudbrightshire, by J. Williams. T.D.G.N.H.A.S., Vol. XLIV, p.126-32.

at the southern end of the "Central ditch." The pit, which was not carried to completion, indicated that the ditches at this point were much deeper than had previously been thought —indeed, they are probably rock-cut as is the Northern end of this same "Central ditch." The finds 19-20 were recovered from this pit.

1967-574-19. Two small pieces of vitrifaction—one bears the impression of a piece of wood. The vitrifaction is upon brick-red calcined greywacke.

1967-574-20. Small fragment of cinder from iron-working. Dimensions: 7.0 x 6.0 x 4.0 cms.

7. 1967. TRIAL PIT B

This small trench was opened just below the barmkin wall on the south-western rampart. The position of the trench was also immediatly in line with the gulley above the rubbish spread on the South-western slope. The trench measured six feet wide by two and a half feet—the average soil depth was thirty-six inches. The objects found—mediaeval fragments and vitrifaction—seem to indicate that the top of the hill was flattened off in late Mediaeval times in order to erect the Tower-house and barmkin wall on a relatively flat surface. The finds from this pit are 21-25.

1967-574-21. Two fragments of sandstone flagstones:

(a) In red permian sandstone: 15 x 8 x 5 cms.

(b) In coarse red gritstone: 11 x 9 x 5.5 cms.

1967-574-22. Large fragment of vitrifaction fused on a mass of small stone chips and pebbles. Dimensions: 9 x 7 cms.

1967-574-23. Small fragment of yellow-green lead glazed pottery—the glaze is speckled with dark-green blotches which are probably due to admixed copper. Fairly hard gritless fabric. 14th-15th century.

1967-574-24. Iron (?) wall-hook. Similar to 1964-57-10.

1967-574-25. Small fragment of tap slag—recovered from a mole-heap immediately above Pit B.

APPENDIX

BONE MATERIAL FROM TYNRON DOON, 1964

By A. S. CLARKE, Ph.D., B.Sc., The Royal Scottish Museum, Edinburgh

The osteological material excavated from this site consists of a large amount of bone fragments, a few intact bones and a large number of teeth. A few of the bones bear knife cuts. All items are soft, friable and brittle, and pronounced abrasion sometimes prevented certain identification and usually inhibited accurate measurement. The bulk of the bones are from ox with very few items from pig or sheep although pig teeth make up nearly one-third of all teeth present. About one-third of the material was discarded as being too fragmented to be of any value and the numerous vertebrae and ribs were not examined in detail.

BONES

OX

Astragalus

Ten right, three left and three indeterminate.

Average width (eight measured) 40.1mms (35mm-43.5mm).

Average length (six measured) 61.1mms (58.5mm-63mm).

Calcaneum

Two right, five left and six indeterminate.

Length (one only) 123mms.

Width of base (two only) 47mm, 38mm.

Mean minimum width of tuber calcis 28.4mm (27mm-31mm).

Metapodial

Sixty-seven pieces are referable to metapodials and of these one is a nearly complete metacarpal and one a similar metatarsal. There are ten proximal and twelve distal ends of metacarpals and eleven proximal and eleven distal ends of metatarsals. In addition eight separate distal condyles can be associated in pairs to represent four more metapodials. No attempt was made to refer metapodials to right or left sides. From the parity of numbers of proximal and distal ends and of fore and hind limbs it may reasonably be assumed that the number of animals represented lies between eight and seventeen with a mean of twelve, a number not inconsistent with the ten individuals represented by the right astragali.

Maximum length complete metacarpal	163mm.
Proximal width	45mm.
Distal width	- (50-61 in three others).
Minimum width	27mm.

Scapula

The twenty-three proximal ends, six right and six left, and some fragments of blade, which are all referable to Ox, are mainly too worn for measurement. In one case the edge of the oval glenoid cavity is sufficiently sharp to allow measurements of the two diameters. The lesser diameter is 41mm and the greater 52mm; the width of the scapula at this point, including the tuber scapulae, is 61mm.

Humerus

Distal ends of eighteen left and twelve right humerii are distinguishable together with other portions. The two best preserved ends from the right have maximum widths of 70mm and 81.5mm and two from the left measured 65mm and 72mm giving a mean width of 72mm.

Radius

One complete left radius.

Length	242mm.
Proximal width	68mm.
Distal width	64mm.
Minimum width	35mm.

Nine left and six right proximal ends give a mean proximal width (eight measured) of 66.6mm (60mm-73mm). Five left and one right distal ends give a mean distal width (five measured) of 57.4mm (54mm-61mm).

Ulna

Parts of eight proximal ends.

Femur

One distal end and a dozen or so fragments of proximal ends.

Distal width 81mm.

Distal anterior/posterior thickness 109mm.

Tibia

Three out of eleven distal ends are measurable, though worn, and have widths of 53mm, 53mm and 55mm. Of four proximal ends the best one measured 78mm in width but a chip off one side indicates an original width some four or five millimetres greater.

Phalanges

Eight third phalanges (hooves).

Fourteen second phalanges, four in excellent condition:

Posterior widths 25mm; 26.5mm; 27mm; 37.5mm.

Lengths 37mm; 40mm; 41mm; 44mm.

If posterior width is expressed as a percentage of the length the three smaller

phalanges yield values of 67.5, 66.2 and 65.8 respectively while the largest one has a value of 80.6. This specimen is not only very much larger than the others but differs so markedly in proportion that it must represent a different kind of animal and is, presumably, of different sex.

Skull

More than fifty pieces of calvarium, petious beres, bits of mandible and maxillae, etc., were too fragmentary to yield more than identification. A length of horn core from near the distal end measures:

Length of outer curve	133mm.
Greater diameter (proximal)	39mm.
Lesser diameter (proximal)	30mm.
Circumference (proximal)	103mm.

SHEEP

Two right astragali, one comparable in size to that from a Blackface ram, the other somewhat smaller and partially calcined. These are referred to sheep only because this provides the nearest match but they are untypical and distorted as if modified as a result of injury to some other part of the limb though this implies similar injuries and similar adjustments of two different animals. There are also three quite normal calcanea; a juvenile scalula; first, second and third phalanges and a few pieces of large limb bones and a number of vertebrae.

PIG

Distal ends of five right and three left humerii and one humerus possibly referable to pig. All are in poor condition.

TEETH

OX

Twelve incisors.

Nineteen right lower third (last) molars including three unerupted.

Nineteen left lower third molars including three unerupted.

The erupted molars of both sides show moderate to considerable wear. On the evidence of these teeth a minimum of nineteen animals is represented of which three, or fifteen per cent., were under two years of age. The remainder of the molariform teeth, some 220, show all stages of wear varying from unerupted to teeth so worn that their crowns are little more than thin plates on the roots and representing animals well into their third decade of life.

SHEEP

An upper second and a lower (probably second) molar.

PIG

Twelve lower incisors including two "in situ" in a mandible tip.

Five upper, and seven lower, canines.

Seven entire, and two partial, unerupted second molars.

Sixteen entire, and four partial, unerupted third (last) molars and twenty other third molars showing varying amounts of wear.

Seventy-eight other teeth.

No attempt was made to assign the second and third molars to side or jaw but the total of forty third molars must represent a minimum of ten animals of which half were under two years of age. The unworn second molars show that some or all of these were under one year.

HORSE

Four upper left cheek teeth including the first and last and four upper right cheek teeth including the first. No teeth appear to be duplicated and all appear to be from the same animal. Two of the right-hand teeth however are slightly smaller than the others and under other circumstances would be regarded as from another animal.

Two upper incisor teeth from a horse of about seven years of age are probably from the same animal as the rest of the teeth which show a similar amount of wear.

Two upper and one lower canine may doubtfully be referred to the other teeth.

RABBIT

Left right mandibles and teeth of two very young specimens.

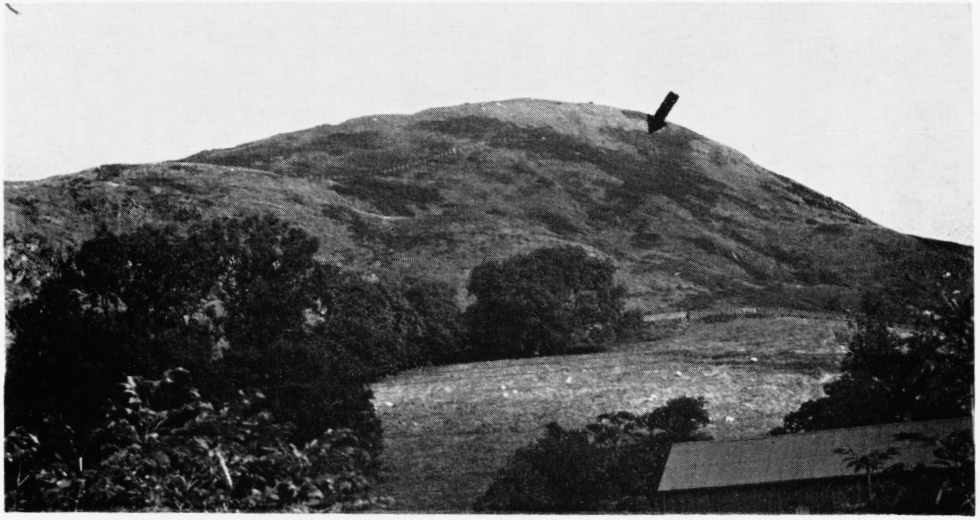

Plate II—Tynron Doon from the South-West. The area of excavation indicated.

A CRANNOG AT LOCH ARTHUR, NEW ABBEY

by

JAMES WILLIAMS, F.S.A.Scot., F.R.S.A.I.

The sheet of water known as Loch Arthur, Lochend, or Lotus Loch[1] is situated at the western extremity of the parish of New Abbey in the Stewartry of Kirkcudbright. The Loch, which lies below Lotus Hill, is approximately 1000 yards in length by, at maximum, 500 yards in breadth; it covers an area of 74 acres and at its greatest depth is approximately 50 feet deep. On the

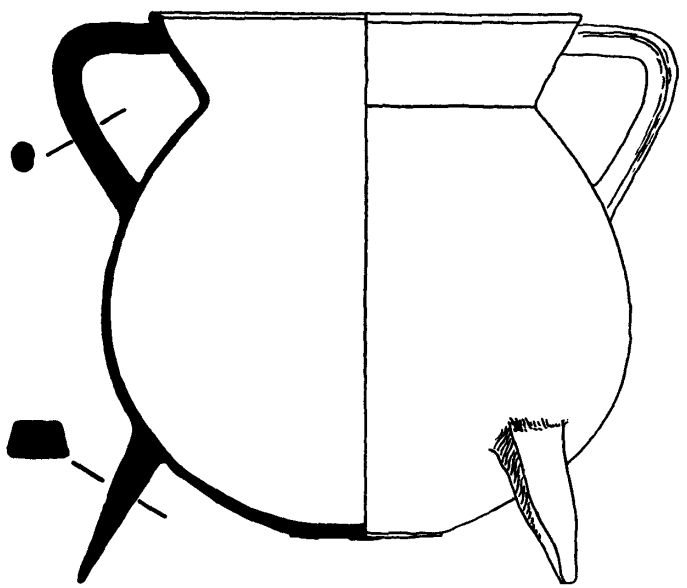

Fig. 2—15th century bronze tripod pot (X¼).

Northern shore, at Nat. Grid. Ref. NX903690, is a small artificial island or crannog. This island, which is approximately 100 feet in diameter and connected to the mainland by a muddy reed-bed, first attracted the attention of archaeologists some time prior to the period 1840-44 when the new Statistical Account was being drawn up for the Parish of New Abbey.[2] At this time two mediaeval bronze tripod cooking pots were recovered from the loch. Both of these vessels were originally in the hands of D. Hamilton Craik of Arbigland, upon whose property they were found. The present location of these pots is not

1 The loch is most commonly called " Loch Arthur "—the earliest form of this name is " Loch-artur," which appears in the Registers of the Cumberland Abbey of Holm Cultram in 1185-6. See " Register and Records of Holm Cultram " by Grainger and Collingwood, p. 49.

2 New Statistical Account of Scotland, Kirkcudbrightshire, p. 250.

known, but a third vessel, found in "Lochend Loch," is retained by Dumfries Burgh Museum. The vessel is of a probable 15th century type and bears the following mid-Victorian inscription: "This/Ancient Roman Brass Pot/found in/Lochend Loch/a few years ago/Presented by/Adam Rankine/1852." (Fig. 2).

The island again attracted attention in July, 1874, when a large dug-out canoe was discovered on the shore opposite to the island. This discovery is described in P.S.A.S., Vol. XI, p. 21-3, and Vol. XXXI, p. 269-70. A very full description of the canoe is given in J. K. Hewison's "Romance of Dumfries and Galloway in Early Caledonia" (1939), where detailed measurements are included. The canoe, including an animals-head prow, measured 45 feet 6 inches in length, but after being damaged the bow portion was presented to the National Museum of Antiquities of Scotland, Edinburgh. The more broken stern portion was presented to our own Society,[3] but owing to the Victorian Museologist's passion for displaying such items upon open lawns nothing identifiable now remains.

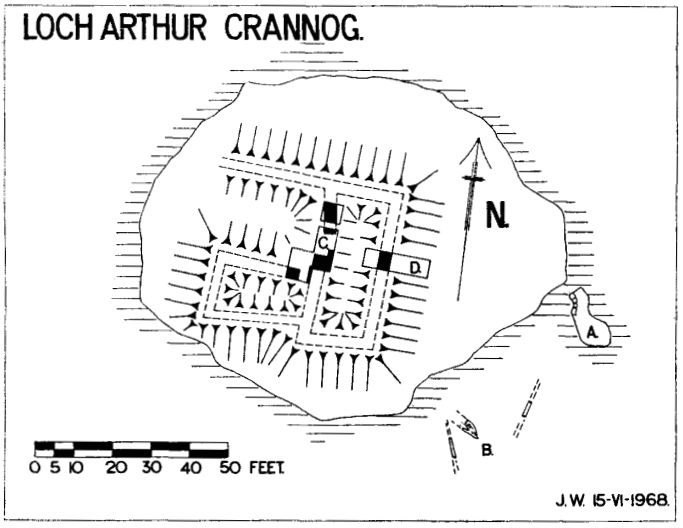

Fig. 1—Ground plan of the Crannog at Loch Arthur, New Abbey

The canoe was found when the level of the loch was extremely low and the following notes[4] were made concerning the island at that time:

> "It (the Island) is about 100 feet in diameter, and is approached by a stone causeway about 30 yards long, which was laid bare last summer (1874) by the lowness of the lake. The artificial nature of the island may be seen by the remains of the oaken piles driven in in rows, with horizontal beams between, which can still be traced in the water round the north-east and south sides. The lines of two small enclosures can be followed on the south side of the island.
>
> No excavations have yet been made on the island, but ashes and other signs of fire were found many years ago."

In order to remedy this last statement the writer and Mr A. E. Truckell of

3 Antiquarian Society Letter-books.
4 P.S.A.S. Vol. XI., p. 23.

Dumfries Burgh Museum undertook a series of small exploratory excavations during 1966-67. The site was planned in June/July, 1968. The results of this work did not contribute anything towards a firm dating of the site, but the information obtained is summarized below. (see Fig. 1.)

From the evidence of all previous accounts the island must be regarded as being artificial and built on a wooden platform connected to the mainland, on the north, by a stone causeway—this is now obscured by mud and reeds. Structural radiate timbers are now only visible on the south-east edge of the crannog. The island is covered by a light layer of peaty soil and leaf-mould and in it were found the footings of drystone/clay-packed walls. These walls measure, on average, 30-36 inches in thickness and as they now exist they stand at a height of about 18 inches above the general level of the island. Judging from the rubble surrounding these footings the walls must originally have stood approximately 36 inches high and in all probability they represent the stone undercroft of a wooden framed building. The main building lies on a N-S orientation and measures, internally, 35 feet by 15 feet. The walling exposed in the excavated areas at D and the small unmarked section to the north of C on the site-plan were typical of the main walls of this structure: These sections also indicated that the interior floor was cobbled and raised some 6 inches above the general ground level.

The section at C was extremely complicated and proved difficult to interpret satisfactorily but possibly represents entrances to the main building and the smaller trapezoidal annex which lies to the west. This smaller structure is enclosed by walling very similar to that of the main building. The surface of the island, at this point, has been much disturbed in the past but the annex can be measured, approximately at least, and its position and size are indicated on the site plan.

The paved and slightly raised structure at A may be the remains of a small jetty. At point B on the site plan large oaken timbers are observable below the surface of the loch; these are the only timbers now remaining of the structures described in 1874—also visible at this point is a possible fragment of a dug-out canoe. The island is covered by a number of large trees and an appreciable amount of undergrowth, both of which made excavation and interpretation difficult. Apart from the late mediaeval tripod pots mentioned earlier no finds of chronological significance were recovered.[5]

The dating of crannogs or lake-dwellings, in the absence of good stratigraphic evidence, is an extremely difficult matter. As defensive structures they were an extremely long-lived type: first known in the neolithic period they were perhaps most prominent during the iron age but continued in use throughout the early mediaeval and mediaeval periods. They lasted certainly as long as the late 16th century—the maps of Timothy Pont show habitation sites in lochs during the 1590's—and, indeed, in 1608 an Act of the Scottish Parliament was

5 A small mesolithic flint was recovered from the soil in section D. This object must have been brought to the island accidentally and cannot be considered when dating the site.

passed expressly forbidding the erection of such structures: undoubtedly the erection and habitation of crannogs, in Scotland at least, continued well into the 17th century. These structures may represent the defensive house-type of the lesser lairds in a time prior to the development of the smaller towerhouses in the 16th-17th centuries. They can perhaps be regarded as the last line of defence to a mainland-sited economy. This certainly appears to be the case at Lochrutton Loch, where a crannog, with a possible hall-house of the mid-13th century, was excavated in 1901-02 by James Barbour of this Society.[6] At Lochrutton the crannog, in the centre of the loch, was approached from a modified promontory on the eastern shore—such a combination of structures could possibly represent the Norman motte and bailey translated into a native context and ideology; the crannog acting as the motte and the promontory/mainland site the bailey. Like the towerhouses crannogs must represent, by their very nature, a structure more suited to passive than active defence. This being the case, we must see them as being built for defence in cases of inter-family feuds, etc., and not designed to withstand the effects of organised warfare. Only when it became possible to either build more substantial defences (i.e. towerhouses) or when conditions became more settled could the crannogs be abandoned. This abandonment must have commenced in the early to mid-16th century when the smaller towerhouses became common and was only complete by the last quarter of the 17th century. By this time towerhouses were being replaced by less defensive house-types reflecting the more settled conditions then prevailing.

It is currently felt that at least a small proportion of crannog sites in Dumfriesshire and Galloway may be structures of this type, i.e. island built hall-houses and dateable to the 13th-17th centuries. However, until such time as the present structure and others like it in our area are excavated and yield dateable artifacts we can, at best, merely speculate on the date and exact function of these intriguing structures.

6 See T.D.G.N.H.A.S. 11/17/2, p. 128; 11/17/3, p. 246; 111/44, p. 141.

SOME LETTERS FROM DUMCRIEFF TO SIR JOHN CLERK OF PENICUIK

by

W. A. J. PREVOST

About the tenth of August, in the summer of 1727, Sir John Clerk of Penicuik and a part of his family went to Moffat where he spent his leisure time in fishing, shooting and drinking the water from the Moffat Well. This visit was an annual event and for long he had been accustomed to stay in lodgings of some kind or another. This was not a very satisfactory arrangement for a man in his position and on 29 November, 1726, he purchased from Charles Duke of Queensbury the house and mains of Dumcrieff, a small estate about a mile and a half from Moffat. However, he continued to stay in Moffat in lodgings until the house could be put in order, " for at that time," so he writes, " I had but little accommodation at Drumcrief which I had bought."[1]

There were few people better qualified than Sir John to improve his little estate. There are numerous references in his *Memoirs* of work done on his various properties and he was a most progressive landlord with many interests, not least of which was his knowledge of architecture. For example, he records that in May, 1723, he finished the design of Mavisbank, a delightful house in Lasswade which, " under the correction of William Adam," was almost finished in 1727 when he furnished some rooms and lived there with his wife and part of his family during the months of June and July. In addition, his advice on various matters was much sought after and which are too numerous to mention. Thus he journeyed to Whithorn in 1735 for the express purpose of advising his brother-in-law the Earl of Galloway as to whether he should rebuild his old house which had been burnt down or build a new one.[2] On another occasion he received a most appreciative letter from William Grierson concerning a " pidgeon coat " at Rockhall " which is now finished according to the model I showed you last summer at Moffat . . . and I would be proud to have the Honour of seeing you here for to take a view of it."[3]

Sir John wasted no time in carrying out his plans for improving his property and a bundle of letters addressed to him from Dumcrieff and Moffat is full of information concerning the work which was being done. The earliest letter, 14 March, 1727, is from John Marshell, then gardener at Dumcrieff, who asks for " Gousberris and Curands . . . a feu sets of the best kinds." He also asks for " 1500 thorns to plant round the Little Garden and Luckways I wrote for a few Garden Seeds and any other plants suitable." The reply was to be

1 **Clerk of Penicuik's Memoirs** 1676-1755, (Scottish Hist. Society, 1892).
2 TDGAS xlii (1965), 133.
3 Clerk of Penicuik Muniments. GD 18, 4097 (Scottish Record Office).

addressed to John Dickson " to be left to the caier of Mr Grahame, Post Master att Moffat."[4]

John Dickson seems to have been Sir John's clerk of works in Moffat and during the baronet's stay there in the summer of 1727 it is almost certain that the two men discussed and planned how best to put the house in order. In a letter[5] written on 4 September by Dickson it is evident that they intended to raise the back wall of the house " where the Stair and Seller is " and put on a slate roof. Dickson sent Sir John an estimate for the work which Dickson thought was far too high and he suggested that some more straw laid upon the thatched roof might keep the house pretty dry for some time. The estimate is as follows:

Impr for Sclait wining	20. 0.0
Item to for laying them on	10. 0.0
Item to for 30 firr dails, 15 pens each dale[6] ...	22.10.0
Item to for Sauing the dails	03.00.0
Item to for a meson and his man 3 days work ...	2.16.0
Item to for 2 Lods of lime	00.12.0
Item to for 800 Nails for Nailing on the Lating and Sclait	02.00.0
Item to for wright work for Laying the Spars[7] right and Lating the Saime	01.16.0
Suma ...	62.14.0

On 29 January, 1728,[8] Dickson informed Sir John that the masons were searching for a freestone quarry for stone for the bridge which was to be built over the Moffat Water near Dumcrieff. They were then working on Craigie Hill, now called Hunterheck Hill, for pend stones for the arch. " If your Honour will grant us the favour to let us Sell a Drink of eall the time the bridge is a building I dout not but we may mack some Little thing of the workmen."[9]

The house was still not habitable when Dickson wrote to Sir John on 22 July 1728 about lodgings.

" Honoured Sir,"

" I spoke to Mr Boe[10] about Lodgings as your honour wrote and now find none in Moffat convenient conform to your honour's Direction, but Bearholm[11] has importuned his Sister in Law the Lady Dumcreif to let your honour have the Dineing room of ffrenchland with tuo bed chambers all well lined and panted, with one bed in every one of the bed chambers but there may be a

4 Ibid
5 Ibid, 5697.
6 Dail, deal a board or plank of wood.
7 Lat, latted. To lath, to nail laths to spars or joists for the purpose of plastering.
8 Clerk of Penicuik, GD 18, 5697.
9 Ibid.
10 John Boe, schoolmaster at Moffat.
11 William Johnstone of Beirholm. He was factor to the Queensberry Estates. P. W. L. Adams. **A History of the Douglas Family of Morton**, 277, 278.

folding bed provided which will make tuo beds in one room. If your honour come there you must cause bring bed linnings alongst and table napierie. There is only this inconvenience that a bathing Stand[12] cannot be got into any of the rooms for the narrounes of the doors but the quality and gentlemen and women who stayed there always bathed in the Kitchene which is very clean and nate. The Lady Dumcreif has but one servant which in my humble opinion will be too few both to Dress victuals and attend other Service about the house. Your honour must provide your own fire and candle and buy your own victualls which can be had every day out of Moffat. The Lady Dumcreif is by all reckoned a gentlewoman of good Sense and manners and there for I am hopefull both your honour and your Lady will be very well pleased with her conversation of what Servants your honour brings with you. They may be provided with beds in the other pairt of the house that Mr Boe wrote to you anent."[13]

Sir John makes no mention in his memoirs of visiting Moffat that summer but one may rest assured that he did. He then made plans for enclosing a park with a dry stane dyke which was probably the first fence of its kind to be built in Upper Annandale. In about 1712 landlords in the Stewartry of Kirkcudbright started to build dry stane dykes, and in the Buccleuch Muniments there is an account from Andrew Scott, dyker, who had built a dry stane dyke in 1710.[14]

"For ane nout fold in Sauchtrees consisting of forty tuo Rood Att tuo pence per Rood Inde	0.07.0
"For ane nout fold at Ruchlee consisting of fifty tuo Rood Att three happence per Rood Inde	0.06.6
	0.13.6

These early accounts contain no reference to the dimensions of the dykes built but on 24 September, 1728, John Dudgon wrote to Sir John with reference to the dyke to be built on Dumcrieff. Dudgon had spoken to three "Dickers" who were very willing to carry out the work. "Luckways the man that led the Stons to the Bridge is wiling to undertack both the wining and Leding the Stons for 3 shlings and 6 pens for 24 els of Lenth and 6 quarters hight."[15] This indicates that the height was to be at least 4′ 6″, for the Scotch ell is given in *Chambers Scotch Dialect Dictionary* as being 37.0578 inches. Dudgon adds that "If you incline to mack it a Dray Ston Dyck this man will undertack to won and led the Stons for 7 shilings the meson rude, and the meson will undertack it for 6 shilings the meson rude."[16] The rood varies and Dr Singer writes in 1812 that the whole expense of quarrying, carriage and

12 Bathing stand. Mr Murison writes that this is a bath-tub. A stand was a big wooden tub, frequently, but not always on a stand, used for various purposes such as salted beef, etc.
13 Clerk of Penicuik, GD 18. 5697.
14 Buccleuch Muniments. Edinburgh Record Office, GD 224/239.
15 Clerk of Penicuik, GD 18. 5697.
16 Ibid.

building a Galloway dyke 5′ high generally amounted to about 8/- per rood of nineteen feet long in the line of fence.[17] Dudgon's estimate amounted to 13/- shillings per mason's rood.

"Charge what the Dray Ston Dycke wold amount to at 7 Shill: the meson rude ...	17.10.00.0
"To the Meson work for 50 ruds at 6 shillings the rude	15.00.00.0
Suma ...	32.10.00.0

In August, 1729, Sir John with his wife and daughter went to Moffat and again lodged in Frenchland. Dumcrieff was not neglected and in October Dickson wrote asking for 2 garden spades and a pick and 30 fruit trees to plant in the "yeard." He reckoned that 7605 thorns would be required to plant the whole ground as planned and wanted "the thorns as soon as can be gotten." Later in the winter, in February, 1730, Sir John was informed that 2 Green Gage, 2 Perdrigon plums and 2 White Violet plums[18] had arrived but he also received an urgent reminder to send 4500 thorns and as many young firs as could be spared "to plant in the Bank." That August Provost Johnstoun had arranged for Frenchland to be at Sir John's disposal as heretofore but the baronet records in his **Memoirs** that his wife and some of his family stayed at Dumcrieff. If they did it seems likely that they were not comfortably housed for a letter from John Dickson dated 6 October reports that "the house has come a good lenth, the Scleters is more than half don with it and if the weather prov good they will finish the house this week. John Black and I we have mesured the Sclet work of the Staercaes and we find it to be about 32 ells. The Scleter reckons the tuo Gutors to be Double work which he thinks will macke it out a Rude . . . ."

"I inquired about Coreheids chees and got Notis that he never sels any, Your servant Dan bought 20 Ston of cheess when he was last hear; there is not much better made in this countrey. I sent it to him on Munday Last . . . . I shall mind the Hau thorn berries."[19]

In March, 1731, Dickson asked for a man to help him with some planting and other work. He sent the bad news that "Our neighbour the tenant in Craigbeck has mett with a great loss on Saturday night last. His bayer and 23 heid of Cattle and tuo horss is brunt all to ashess." In June Dickson was still wanting help ". . . . If I can get tuo men to help me I shall lay in calls (caulds) in the water and lickways floor the dovecot with clay. There is no men to be goten to work at Moffat under 6 pens a day and there vituals. I spak to tuo of the tenents to work with me at the water but they are throng with there oun

17 Dr Singer, **Agricultural Survey of Dumfriesshire**, 149.
18 Mr David D. Murison informs me that both these varieties of plums are named in Forsyth's **Treatise on Fruit Trees.**
19 Clerk of Penicuik, GD 18, 5697.

work at this time. The plasterer has been hear. I have agried with him to plaster the hous for four pens the ell of the roof and tuo pens the ell of the walls. He says it will lack 60 Bushells of Lime and 7 or 8 Stons of haier. Your honour knous that the hous cannot plaster before the wright be don with his work. I think your honour should writ to Warranbee[20] for Som Lime, for most of the Lime is come of the Sclats, it being don to seal the Last Seson. If you writ for the 60 bushells it will be about 40 horses Lods . . . ."

On 8 November Dickson asknowledged the receipt of " 72 Lathing Dales and 2 other Dales inch thick, and the frying pan. The wright is here working and his laid the garrat floor and his hightned the roum where you stay 3 foots and his nailed up the Lathing ready for the plastring. They have taken doun the pertichions and is putting them up as you Lest orders in your Memorandum."[21]

" Your 90 Dales that was last bought at Drumfrice is all come here: there was 12 of these dales taken to be heks and mengers in the Stable."

" John Black want about 30 more Dales to finish the work . . . John will put 3 higher doars in the 3 roums and disposs of the 3 old doars in the tuo Closets and the Seller if your honour think fit . . . As for more Lyme I am afrayed that Waranbie's tenants will not bring it at this time of year . . . Let me knou if you receaved from the Moffat Carier 28 pints of Nuts and the Linings. I sent them that week that you sent for the Stons." These stones to which Dickson refers were the Roman altar stones with inscriptions which Sir John had bought from Mrs Bell of Scotsbrig and about which much has been written.[22]

On 17 January, 1732, Dickson reported that " the wrights was done with all the old Dales on the eight of last mounth. Mr Corrie[23] his sent from Drumfrice 30 Dales but they are not dray enough to work as yet. There will be Lathing Dales a wanting for the under pairt of the house, the rooms above and the Stair his tacken all that was hear and all that you sent but a very feu that is left. Warnbie his sent me word that the Lyme will be hear betwixt and the first of March. Your honour most send from Edinburgh ten or tuelve ston of hair and about 4 ston of Chalk for whiteing; there is no hair to be had at Drumfrice or at Moffat." Dickson suggests 40 fruit trees and a great many other bushes such as gooseberry and currant for planting.

In his next letter written just a month later Dickson writes that there is no need to send hair as enough had been bought to finish the house. This was very satisfactory as the plasterer could not make plaster without hair to mix with the lime. Dickson also wrote that he was employing a smith to make bands for the doors but Locks may be sent later. " If your honour think fit John Black will put bound Doars on the tuo best roums above Stairs . . . If your honour could send Some of your oun Servants with the trees and the

20 William Carruthers of Warmanbie near Annan. P. W. L. Adams, **Douglas of Morton,** 339.
21 Clerk of Penicuik, GD 18, 5697.
22 TDGAS (1961), 128 et seq.
23 Joseph Corrie was the town clerk of Dumfries and the factor of the Middlebie Estate.

feu Garden Seeds they wold be more carefull of them than any of the cariers, for the last trees you sent the tops of them was ill broken by the way."

Sir John visited Dumcrieff in April, 1732, and found that the workmen had a "little repaired" the house and put the garden in better order. Dickson's report of 27 June[24] some two months later was most encouraging for "the Stair and the uper roums will be finished this week. If your honour think fit to send as many firr Clefts from Lith the nixt week and let the hous be all done befor the plastrer goe from this place. John Black is out of Daels at this time, He cannot let your honour have any to doe the under pairt of the hous."

By the end of July, 1733, it is evident that the house was ready to receive visitors, for Dickson writes that "Moffat his not been throng this summer so that no body offered to tack the hous from us. I hope the hous will be in order when you come. There is a new sit[25] house built for the Millar near the Mill and at this time we are reparing the kitchen. I wish I had known your honours mind which way you wold have had the kitchen Don for I am afrayed it will be a little hard to prevent the smoking of the hous. When your honour coms hear you may eather bring your coach or chaise, for I have a mind to tack doun the end of the barn befor the mesons goes away, and I hope your honour will give orders to John Black to put Doars on the barn to prevent any body to doe hurt to the coach or chaise . . ." In December he reported that "the millar is most diligent liding of stones for the park Dyke; suposs 4 mesons were entred to work now they wold not overtack the millar this side of Whitsonday." The men doing this work were stane dykers and to call them masons today is quite wrong, especially as it is said that dykers can do the work of masons but not *vice versa.*

A more scholarly Rob Clerk takes up the tale. He was staying in Dumcrieff and kept Sir John informed about the outside work and in particular about some ditching which could well have incorporated a kind of Galloway hedge[26] besides its use as a drain. His letters were mainly concerned with estimates and the first is dated 21 September, 1734.[27]

"Dr Baron, I have had both your letters and shall see what you wrott in them, wt the memorandum you left wt one obtemperate in the letter therof. George pennycook came safe here wt your pownie on Tuesday about sunset. Your ditching since he came wt Jo Marshall and the uther 2 men goes very well on." A long rambling report on various contractors is omitted. It concerned who was to lead stones "to face the ditches and the park dyke; there will be some difficulty as to the price you sett doun, viz 4 shill Scotts the long rood." The work of ditching was begun and there were almost as many stones in the spoil which would face the "foreside" of one of them. "Your massons make demurre if any others shal be employed in faceing the ditches

24 Clerk of Penicuik, GD 18, 5697.
25 Sit house. a dwelling house.
26 F. Rainsford-Hannay. **Dry Stone Walling**, Plate 3b, 32.
27 Clerk of Penicuik, GD 18, 5720.

and park dyke but themselves. They are capable to perform both the park dyke and face the ditches before martinmas . . ."

"Since you went home every day is longer than 3. I take a turn 3 or 4 times every day to the ditchers and once a day the circuet of your park and see the massons. On Thursday last Mr Mackie came out to me but went up near to Bodsbeck to the fishing, The rain came on. We killed about a dozen of parrs each, wade the water, and came to Drumcreife wett both to the skin. This was all we did that day and no more . . . ."

Six years ago Dickson had supplied Sir John with "20 pts of nutts and one pts hunie" and this year Rob Clerk wrote that Sir John had ordered 20 pints of nuts from the millar's wife, 20 from another woman, and "William Gibson is comeing for a milstone for his miln and brings a cart load of nutts with him."

On 30 September, 1734,[28] Rob Clerk writes "Dear Baron, I had your last on Saturday night. The bad weather makes your work go on but slowly; so farr as they have wrought is a good substantial ditch, the ground is either so hard thay they must pick it with mattocks, or so mossie as that they are mid leg in water . . . . "Gibson[29] will not comply to lead the stones to face the ditches so farr as they are to be faced wt the yaird dyck which may amount to about 3 or 4 long rood under 7 shill str per rood. He says he hath 2 horse to mentaine and must buy fodder to them so he cannot do it under."

"This is a strange watry country. We have not had 4 fair days since you parted hence. I believe I shall turn a fish. I am so soaked wt water within and without every day . . . ."

Rob Clerk sent a very rough sketch of the land which had been "overflowen" by a flood which he describes in his next letter. On it the Moffat Water and the bridge are clearly shown, and from the bridge two dark lines in ink mark the ditches on either side of the highway in the direction of Moffat. The park dyke is faintly marked in with a pencil on the left-hand side of the plan, the use of the pencil indicating that the dyke was not finished. In short, all the low lying ground on both sides of the bridge was covered with water The flood was described in a letter 1 October, 1734, by Rob Clerk to Sir John.

"Dear Baron. This is to acquaint you that this hath bein a sad day here thro'w the violence of a great storm of rain and tempest . . . . The whole walkers haugh was overflowed and their house narrowly preserved; they fled out of it for their lives and had not the massons and others given help both the house and the miln also had been carried of. The water was att the top almost of tender trees in the walkers haugh" and covered the haugh up to the yard dyke at Craigbeck. This point was where now stands the shepherd's cottage, on the new road built many years later by Dr Rogerson to do away with the old road

28 Ibid.

29 John Murray leased a wauk mill at Dumcrieff to Patrick Hastie, dyer in Breckonside, tack dated 12 April 1717. Two years later he leased a corn mill to William Gibson, portioner in Crawford, tack dated 14 May 1719. John Murray was then owner of Dumcrieff which he sold to Lord George Douglas in 1724. The mills were being worked at the turn of the century by a family of Proudfoots.

which passed through the Dumcrieff policies. One poor woman's six stacks of peats were clean swept off by eleven o'clock in the forenoon. All Sir John's " yaird haugh and the under part of the yaird where the hedge and ashes [are] and about the hay stacks all over flowen doun to the bridge and above 30 ells this syde of the bridge upon the Hy way, and hath laid flat and demolished above 20 or 25 ells of the ditch on either or both syde of the way which must all be wrought up again. Thirdly the under haugh where you designe to sowe your wheat was all overflowen up to the park dyke and ditch head within a foot of it where you designe the park to be watered, and they say had it been tilled it would have been nothing but a sand bed and all the earth carried off: all the vestiges of the enclosure are gone wt 2 or 3 pieces which were wrought therof when you were here. 4 or 5 days will not repair the losse done to the ditches which they must sett about if the weather permit which yet continues bad and stormy."

" I shall be willing to know your mind about what your lads are to do. They say that if they gett their ditches upon the hy way made up and planted wt thornes and the rest done on the watersyd in the spring, is the most they can get done this bad season. Old Herbert here says the lyke flood was never seen in Moffat water in his dayes. As to Willie the miller there will be a necessity to give him 7 shill ster for stones to face the ditches to the bridge to preserve them from the cattall and by land drovers . . . I am jealous I shall take my leave of this country as I did of Loch Skeen, Never to see it again in the body but to look doun on it wt all the world wt ane everlasting farewell . . . " Rob Clerk.

HEARTH TAX OF DUMFRIESSHIRE. PART 2

By Duncan Adamson

(**Editorial Note**—Part 1, which included the lists for Dumfries Burgh and some of Nithsdale parishes, appeared in Volume XLVII. Pressure of space prevents the publication of the whole of the remainder of the lists in this volume, but the remainder of the Nithsdale parishes appear below, also the Eskdale ones. The Annandale parishes and Mr Adamson's discussion will follow in a later volume. The author wishes to thank the Earl of Leven for permission to use his papers in the Scottish Record Office.)

CLOSEBURN

Closeburn

(1) Jo Patrick in Townhead of Auchenlouk 2
(2) Thomas Milligan yr 1
(3) Rot Gourie, Cleuchfoot 1
(4) James Gairdie (Goudie), Troughgate (Prowyhyett) 1
(5) Thomas Gairdie (Goudie) yr 1
(6) John Moncie (Mancie) yr 1
(7) Culbert Mckeige, tounfoot of Auchenleck 1
(8) Helen Rodsgersone, cottar yr ... 1
(9) James & Gavin Mcmurdies in Land & a kilne ... 3
(10) John Goudie, Sandrum 1
(11) James Shap, Highland 1
(12) John Sharp, Lineburne 1
(13) John Coupland yr 1
(14) Eduard Huck yr 1
(15) Jo Broun, Tindualldicks 1
(16) Rot Broun yr ... 1
(17) Wm. & George Sharpe in Halbanks 2
(18) Jo Kirkpatrick, Tindpant 1
(19) Tho Coake, Shankhead 1
(20) Jo Pagan, Neutounmains 1
(21) John Milligan, yr 1
(22) Ninian Kilpatrick yr 1
(23) Sara Dun yr ... 1
(24) Agnus Lorimer, Coskinhill 1
(25) John Smith &
(26) John Wallace in Creishope 2
(27) Tho Nivieson, millar at Closburne 1
(28) Margaret Kilpatrick at ye mill ... 1
(29) Janet Hendersone yr 1
(30) James Henderson in Wilsontoune ... 1
(31) James Dalzell yr 1
(32) Wm. Sprott in Wakemilne 1
(33) Helen Gilcrist in Campell 3
(34) James Goudie in Dressertland 3
(35) Jo Milligan & Jo Mcclug (Mcclyge) cottars 2
(36) Jean Rodgersone & Thomas Broun in Braithsmorland 3
(37) James Mcturk, Closburn Townhead 2
(38) John Ker yr 2
(39) John Smith yr ... 2
(40) John Dilrumple yr 1
(41) John Goudie yr ... 1
(42) Rot Doun elder yr 1
(43) Rot Doun younger yr 1
(44) John Milligan, wiver 1
(45) John Mckie yr ... 1
(46) William Craig, litster yr 1
(47) James Dunne yr 1
(48) Jean Dunne yr ... 1
(49) Thomas Taitt, yr, wiver 1
(50) John McMurdie yr 1
(51) Katarine Black in Greenknou 1
(52) John Milligan yr 1
(53) Wm. & Rot Cooks, Dumbreck 2
(54) Jo Petticreu in Closburnmains ... 1
(55) Jo Wilson in Shiellgreen 1
(56) John Sharpe yr ... 1
(57) Rot Lauson & Adam Kennedy in Gilshielsland 2
(58) Tho Watsone in Pothouse 1
(59) Jean Johnstone yr 1
(60) Jo Kilpatrick, Barnmure 2
(61) Henry Taitt yr ... 1
(62) Jo Mcgill Bogsyde 1
(63) Jo Watson & Alexander Goudie, Croolchapel 3
(64) Rot Moffitt, Coufaddock .....
(65) Wm. Kilpatrick, Marjoryhill 1
(66) Jo Gibson & Jo Nivisan in Park 2
(67) John Taitt yr ... 1
(68) Rot Gillespie in Rigg 1
(69) Bessie Gillespie, yr 1
(70) Alexr. Taitt, Barrescock 1
(71) Tho & Andreu Frissels in Auchencairne 3
(72) Jo Nivisone & Tho Wallace, Shankfoot 2
(73) David Kilpatrick, Whitspott 1
(74) Jo Kilpatrick, Brigbroughhead .. 1
(75) Jo Glencorse in Midbrigbrough ... 1
(76) Tho Kilpatrick in Cairne 1
(77) Tho Wallace Holl 1
(78) Rot Gillesone, Brigbroughfoot ... 1

(79) Archbald Glencorse yr 1
(80) Jo Baxter, Brigbroughmill 1
(81) David Smith, Dunine 1
(82) Thomas Wallace yr 1
(83) Margaret Aickfoord, Gatesyd ... 3
(84) Jo & James McCoons, Kirkland 4
(85) Margaret Lorimer yr 1
(86) Margaret Dalzell yr 2
(87) Jo Milligane Gate 2
(88) Place & Dwellinghouse of Closburne 12
(89) In ye wast house of Neuton 3

D of Queensberry

(90) Andreu Frissall, Glenwood & John Wilkine yr 2
(91) Adam Broun & James Hotson Corsburne 2
(92) Andreu Frissal ... 1
(93) George Johnstone, Bubhill (?) 1
(94) Jo & Thomas Brouns yr 2
(95) Wm. Pettie in Knockinshang ... 1
(96) Jo Gillespie & Wm. Chisholme yr 2
(97) Janet Johnstone yr 1
(98) Tho & James Brouns in Brandrigge 2
(99) Wm. Herknes & Wm Mather, Michaelslacks ... 2
(100) James & John Minzes in Locharben 2
(101) George Minzeas yr 1
(102) Jo Dalzel & James Muncie Garock ... 2
(103) James Sloan Rosehill 1
(104) Jo Milligan Longcroft 1
(105) Jo Gilcrist, Dalgarnogate 1

Couhill

(106) David Watson, Overwindiehill ... 1
(107) John Watsone yr 1
(108) George Gillespie yr 1
(109) Thomas Gillespie yr 1
(110) John Jacksone in Neyr Windiehill 1
(111) Bessie Dinuiddie yr 1
(112) John Johnstone yr

Clackrae

(113) Andreu Taitt Neyr Clachrae ... 2
(114) Peter Smith, Midtoune 1
(115) James Hernes (Herkness) in Overclachrae 1
(116) Janet Mckinzie yr 1
(117) John Johnstone Auldgarth 1
(118) Thomos Frissall yr 1
(119) John Frissall yr ... 1

Total 172

Notes

(a) Deficients of Closeburn Parish (GD 26/7/375/4)
John Watsone Couhill 1
John Johnstoune 1
Thomas Gilespie . 1
Clachrae's tenants 5
No poor listed
(b) Poor (GD 26/7/318)
(120) James Tait coter in Closburn Mains
(121) Elspet Mcklein coter, Closburn myln
(122) Elspet Mcken coter yr
(123) Sara Mcken coter yr
(124) Janet Rogerson coter yr
(125) Bessie Macharg coter yr
(126) Jeane Gilherst coter Campell
(127) Janet Miler coter in Knowe
(128) Janet Kirk coter of bourntoun (Closbourntoun ?)
(129) Marg Mcturk coter yr
(130) Janet Smith coter yr
(131) Jean Kirkpatrick „ yr
(132) Jean Glencors coter yr
(133) Margret Dun coter yr
(134) Susan Paterson coter in Closeburnmain
(135) Margaret Kirkpatrick coter in Bormur (Cormur ?)
(136) Robert Moshen (?) c. in Park
(137) William Ker c. Moshead
(138) James Kirkpatrick c. M'muryshill
(139) Homer Thomson c. Whitspots.
(140) Bessie Sharp c. Brigburghhead
(141) Barbra Niveson c.
(142) Agnes Willes c. Cowhill (?)
(143) Robert Smith c. Dining
(144) Culbert Padgien c. Gait
(c) Couhill's list given in by John Maxwell of Barfill, "curator to the minr."
(d) Clachrae's list — signed by John Johnstoun, dated 11/5/1691 for Clachre & Auldgirth
(e) A list of hearths of High Auldgirth
(145) My own hus & chamber 2
(146) John Gibson yr ... 1
(147) Nathaniell Cowen yr 1
(148) Alexander Walace Lochsid 1

This list seems to be omitted from the main list, and is signed, rather illegibly, apparently Ilisabeth Furgyn.

MORTOONE

Duke of Queensberry

John Breidfoot & James Goudie in Laught ... 2
Barbary Chrightone yr 1
Janet Patersone in Gatelaubridge 1
Jo Coupland, Daumcork 2
Jo Shankieland & James Blakewood yr 2
John Douglas yr 1
Jo Wakers elder & younger Kirkland ... 2
Jo Fergisone & Tho. Cubbyr 2
Alexander Milligan, Burne 1
George Milligan, Bush 1
Tho Dalzell, Whitefold 1

Eduard Goudie & Jo Hotson 2
Wm. Milligan & Heugh Douglas Mortone 2
Wm McKall & Jo Glencorse yr 2
Mortone Manse ane kilne 1
James Wallace yr 1
Wm Hammiltone & William Haire in Old Castle 2
John Haistie 1
Jo Frissel & Jo Rodgersone in East Mortone 2
Wm McKals elder & younger yr 2
John Douglas yr & kilne 2
Jo Waker Damptone ... 1
Peter Bleithman & Wm Fergison yr 2
Jo Dougell & kilne 2
James Walker yr 1
Thomas Stott & kilne ... 2
Tho Dougell yr 1
Jo Waker Carrinhill ... 1
Rot & Culbert Wakers yr 2
James Rorimer (sic) Carinfoot a milne & hearth 2
Jo Lorimer & Peter Mcrae yr 2
Rot Patersone yr 1
James Grier Langmyle ... 2
Charles Shinnan & Rot Dalzel Thornhill 2
(in version 2, C.S.'s name is written in an indeterminate fashion which makes Fliman more feasible)
Gilbert Milligan & George Scotlo yor yr (poss. Scollo/Scello) ... 2
George Scollo eld (see above) & Jo Harstains yr 2
James Edgar & Jo Wilsone 2
John Lorimer 2
Archibald Shankland Goat Fraeboor 2
Anreu Angus yr 3
James Milligan yr 1
John Dalzel of Clauffoot 1
inlists for himself 2
71
(No lists of deficients for Morton

TINAULD

Tinuald in lists

(1) In ye place of Tinauld 10
(2) Herbert Mundels in ye milne 2
(3) John Clark 1
(4) John Litster 1
(5) John Wells 1
(6) Andrev Bell, smith 2
(7) Janet Crosbie 1
(8) James Dinwoodie 1
(9) Harbert Bell 1
(10) William Bell 2
(11) Rot Fraser 1
(12) Rot Dinwoodie ... 1
(13) John Fisher 1
(14) John Becktoun ... 1
(15) John Wright 1
(16) Eduard Mundall ... 1
(17) Margaret Ritchardsone 1
(18) Marion Bell 1
(19) Tho Fisher 1
(20) John Becktoun ... 1
(21) Patrick Litster ... 1
(22) John Quarrier ... 1
(23) James Aitchisone 2
(24) Andreu Sharp ... 2
(25) Rodger Kilpatrick 2
(26) John Corsbie 1
(27) John Mundall 3
(28) David Bell, smith 2
(29) William Bell 2
(30) William Robsone 1
(31) James Mundall ... 2
(32) Andreu Corbitt ... 1
(33) John Livistone ... 1
(34) James Greenhill ... 1
(35) Tho Greenhill ... 1
(36) James Robesone 1
(37) John Glover 1
(38) John Robesone ... 2
(39) James Douglas ... 1
(40) Five cottars 5
65

Notes

(1) Deficients of Tinnuald Parish
(41) John Sittlietown, officer 4
(whose name is not included in the parish list above)
(2) GD 26/7/340 — gives the same names as above, dated 8th March, 1693, given up by John Broune, servitor, to ye Laird of Tinwald
(3) GD 26/7/300 — gives a list of Robert Dalziel's tenants in Tinwald & elsewhere.

KIRKMICHAELL PAROCH

Ashieshiels

(1) James Hendersone in Hisliebrae 1
(2) James Reed yr ... 1
(3) Thomas Smith yr 2
(4) James Smith yr ... 1
(5) David Eddaill in Green 1

D. of Queensberry

(6) Wm Corrie Auckenskeu 2
(7) James Mccourtie yr 1
(8) George Roussell yr 1
(9) Jo Craig Knock ... 1
(10) Jean Patersone ... 1
(11) Agnes Smith yr ... 1
(12) Jo Corrie Burane 1
(13) James McWhinie yr 1
(14) James Coupland yr 1
(15) Wm Couplan in Wrathes 2
(16) David Watsone yr 1
(17) James Coupland Kirkland 1
(18) George Corrie Kirkgreen & a kilne 2
(19) Jo Kilpatrick in Mickleholme 1
(20) James Kilpatrick yr 1
(21) Tho Grahme & smiddie 2
(22) Rot Grahme 1
(23) John Grahme 1
(24) Adam Herkness yr 1
(25) Rot Burges yr ... 1
(26) Agnes Thorburne yr 1
(27) William Kilpatrick yr 1
(28) William Farish yr 1

(29) Ane kilne 1
(30) Jo Ritchie in Overgarrald 1
(31) James Burges yr 1
(32) William Johnstone yr 1
(33) William Kilpatrick yr 1
(34) Rot Johnstone in Lithhouse 1
(35) John Johnstone yr 1
(36) Tho Esdaill in Neyr Garrald 1
(37) James Kirkpatrick yr 1
(38) James Corsbie yr 1
(39) James Esdaill yr 1
(40) John Kirkpatrick yr 1
(41) John Corsbie yr ... 1
(42) George Johnstone in Rose 3
(43) Wm. Johnstone yr 1
(44) James Johnstone yr 1
(45) John Johnstone yr 1
(46) William Johnstone yr 1
(47) Wm Rodsgersone elder 1
(48) Wm Rodsgersone younger 1
(49) Rot Bell yr 1
(50) James Fead yr ... 1
(51) James Patersone yr 1
(52) Wm Shitleing in Rigefuts 1
(53) John Shitling yr ... 1
(54) Ane kilne 1
(55) Alexr Mcgill Cumlays 1
(56) Walter Mcgill yr 1
(57) Wm Corrie Neyr Defibell (?) 1
(58) Samuell Mcgill yr 1
(59) John Corrie yr ... 1
(60) John Herres yr ... 1
(61) James Trame (?) yr 1
(62) James Thorburne yr 1
(63) Andreu Grahme Brigs 1
(64) Alexr Shitlingstone yr 1
(65) John Fead yr 1
(66) John Corrie yr ... 1
(67) James Douglas yr 1
(68) John Russell yr ... 1
(69) Jo Thompsone Over Defibell & kilne & smiddie ... 3
(70) William Wotsone yr 1
(71) Alexr Brettan yr 1
(72) Jo Brettan younger 1
(73) Jo Brettan elder 1
(74) Jo Patersone Cockaige 1
(75) Jo Kilpatrick Haughhead 1
(76) Jo Aitkine in Langholme & a kilne (i.e. Lamholm) 2
(77) Jo Shitlintone yr 1
(78) Jo Kirkpatrick Gamrige 1
(79) Jo Johnstone yr 1
(80) Wm Johnstone Lochrighead 2
(82) William Thorburne Pulmoe (?) (i.e. Pielmuir) ... 1
(82) William Thorburne 1
(83) Jo Corrie Neyrmilne & a kilne ... 2
(84) John Smith yr ... 1
(85) James Burges yr 1
(86) Wm Carruthers yr 1
(87) James Douglas Courance 1
(88) Thomas Johnstone yr 1
(89) Bessie Johnstone yr 1

Notes

1. GD/26/7/375/2 — Deficients: Thomas Smith in Hisliebrae ..... 3 David Esdaill in green 1
2. See also Sir Robert Dalyell's list

MOUSWALD

D of Queensberry inlists

(1) John Carlile 1
(2) William Carruthers 1
(3) Isabel Tuidope ... 1
(4) Janet Caveat ... 1
(5) John Forgesone 1
(6) James Tuidope ... 1
(7) George Irving ... 1
(8) David Hainine ... 1
(9) Geo. Tuidope 1
(10) For ane kilne ... 1
(11) John Rae 1
(12) Rot Mundell (incl. kilne 2
(13) Rot Wright 1
(14) George Rae 1
(15) William Crorie ... 1
(16) James Clerk 1
(17) John Mccartie ... 1
(18) James Haugh 1
(19) Helen Douglas ... 1
(20) Peter Bartine 1
(21) Thomas Rae 1
(22) Thomas Maxwell 1
(23) William Bel & an kilne 2
(24) Andreu Bartine ... 1
(25) Bessie Dickson ... 1
(26) Rot Bartine 1
(27) Rot Dicksone ... 1
(28) David Gash 1
(29) Gavine Dicksone 1
(30) Nocolas Cuninghame 1
(31) Jean Carruthers ... 1
(32) John Kent 1
(33) Margaret Blair ... 1
(34) Thomas Dicksone 1
(35) William Irving ... 1
(36) Janet Gass 1
(37) John Edgar 1
(38) William Maxwell 1
(39) Francis Dicksone 1
(40) John Ker 1
(41) Isobel Dicksone & smiddie 2
(42) James Nickolsone 1
(43) John Nickolsone 1
(44) Janet Nickolsone 1
(45) John Dicksone ... 1
(46) Thomas Edgar ... 1
(47) John Roull 1
(48) Matheu Dicksone 1
(49) Peter Rae 1
(50) George Irving ... 1
(51) James Waker 1
(52) John Rae 1
(53) John Dicksone ... 1
(54) John Irvine 1
(55) John Irvine younger two (sic) 1
(56) Rot Blackstock ... 1
(57) Katarine Coupland 1

Lagge

(58) For his mansion house 9
(59) George Shanks, Rochell 1
(60) Andreu Scott yr 1
(61) William Wright yr 1
(62) Jo Tuidhope, Burntfield 1
(63) John Waker, Rocell 1
(64) James Mill yr ... 1
(65) Rot Palmer yr ... 1
(66) John Palmer yr ... 1

(67) Rot Gloss yr 1
(68) Matheu Palmer yr 1
(69) Lanclot Palmer yr 1
(70) John Flimmine yr 1
(71) William Palmer yr 2
(72) Wm. Kilpatrick, Woodsyde 1
(73) James Roull, smith 2
(74) James Rae yr ... 1
(75) John Johnstone yr 1
(76) Matheu Dicksone yr 1
(77) James Nickol yr... 1
(78) James Cochran yr 1
(79) William Smith ... 1
(80) Tho Rae & a milne 2
(81) George Irvine, Woodsyde 1
(82) George Irvine, Boghall 1
(83) Eduard Ferguson, Saturhirst 1
(84) Eduard Palmer, Bucklarcoatt 1
(85) George Crightone, Milneholme 1

Ramerskeels

(86) John Underwood, Longdick 1
(87) John Gilchrist, Raples 1
(88) Christopher Irvine yr 1

Robbiewhat

(89) Himself 1
(90) David Coupland yr 1
(91) James Muncie yr 1

William & The Raes in Drummoo r

(92) William Rae 2
(93) Tho. Rae & a kiln 3
(94) Nickol Snadin yr 1
(95) John Hill 1

Lagg in Lists Tirthorl pa

(96) George Wilkine ... 1
(97) Rot Wilkine 1
(98) William Wilkine 1
(99) John Mcgiltrock (Mackgill) 1
(100) Rot Neilsone 1
(101) Andreu Ritchartsone 1
(102) Alexander Wright 1

D of Queensberry

(103) James Potter 1
(104) James Litle 2
(105) John Nicolsone ... 1
(106) Andreu Ritchartsone 1
(107) Rot Little 2
(108) William Ritchartsone 1
(109) William Litle ... 1
(110) James Dinwoodie 1
(111) John Wright elder 1
(112) Herbert Carlile ... 1
(113) James Ritchartsone 1
(114) Janet Litle 1
(115) Rot Litle 1
(116) Helen Litle 1
(117) Harbert Carlie ... 1
(118) John Swan 1
(119) John Halidav 1
(120) William Haliday 1
(121) James Porter. ... 1
(122) Thomas Mitchell 1
(123) Janet Dicksone ... 1
(124) William Rentoun 1
(125) Janet Lausone ... 2
(126) James Bell 1
(127) John Coulter ... 1
(128) James Neilsone ... 1
(129) Agnus Mouse ... 1
(130) Rot Lausone 1
(131) Rot Lausone 1
(132) John Irvine 1
(133) Peter Potter 1
(134) Tho Burnet 1
(135) Adam Glassell ... 3
(136) James Potter 1
(137) Michaell Coulter 1
(138) John Glassell ... 2
(139) James Maire 1
(140) James Coulter ... 2
(141) Matheu Coulter ... 1
(142) Helen Martine ... 1
(143) Rot Kilpatrick ... 1
(144) Patrick Livistone 1
(145) Janet Glassell ... 1
(146) William Waker 1
(147) John Coulter ... 2
(148) Rot Glassell 1
(149) Harbert Burnet ... 1
(150) John Burnet 1
(151) Matheu Wightman 2
(152) Janet Coulter ... 1
(153) Rot Potter 1
(154) James Broune ... 1
(155) James Litle 1
(156) Isabel Mair & her sonne 3
(157) John Carlile 1
(158) James Black 1
(159) James Black & Jo Carsone 1
(160) John Kilpatrick ... 1
(161) Bessie Lausone ... 1
(162) James Coutart 1
(163) James Johnstone 1
(164) George Swan 1
(165) David Corsbie ... 1
(166) James Dicksone 1
(167) James Nicolsone 1
(168) Adam Bell 1
(169) James Potter 1
(170) John Herron 1
(171) John Wright 1
(172) James Ritchartsone 1
(173) Ane kilne 1
(174) Willram Suan ... 1

Totel—201

Notes—No poor listed in official list (375/2). In deficients are Lagg, 15 others, and " omitted in Mousewald 4." Most of the deficients are either from Rochell or Lagge's Torthorwald tenants.

Although the total hearths is given as 201, there were apparently 207 when mistakes in addition and the 4 ommissions are added.

From original lists

(1) Rammerskeills list of hearths for Rivell & Mouswald 1691—for James Scot, collector of the hearths—nithsd & a.daill. Very difficult to read.
(2) D. of Q's list, Nov. 1691—given in by James Dicksone, baillie for His Grace's interest there (Mouswald)—61 hearths.
(3) List of hearths belonging to Sir Rot Grierson of Lag & his tenants wt p of Mussuall given up be John Fleming.
(4) List of hearths pertaining to me, Pattrick Cairll of Robig (see 89).
(5) Ramesk's list dated 22/10/90—in Mouswald.
(6) Grierson's list 17/10/90—varies from final list in giving only 8 for his mansion house.
(7) A list of Queensberry's Mousewald hearths, but not in the same order, nor as many (53 against later 60) and giving places. Includes
David Wood, house and smiddy 2
Wm. Maxwell h & kill 2
Considerable variation in names.

SIR ROBERT DALYELL'S LAND IN KIRKMICHAEL, TINWALD, TRAIL-FLATT

Kirkmichael

(1) Place of Kirkmichall, of hearths, oven & furnish 17
(2) William Gillespie in Mains 1
(3) Andru Lauson yr 1
(4) John Wilson Hardop 1
(5) Wm Milligane ... 1
(6) Gilbert Hutchisone herd in Holhouse 1
(7) Tho Lason, Craigsheils 1
(8) John Tait, Craigsheils 1
(9) James Mclennan Neise Glenn 1
(10) Wm Gillespie cottar 1
(11) Rot Gillespie cottar 1
(12) Wm Johnstone ... 1
(13) Rot Killpatrick Overwodd 1
(14) James Kilpatrick cottar Overwodd 1
(15) Issobel Kilpatrick 1
(16) James Killpatrick Netherwodd 1
(17) James Johnston Neise 1
(18) John Wilsone Buss 1
(19) Elspeth Frissall Blackcleugh 1
(20) Marian Mclellan Glenkill 1
(21) Jean Mclennan yr 1
(22) Marion Tait cottar yr 1
(23) Geo Gillespie Lamphitts 1

Kirkmichael toune

(24) Hew Dovison (?) & killie 2
(25) James Killpatrik ther 1
(26) James Thomsone 1
(27) Robert Adamsone 1
(28) John Robsone ... 1
(29) Thomas Munsies 1

Cottars

(30) Thomas Skails ... 1
(31) Jenet Murray ... 1
(32) John Killpatrik ... 1
(33) Jenet Adamsone 1
(34) Alexander Killpatrick 1
(35) cottars John Dinuddie 1
(36) David Kellie 1
(37) Jenet Corbit (?) 1
(38) John Killpatrik ... 1
(39) Cathrin Dinwiddie 1
(40) John Corsbie 1
(41) Geo Craige 1
a kill 1
(42) A cottar Jenet Tait 1
(43) Wm Craig yor ... 1
(44) John Swane 1
(45) cottars James Thomesone smith 1
His furnace 1
(46) James Robsone ... 1
(47) cottare Archbald Kirk 1
(48) Nanse (?) Fareis 1
(49) Wm Craig elder ... 1

The tenn pund land of Daruskeen (?) in Paroch of Tinele

(50) John Corbit Smithton 1
(51) John Corrie Smithton 1
(52) Andro Corrie, Smithton 1
(53) Hell Corrie Smithton 1
(54) Herbert Faid Fulton 1
(55) John Corbit 1
(56) Bessie Corbit cottar 1
(57) John Burges 1
(58) Michall Porter ... 1
(59) Cottar Agnes Charters 1
(60) Herbert Burges ... 1
(61) John Faide 1
(62) Patrik Charters ... 1
(63) James Black 1
(64) Robert Corrie cottar 1
Amongst them all a kill 1
(65) Auchenflourdhill James Robsone ... 1
(66) Alex Robsone ... 1
(67) Jenet Mack cottar 1
(68) Dyke of Daruskeen Alex Robsone 1
(69) Cottar Thomas Dickson 1
(70) John Burges 1
(71) James Munell ... 1
(72) Thomas Mechie (?) 1
(73) James Corrie 1
(74) Over Carsse Wm Brand elder 1
(75) Over Carsse Wm Brand yor 1
(76) John Corrie 1
(77) Wm Smith 1
Amongst them a kill 1
(78) The Over Lengait Elspeth Swane ... 1
(79) Cottar James Watsons 1
(80) The Nether Lengait Rot Richardsone 1
(81) Hartbusse Wm Haliday 1
(82) Wm McVitie 1
a kill 1
(83) Cottars Jenet Edgar 1
(84) Alex Smith 1
(85) John Rainine 1
(86) Cottars Cathrin Wilson 1
(87) Robert Chirrie ... 1
(88) Herbert Nell (or Well) 1
(89) Cottar Nicol Thomson 1
(90) Herbert Hill, Tho Miller 1
(91) John Swane 1
(92) Over Cotympan James Swane 1
(93) John Waterit 1
(94) John McUne 1
(95) Nether Cotympan Alex Porter 1
(96) John Nell (Well) 1
(97) Cottar Margret Edgar 1
(98) Jenet Brettan ... 1
(99) James McUne... 1
(100) Rot & Andro Spenne 1
(101) The Smidin? Ja Coudan 1
(102) Adam Coudane ... 1
(103) A misfeildtoun James Coudane ... 1
a kill 1
(104) John Nell? 1
(105) Cottar Rot Corrie 1
(106) Grissal Jonston ... 1
(107) Wm Nell 1
(108) Agnes Coudane ... 1
(109) Wm Spenne 1
(110) Andro Glover ... 1
(11) John Corsbie 1
(112) John Brettan 1
(113) Herbert Nell? ... 1

The tenn pundland of Auchenane in paroch of Trailflatt annexed to Tinnell parish

(114) The Fairniecleuch James Paterson ... 1
(115) The Hightoune John Corsbie 1
(116) Andro Corbit ... 1

(117) John Brettan 1
(118) Robert Burges ... 1
(119) Alex Corsbie 1
(120) Cottar Cathrin Becton 1
(121) John Charters ... 1
(122) The burne of Auchenane Wm Anderson 1
(123) Wm Nell? 1
(124) John Nell? 1
(125) Wm Fisher 1
(126) Jean Brettan cottar 1
(127) Andro Glover ... 1
(128) Shealhill James Bryden 1
(129) Over Coushae John Brettan ... 1
(130) John Becton ... 1
(131) Nether Coushae James Brettan ... 1
a kill 1
(132) Leanheid Marian Nell 1

The tenn pund land of Trailfatt in the paroch thereof

(133) Skipmyre James Paterson 1
(134) John Paterson ... 1
(135) Wm Grame 1
(136) Tho Munshes 1
Amongst them a kill 1
(137) The Hunter house Wm Stodert herd 1
(138) Bankheid Eduard Lasone 1
(139) The kirk Rot McVitie 1
(140) Cottars James Scott 1
(141) Benthouse Robert Phareis 1
(142) James Phareis elder 1
(143) James Phareis yor 1
(144) Lochsyd Belsies and Slaks John Spenne 1
(145) His cottar Nans Latimer 1

The Damhead in the Paroch of Trailflatt

(146) Wm Bryden 1
(147) Andro Bryden ... 1
(148) Milltoun of Trailflat Wm McVitie 1
(149) His cottar And Fareis 1
(150) John Grahme 1
(151) Wm Carruthers ... 1
(152) Tho Aiken 1
(153) John Wilsone? ... 1

Singned Hen Dalyell
Dated 10/11/1690

WESTERKIRK PAROCH

D. of Bucclewgh

(1) Tho Little Sheill 1
(2) Archibald Scott yr 1
(3) Wm Reive yr ... 1
(4) Ja Little 1
(5) Wm Scott 1
(6) Andrew Midletown 1
(7) Jo Beattie 1
(8) Jo Little 1
(9) Joh Grahm & Mill 2
(10) Jo Scott Bilholm 1
(11) David Little 1
(12) Paterick Little ... 1
(13) George Scott 1
(14) Wm Learmonth & kill 2
(15) Tho Little Bankhead 1
(16) Wm Blaik 1
(17) Tho Greive Megdaill 1
(18) Jo Beattie Arswood 1
(19) Alexr Armstrong Bailyeshill &
(20) Adam Bigholms ... 2
& a kill 1
(21) Wm Beattie Leinholm 2
(22) George Beattie Berperat 1
(23) Jo Armstrong yr 1
(24) Andrew Little ... 1
(25) Wm Grahm 1
(26) Mrrs Dalglish Enzieholm 2
(27) Symeon Johnston yr 1
(28) Wm Johnston yr 1
(29) James Byers yr 1
(30) Walter Greive Slenishwater 1
(31) Tho Hislope yr ... 1
(32) Walter Cordlay (?) & kill 1
(33) Tho Johnston Knocks 1
(34) Andrew Thomson 1
(35) Wm Moffit 1
(36) Wm Thomson ... 1
(37) James Thomson ... 1
(38) Archibald Little ... 1
(41) Isabell Little 1
(42) Margaret Cranston 1
(43) Tho Cranston ... 1
(44) Jo Little 1
(45) Andrew Little ... 1
2 kills 2
(46) Andre Thomson Bownes 1
(47) Andrew Little Borkine 1
(48) Wm Scott yr 1
(49) Jo Scott yr 1
(50) George Little 1
(51) Andrey Littl 1
an kill 1
(52) Jo Greive Garrald elder 1
(53) Jo Greive yngr yr 1
(54) Wm Black & kill 2
(55) Jo Brunton Thickside 1
(56) Hewgh Simpsone 1
(57) Wm Aitchieson Blaikesk 1
(58) Wm Grahm 1
(59) Jo Armstrang 1
(60) Paterick Andieson 1
(61) Rot Greive Kilburne 1
(62) Wm Armstrange 1
(63) Jo Atchieson 1
(64) Jo Niccoll & kill 2
(65) Jo Beattie Neyrland 1
(66) Jo Donaldson yr 1
(67) Jo Nisbitt 1
(68) Francis Grahm ... 1
(69) Hillen Thomson Twiglees 1
(70) Jo Nicoll 1
(71) Jo Park 1
(72) Jo Scott 1
(73) Wm Nicoll Tolshawhill 1
(74) Rot Andieson ... 1
(75) James Moffit 1
(76) Jo Scott 1
(77) Ritchart Bell, Westside 1
(78) Fergus Grahm ... 1
(79) Wm Irvine 1
(80) Francis Elliott Tanlawhill 2
(81) Archibald Thomson & kill 2
(82) Wm Park Castlehill 1
(83) Euphean Scott ... 1
(84) Bessie Atchieson 1
(85) Mitchall Andieson 1
(86) James McLean & mill 2
(87) Wm Beattie Watcarick 3
(88) Jo Dickson 1
(89) Jo Thmosn 1
(90) Wm Beattie 1

(91) Jo Beattie 1
(92) Rot Glendinning 1
(93) Wm Thomson ... 1
(94) Wm Little 1
(95) Alex Smith Canhill 2
(96) Jo Grahm Holm 1
(97) James Stoddart & kill 2
(98) Dumfedling, James Park 1
(99) Wm Beattie 1
(100) Andrew Thomson 1
(101) Wm Grahm 1
(102) Wm Black 1
(103) Rot Thomson ... 1
(104) Wm Dods 1
(105) Wm Thomson ... 1
(106) Tho Black 1
(107) Jo Cowan 1
(108) Adam Glendining 1
(109) Tho Little & kill... 2
(110) Samuell Grahm Fingland 1
(111) Adam Blaick 1
(112) Adam Ladlay 1
(113) Alexr Ladlay 1
(114) Andrew Park 1
(115) Marion Blaick ... 1
(116) Wm Blaick 1
(117) Wm Greive in Langshawburn ... 1
(118) Wm. Ladlay ye ... 1
(119) Wm Scott 1
(120) Bessie Hope 1

E of Tarras

(121) Wm Blaick in Cassar 1
(122) Wm Blaick 1
(123) Wm Blaick 1
(124) Andrew Blaick ... 1
(125) Jo Blaick 1
(126) Rot Kerr 1
(127) John Kerr 1
(128) Rot Ballintine 1
(129) Walter Blaick 1

Westerhall

(130) The Mansion house 10
(131) Wm Scott Felbrae (?) 1
(132) Archbald Scott yr 1
(133) Janett Cranston yr ... 1
(134) James Scott yr ... 1
(135) Jo Gibson yr & kill 2
(136) Jo Poll in Glendining 2
(137) Jo Hislope yr ... 1
(138) Wm Little in Crucks 1
(139) Janett Ramsey (?) 1
(140) Jo Little yr 1
(141) Wm Lealhan, yr 1
(142) Rot Grahm in Kirktownhill 1
(143) Jo Fletcher yr ... 1
(144) Wm Thomson yr 1
(145) Jo Lithgow 1
(146) Andrew Glendining 1
(147) Tho Murray in Birkraine 1
(148) Andrew Little in Rigg 2
(149) Tho Tailfer yr ... 1
(150) George Beattie yr 1
(151) Halbert Dinn & (?) kill ..... 1(?)
(152) Jo Hope in Burnfoott 1
(153) Wm Beattie yr ... 1
(154) James Tailfer in Felholm 1
(155) Rot Glendinning yr 1
(156) Hillen Thomson yr 1
(157) Euphean Thomson yr 1

. . . Laing of Westerkirk

(158) inlists 6

Rennaldburn

(159) Adam Ladlay in Aberlosk 1
(160) Andrew Blaick yr 1
(16) Thos Ladlay yr ... 1
(162) James Scott in Midraeburn 1
(163) Jo Ladlay yr 1
(164) Jo Brunton yr ... 1
(165) Jo Armstrang in Clarkhill 1
(166) Walter Beattie yr 1
(167) Francis Nicoll yr 1
(168) Wm Caruthers yr 1
(169) Andrew Scott 1
(170) James Andieson in Graystone 1
171 Jo Ladlay yr 1
(172) Wm Ladlay in Rennaldburn ... 1
(173) James Greive yr 1
(174) David Murray in Coatt 1
(175) Wm. Park 1
(176) James Park 1
(177) James Murray ... 1
(178) Tho Little 1
(179) James Ladlay 1
(180) Jo Thomson & kill 2

Raeburn

(181) Jo & Tho Ladlay in Yettbyer (?) ... 2
(182) George Dickson ... 1
(183) Jo Little 1
(184) Wm Lainge & kill 2
(185) Andrew Ballindin Midlaw 1
(186) Andrew Hislope .. 1
(187) Wm Dods 1
(188) Hillen Bredine 1
(189) Jo Hope 1
(190) James Scott 1

Crossyeards

(191) James Burrell yr 1
(192) Wm Beattie Mudlaeknow & kill ... 2

Ports of Crurie

(193) Jo Smith yr 2
(194) James Stoddart ... 1
— an kill 1

Thorlishope yngr

(195) Wm Tailfer Eltigell (?) 1
(196) James Tailfer yr... 1
(197) Adam Little yr ... 1
(198) Walaer Beattie ... 1
(199) James Nicoll Midgewholl 1

Thorlston

(200) James Ladlay Birrin (?) lowge & kill 2
(201) Archbald Greive 1
(202) Jo Scott 1
(203) Jo Bold Neyr Cassae 1
(204) Tho Anderson ... 1
(205) Wm Ladlay 1
(206) James Greive 1
(207) Tho Beattie 1
(208) Jo Ladlay & kill 2
(209) Frances Scott of **Dalswinton for himself** 2
(210) Tho Rae & kill ... 2

STAPLEGORDON PAROCH

D. or Bucclewch

(1) Tho Little in Wholl 1
(2) Geo Scott 1
(3) Mathew Little in Bombie 2
(4) Blanch Little 1
(5) Blanch Johnston... 1
(6) Mrs Pringall in Carlisgill 2
(7) John Hope 1
(8) Alexr Borthwick 1
(9) Rrchbald Irvine ... 1
(10) Tho Hope and kill 2
(11) Jo Holson Burnfoott 2

(12) Alexr Small 1
(13) Michaell Tod Bankhouse 1
(14) Jo Scott 1
(15) . . .ilholm Walter Dalglish 1
(16) Rot Gowinlock ... 1
(17) Wm Tailfer Whitshiells 1
(18) Rot Paterson 1
(19) In the Dutches house in Langholm castle & an mill 12
(20) Tho Tweddall & Wm Howie yr ... 2

Broomholm

(21) Jo Hall, Arkenholm 2
(22) James Cranston ... 2
(23) Ecklor Pasley ... 1
(24) Jo Pasley 1
(25) Wm Alexr 1
(26) Walter Nicolson .. 1
(27) Ritchart Meills 1
(28) Hewgh Alexr 1
(29) Wm Armstrang .. 1
(30) Jo Cranston 1
(31) Francis Bell 1
(32) Jo Glendining ... 1
(33) Roe Belverntowne 1
(34) Janett Purves (?) 1
(35) David Dickson ... 1
(36) Rot Pasley 1
(37) Jean Scott 1
(38) George Trumble... 1
(39) Tho Atchesonne .. 2
(40) Antonie Browne .. 1
(41) Symeon Fletcher 1
(42) Janett Forsith ... 1
43 Agnus Ames 1
(44) Jo Bunam 1
(45) Jo Scott 1
(46) Jo Forsyth 1
(47) Rot Mcgill 1
(48) Jo Little 1
(49) David Reed 1
(50) George Thomson yngr 1
(51) Wm Irvine 1
(52) Andrew Wright ... 1
(53) Tho Hendersonne 1
(54) James Reed 1
(55) Jo Maxwell heritor 4
(56) Wm Paine, Broomholm 1
(57) James Thomson ... 1
(58) Walter Breidine ... 1
(59) Wm Clark 2

Rott Elliott portioner of Arkenholm

(60) Rot Elliott 3
(61) Symeon Armstrang 1
(62) Tho Byers 1
(63) James Pasley yngr 1
(64) James Johnston older 1
(65) Jomes Johnstone yngr 1
(66) Bessie Armstrang 1

Rot Maxwell portioner

(67) George Thomson older 3
(68) Rot Hunter 1
(69) Archbald Elliott 1
(70) Wm Reed 1
(71) Jo Beattie 1
(72) an wast howse ... 1
(73) Janett Fletcher ... 1

Tinwald portioner yr

(74) James Pasley elder 1
(75) Wm Fletcher 1
(76) Alexr Allan 1
(77) Lanclitt Armstrang 1
(78) Rot Kirkhope ... 2
(79) Jo Armstrang elder 1
(80) Jo Hope 1
(81) Jo Wilson 2
(82) James Gowinlock 1
(83) Tho Gowinlock ... 1
(84) Wm Lawson Roshell 1

Tho Armstrang of Craigs

(85) Himself 1
(86) Andrew Armstrang 1
(87) Walter Armstrang 1
(88) Jo Irvine 1
(89) Agnus Murray ... 1
(90) Wm Irvine 1
(91) Anna Allan in Neyr Craigs 1
(92) Tho Nicoll yr ... 11
(94) Andrew Little ... 1
An kill 1

Renneldburn

(95) Jo Beattie in Dowgland 1
(96) Mathew Little ... 1
(97) Wm Ronnald 1
(98 Jo Little 1

EWES PAROCH

D. of Buccelwgh

(1) Edward Atchison Dewslees 1
(2) Jo Elliott Burnfoot 1
(3) James Anderson 1
(4) Rot Anderson yr 1
(5) Tho Armstrang Blackhall 1
(6) Wm Armstrang ... 1
(7) James Hutton ... 1
(8) James Hislope ... 1
(9) Rot Scott Wnthank 1
(10) Jo Hislope 1
(11) Adam Elliott 1
(12) George Hislope ... 1
(13) Archbald Beattie 1
(14) Wm Foster 1
(15) Wm Nicoll Mospable 1
(16) Wm Byers 1
(17) Tho Pott 1
(18) Ja Henderson Glendevan 1
(19) Jo Elliott 1
(20) Jo Bell 1
(21) Wm Blacklock ... 1
(22) Patrick Henderson 1
(23) Wm Armstrang Boghill 1
(24) Isabell Armstrang 1
(25) Tho Chyholm (?) Flask 1
(26) Jo Telfer 1
(27) Jo Irvine 1
(28) Wm Little 1
(29) Tho Little 1
(30) George Tailfer ... 1
(31) Tho Murray 1
(32) Wm Murray 1
an kill 1
(33) Symeon Little Wraee 1
(34) Wm Hislope 1
(35) Adam Hislope ... 1
an kill 1
(36) James Davieson .. 1
(37) Margaratt Murray Sorbie 3
(38) Cristopher Armstrang in Kirktoun 2
(39) Rot Wright 1
(40) Andrew Lambe ... 1
(41) Margaratt Beattie 1
(42) Rot Scott Buss ... 1
(43) Walter Scott 1
(44) Andrew Scott ... 1
(45) Jo Armstrang Burngrains 1
(46) Jo Nicoll 1

Muckledaill

(47) Himself 5
(48) Ritchart Brown 1
(49) Wm Yowng 1
(50) James Huggon ... 1

Cowns (?) inlist tarras

(51) Wm Elliott 3
(52) Wm Lason Greenhills 1

(53) Walter Elliott Middlemoss 1
(54) Wm Tailfer Breedhead 1
(55) Wm Tailfer yr called Venterer ... 1

Arkletown

(56) Himself six kill & mill 8

(57) Rot Lawson 1
(58) Ester Scott 1

Gledswood

(59) Walter Chyholme in Briarieshaw ... 1

CANONBIE PAROCH

D. of Bucclewgh

(1) Jo Armstrang in Hairlaw 3
(2) Adam Moffitt 1
(3) Jo Irvine 1
(4) Tho Armstrang ... 1
(5) Wm Scott 1
(6) David Spiddie (?) 1
(7) Walter Scott 1
(8) Francis Bell 1
(9) Andrew Little ... 1
(10) Jo Irvine in Hagg 1
(11) Christpoher Armstrang 1
(12) George Armstrang 1
(13) James Scott 1
(14) Wm Scott 1
(15) John Mintor 1
(16) Wm Armstrang ... 1
(17) James Moffitt in Hairlawwholl 1
(18) Adam Purves ... 1
(19) Tho Armstrang elder 1
(20) Tho Armstrang yngr 1
(21) Ronnald Armstrang 1
(22) James Dickson ... 1
(23) James Dickson in Overcruckholm ... 2
(24) Wm Armstrang in NeyrCruckholm ... 2
(25) Wm Brown in Rowinburn 2
(26) Jo Beattie 1
(27) Jo Armstrang in Newton 1
(28) Adam Murray ... 1
(29) Francis Bell 2
(30) Gawin Elliott for howss mill & kills 4
(31) Wm Wilson yr ... 1
(32) Margaratt Elliott 1
(33) David Little in Canabie 1
(34) Hillen Dalglish ... 1
(35) Tho Little 1
(36) Rot Elliott 1
(37) Hewgh James in Baitbankhead 1
(38) Jo Elliott in Canabie 1
(39) Ritchard Thomson 1
(40) Wm Bell 1
(41) Walter Scoon millar 1
(42) Rot Scott 1
(43) Ja Irvine Loinieclewgh (?) 1
(44) David Armstrang 1
(45) Wm Bell 1
(46) Francis Yeaman (?) 1
(47) Margaratt Beattie 2
(48) Wm Little in Hagreen 1
(49) Rot Deans in Archerbeck 4
(50) Wm Atchison ... 1
(51) Rot Burges 1
(52) Tho Riddell in Nottieholm (?) ... 2
(53) David Irvine 1
(54) Rot Wilson 1
(55) Ninian Armstrang in Utterwoodhead (?) 1
(56) Tymothie Armstrang 1
(57) James Blacklock in Barrycrofts 1
(58) James Mitchhillhill 1
(59) Lanclitt Foster ... 1
(60) Jo Armstrang 1
(61) Adam Amis Hardenside 2
(62) Blanch Moffitt ... 1

WAHOPE PAROCH

D of Bucclewgh

(1) Archbald Thomson Scorknow 1
(2) Jo Huggon Shaw 2
(3) Jo Irvine 1
(4) Adam Hyslope & kill 2
(5) Christopher Helliday Bigholm 1
(6) Walter Elliott Clewghfoottş 1
(7) Ninian Elliott yr 1
(8) James Scott Calfeild 3
(9) Jo Moorhead Nyhill (?) 1
(10) Wm Irvine yr ... 1
(11) Hillen Dyell Becks 2
(12) Wm Irvine 1
(13) Jo Hunter Meikleholm 1
(14) Tho Little 1
(15) And Little 1
(16) Jo Warnock 1
(17) Wm (?) Scott Bloch 2
(18) Jo Herkness 1
(19) Rot Armstrang ... 1
(20) Jo Murray in Irvine 1
(21) Geen Armstrang an kill 1
(22) Jo Fairbairn for howss & mill ... 2
(23) James Rae Blochburnfoot 1
(24) Wm Stoddart Wholl 1
(25) Wm Grahm Ershaw 1
(26) Tho Stoddart ... 1
(27) Adchbald Grahm 1
(28) Andrew Armstrang 1
(29) Wm Scott Wyleholm 1
(30) Jo Scott Stubholm 1
(31) Wm Glendining yr 1
(32) Jo Rutherford ... 1
(33) Jo Beattie 1
(34) Jo Armstrang ... 1
(35) Jo Browne Mulholm 1
(36) Ja McVittie 1
(37) Andrew Scott 1
(38) Paterick Keine ... 1
(39) Wm. Keine 1
(40) Jasper Boy (?) ... 1
(41) Andrew McVittie 1
(42) Andrew Armstrang Midleholms 1
(43) Tho Little yr 1
(44) Adam Armstrong Westwater 1
(45) Jo Irvine 1
(46) Tho Rae 1

(47) Mr Rot Allan for ye mans (?) 3
(48) Archbald Johnston in Logonhead ... 1

Springkell

(49) Wm Beattie Logonhowse 2
(50) Janett Beattie Knowhead 1
(51) Adam Beattie Loganmains 3
(52) George Herkness Stabbiknow 1
(53) Ronald Armstrong Moseside 1
(54) John Armstrang Stork 1
55() Wm Beattie Duiholme (?) ... 2
(56) Jo (?)eathead Sickhead 1
(57) Rot Grahm Greenwrae 1
(58) Ja Armstrong Cadgillfoott 1
(59) Rot Herkness Timpen 1
(60) Jo Armstrong Timpenheck 1
(61) Ritchart Armstrang in Cadgillhowse 1
(62) James Tailfer Aikillbill 1
(63) Wm Bell Cadgillside 1
(64) Wm Grahm Waplies 2
(65) Wm Beattie Dickside 1
(66) Jo Armstrong Peillwalls 1
(67) Ja Armstrong Bograe 1
(68) Jo Grahm Wattaman 1
(69) Jo Irvine Auchingeil 3
(70) Jo Greensheills Bawklish 2
(71) Ja Armstrong Cadgillhead 1

James Purdies of Smelholms

(72) Jo Beattie yr ... 2
(73) Jo Little Chappelknow 2

KIRKMAHOE

Dalswinton

(1) Himself 11
(2) James Ferguson, Drumbank 1
(3) Isabel Leithen ... 1
(4) William Rae, smith 2
(5) Rot Lourie 1
(6) John Mccaige ... 1
(7) James Couan, Bankhead 1
(8) Nickolas Corbitt 1
(9) William Wallace 1
(10) Eduard Couan ... 1
(11) Agnes Niviesone 1
(12) Alexander Maxuell 1
(13) Jo Robisone, Forrestoune 1
(14) Osie (sic) Edgar & Rot Edgar yr 2
(15) Archbald Mcconnell 1
(16) Jean Glencorse, Dalsuinton 1
(17) Charles Paislay ... 1
(18) Joe Watsone, Tounhead 1
(19) Thomas Watsone yr 1
(20) John Kilpatrick yr 1
(21) James Watsone ... 1
(22) Thomas Mcmurdie 1
(23) Alexander Robisone 1
(24) Rot Neulans 1
(25) John Smith 1
(26) Alex Smith 1
(27) John Johnstone ... 1
(28) John Glendining 1
(29) John Couan, Brae 1
(30) Grissel Kilpatrick 1
(31) Gilbert Couan ... 1
(32) Rot Couan yr ... 1
(33) Barbary Couan yr 1
(34) Agnes Lourie yr 1
(35) John Smith younger 1
(36) William Laurie ... 2
(37) James Couan 1
(38) Jean Johnstone ... 1
(39) William Suan ... 1
(40) John Couan 1
(41) Thomas Irvine ... 1
(42) Katarine Reikie ... 1
(43) Jo Watsone, Crofthead 1
(44) Alexander Laurie 1
(45) Rot Couan 1
(46) Rot Morrie & a kilne 2
(47) Wm. Mcgie & milne 2
(48) James Cambell ... 1
(49) Eduard Cambel 1
(50) William Suan ... 1
(51) Nickolas Watson 1
(52) Barbary Couan ... 1
(53) Tho Fergusone, Lees 1
(54) James Wilsone ... 1
(55) Peter Couan, Robtoun 1
(56) Jo Smith, Elder & kilne & smiddie 3
(57) John Smith younger 1

Earl of Nithsdale

(58) Alexr. Robsone ... 1
(59) James Rulle 1
(60) Gavine Sharpe ... 1
(61) Helen Maillen ... 1
(62) James Robesone 1
(63) David Welsh 1
(64) Rot Robesone ... 1
(65) Margaret Shaw ... 1
(66) Archbald Wright 1
(67) Alexr Robsone, brigs 1
(68) Jo Nickalsone ... 2
(69) James Nicolsone 1
(70) James Scott 1
(71) John Broune 1
(72) David Thompsone 1
(73) John Maxuell ... 1
(74) Janet Glossell ... 1
(75) William Bell 1
(76) Rot Robsone 1
(77) James Hunter ... 1
(78) Rot Robsone, Collouell 1
(79) James Laurie 1
(80) Jean Thompsone 1
(81) John Steuart 2
(82) James Waker 1
(83) Marian Wallace 1
(84) William Corrie ... 1
(85) Rodsger Robsone 2
(86) John Martine 1
(87) David Edgar 1
(88) John Corsbie 1
(89) Nicolas Robsone 1
(90) David Rodan 2
(91) Eduard Steuart ... 1
(92) Iein Wallace 2
(93) Susanna Robsone 1
(94) George Edgar ... 1
(95) William Gillespie 1
(96) Alexr Watsone ... 1
(97) James Wilsone ... 1
(98) Jo Dinwoodie ... 1
(99) James Harper ... 1
(100) Rot Ireland 1
(101) John Watsone ... 1
(102) Rot Smith 1
(103) **James Glover, portioner of Kirktoun** in lists 1
(104) **Rot Shortrige, portioner** in lists 2
(105) **Jo Thomsone, Kirktoune** in lists 2

Homer Maxuell of Kilbane
(106) For Himself 6
(107) Rot Watsone & Rot Bean, Auchengerth 2
(108) Jo Lausone &
(109) James Gillespie & Janet Hidlistone, Burnsyde 2
(110) James Beck, Rellickhill 1
(111) Andreu Gillespie, Lakebud 1
(112) James Robsone, Kilblane & a kilne 2
(113) David Wilsone, Janet Tailfar, Mary Murdoch, poor 2
James Wallace of Caryeild
(114) Himself 3
(115) James Wightman, Caryeild 1
(116) John Sharp, yr ... 1
(117) Jo Glover Kirktoun 2
(118) Two Kilnes 2
(119) Alexr. Glover ... 1
(120) Rot Reed 1
(121) Heugh Glover ... 1
(122) Rot Mclurg 1
(123) Mary Murdoch ... 1
Ridding Wood
(124) Himself 4
(125) Jo Wallace, Nicoll Irland, Wm. Beck, Agnes Charters 4
(126) **Rot Maxwell, Portioner of Caryeild, in lists** 1
(127) **Jo Glover, portioner yr** in lists 1
(128) **Barbary Thomsone, portioner yr** in lists 2
(129) Jo Wallace, portioner yr in lists 1
(130) **Jo Martine in Auchinraphe** in lists 2
(131) **Thomas Irvine portioner in Auchencairne** 2
(132) **Jean Grahame in Whystans** in lists 2
Total 180

Notes:—
Deficient & Poor (GD 26/7/375/2)
Deficient—Will Lowrie, now in Riddingwood (see 36) for hous & kill 2
John Glover in Kirktown 2
Poor—
(133) David Farish 1
(134) Agnes Stodhart in Carnsalloch 1
But also entry number 113 for three poor in Homer Maxwell's list
Found in GD/26/7/358, the following list signed by Ro Maxuell, for Carnsalloch.
(135) My own house & kill 10
(136) Robert Cowan ... 1
(137) Thomas Gillhagie 1
(138) Rot Wallas 1
(139) Wm. Farish 1
(140) Alexr Ander Tait 1
(141) Gorge Irving 1
(142) Jo McBurnie 1
(143) Johne Shearp ... 1
(144) Bessie Wallas ... 1
(133) David Farish in the kirke box ... 0
(134) Agnes Stodert in the kirk box 0

Same source: A sheet of paper gives a list of the "hearths belonging to some of ye pettie heritors in ye parish of Kirkmahoe". Written in various hands, dated 10th Feb., 1692, to 23rd Mar., 1692.

By and large. this is identical with entries 103 to 132. but it includes one or two additional items:—

(104) Rot Shortridge names his hearths as for Janet Robsone, his mother, and James Reid. his tennent.
(105) John Thomsone's hearths possessed by himself. and the other by James Faldside (?) his tenent
(106) Homer Maxwell—"5 chymnies & a kiln"
(118) "Two kilns in Kirktoun one yr possest by Alex Glover."
(124) Riddingwood—3 & and kilne. His list signed by T., or W., Charters.
(127) John Glover—lyfe rentor.
(128) Barbaray Thomsone, two possessed by herself, and the other in Kirktoun possest by John Ge(ron)?—attested by B. T. lyferentrix.
(130) John Martine possesses his two as wodsetter.
(131) Thomas Irving, apparently described as a merchant in Dumfries, with 2 hearths in Nether houses in Auchincaine, possessed by Jon Cavanes elder and younger.
(132) Jean Graham's hearths attested by James Grahame life renter.

Apart from Jean Grahame & John Wallace, all the petty heritors appear to have signed their own lists.

Same source: Hearths belonging to Mr Hugh Maxwell of Dalsuintoune, 22nd Janrie, 1692.

(25) John Smith officer. The list signed by Hugh Maxwell, John Cowan, James Cowan, James Cowan, James Cowan, James Ferguson, John Glendining, and John Smith's mark.

RUTHWELL
V of Stormonth
(1) Thomas Wilsone, Cookpooll 2
(2) William Davidsone 1
(3) Herbert Davidsone 1
(4) George Davidsone 1
(5) John Wilsone tuo (sic) 1
(6) Thomas Nickolsone 1
(7) James Morpett ... 1
(8) Jean Nielson, Windihall 1
(9) John Gillespie ... 1
(10) Thomas Wilsone ... 1
(11) James Ker, Bourhouse 1
(12) Duncan Foird 1
(13) Thomas Morpitt ... 1

(14) Walter Patersone 1
(15) John Couplands ... 1
(16) Wm. Swan, Rochelscarf 1
(17) William Mitchell ... 1
(18) Helen Scott 1
(19) Hen Murray 1
(20) William Irvine, Ryehills 1
(21) John Irvine 1
(22) John Black, Sleathill 2
(23) James Black 1
(24) Rot Dicksone 2
(25) James Kinheath, Boghall 1
(26) George Hill 1
(27) Thomas Ritchartsone 1
(28) James Murray, Doppe & kilne ... 2
(29) Christan Suaden ... 2
(30) Janet Suaden 1
(31) Sara Carlile, Lamebrigs 1
(32) Walter Irvine ... 1
(33) John Roull 1
(34) Tho Underwood, Larthill 1
(35) David Paterson ... 1
(36) John Nickolsone 1
(37) David Murray, Belriddine 2
(38) John Weims, Tappe 1
(39) John Corbitt 1
(40) Alexr Black 1
(41) David Ritchartsone, Brou 2
(42) Janet Johnstone ... 1
(43) Jo Ritchartsone, Litleqt 2
(44) Isabel Ritchartsone 1
(45) Isabel Clerk 1
(46) David Ritchartsone 1
(47) Agnus Drysdaill 1
(48) Thomas Broune ... 1
(49) Tho Dicksone, Sleafield 1
(50) William Suaden ... 1
(51) Jo Morpitt, Neubieland 1
(52) Janet Andersone ... 1
(53) Jo Buinien, Bristsyde 1
(54) Alexander Dods ... 1
(55) Ritchart Underwood 1
(56) William Grier 2
(57) James Gass 1
(58) John Patersone ... 1
(59) David Broune, Eckitt 1
(60) Rot Neilsone 1
(61) James Wightman 2
(62) James Sterment 1
(63) George Coupland 1
(64) Tho Underwood, Kirksteill 1
(65) Janet Andersone 1
(66) George Gass 1
(67) George Carruthers 1
(68) Tho Underwood yor 1
(69) Mungo Boyd, Beyberres 1
(70) Janet Muncie 1
(71) George Gibson ... 1
(72) James Muncie, 3 kilns, 2 milns & 3 in house 8
(73) James Fergusone, Rivall 2
(74) David Fergusone 1
(75) Thomas Morpitt ... 1
(76) John Fergusone ... 1
(77) William Fergusone 1
(78) Nickolas Glencorse 1
(79) George Sinclar ... 1
(80) Margaret Irvine ... 1
(81) Alexr. Pattan 1
(82) James Dicksone ... 2
(83) John Dicksone ... 2
(84) John Boid 2
(85) James Dicksone ... 1
(86) George Irvine 1
(87) Jean Neuall 1
(88) John Murray 3
(89) Janet Murray 1
(90) John Boid 2
(91) Gilbert Couper in Cumlungan 7

Holmans

(92) Jo Fergusone, Ruthualtour & kilne 2
(93) Isabel Underwood 1
(94) William Ritchartsone yr 1
(95) Margaret Morpitt yr 1
(96) George Carruthers, Kirksteill 1

Ramerskeels

(97) Jo Coupland, Heugh 1
(98) William Edgar yr 1
(99) Jean Ritchartsone yr 1
(100) John Logon, tailyour yr 1
Qch are included in his list of Mouswald paroch

E of Nithsdall

(101) George Hill, Marland 1
(102) Rot Edgar 1
(103) Isabel Corsbie, Stank 3
(104) John Byres, Locherwood 1
(105) Jo Dicksone 1
(106) William Jaffrey 1
(107) Thomas Dicksone 1
(108) Margaret Edgar yr 2
(109) Rot Bell 1
(110) John Dicksone ... 1
(111) John Dicksone ... 1
(112) John Dicksone ... 1
(113) John Dicksone ... 1
(114) John Dicksone ... 1
(115) William Dicksone 1
(116) Rot Gass yr 1
(117) Thomas Dicksone 1
(118) Janet Dicksone ... 1
(119) William Dicksone 1
(120) Janet Dicksone yr 1

Total 154

THE LIME INDUSTRY IN SOUTH-WEST SCOTLAND

by

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Quarrying of limestone for agricultural and building purposes in Galloway was essentially an eighteenth century development. Although lime had long been used for mortar throughout Scotland " it was primarily the use of lime in

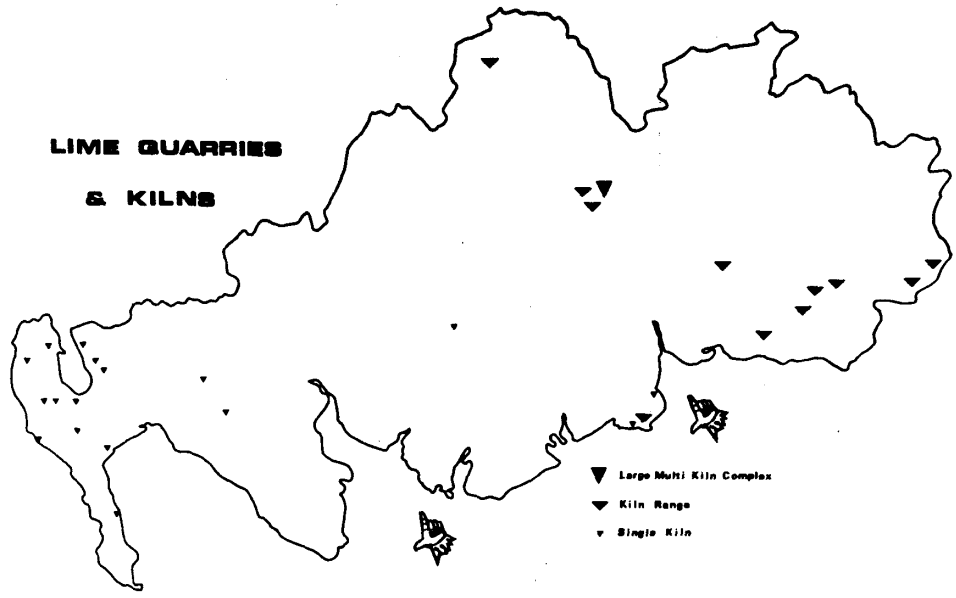

Fig. 1—Lime Quarries and Kilns in South-West Scotland. Arrows indicate lime imports from acress the Solway Firth.

agriculture which led to the multiplication of kilns in the countryside."[1] South-West Scotland affords some particularly interesting examples of lime quarries and associated kilns which developed to supply the demand of local farmers and masons. Geological conditions were such that limestone was confined to a few districts in Upper and Mid Nithsdale, Lower Annandale and the Canonbie district. In Galloway itself, a number of small quarries were worked where limestone existed in small, isolated pockets in the Stewartry parish of Kirkbean and in the Rhins of Galloway. Fig. 1 indicates the location of the main lime

1 J. Butt, **Industrial archaeology of Scotland** (Newton Abbot, 1967), 99; B. C. Skinner, **The Lime Industry of the Lothians** (Edinburgh, 1969), provides an excellent survey of lime quarrying and burning in the Lothian counties, indicating the importance of this rural industry to the agricultural economy.

works. Lime was also a major import into Galloway from Cumberland, a trade dating from the late seventeenth century which became increasingly important during the period 1750-1850. An overland trade in lime from Douglas in Lanarkshire and from the coal mining districts of Ayrshire supplied farmers in Upper Nithsdale and Annandale.

The earliest reference to the use of lime for mortar and fertiliser in Galloway occurs in Symson's *Description* of 1684. By the Baldoon shore of Wigtown Bay he observed that " the sea casts in innumerable quantities of shells, which the whole shire makes use of for lime and it is the only lime which this countrey affoords."[2] The shells were burnt with peats in primitive kilns (not unlike early corn kilns) and the process took as much as 24 hours, depending on the amount of lime required. Shell lime from Wigtown Bay was in use as late as the 1790's in parishes near the shore.[3]

The first use of limestone deposits was in the coal-bearing districts of Sanquhar and Canonbie. In the mid-eighteenth century, lime was burnt with local coal at Auchengruith, west of Sanquhar, and at Corsancone in the same neighbourhood, kilns were supplied with coal worked from an ingaun-e'e (a level driven along the coal seam) in the Lagrae Burn, two miles west of Kirkconnel.[4] On the Duke of Buccleuch's Canonbie estates, a " lyme quarry " was operating at Hollhouse in the valley of the Esk *c* 1768 and clearly the shortage of coal for these kilns was one of the reasons for sinking the new pit, described in the *Canonbie Coal Journal* 1768-70.[5]

Sir James Kirkpatrick, an early improver, began the Closeburn limeworks *c* 1774 and this was the first of several in the district to use limestone deposits in Mid Nithsdale.[6] These works are not only well documented, but also preserve the finest bank of kilns in southern Scotland. Sir James himself went bankrupt in 1780 and the following year his trustees entered into agreement with John Kellock, Jr., of Thornhill " for the management of the limeworks in the lands of Kellock and Croal Chappel on the estate of Closeburn." By a contract dated 17th January, 1781, Kellock " bound himself to use his utmost endeavours to bring forward the Works so as to have Lime ready for the Spring and thereby as much as possible prevent the loss which may arise from the Quarry having lately laid unwrought." He undertook to employ the necessary workmen and " to have a sufficient quantity of well burned Lime to answer the demands of the country " as well as to increase sales and " keep regular books." He was also responsible for work at the quarry and for keeping the limestone face there " clear and open."[7]

Kellock apparently did not keep to the letter of his contract, for by 1783 a new manager, Alexander Williamson of Dalton, was in charge of the limeworks

2 A. Symson. **A large description of Galloway, 1684** (reprinted Kirkcudbright, 1841), 62-3.
3 Old Statistical Account, **1**, 251; **4**, 139; **14**, 475.
4 J. Brown, **The History of Sanquhar** (Dumfries, 1891), 340.
5 Scottish Record Office, **Buccleuch Mun.** GD 224/240, Journal of the Canonbie Coal, 1768-70, 54, 60-1, 64.
6 OSA, **13**, 240.
7 SRO, **Closeburn Writs** GD 19/405, Contract between Alex. Farquharson, Trustee for Sir James Kirkpatrick and John Kellock, Jr., 1781.

at an annual salary of £45 with commission on each measure of lime sold. Drainage was becoming a problem and a level had been constructed "to draw off water from the works."[8] A valuation of tools at Closeburn in 1783 gives some idea of the equipment of a limeworks:

Iron tools including:			
18 Kiln bars and Pokers			
19 Napping hammers			
6 Scrapers			
26 spades and shovels	£12	14s	7½d
Wooden tools including:			
24 earth Barrows			
17 buckets	£42	16s	5½d
Coal, 3014½ loads	£87	18s	2d
Total valuation	£133	9s	3d

A "horse engine" or gin was valued in addition at £13 10s. This was used for drainage and haulage, though later replaced by a water wheel. The same year James Stuart Menteith became proprietor of the Closeburn estates and the limeworks entered a period of renewed expansion.[9]

During 1778-91 the population of Closeburn parish rose from 1000 to 1490, an increase almost entirely due to the development of the lime industry, and the transformation of the landscape by the new agriculture was so noticeable that the acclaim given the proprietor and his limeworks by a contemporary is not at all surprising.[10] A second works was opened with its own quarry and kiln bank c 1787 and by 1794, output from the two works ranged from 60,000 to 70,000 measures per annum worth £2250-£2625. Production costs were high because coal was brought from Sanquhar, fourteen miles distant.[11]

The interest of the owners in their limeworks is clearly illustrated by the energy of Charles Menteith, who experimented with various types of kilns and invented fuel-saving methods. His description of the quarry and kilns at Closeburn in 1810 is most valuable.[12] The limestone seam was 18 feet thick and it was quarried by mining, "strong pillars to support the roof being left at 10 or 12 yards' distance, the roof and floor worked into regular form, the latter accessible to horses and carts, and the kilns close at hand."[13] "The form of the lime-kilns," wrote Menteith, "is oblong (and) having tried kilns of a variety of forms, the contractor and workmen are of the opinion that a kiln of this form produces a greater quantity of well-burnt lime in a given time, than the circular kilns of larger dimensions in common use; and that a less quantity of coal is necessary for burning a given quantity of lime-stone."[14] The kilns were fitted with cast-iron grates (within arched entrances) and cast-

8 ibid, GD 19/406, Agreement between Alex. Williamson and Kirkpatrick's Trustee, 1783.
9 ibid, GD 19/407, Valuation of Tools at Closeburn, March, 1783.
10 New Statistical Account IV., Dumfries, 79.
11 OSA, 13, 233, 240-1.
12 W. Singer, **General View of the Agriculture of the county of Dumfries** (Edinburgh, 1812), 540-8.
13 ibid, 40.
14 ibid, 541.

iron tops or chimnies, the latter keeping heat in the kilns and aiding gravity loading. Output c 1812 was estimated at 100,000 Carlisle bushels (150,000 measures) and Menteith's profit was £2000 per annum.[15]

Several notable developments had taken place by 1834, when the kilns were described as being "of the most improved construction for burning lime with the smallest quantity of fuel." Limestone was blasted and raised from the quarry to the kiln head by "an iron railway" on an inclined plane 200 yards long, "up which loaded waggons ascend with the utmost facility, by means of a water wheel put in motion by a stream brought six miles for the purpose." The water also turned a lower wheel which powered bellows to provide a blast in the kilns and drove drainage pumps as well as a saw mill. Annual output of lime was worth £35,000.[16] Much of the works, which continued in operation until the late nineteenth century, survives as it was in the 1830s, including the fine bank of three kilns and the track of its associated inclined railway.

On the opposite bank of the Nith another lime works was begun in 1788 at Barjarg on the estate of the Hunters of Barjarg, an old-established landed family. Documentary fragments from the family muniments provide some detail of operations at this works during 1793-1811. According to the accounts, 1793 was a bad year, in which the loss on operations was £284:

		To Lime Sold ...	£694
To Sir James Kirkpatrick for Iron and Wooden Quarry Tools, Smith Tools, Etc.	£338		
To Coals	£334		
To Working Expences ...	£406		
	£978		

Clearly the loss was the result of the purchase of essential capital equipment from the Closeburn lime works nearby.[17] The following year, the works employed 30 to 40 labourers for seven or eight months each year, producing 20,000 to 30,000 measures of lime worth 9d per measure (two Winchester bushels) while accounts for 1794 indicate outstanding debts (mostly by local farmers) amounting to £129.[18] By 1802, the Barjarg quarry and kilns were let to David, John and William Kirkpatrick at a lordship of 2d on each measure sold. The output during the period 1803-9 was as follows:

15 ibid, 41.
16 NSA IV Dumfries, 86-7.
17 SRO, **Hunter of Barjarg Mun.** GD 78/233, Accounts re the Rev. Dr Hunter's lime quarry at Barjarg, 1793-1811, Account for 1793.
18 ibid, Arrears on 10th March, 1794; OSA, **12**, 80.

	Measures	*Lordship*
1803	35,793	£298 5 6d
1804	34,744	£289 10 8d
1805	39,076	£325 12 8d
1806	21,373	£222 12 8d
1807	25,013	£260 11 0d
1808	28,112	£292 16 8d
1809	17,057	£177 13 6d

An "Abstract of Lime Burnt & Sold at Barjarg" details the destination of output during 1805. A great deal of lime was delivered to surrounding districts, but a large quantity found its way to more distant parishes in the Stewartry, notably Balmaclellan and Kirkpatrick-Durham. Rentals of 1810-11 indicate that the contractors leased Barjarg village for £9 per annum, paid £2 1s depreciation on quarry tools worth £40 and £4 1s interest on "the expense of the Syphon"—a piece of drainage equipment at the quarry. Barjarg and a second works at Porterstown nearby were still operating in 1835 and lime produced there was still much in demand both for the land and for building purposes.[19]

Throughout lower Annandale, a number of lime works began production during the era of agrarian improvement in the latter half of the eighteenth century. South of Lockerbie, a quarry produced "a coarse, dark-coloured lime for the land" while the Kelhead quarry in Cummertrees burnt limestone "of exceeding fine quality," although burdened by the high price of coal imported from England.[20] Alexander Dirom of Mount Annan had a large limeworks at Quarry Park near Kirtlebridge, which supplied his own estate and surrounding parishes. As at Closeburn, experiments with various types of kilns were tried and the nearby quarries on Brownmoor were drained by water-powered machinery. Several works were active in the 1830s, supplying lime to inland districts of Dumfriesshire that could not derive the same advantage from imported English lime as the farmers on the Solway coast. Yet many of the works in Annandale had to rely on English coal for lime burning. Caldronlee, Kirkpatrick-Fleming, where there was a 30-foot seam of limestone and four "good draw kilns," either obtained its coal from Canonbie (nine miles away) or by sea from Cumberland, which involved eight miles' cartage from Annan.[21]

Limestone existed in isolated pockets in the Stewartry and wherever discovered was eagerly quarried by "improvers." Only in the Kirkbean district were deposits large enough to merit more than local exploitation and three small limeworks were established within a few miles of each other. The earliest, Torrorie, was built by William Craik of Arbigland, the famous improver, and is marked on John Ainslie's map of 1797. Another "limekill," about a mile west of Arbigland, was working at the same time, deriving its raw material

19 NSA IV., Dumfries, 464.
20 OSA, 9, 427; ibid, 7, 306.
21 Singer, 594-5; NSA IV Dumfries, 284.

from a nearby "marle pit." The third kiln, located near Southerness, was built on the raised beach c 1830. Trials were made for coal and thin seams found, but the kilns were supplied from Cumberland. All three works were relatively short-lived, although Torrorrie was still operating in 1855. The sites are not without interest to the geologist as well as the industrial archaeologist.[22]

Localised limestone deposits in Wigtownshire, and particularly in Rhins and Lochryan districts, led to the building of several small kilns serving one or more farms. The distribution of these unusual single kilns is indicated on Fig 1. Little is known of the origin of these kilns, though they probably date from the late eighteenth century, three being marked on Ainslie's map of 1782. Thirteen kilns survived long enough to be noted by the surveyors compiling the first O.S. map. The kilns were very primitive, roughly built of stones from the field (not unlike the older corn kilns) and fired with peats in the same way as shell burning was pursued in Symson's time. A more orthodox kiln was built at Portpatrick to supply the harbour works, begun in 1821. Although infilled and partly obscured by a public convenience, it is an interesting construction with an unusual arched entrance.

During the last decades of the eighteenth and the first half of the nineteenth centuries the limeworks of South-West Scotland were a valuable asset to the agrarian economy of the region. But changes in farming methods, with consequent reduction in demand for lime, the rise of railways and technical problems (such as increasingly heavy overburden and flooding) brought about a decline in output. By 1881 only 30 workmen were employed in the limestone quarries of Dumfriesshire, and ten years later their number had fallen to four.[23] Part-time labour certainly continued as season and demand warranted, but, in 1895 after over a century's activity, the Closeburn works finally closed and Barjarg followed soon after. Workings at Kelhead, Kirtlebridge, Blackwoodridge and Caldronlea were also abandoned. All that remains of this once important industry is perhaps best seen at Closeburn, where the flooded quarry and overgrown, but perfectly preserved kilns, present a unique reminder of a past rural industry.[24]

22 NSA IV Kirkcudbright, 236.
23 PP 1893-4 LXXII, **Report of the Condition of Labour in Open Quarries** (1893); **List of Quarries** (1904); **List of Mines Worked in the Year 1888** (and later reports).
24 For a description of some surviving lime quarries and kilns see my **Industrial Archaeology of Galloway** (Newton Abbot, 1971), 90, 231-3.

APPENDIX

Abstract of Lime Burnt & Sold at Barjarg Limeworks for the Year Ending December, 1805

The following is a list of Dumfries and Kirkcudbright parishes supplied from Barjarg Limeworks during 1805. Lime was generally carted overland.

Parish	Measures
Keir	5885
Tynron	4761
Holywood	1575
Penpont	6801
Dunscore	6655
Glencairn	4828
Durisdeer	3287
Closeburn	1107
Kirkmahoe	456
Irongray	595
Morton	363
Terregles	299
Dalry	156
Kirkpatrick-Durham	324
Balmaclellan	1035
Lochrutton	80
Sanquhar	84

(From SRO GD 78/233 **Hunter of Barjarg Muniments,** Accounts relating to the Rev. Dr Hunter's Lime Quarry at Barjarg)

The Old Place of Sorbie, Gatehouse-of-Fleet and Ferrytown of Cree, Innes Macleod, M.A.: 12½p each.

Mr Macleod, the talented and energetic Extra-Mural Organiser for Galloway, is a first-rate researcher and these attractively written little booklets incorporating the latest research, are a model of what local history should be.

Our area badly lacks modern works of this kind. Let us hope that these are the first of a series.

The March Laws, George Neilson; in Miscellany One, The Stair Society, 1971

1971 is a late date for the first publication of an important paper written in 1902 by that great Ruthwell-born historian, George Neilson, who died in 1923: but better late than never. "The March Laws" covers the history of the Leges Marchiarum controlling Border affairs, over several centuries, from the first reference in 1216 until their extinction by the Union of the Crowns in 1603.

It is a harsh picture—even abbots and priors in the diocese of Carlisle having to duel personally if summoned for offences. If a defendant in a case regarding life and limb dies within the term of 15 days for his appearance, his body shall be brought to the March at the day and place appointed between the parties: "because no man can essoin himself by death"—as Neilson remarks, a grim and archaic provision, probably without parallel in Europe—indeed there is much about the whole code that smacks of earlier days.

The whole paper, of 56 pages, is a fascinating reservoir of information about conditions on the Borders: and, preceding it, there is a most appreciative memoir of Neilson by Professor Stone, Professor of Mediaeval History at Glasgow University. The difficult task of editing a rough typescript has been ably undertaken by Dr Rae, Assistant Keeper of Manuscripts at the National Library of Scotland.

It should be noticed that the next paper in this fine miscellany, "De Composicione Cartarum", an important study of an early Scottish legal treatise, is edited by Mr James Robertson of the Faculty of Law, University of Dundee—none other than the son of our past President of the same name, and equally active in the fields of archaeology and history.

Industrial Archaeology of Galloway; Ian Donnachie; David and Charles; £3.50.

Industrial archaeology is a subject attracting rapidly increasing attention nowadays. Our Society has had several speakers in the last few years: and here, nicely produced, with clear text and good photographs, is a first-rate survey of the area from the Irish sea to the Nith. The chapter headings give the picture—The Regional Economy of Galloway 1700-1900: Agricultural Processing and Rural Crafts: Textiles (including paper manufacture): Mining and Quarrying: Transport and Trade: Section 2 of the book is an Inventory of sites under headings such as "Mills and Farm Processing", "Breweries and Distillery", "Tanneries", etc., with a good description of sites. Some of the larger sections, such as mills, perhaps require rather a search for the type of mill one is after: and perhaps Cluden Mill is too far out of Galloway to be included!

All in all, however, a real tour de force on the part of a young researcher who is now one of the leading spirits in the industrial archaeology field, and one which puts our area in the forefront of the comparatively few districts so far honoured with such a survey.

Britain and Ireland in Early Christian Times—A.D. 400-800, Charles Thomas; Thames and Hudson, London, 1971; 144 pages; 90p.

The Early Christian Archaeology of North Britain, Charles Thomas; published for the University of Glasgow by Oxford University Press; 253 pages; 1971; £3.00.

These are two different books addressed to different audiences—the first an attractively produced paperback presenting the subject to the general public in a lively manner, and very fully illustrated with well-chosen photographs and drawings: the second, a hard-back, based on Professor Thomas' Hunter Marshall Lectures delivered at Glasgow in January and February, 1968. While eminently readable, and as lively and interesting as the other, it is primarily aimed at the scholar and archaeologist and goes much more deeply into the wide range of information yielded by the formidable techniques of modern research. Like the other, it is lavishly illustrated, though with plans and drawings more predominant.

Both works deal with those fascinating centuries of change just before and after the end of formal Roman power in Britain : every kind of evidence is used—linguistic, cultural, legend, archaeological, early documents, artistic development—to create a rich and convincing picture. Professor Thomas, of course, has worked in our area, at Trusty's Hill and Ardwall, and it is gratifying to see how very largely Dumfries and Galloway—particularly Galloway—figure in both books.

To those for whom this period has a particular fascination, both books can be strongly recommended.

"Who Are The Scots?", B.B.C.; Ed. Gordon Menzies; 144 pages; £2.00.

So far as wireless and television go, Scotland has had remarkably little in the way of historical and archaeological programmes. A start has been made recently with the television programme "Who Are The Scots?" taking Scottish history from the Mesolithic of 6,000 years ago up to the death of Alexander: a programme which, though it seems to the archaeologist to make surprisingly little use of the richness of the material available (far more use could have been made of sites and objects) and, though the statements made at times, showed insufficient understanding of the subject, yet seems to have been a real success and to have interested a great number of the lay public to whom it was directed.

The book is complimentary to the programme, though covering the sections more fully than was possible in the time available on television. Most, though not all, of the writers figured in the programme. The chapter headings and authors give a clear hint of the contents: "The First Peoples", by Professor Piggott: "Metalworkers" by Graham Ritchie and Anna Ritchie: "The Roman Frontier" by Anne S. Robertson: "The Problem of the Picts", by Isabel Henderson: "The Scots of Dalriada" by John Bannerman: "Briton and Angles" by D. P. Kirby: "The Early Christian Church" by Charles Thomas: "The Norsemen" by David M. Wilson: "Anglo-French Influences" by G. W. S. Barrow, and the "Making of Scotland" by A. A. M. Duncan — a very high-powered team, and each with his (or her) individual approach. Necessarily, it is summary: the specialist will find many things lacking, and some dangerous generalisations: but, for the layman for whom it is intended, it is a very good summary, improved further by the excellent reading list at the end.

"Joseph Thomson and the Exploration of Africa", Robert I. Rotberg; 1971; Chatto and Winders; £3.15.

Biographies of Dumfries and Galloway people are not so common nowadays, and Professor Rotberg, a specialist on African history, has produced a most readable work on that much neglected character Joseph Thomson of Penpont and Thornhill. Thomson's background, childhood and youth is very fully dealt with, and this cocky, ebullient little man emerges as a very attractive personality, just too late for major exploration, never quite finishing anything he started and cut down prematurely by illness contracted in his

journeys. Professor Rotberg, with American thoroughness, has succeeded in building up a very full picture despite extreme difficulty in finding material relating to his subject—he told the writer that he was appalled to find so little surviving: but his wide background knowledge of 19th century Africa has enabled him to seek out the information by indirect routes where the direct ones failed.

"Field Archaeology in Britain," John Coles. Methuen. Paperback, £1.75; Hardback £3.50

John Coles is well known to members of this Society and has done much work in our area since he first came to it at the beginning of the sixties. It is especially gratifying therefore to read this work, designed for the interested amateur, and to find his great technical skill, his clarity of expression and attractive approach to the reader, more apparent than ever.

The writer of this review has read many books on field archaeology over the past quarter century, some good, some indifferent; but none has impressed him as has this one. A few chapter headings and sub-sections give an idea of the organisation: Archaeology as a Technique, The Amateur and the Professional, Discovery of the Evidence, Fieldwork, Grid and System Walking, Aerial Photography, Shadow Sites, Map-making, Detection Devices, Collecting and Collections, Recording of Sites, a long section on Surveying, Excavation, Permission, Finance, Recruitment of Staff, Public Relations, The Approach to Excavation, The Aim of Excavations, Rescue Digs, Research Excavation, Experimental Excavation, Treasure Hunts, Problems in the approach to Excavations, Labour Relations, Tools and Techniques, Safety, the important subjects of Recording, Conservation, and the making-up of samples, Conscience and Confession, Understanding the evidence, the Organisation of Prehistoric Archaeology in Britain. There is an excellent bibliography and a clear index. The maps and photographic illustrations are well reproduced.

Altogether, this is a book the reviewer can recommend with particular pleasure.

Note:— All the foregoing reviews are by A. E. Truckell.

PROCEEDINGS 1970-71

9th October, 1970.—The Annual General Meeting of the Society was held in the Ewart Library at 7.45 p.m., the President, Mr James Robertson, being in the chair. The Accounts of the Society were presented by Mr Robertson, who had acted as Hon. Treasurer for the latter part of the 1969-70 session; the Accounts were adopted. The list of Office-bearers recommended by the Council was confirmed. One junior and nineteen adult members were elected. Mr A. E. Truckell of the Dumfries Burgh Museum lectured on "Witchcraft and Magical Practices in the South-West of Scotland."

23rd October, 1970.—This meeting took the form of two films, "Where the Curlew Calls" and "Birds of Strathspey." Both were colour films and excellently produced. One junior and eleven adult members were elected.

6th November, 1970.—Dr Butt, of Strathclyde University, gave a lecture on "The Cotton Industry of the South-West." He illustrated his talk by a short series of colour slides showing local industrial archaeology sites. Three adult members were elected.

20th November, 1970.—Miss Mulroy gave a lecture on a visit "From Kabul to Katmandu, via Bokhara and Samarkand." Miss Mulroy illustrated her lecture by some very fine coloured slides. Two adult members were elected.

4th December, 1970.—Dr Maitland and Mr West from the Nature Conservancy in Edinburgh lectured on Fresh-water Conservation problems with particular reference to the Lochmaben Vendace. The lecture was illustrated by an excellent series of slides. One junior and two adult members were elected.

8th January, 1971.—Mr Innes MacLeod, extra-mural organiser for Galloway, gave a lecture on "Canna and Eigg: a survey of two West Highland Islands." His lecture was illustrated by a particularly fine series of coloured slides. One adult member was elected.

22nd January, 1971.—Due to the unfortunate absence of Mr Robin Birley, the scheduled speaker, Mr James Robertson kindly agreed to lecture, at very short notice, on "The Early History of the Dumfriesshire Roads." One adult member was elected.

5th February, 1971.—Mr David Breeze of the Department of the Environment, gave a lecture on "The Building of Hadrians Wall." His lecture was illustrated by an excellent series of slides and plans. Two adult members were elected.

19th February, 1971.—Mr Lionel J. Masters, a member of the Society's Council and extra-mural organiser for Dumfriesshire, gave a lecture on his "Excavation of a Long Chambered Cairn at Lochhill." The lecture was illustrated by a fine series of colour slides and plans. One adult member was elected.

5th March, 1971.—Mr George Jobey, of Newcastle University, gave a lecture on his excavation at Burnswark Hill Fort. Mr Jobey illustrated his lecture by a series of slides taken during the excavations. One adult member was elected.

Publications of the Society

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Records of the Western Marches, Vol. III, The Upper Nithsdale Coalworks from Pictish Times to 1925, by J. C. I. M'Connell, 1962. 75p.

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