

# The Economy of the Irish Rath

By V. B. PROUDFOOT

*Lecturer in Geography, Durham Colleges in the University of Durham*

RATHS are small, usually circular, earthworks which excavation has shown were farmsteads belonging, in general terms, to the first millennium A.D. but remaining in use until the coming of the Anglo-Normans to Ireland in the twelfth century.<sup>1</sup> Such earthworks are widely distributed throughout Ireland, and are commonly known as forts although the anglicized terms rath and lis from the Irish *rath* and *lios* are also widely used and are frequently incorporated in place-names. The exact meaning of these Irish words is uncertain and rath is used here as an archaeological term without any linguistic implications.<sup>2</sup> It is preferred to the terms fort or ring-fort because these are generally misnomers, for the bank and ditch surrounding the central enclosed area must often have functioned as little more than a fence to prevent stock from straying and a protection against wild animals. Ring-work might be applicable as a term provided it is remembered that the sites are not always strictly circular. The term cashel is used to describe the stone-built enclosures which are the counterpart of the earthen rath. The distinction between rath and cashel is somewhat arbitrary, for enclosing banks may be built of both earth and stone, although cashels seldom have ditches, so that their walls must normally have been built of stone collected from the glacial drift or quarried from neighbouring rock outcrops. Generally raths and cashels occur singly, although conjoined sites are known and, very rarely, small clusters of raths are also found. Nevertheless the rath and cashel should be regarded as Irish examples of dispersed farmsteads—*Einzelhöfe*.

The enclosed area which is the essential part of the rath or cashel is generally circular although occasional oval or rectilinear examples are also found. There is considerable variation in the size of the enclosed area, but in county Down, for example, a diameter of about 100 ft. is usual. Rathes surrounded by more than a single ditch and bank are relatively uncommon. Although such sites seem more impressive than the rath with single ditch, they are often overlooked from adjacent high ground so that they may well have been built for reasons of social, rather than military, prestige. Traditionally many of these more imposing sites have been regarded as residences of minor chieftains, but some seem to have differed little in economy from the small rath farmstead and the central enclosed area is often no larger than that of the rath with a single ditch enclosing it. Moreover, the seemingly random distribution, in some areas at least, of these raths with more

<sup>1</sup> Throughout this paper the term medieval is used in a restricted sense for the period following the Anglo-Norman invasions in the twelfth century.

<sup>2</sup> For the linguistic problem *v. Archaeol. News Letter*, iv, no. 5 (Jan. 1952), 73, and for place-names *v. S. MacAirt*, 'County Armagh: toponymy and history,' *Proc. Irish Catholic Historical Committee* (1955), pp. 1-5.

than one ditch, in relation to obvious small natural units, or supposed tribal territories, does little to support the traditional view as to their function. Examples of both raths and cashels with single and multiple ditches or banks are known to have been used as monastic or similar ecclesiastical sites. The only large monastic site so far excavated, that at Nendrum in county Down,<sup>3</sup> a triple-walled cashel of considerable size, seems to have had an economy similar to that of the more usual secular rath sites, provided that the finds all belong to the monastic, and not to any earlier secular, occupation.

Apart from separating such imposing structures as the triple-ringed raths from simpler raths and cashels it is scarcely possible to classify the latter without excavation. Recent excavations have indicated that sites superficially similar have had quite different structural histories, and careful study of air-photographs has suggested that modern tillage has altered the appearance of many sites, by levelling banks and filling ditches. The difficulties inherent in using present appearance as a basis for classification are well illustrated by considering four raths each of which had eventually assumed a mound-like, almost a motte-like, character, surrounded in two of the examples by a shallow ditch. Each could have been classified in Ó'Ríordáin's terminology as a 'Platform-type ring-fort'<sup>4</sup> but there were significant differences in their development (FIG. 27). At Sallagh Fort (Antrim) and Ballingarry Down (Limerick) the platform had been built up over a fairly lengthy period by a succession of occupation-layers separated by sterile layers of clay. The uppermost occupation at Sallagh Braes was apparently earlier than Anglo-Norman for no medieval sherds were found, whereas the final occupation at Ballingarry Down had occurred in medieval times. Superficially both sites bore a close resemblance to the rath at Ballyfounder (Down), but the mound-like appearance in this case was created when the intensive early (dark-age) occupation was covered by several feet of boulder clay on top of which some medieval occupation took place followed by further deposition of clay. At Lismahon (Down) a mound already of considerable height as a result of dark-age occupation was heightened after the English conquest of Down in 1177.<sup>5</sup>

Excavation has also shown striking differences in plan, and sometimes also in function between the earliest and latest phases of occupation on rath sites. Rath 2 at Lisnagade (Down) changed from being surrounded by a small irregular-shaped enclosing bank and ditch to being encircled by a regular deeply-cut ditch. The function of the site changed, but not necessarily at the same time as the plan of the enclosure changed, when a building interpreted as a barn replaced an older house (FIG. 29). A similar change in the plan of the enclosed area has recently been found on the rath site at Langford Lodge (Antrim) excavated by D. M. Waterman. Other examples of changes in plan are provided by Uisneach and Togherstown (Westmeath), excavated by Macalister and Praeger in the 1920s. Both sites seem initially, perhaps, to have consisted

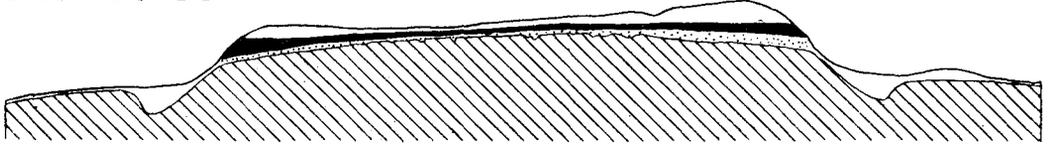
<sup>3</sup> Unless specific points are in dispute references to excavated sites are not made in the footnotes. A bibliography of such sites is given in Appendix I.

<sup>4</sup> S. P. Ó'Ríordáin (1953), pp. 20-21.

<sup>5</sup> D. M. Waterman, 'Excavations at Lismahon, Co. Down,' *Med. Archaeol.*, III (1959), 139-176.

of simple circular enclosures each bounded by a ditch and bank or banks. Later than these were complex structures, clearly belonging to several different periods of building. Whereas the earliest features might have warranted the inclusion of these sites in a discussion on raths and their economy, the later features are so different that the sites have been grouped separately, their nearest analogies

## BALLYFOUNDER



## LISMAHON



## SALLAGH FORT

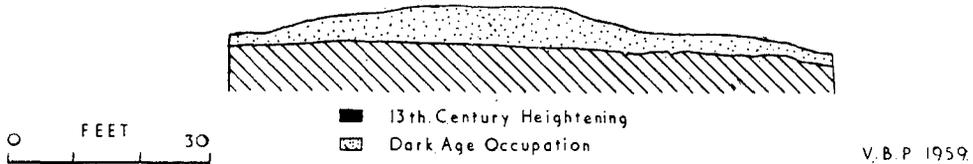


FIG. 27

SECTIONS THROUGH THREE EXCAVATED SITES OF 'PLATFORM TYPE' (p. 95)

being, perhaps, with the forts of the western seaboard and large complex cashels such as Cahercommaun.<sup>6</sup>

Distinction should also be drawn between raths, whether or not they possess more than one ditch, and the much larger hill-forts, some of which must have functioned as tribal centres.<sup>7</sup> At least some promontory forts and the large stone forts of the western seaboard should also be separated from the raths

<sup>6</sup> Further afield the analogies of some of these complex sites are surely to be found in the multiple-enclosure forts of south-western Britain, A. Fox, 'South-western hill-forts,' in *Problems of the Iron Age in Southern Britain* (London Univ. Inst. Archaeol., Occ. Paper no. 11, ed. S. S. Frere), pp. 35-60.

<sup>7</sup> E.g. Downpatrick: V. B. Proudfoot, 'Excavations at Cathedral Hill, Downpatrick,' *Ulster J. Archaeol.*, xvii (1954), 97-102 and xix (1956), 57-72.

and cashels. These might be grouped with the hill-forts, although little is known of their real functions.

No detailed survey of the archaeological evidence concerning the Irish rath has been published since 1901, when Westropp's classic paper on *The Ancient Forts of Ireland* was published.<sup>8</sup> Since then several general accounts of raths and other, contemporary, earthworks based on both surface study and excavation have appeared, notably accounts by the late S.P. Ó'Ríordáin and by the de Paors.<sup>9</sup> An examination by Duignan of the archaeological and literary evidence for early Irish agriculture published in 1944 has formed an invaluable starting point for further investigations.<sup>10</sup> The present paper considers the evidence relating to rath sites excavated between 1925 and 1955.<sup>11</sup> There are very few earlier excavations than these although one of the first systematic accounts of a rath was prepared as early as 1867 by Pitt-Rivers.<sup>12</sup> In the whole of Ireland the distribution of recently-excavated sites is very uneven and therefore unsatisfactory as the accompanying map shows (FIG. 28). There are large areas in which no raths have ever been excavated and many other areas in which the standard of excavation has been so unsatisfactory that the excavation reports are of only slender value. Until quite recently even the recording of major finds left much to be desired so that it is not surprising that scant attention has been paid to such mundane finds as charcoals, animal bones, metal ores and slags upon which any assessment of the economy of raths must be based. Notable exceptions to the haphazard recording of such finds are the excavation reports of Oliver Davies, J. Raftery and M. J. O'Kelly.

### DATING

The only area for which a type series of datable excavation results exists is south Antrim where six sites have produced pottery of similar type, and a date for the pottery from one site—that at Lissue—is provided by a decorated stone slab assigned with considerable certainty by G. Bersu to the later tenth century A.D.<sup>13</sup> Unfortunately it is not possible to correlate even these finds with those obtained in south Down, where numerous sites of broadly similar date have been systematically examined for the Archaeological Survey of the Government of Northern Ireland. The dating of most sites depends on the dates assigned to small personal decorated objects found in stratified deposits on the site. It seems reasonably certain that the general features of the artistic development of the ornament on such personal objects as pins and brooches is now known, but one of the major problems is the long survival of plain types with simple decora-

<sup>8</sup> T. J. Westropp, *Trans. Roy. Irish Acad.*, xxxi, pt.14 (1902), 579-730.

<sup>9</sup> S. P. Ó'Ríordáin (1953); M. and L. de Paor (1958).

<sup>10</sup> M. V. Duignan (1944).

<sup>11</sup> This paper was read at a meeting of the Society of Antiquaries, London, in December 1959. Since then some minor modifications have been made to the text and illustrations, mainly to incorporate data published during 1960.

<sup>12</sup> Pitt-Rivers, A. Lane-Fox, 'Roovesmore . . .', *Archaeol. J.*, xxiv (1867), 123-139.

<sup>13</sup> G. Bersu, 'Lissue,' *Ulster J. Archaeol.*, x (1947), 50.

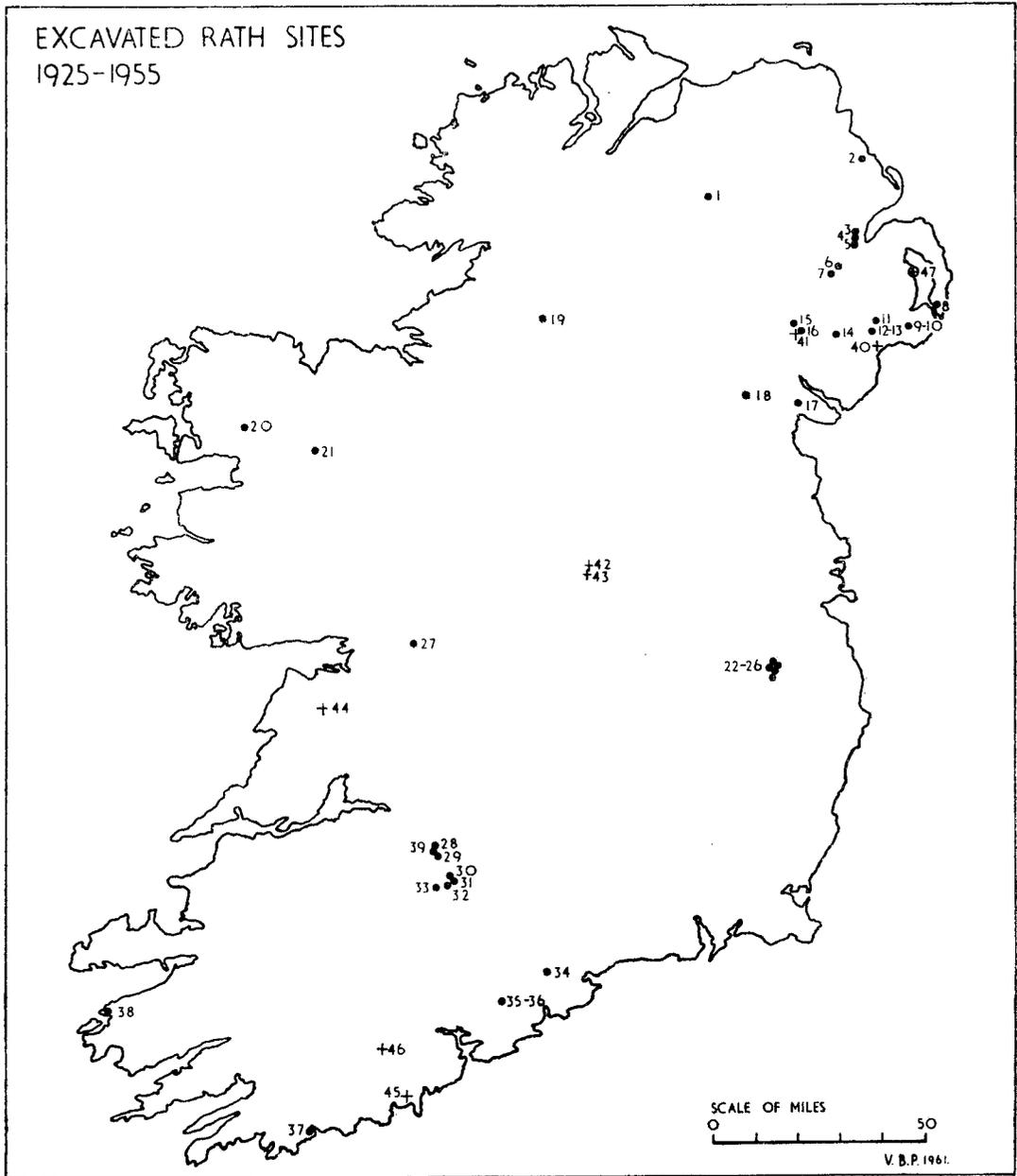


FIG. 28  
DISTRIBUTION OF EXCAVATED RATHS (p. 97)

tion. For this reason the range of date of the occupation can be assessed adequately on fewer than half of the excavated rath sites.<sup>14</sup>

On some sites in Antrim, Down and Armagh terminal datings have been fixed within close limits by medieval pottery occurring in late occupation-levels. Near Dublin none of the excavated sites to the south of the city in county Wicklow produced finds that could be dated. It is to be hoped however that the occurrence of a considerable amount of imported Roman pottery at Tara will enable a sequence of datable finds to be established for this region.<sup>15</sup> In the extreme south, in county Cork, a number of sites have been dated by the occurrence of imported pottery of post-Roman date to the fifth, sixth and seventh centuries—dates which agree with those suggested from early historical sources.<sup>16</sup> It must remain doubtful, however, if the same reliance as to date can be placed on single sherds of imported pottery such as have been found on several of the excavated rath sites in county Down.

At Carrigillihy, also in county Cork, pottery belonging to the earliest occupation of the site was thought to be neolithic or early-bronze-age. The sherds are, however, not sufficiently characteristic to be certain of this, so that the date of the primary stratum is uncertain.<sup>17</sup> Data from this stratum have therefore been omitted from the economic discussion later in this paper.

To the north of these sites in county Limerick are seven sites or groups of sites excavated by Ó'Ríordáin during the Lough Gur campaigns. Several can be dated to the eighth-tenth centuries A.D., but the site at Cush, about which much has been written, is of uncertain date.<sup>18</sup> Here a series of conjoined raths with an associated field system exists. In one of these raths were several bronze-age urn-burials. It has been claimed that these burials are later than the occupation of the raths, but there seems to be no stratigraphic reason recorded to substantiate the claim. All the published evidence can more easily be interpreted by suggesting that the rath was built in an area in which earlier burials had taken place. There is then no reason to discard the evidence of the 67 rotary querns or quern fragments found on 6 of the 10 excavated sites and of the iron slag found on at least 5 of the sites in providing a date for the rath sites as a whole. While the detailed history of the rotary quern is not certain, it is reasonably clear that rotary querns are unknown in northern or western Europe earlier than the third century B.C. There is therefore no reason to date the sites at Cush earlier than the third century B.C. and it is much more likely that the earliest of the raths is several centuries later than this.

<sup>14</sup> Detailed discussion in V. B. Proudfoot (1957); esp. pp. 219-324.

<sup>15</sup> S. P. Ó'Ríordáin, *Tara* (Dundalk, 1954), pp. 21-22.

<sup>16</sup> C. Thomas, 'Imported pottery in dark-age western Britain,' *Med. Archaeol.*, III (1959), 89-111.

<sup>17</sup> Detailed discussion in V. B. Proudfoot (1957), pp. 320-322. See also Sir Mortimer Wheeler, *The Stanwick Excavations* (Res. Rept. Soc. Antiq. London, XVII, 1954), p. 40.

<sup>18</sup> *Inter al.* S. P. Ó'Ríordáin, 'Prehistory in Ireland 1937-46,' *Proc. Prehist. Soc.*, XII (1946), 162; *id.*, 'New evidence on neolithic and early bronze age pottery in Ireland,' *Congrès Internat. des Sciences Préhist. et Protohist. Zurich 1950. Acte de IIIe Session* (Zurich, 1953), p. 192; H. O'N. Hencken, 'Ballinderry crannog no. 2,' *Proc. Roy. Irish Acad.*, XLVII C (1942), 25; R. B. K. Stevenson, 'Some relics from Kildalton, Islay,' *Proc. Soc. Antiq. Scot.*, LXXVII (1944), 125; V. G. Childe, 'Rotary querns on the continent and in the Mediterranean basin,' *Antiquity*, XVII (1943), pp. 19-26; V. B. Proudfoot (1957), pp. 283-312.

The only other site of early date is the rath at Feerwore built near the decorated Turoe stone, the style of which most probably belongs to about the third century B.C. It is not certain that the earliest settlement, with which

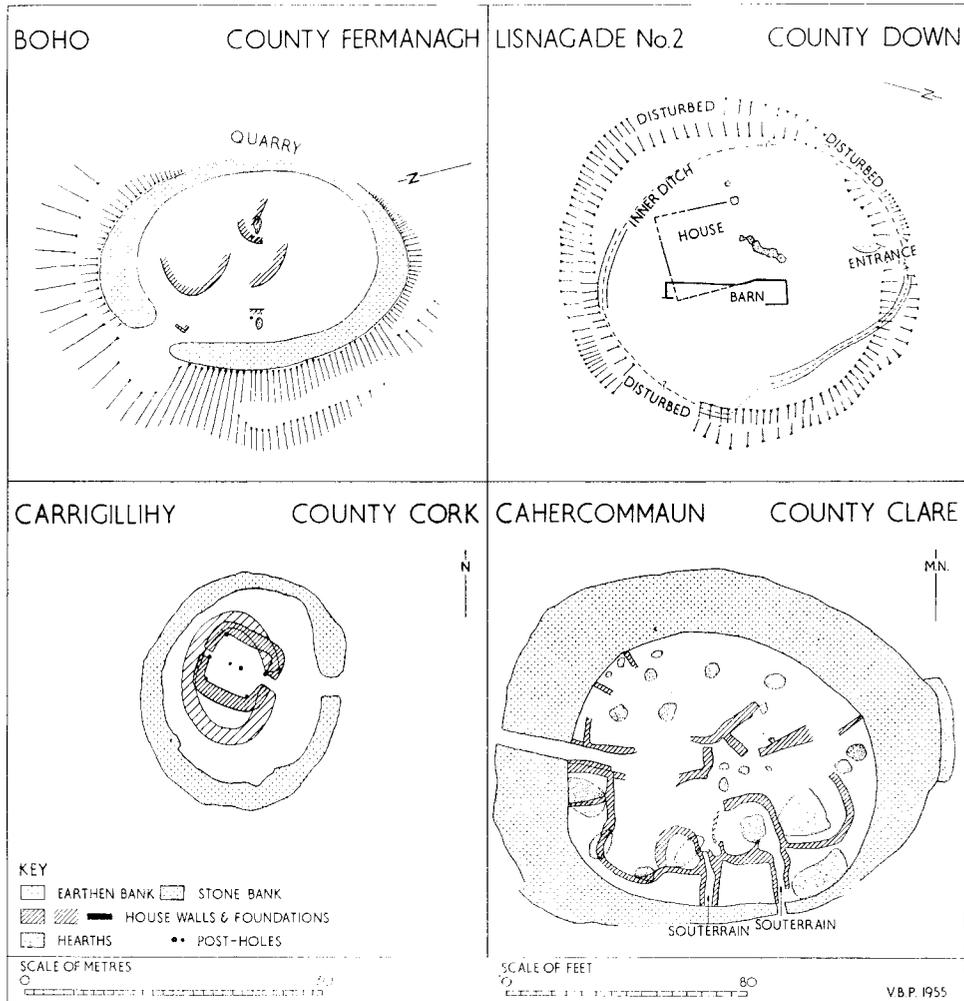


FIG. 29  
 PLANS OF EXCAVATED RATHS (p. 101)  
 (After *Ulster Folklife*, 1 (1955), 23, fig. 1, by courtesy)

was associated an iron fibula which could be of similar date, was enclosed, but the rath with its enclosing bank and ditch must certainly have been built not long after the initial settlement. A socketed iron axe and evidence of iron smelting from the earliest phases of this site suggest the possibility of intensive land

utilization out of which might well have arisen the necessity for a permanent enclosed farmstead. Significantly the iron fibula, the socketed iron axe and the style and type of the Turoe stone itself are of direct continental origin.

There is unfortunately no satisfying evidence to place any of the other excavated sites in the long period between Feerwore and such post-Roman sites as Garranes and Ballycattcen. Some of the Cush sites might belong to this period if the settlement there had been long-lived.

## HOUSES AND OTHER BUILDINGS

Excavation of rath sites in the country as a whole has revealed within the enclosing banks and ditches a bewildering variety of structures built of different materials (FIG. 29). These structures served as dwelling-houses, store places, and general purpose farm-buildings, but it is often difficult to be certain of the exact functions of individual buildings. It is very rare for anything more than foundations of buildings or series of post-holes to have survived, so that the evidence for actual methods of construction is not very satisfactory. Timber, clay or turf, and wattle-and-daub were all used in house building. Generally the buildings within cashels were stone built and many utilized the cashel walls to form part of their structure. Corbelling was used in at least one of the round stone houses at Leacanabuaille and this technique is, of course, well attested on such early Christian sites as the oratory at Gallerus or the monastery at Skellig Michael.<sup>19</sup>

Archaeological evidence accords to a limited extent with the literary evidence relating to building materials,<sup>20</sup> but there is as yet no archaeological evidence to support suggestions, derived from the literature, of log-built houses, or of parallel rows of posts supporting between them a clay, wicker or wattle packing, although walls of this type have been recorded from houses of a much earlier period.<sup>21</sup> Archaeological evidence for roofing materials is scanty, whereas the literature suggests the use of domed wicker roofs and roofs thatched with both straw and rushes perhaps at no great height from the ground, for damage by stock is mentioned. Some buildings might have been of more than one story and the roofs of some houses may have been provided with sky- or top-lights, perhaps built as suggested in the reconstructed drawing of a house at Drumaroad, co. Down (FIG. 30). The high standard of woodworking shown in this reconstruction would have been easily within the competence of people living in a still well-wooded environment and evidence for such craftsmanship as this comes from crannogs of late-bronze-age to early Christian times.<sup>22</sup> Apart from buildings

<sup>19</sup> H. G. Leask, *Irish Churches and Monastic Buildings*, I (Dundalk, 1955), chs. 3-5; L. de Paor, 'A survey of Sceilg Mhichil,' *J. Roy. Soc. Antiq. Ireland*, LXXXV (1955), 174-187.

<sup>20</sup> P. W. Joyce (1903), esp. II, ch. xx; E. O. Curry (1873), esp. I (by W. K. Sullivan), pp. cxcvii-cccix, and III, lectures XIX and XX; A. T. Lucas, 'Wattle and straw mat doors in Ireland,' *Archica* (Studia Ethnographica Upsaliensia, XI, 1957), pp. 16-35.

<sup>21</sup> S. P. Ó'Ríordáin, 'Lough Gur excavations,' *Proc. Roy. Irish Acad.*, LVII C (1954), 300-306.

<sup>22</sup> *Inter al.* W. G. Wood-Martin, *The Lake Dwellings of Ireland* (Dublin, 1886), e.g. pp. 177-178. Ballykinler crannog 'of the usual construction' with the timbers mortised together; G. R. Buick, 'Moylurg Crannog,' *J. Roy. Soc. Antiq. Ireland*, XXIV (1894), 315-7; W. F. Wakeman, 'Lisnacrogger,' *J. Roy. Soc. Antiq. Ireland*, XVI (1883-4), 377; H. O'N. Hencken, 'Ballinderry crannog no. 2,' *Proc. Roy. Irish Acad.*, XLVII C (1942), 8 and pl. vi.

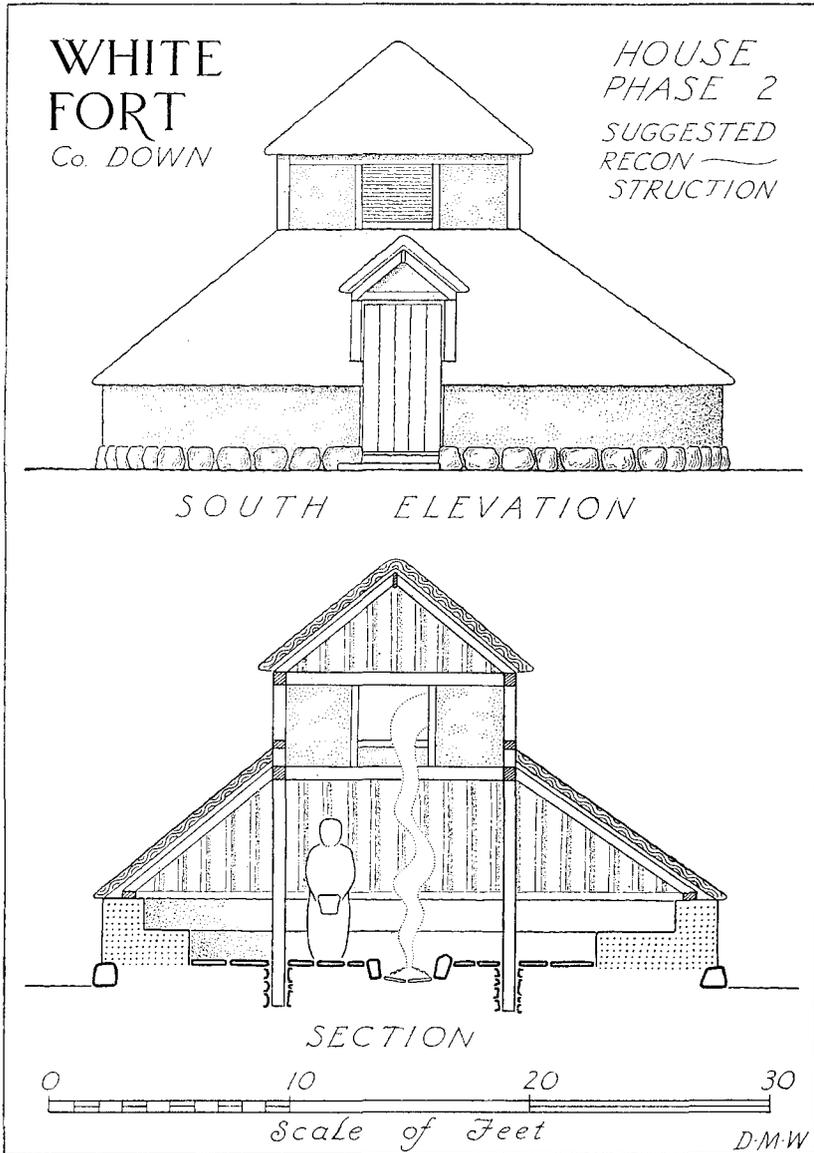


FIG. 30  
RECONSTRUCTION OF THE EXCAVATED HOUSE AT WHITE FORT,  
DRUMAROAD, CO. DOWN  
(After D. M. Waterman in *Ulster J. Archaeol.*, XIX (1956), 82, fig. 7, by courtesy)

erected against the interior face of the cashel walls or against the palisade or revetting of the earthen bank of the raths most structures were freestanding and approximately round or rectangular in shape. An important exception to this is the rath at Lissue, where several rings of concentric post-holes were found which Bersu thought had supported a roof covering the whole rath. This large house, more than 100 ft. in diameter and roofed with sods carried on timbers, would have served not only as a dwelling house but also as a roofed and enclosed 'farmyard' with all the farm-buildings under one roof. A large house of similar size, but apparently free-standing within the rath, has more recently been excavated at Doon, Draperstown (Tyrone). Although the reconstruction of the evi-

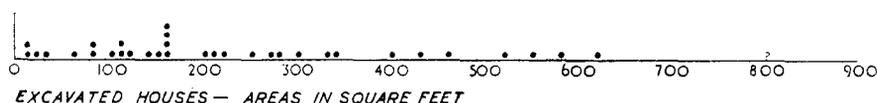


FIG. 31

## SIZE OF HOUSES IN EXCAVATED RATHS

Each house of known size is represented by a single symbol. When more than one house of similar size is known the symbols are placed in a vertical line. Details of all excavated houses are given in Appendix II, p. 121.

dence at Lissue has been criticized, the important point in its favour is the lack of any drainage system which would have been essential on this relatively low-lying site had there been a free-standing house within the rath for any considerable length of time. That such a house existed during one phase in the history of the site is suggested by the anomalous stone kerb found near the centre of the rath, perhaps part of an early structure destroyed when the rath was entirely roofed.

In this large house at Lissue the central living quarters seem to have been only about 30 ft. in diameter. Generally it is difficult to be certain of the ground plans of structures, for rebuilding during lengthy periods of occupation has resulted in mazes of post-holes or wall-fragments which excavators have not been able to interpret. In size the excavated buildings range from structures which can have been no more than small stores, less than 20 sq. ft. in area, to houses (sometimes divided into two rooms) more than 600 sq. ft. in area (FIG. 31 and Appendix II). The median size of these free-standing buildings is just over 180 sq. ft., which would give a circular building about 15 ft. in diameter or a building not quite 14 ft. square. The minimal floor area might in some cases have been enlarged by the provision of wall-beds—as seemed possible at Drumaroad—but these buildings can never have been more than the homes of small family groups. It is suggested that a house of about 180 sq. ft. could just accommodate three adults and five or six children, certainly not a family group significantly larger than this.

It has rarely been possible to determine exactly how many buildings would have been in use at any one time, but it is unlikely that there was ever more than one family dwelling-house in use at the same time within a single rath. As indicated by their size or form some buildings were obviously not dwelling houses. Small stores of less than 20 sq. ft. have already been mentioned, while

the long building at rath 2 Lisnagade, open on one side, can reasonably be interpreted as a barn. Similarly buildings arranged around the periphery of the enclosed area of sites such as Garranes, and Ballymacash excavated by E. M. Jope, can be regarded as storage and working places, or sometimes animal sheds.

The literary evidence on the size and functions of rath buildings is difficult to interpret for much of it seems to describe a heroic state of affairs rather different from the scale or style of buildings revealed by excavation. Sullivan suggested that the houses were of two types—one, a long quadrilateral timber building with a roof thatched or covered with mud and straw; the other, a circular house of wattle or wickerwork with a domed wicker roof.<sup>23</sup> Some of these buildings might have been of more than one story, but obviously no archaeological evidence relating to this problem is likely to survive. References to damage being done to thatched roofs suggest that the walls of many buildings may not have been of any great height, a view which is substantiated by reconstructions of the larger buildings, for the necessary pitch of the roof of 45° limits wall height very drastically unless centre posts more than 30-40 ft. high are employed. Occasional mention is made of more than one room in the house but far more frequently it is asserted that individual buildings were used for different purposes, the women in particular having a house of their own. The size of the buildings is quite uncertain for only one linear dimension is given. There is little evidence from excavation to support the lists of subsidiary buildings such as pig-sties, calf- and sheep-houses, and items of equipment associated with each, which various classes of farmers are supposed to have possessed, for example, according to the law-tract known as *Crith Gablach* the *bóaire febsa* should have had in addition to his house of dimension 27 ft., an outhouse of dimension 15 ft., a drying kiln, a barn, a pig-sty and sheep- and calf-houses.<sup>24</sup>

### TILLAGE

Direct archaeological evidence for the economy of those who lived in raths and cashels is meagre, for there are few finds of the grain which was grown although there is considerably more evidence as to the type of livestock reared. The archaeological finds can, however, yield considerable indirect evidence as to the economy and can also be supplemented by written evidence from such early sources as the Brehon laws of the seventh-ninth centuries A.D. or from some of the lives of the early Christian saints.

Certainly most if not all of the small raths were either farmsteads or cattle enclosures, but it is rarely possible without excavation to be certain whether or not a site was ever occupied. There is only one satisfactorily excavated site which seems never to have been lived in or indeed used at all—that at Garryduff

<sup>23</sup> E. O'Curry (1873), I (by W. K. Sullivan), loc. cit. in note 20.

<sup>24</sup> The belongings and status of various classes of farmers are defined in the law-tract known as *Crith Gablach*, the most recent edition of which is by D. A. Binchy, *Crith Gablach* (Dublin, 1941). The passage here summarized has often been discussed, for example in E. O'Curry (1873), II, 35-38, III, 25-29, and text in III, 456-512. See also M. and L. de Paor (1958), pp. 77-79.

2, where an imposing structure with stone faced bank and deep rock-cut ditch enclosed a central area, oval in shape with a maximum diameter of 190 ft.

All the evidence from each recently excavated rath has been tabulated to give as complete an impression as possible of the economy. The larger raths with multiple banks and ditches, which may have been chieftain's residences, as suggested for Garranes and Ballycatteen in the early literature, are listed separately from the small raths. Similarly the monastic site at Nendrum is separately tabulated. Information covering several centuries has, in some cases, been compressed and treated as though it were of uniform date: without such treatment the data relating to the economy would be even more fragmentary and no general view of the economy could be established. Where there is a medieval layer overlying an earlier layer the data from each have been kept separate and the same is true of the two strata at Carrigillihy.<sup>25</sup> However, all the data from the raths at Cush have been considered together, as the sites seem to have been essentially contemporaneous, and it is difficult to attribute finds to individual raths within the complex.

For each site those structural features found during excavation and thought to be relevant in any consideration of rath economy are listed in Table I. They include souterrains, storage-pits, and kilns; dwellings and storehouses have already been discussed and are not included here. Actual finds of grains, and of animal, fish or bird bones are recorded, so also are finds of pottery, wooden, bone and metal objects. Where finds can be used to infer that certain specialized activities were taking place this is also noted. Trade, especially local trade in raw materials such as iron ores, and in small finds such as glass beads, has been inferred for many sites. Finally an attempt is made to summarize the varied sectors of the rath economy under the broad headings, Tillage, Livestock, Gathering, and Manufacturing.

Within many raths underground structures known as souterrains are found. These probably had various functions as indicated by the differences in the structures themselves. Perhaps those with traps and obstructions were intended, at least in part, for use as refuges or hiding places; alternatively, the obstructions may have been designed to prevent animals from entering the souterrains. Pits in the floors of some souterrains, as at Ballyaghagan, may have been used as store-holes, perhaps with leather, or wooden, or pottery vessels placed in them to hold milk or grain. The piles of ashes often found in souterrains may be the result of drying or smoking foodstuffs underground as is also suggested by the chimney vents found in some. Alternatively the ashes may have been used to preserve foodstuffs, a technique practised in the Hebrides until at least the seventeenth century.<sup>26</sup>

A puzzling feature about some souterrains is the way in which the rough stones of which they were built have been smoothed or polished, often at a height of one to two ft. from the floor. Such might have been caused by animals

<sup>25</sup> In Table I medieval data are indicated only for Ballyaghagan, and have been omitted for other sites such as Castle Skreen 2, and Ballyfounder.

<sup>26</sup> Sir Lindsay Scott, 'Gallo-British colonies,' *Proc. Prehist. Soc.*, xiv (1948), 124-5.



rubbing against the walls, as can often be seen in modern byres and animal houses. Unfortunately for this explanation not all the souterrains in which this has been noticed would be accessible to animals, and Macalister and Praeger in their report on Togherstown rightly drew attention to the dangers of animals suffocating in such conditions. Whether this wall-polish could have been produced by rubbing sacks of grain, for example, against the walls seems improbable—far more likely that the sacks would have been torn.

There is no evidence for the suggestion that these underground structures were ever used for burials, apart from the finding of a human skull and other bones in the souterrain at Cahercommaun.

Direct evidence for tillage is slender.<sup>27</sup> Parts of ploughs—coulters or shares—have been found on only four raths and on the dark-age site at Dundrum castle. Sickles or reaping hooks are known from only three sites. Some coulters and shares suggest a heavy plough which would have been necessary to deal with the heavier soils being cultivated for the first time during the first millennium A.D. Evidence from pollen,<sup>28</sup> from charcoal,<sup>29</sup> and from soils<sup>30</sup> preserved beneath rath banks, suggests that in at least some lowland areas near raths the original woodland had been cleared and that there were areas free of forest dominance, but covered in part by scrub at the time the sites were built or occupied. Grass sod must relatively quickly have covered the surface of land not continuously cultivated, so that a heavy plough and especially a heavy coulter would have been necessary. Whether or not the plough had wheels is uncertain. According to various literary sources it was usually drawn by a plough-team of 2, 4, or 6 oxen yoked to the plough and controlled by a goad. Sickles or reaping hooks were probably used for cutting the grain crop, although it has to be remembered that they could also have been used for lopping slender branches from trees for use as animal fodder, or for cutting rushes for thatch.<sup>31</sup>

Spade cultivation may also have been carried on but no evidence for this from rath sites has survived, although the use of peat for fuel and the use of cut turves in buildings, as at Letterkeen, imply that spades were in use. Few ancient fields can be associated with raths, only those at Cush being surely contemporary with any excavated sites. It is probable however that the fields at Caherguillamore and Two Mile Stone are broadly contemporary with the raths or cashels set in their midst.<sup>32</sup> It has often been claimed that concentric field banks surrounding a drumlin or similar feature on the summit of which is a rath are contemporary

<sup>27</sup> The best summary available of both the archaeological and literary evidence is M. V. Duignan (1944). See also M. and L. de Paor (1958), ch. iii.

<sup>28</sup> G. F. Mitchell, 'Post-Boreal pollen-diagrams from Irish-raised bogs,' *Proc. Roy. Irish Acad.*, LVII B (1956), 185-251, esp. 243-249.

<sup>29</sup> V. B. Proudfoot, 'Note on a rath at Croft Road, Holywood,' *Ulster J. Archaeol.*, xxii (1959), 106.

<sup>30</sup> V. B. Proudfoot, 'Lisnagade 2,' to appear in *Ulster J. Archaeol.*

<sup>31</sup> For the use of elm leaves, twigs and bark as cattle food in Scandinavia v. R. Nordhagen in *Studies in Vegetational History in honour of Knud Jessen* (Geol. Survey Denmark, 2 ser. no. 80, 1954), p. 303; J. G. D. Clark, *Prehistoric Europe* (London, 1952), p. 119. For tree lopping knives or leaf-knives v. A. Steensberg, *Ancient Harvesting Implements* (Copenhagen, 1943), pp. 179-190.

<sup>32</sup> Summary of evidence in V. B. Proudfoot, 'Ancient Irish field systems,' *Adv. of Science*, xiv, no. 56 (1958), 369-371.

with the earthwork, but this has yet to be demonstrated by excavation.<sup>33</sup> The rarity of fields associated with raths is not altogether surprising, for in very many areas the raths are situated on modern farmland, and ancient field boundaries must often have been either ploughed out or incorporated in later field systems.

The Irish laws suggest that part of the agrarian economy was based on private property in land and that fields were fenced and ploughed, and that in them a wide variety of crops was grown. There are also elaborate rules for the usages of common land so that it seems likely that two systems of land tenure were in operation alongside each other, and it may well be that open and enclosed fields also co-existed.<sup>34</sup>

Five grain crops are named in the early literature—'red' and 'white' wheat, oats, barley, and rye.<sup>35</sup> Flax and various vegetables are also mentioned. Flax seeds have been found during excavation in the silt of the ditch of the early rath at Lissue, and oats were found at Ballingarry. Wheat and barley were found at Lissachiggel. Indirect evidence for flax growing is provided by rubbing stones used in the final preparation of linen cloth, one of which was found at Ballyaghagan (Antrim).

Kilns or ovens probably used for drying grain have been excavated at Letterkeen and Ballymacash. The kiln at Garranes was probably for drying grain although it may have been used for industrial purposes. The structure at Uisneach, thought by Macalister to have been a ruined cist, might more plausibly be regarded as an oven or kiln for drying grain.<sup>36</sup> There are some fragments of burnt clay from the monastic site at Nendrum which may be part of an oven. In this connexion it is interesting to find reference to monks drying grain in a poem describing St. Mochta's monastery in Louth,<sup>37</sup> while another source records the kiln catching fire in St. Enda's monastery in Aran.<sup>38</sup> In the passage from *Críth gablach* already mentioned in discussing the houses of various grades of society a drying kiln is mentioned as one of the requisites of the *bóaire febsa*. Grain and hay may also have been dried on racks, but the complex associations of post-holes found on many sites have seldom been analysed into their various components with the thoroughness exhibited by Bersu at Little Woodbury,<sup>39</sup> so that evidence for such structures is lacking. The storage of grain in granaries supported on four posts is a possibility suggested already by Piggott for rath 1 at Cush.<sup>40</sup>

Storage of dried grain in pits or silos may also have been practised, as it was at the hill-fort at Downpatrick during the period under discussion.<sup>41</sup> Pits

<sup>33</sup> For a good illustration of this feature *v.* E. E. Evans in *Man's Role in Changing the Face of the Earth* (ed. W. L. Thomas, Chicago, 1956), p. 235.

<sup>34</sup> Cf. G. Hatt, 'The ownership of cultivated land,' *Det. Kgl. Danske Videnskabernes Selskab: Historisk-filologiske Meddelelser*, xxvi, no. 6, 1-22.

<sup>35</sup> M. V. Duignan (1944); P. W. Joyce (1903), II, 41-2, 141-4, 271-4; E. O'Curry (1873), I (by W. K. Sullivan), cccxii-cccxxviii.

<sup>36</sup> R. A. S. Macalister, *Proc. Roy. Irish Acad.*, xxxviii c (1928), 95-6.

<sup>37</sup> Quoted by H. Waddell, *The Wandering Scholars* (Penguin Edition, 1954), p. 77, from J. H. Todd, *Life of St. Patrick* (Dublin, 1864), pp. 30-1.

<sup>38</sup> P. W. Joyce (1903), II, 342.

<sup>39</sup> G. Bersu, 'Excavations at Little Woodbury 1 . . .,' *Proc. Prehist. Soc.*, vi (1940), 30-111.

<sup>40</sup> S. Piggott, 'Timber circles: a re-examination,' *Archaeol. J.*, xcvi (1939), 221.

<sup>41</sup> V. B. Proudfoot, *Ulster J. Archaeol.*, xvii (1954), 98.

have been recorded at several sites and these have been interpreted as storage-pits, probably for grain but perhaps also for acorns, mast or other stores. Of considerable interest is the bell-shaped pit at Kiltera<sup>42</sup> and the pit partly built into the wall and partly dug into the underlying till at Togherstown.<sup>43</sup> The former can be paralleled at Little Woodbury<sup>44</sup> and the wall-silo at Pendeen in Penwith, Cornwall.<sup>45</sup> Grain was also stored in barns specially constructed for this purpose.<sup>46</sup>

Even on sites where there is no definite evidence for grain production querns used for grinding corn are found. The presence of these does not necessarily imply that the inhabitants actually grew the grain used. Querns are found even on such sites as Lackan, where the rath was built on a peaty sub-soil, and Letterkeen, where present-day arable land occurs only in isolated patches separated by bleak moorland. A kiln at the latter site does suggest grain growing even in such improbable surroundings, and it is probable that most rath farmers produced annually at least a small amount of grain for home consumption.

### LIVESTOCK

However, over much of the country the rearing of livestock must have been more important than tillage, as it still is today. Wealth and tribute were measured in numbers of animals, of which cattle were the most important.<sup>47</sup> Estimations of either the relative importance of stock-rearing in the agrarian economy as a whole, or of the importance of cattle as compared with other animals, are far from satisfactory and liable to error from the selective collection of material during excavation.<sup>48</sup> Evidence for the keeping of livestock comes from the quantities of bones of domesticated animals found on excavation sites. Unequal preservation of bone, however, robs us of much material and inadequate identification and recording of bones found during excavation makes it difficult to obtain detailed analyses of equal value from sites of different dates in differing environments—few analyses, for example, match those recently prepared by Mrs. Joje. As a result it is impossible to define regional or chronological variations; nor has it been possible to standardize the data from various sites. In Table I unidentified or unidentifiable animal bones have been recorded only in the summary column. Detailed evidence such as exists for some of the crannogs does not exist for any excavated rath or cashel.<sup>49</sup> At all the sites for which data exist cattle bones far outnumber those of all other livestock. Only at Boho

<sup>42</sup> R. A. S. Macalister, 'Kiltera,' *Proc. Roy. Irish Acad.*, XLIII c (1935), 5.

<sup>43</sup> R. A. S. Macalister, 'Togherstown,' *Proc. Roy. Irish Acad.*, XXXIX c (1931), 69.

<sup>44</sup> G. Bersu, *Proc. Prehist. Soc.*, VI (1940), fig. 13.

<sup>45</sup> E. V. Clark and E. B. Ford, 'An above-ground storage pit of the La Tène period,' *Proc. Prehist. Soc.*, XIX (1953), 121-126.

<sup>46</sup> P. W. Joyce (1903), II, 42, and cf. the evidence for a barn at Lisnagade 2 (above p. 95).

<sup>47</sup> F. E. Evans, 'Dairying in Ireland through the ages,' *J. Soc. Dairy Technology*, VII (1954), 179-187; A. T. Lucas, 'Cattle in ancient and medieval Irish society,' *O'Connell School Union Record 1937-1958* (Dublin, 1958).

<sup>48</sup> On errors arising from selective sampling, v. J. W. Jackson, 'The animal remains from Little Woodbury,' *Proc. Prehist. Soc.*, XIV (1948), 19.

<sup>49</sup> E.g. C. B. Jones, 'The animal remains from Ballinderry crannog no. 3,' *Proc. Roy. Irish Acad.*, XLVII c (1942), 68-70. For a summary of data relating to crannogs see V. B. Proudfoot (1957), ch. 3.

does the percentage of cattle bones fall below 70%. At Cahercommaun on the limestone uplands of north Clare the percentage of cattle bones is 97. The relative scarcity of sheep bones from sites on the damper lowlands is understandable, for much of the land surrounding the cultivated fields and secondary scrub must have remained as woodland and the sheep, unlike the cow and pig, is ill-suited to such an environment.<sup>50</sup> However, it must be emphasized that the numbers of sheep kept may be grossly underestimated by considering only the faunal evidence from sites. These bones are essentially those of the animals eaten: but the sheep was perhaps far more important for its wool than for its mutton, so that the number of bones does not truly represent the numbers of sheep kept. Finds of shears, similar to modern sheep shears, from such sites as Carraig Aille II, provide satisfactory archaeological evidence for the rearing of sheep for their wool.

Sheep were generally of slender build and more active than those of modern times, although there seems to have been considerable difference in size between rams and ewes. Whether more than one breed was common is uncertain.<sup>51</sup> Cattle were of *Bos longifrons* type—the so-called Celtic shorthorn, but there seem to have been both horned and hornless animals. Animal remains from crannogs suggest a range of breeds corresponding to such modern breeds as the Kerry, Dexter, Longhorn, Shorthorn, Hereford, Aberdeen-Angus, and Redpoll.<sup>52</sup> Much has been written about the history of the polled cow in Ireland, and the early theory that the Irish Moyle and similar breeds are the result of Scandinavian imports is still current, although the view that polled forms are of a reversionary nature is also strongly held.<sup>53</sup> Lack of detailed data makes impossible discussion on the problems of deterioration of animals under domesticated conditions and the possible necessity of upgrading animals in the iron-age and early Christian period when sturdy beasts would have been required for draft purposes.<sup>54</sup> Evidence for the use of oxen as draught animals is to be found in the early literature, but the yokes occasionally found in Ireland do not necessarily imply the use of oxen for draught, as is sometimes stated.<sup>55</sup> Where raths were situated on the forested lowlands cattle may have foraged in the woodland but on the dry limestone plateaus of western Ireland the cattle belonging to the owners of the many cashels found there probably grazed on open pasture land. In such

<sup>50</sup> J. G. D. Clark, 'Sheep and swine in the husbandry of prehistoric Europe,' *Antiquity*, XXI (1947), 122-136.

<sup>51</sup> R. F. Scharff in 'Uisneach,' *Proc. Roy. Irish Acad.*, xxxviii c (1928), 124; *id.*, 'Some notes on the Irish sheep,' *Irish Naturalist*, xxxi (1922), 73-76.

<sup>52</sup> *Inter al.*, C. B. Jones, 'Ballinderry crannog no. 2,' *Proc. Roy. Irish Acad.*, xlvii c (1942), 68-70; R. F. Scharff in 'Uisneach,' *Proc. Roy. Irish Acad.*, xxxviii c (1928), 123; H. M. Jope in 'Boho,' *Ulster J. Archaeol.*, xvi (1953), 51-3.

<sup>53</sup> J. Wilson, 'The Scandinavian origin of the hornless cattle of the British Isles,' *Sci. Proc. Roy. Dublin Soc.*, no. 5, xii (1909), 145; J. Hammond, *Farm Animals* (2 ed. London, 1952), p. 162; A. S. B. Wilson, 'Cattle,' in *Chambers' Encyclopaedia* (1950 ed.), p. 187; R. F. Scharff in 'Uisneach,' *Proc. Roy. Irish Acad.*, xxxviii c (1928), 123.

<sup>54</sup> On the effects of domestication under primitive conditions cf. J. Hammond, *op. cit.* in note 53, pp. 161-166 and Tacitus, *Annals*, iv, 72 cited in J. G. D. Clark, *Prehistoric Europe* (London, 1952), p. 123. See also A. C. Cook, 'Cattle,' in *Encyclopaedia Britannica* (1950 ed.), p. 46.

<sup>55</sup> M. V. Duignan (1944), p. 142, and cf. Sir Cyril Fox's reconstruction of the horse-drawn chariot with a yoke from Llyn Cerrig Bach, *Antiq. J.*, xxvii (1947), 117-9.

areas as county Fermanagh, where rath settlement was concentrated on relatively heavy soils near the present margins of cultivation, it is probable that the cattle were grazed on the upland pastures during the summer months.

Second in importance to cattle, both numerically in the analyses of faunal remains, and in the early literature, are swine.<sup>56</sup> Like cattle they could utilize the partially-cleared woodland, feeding on mast or acorns and other wild foods. No evidence, such as that which can be derived from Domesday Book indicating the extent of woodland in terms of the numbers of swine it can support, is found in the early Irish literature, although the variations in the amount of mast available which are noted in the *Annals* is convincing proof of the value of the Irish woodland for this purpose.<sup>57</sup> Pig bones found on excavations indicate that the animals were of a more active and slender build than present breeds—the so-called 'greyhound pig'.

Horses may occasionally have been used for food, as at the Ballinderry crannogs,<sup>58</sup> but there are no references to the bones being split for the extraction of marrow in any of the reports on bones from excavated raths. In most cases, however, it is unlikely that the horses were reared for this purpose. The relatively high percentage of horse bones from Garranes, 9%, a site very probably connected with the Eoganacht chieftains, might be interpreted as supporting the traditional association of the Irish chieftain with these animals either for riding or for use in horse-drawn vehicles. The horse also seems to have been used for ploughing, for it is recorded that St. Ciaran had fifty tame horses for tilling and ploughing the ground.<sup>59</sup>

There is little satisfactory evidence to indicate the extent to which domestic animals were slaughtered in the autumn because of the shortage of winter feeding. As long as farming tended to be extensive rather than intensive there was probably always a certain amount of winter fodder available.

Finally, among livestock, there is the domestic fowl, evidence for which is available from only two rath sites. Fowl are frequently mentioned in the laws and were probably introduced into the country from the Roman world during the early centuries A.D.

The difficulty in estimating the relative importance of tillage and livestock in the farming economy has already been noted. It must be emphasized that the evidence suggests that the economy of the rath farm was essentially mixed. Complete specialization in either crop production or livestock production must have been rare. Considering only the smaller raths which have produced finds, 27, out of a total of 34 sites, have yielded evidence for tillage, for the keeping of livestock, or for both, if the presence of querns is taken as an indication of tillage. Five sites have yielded evidence for tillage only, and nine have yielded evidence for livestock only, whereas thirteen have yielded evidence for both. If querns alone are not regarded as adequate evidence for tillage then the relative impor-

<sup>56</sup> R. F. Scharff, 'On the Irish pig,' *Irish Naturalist*, xxvi (1917), 173-185.

<sup>57</sup> E.g. *Annals of Inisfallen*, entry 6, 1056.

<sup>58</sup> A. W. Stelfox in 'Ballinderry crannog no. 1,' *Proc. Roy. Irish Acad.*, xliii c (1936), 234 and 'Ballinderry crannog no. 2,' *Proc. Roy. Irish Acad.*, xlvii c (1942), 72.

<sup>59</sup> P. W. Joyce (1903), i, 441, ii, 275, 401-422 (for quotation, see *id.*, ii, 275).

tance of tillage decreases (FIG. 32). Absence of evidence for both types of economy is unfortunately only too common but is easily explained. Absence of faunal remains must often be explained by acidic soil conditions in which bone has not survived. However, satisfactory evidence for animal husbandry is to be found in such features as trampled farmyards and quagmire drinking-pools, similar to

## THE ECONOMY OF THE RATH

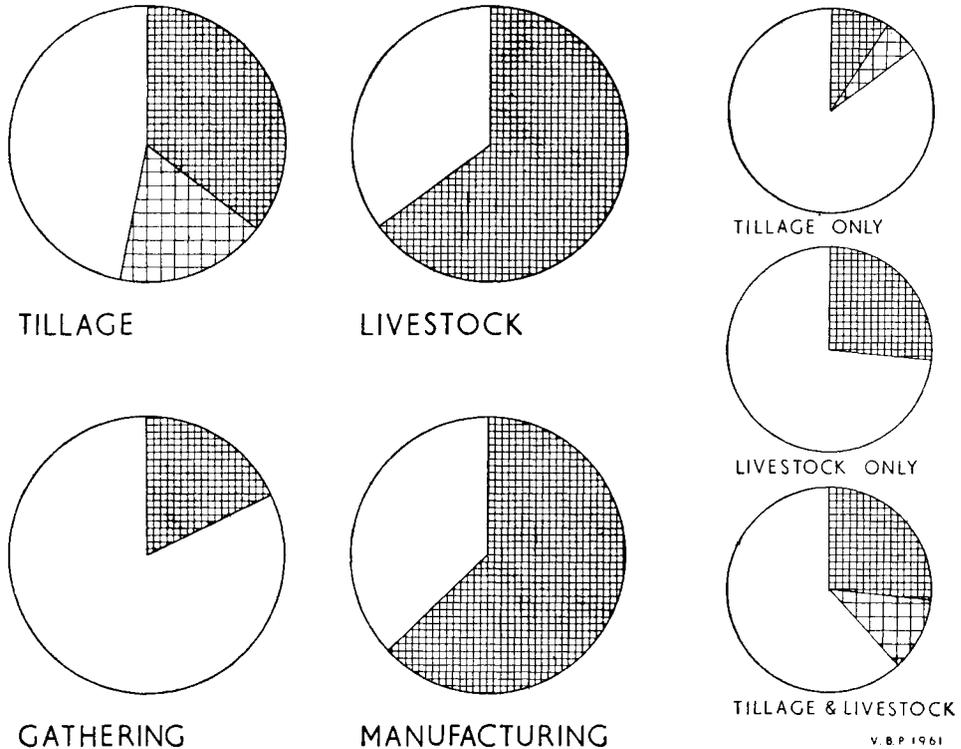


FIG. 32

### ECONOMIC EVIDENCE FROM EXCAVATED RATHS (p. 111)

Each circle represents the total number of sites. The shaded areas in each circle represent those sites for which evidence for a particular activity is available; the blank areas represent those sites for which there is no evidence available. Open shading in circles referring to tillage represents evidence provided only by querns. In the small circles the evidence for tillage and livestock already shown in the large circles, is subdivided, depending on whether these activities occur independently or together.

those excavated in the raths at Castle Skreen. The absence of querns as an index of grain growing can be explained by their value, for quern stones made of traded stone such as Mourne granite<sup>60</sup> were presumably not casually discarded even when a site fell into disrepair or disuse. Then again larger mills, perhaps analogous to the lord's mill of the middle ages, where all the corn was compulsorily milled,

<sup>60</sup> E.g. from Castle Skreen 2 and Ballyfounder. List and distribution-map to appear in E. M. Jope *Ballymacash* (Govt. N. Ireland Archaeol. Res. Publ., forthcoming).

are hinted at in the literature.<sup>61</sup> Nor need lack of storage facilities for grain prove that grain was not grown, since many methods of storage would leave no trace archaeologically, for example, storage in straw-built granaries similar to those which are still used in parts of southern Ireland.<sup>62</sup>

### HUNTING AND GATHERING

Tillage and livestock production were the principal sectors but by no means the entire economy of each rath. There is a little evidence that hunting played a part, albeit a minor one, in the economy of the rath dwellers, the main victim of the chase being the red deer. Bones and antlers of this animal have been found on approximately half the sites from which there is a reasonable-sized collection of animal remains, but these present difficulties of interpretation. At Cahercommaun a discrepancy was noted between the handful of metatarsals and metacarpals as compared with the very large number of distal ends of humeri. The high degree of selectivity of certain bones, presumably for definite purposes could not be accounted for on this site, for no objects made from red deer bones were found. However, antlers had been used for small handles as well as for picks, but some of this might have been collected as shed antler and not have been the result of hunting.<sup>63</sup> Tines only were found at Carraig Aille so that it would seem probable that only the antlers were brought back from hunting or that shed antlers were collected. The red deer is an animal of 'secondary-growth forest' well suited to an environment partly forested but with frequent clearings for agriculture in the lowlands and broad expanses of open grazing land on the mountain pastures.<sup>64</sup> Such conditions must have been widespread in Ireland during the first millennium A.D.

The only other animal of any importance as game was probably the wild pig but there are difficulties in separating the remains of this animal from those of the domesticated pig, which must in any case have lived in a half-wild state foraging in the woodland.<sup>65</sup> Small tanged iron arrowheads from the sites at Carraig Aille can be more reasonably interpreted as weapons used in hunting rather than in warfare. Pointed bone objects which have on occasions been interpreted as spear-heads<sup>66</sup> are of frequent occurrence, as the list in Table II shows. Wheeler has, however, suggested that similar objects from Maiden Castle, Dorset, were possibly used as shuttles, pointing out that their slender nature would make them unsuitable for use as spear-heads.<sup>67</sup> In view of their uncertain

<sup>61</sup> M. and L. de Paor (1958), p. 92; E. O'Curry (1873), I (by W. K. Sullivan), pp. ccclix-ccclx.

<sup>62</sup> A. T. Lucas, 'An Fhóir: a straw-rope granary,' *Gwerin*, I (1956), 2-20, and II (1958), 58-67.

<sup>63</sup> A. W. Stelfox and G. Roche in *Cahercommaun* (Dublin, 1938), p. 76; H. M. Jope in 'Lough Faughan crannog,' *Ulster J. Archaeol.*, XVIII (1955), 77.

<sup>64</sup> F. Fraser Darling (ed.), *West Highland Survey* (Oxford, 1955), p. 177; L. H. Matthews, *British Mammals* (London, 1952), ch. 10; J. Ritchie, *The Influence of Man on Animal Life in Scotland* (Cambridge, 1920), pp. 333-338.

<sup>65</sup> R. F. Scharff, 'On the Irish pig,' *Irish Naturalist*, xxvi (1917), 176; Giraldus Cambrensis, *Topography of Ireland* (ed. J. J. O'Meara, Dundalk, 1951), p. 28.

<sup>66</sup> H. O'N. Hencken, *Cahercommaun* (Dublin, 1938), p. 62.

<sup>67</sup> R. E. M. Wheeler, *Maiden Castle, Dorset* (Res. Rept. Soc. Antiq. London, XII, 1943), pp. 303-6. Data for Dunbell are from R. A. S. Macalister, *Archaeology of Ireland* (2 ed., 1949), pp. 268-9.

function these objects have not been used to indicate either hunting or weaving in Table I.

TABLE II

POINTED BONE OBJECTS ('SPEAR-HEADS') AND EVIDENCE FOR HUNTING AND SPINNING/WEAVING

	'Spear-heads'	Hunting	Spinning/weaving
Ballyaghagan	+	—	+
Carraig Aille and associated house sites	+	Red deer tines	+
Cahercommaun	+	Red deer bones and antlers	+
Dunbell	+	Red and fallow deer	+
Lagore crannog	+	Red deer bones and antlers	+

In his thorough examination of the archaeological and literary evidence relating to 'cooking-places' O'Kelly has provided considerable evidence for hunting in the prehistoric and early historic periods.<sup>68</sup> Some of these 'cooking-places' seem to have been used seasonally and not to have been permanently occupied. Perhaps, some were used by rath-dwellers at particular times of the year, or by certain younger members of the rath families who may have constituted the hunting and warring groups referred to in the early literature as the *fiana*.<sup>69</sup> In either case the evidence for hunting as a part of the economy would be concentrated on such sites, and be sparsely represented at the raths.

Fowling seems to have been of even less importance than hunting. Only two sites have produced bird bones—Carraig Aille and Leacanabuaile. At the latter, built on a commanding position less than a mile from the coast, the capture of sea birds was of importance. These could have been either netted or shot (with arrow).<sup>70</sup> At Carraig Aille bones of eleven different species of bird were recorded. All, with the exception of the cormorant, which is usually a coastal bird, could have been caught near the site.<sup>71</sup> It is unlikely that the raven or sea-eagle bones from Cahercommaun represent birds deliberately caught for food.

Fishing, like fowling, was of lesser importance. Presumably most of the shells of shell-fish found on occupation-sites represent the remains of food, although it has to be remembered that shells also seem to have been used to improve the land.<sup>72</sup> Bones of fish have been found on only three rath sites.

<sup>68</sup> M. J. O'Kelly, 'Excavations and experiments in ancient Irish cooking places,' *J. Roy. Soc. Antiq. Ireland*, LXXXIV (1954), 105-156.

<sup>69</sup> T. G. E. Powell, 'The Celtic settlement of Ireland,' in *The Early Cultures of North-West Europe* (ed. C. Fox and B. Dickins, Cambridge, 1950), pp. 173-195, esp. p. 180.

<sup>70</sup> P. W. Joyce (1903), II, 472.

<sup>71</sup> I am indebted to Mr. C. Douglas Deane of Belfast Museum for helpful discussion on this point.

<sup>72</sup> P. W. Joyce (1903), II, 270.

However, this paucity of fish bones may be misleading, for fish bones, like many bird bones, would disintegrate more quickly than animal bones and might also have been eaten by dogs or cats. Evidence for fishing also comes from perforated stone and lead objects interpreted as net or line sinkers. Fishing with both net and line is mentioned in early literary sources.<sup>73</sup>

### INDUSTRIAL ACTIVITIES

Of industrial activities carried on in raths iron-working and spinning and weaving were most common. Spindle-whorls were usually made of stone and have been found in numbers on several sites. Loom-weights are rarer, one of the few examples coming from Ballyaghagan, where a polishing stone presumably used by weavers for finally smoothing linen cloth was also found. The piece of polished stone pyramidal in shape from Lackan 2 may have been used for this purpose also. No clay loom-weights are known. From rath sites there are no cloth fragments comparable to those from Lagore crannog.<sup>74</sup> A stone from Nendrum with two perforations about 1 in. apart might have been used as a tablet in tablet weaving, although these seem more often to have been of bone.<sup>75</sup> Socketed iron tools with short prongs and rather less than 2 in. wide at the pronged edge were probably used in textile manufacture, perhaps for felting cloth.<sup>76</sup>

Iron tools were widely available to rath and cashel dwellers, many of whom probably made at least their own small tools, the evidence for this coming from the finds of slags and ores on many sites. Methods of iron smelting and forging are uncertain but must have been, by modern standards, primitive and inefficient, if we are to judge from the large quantities of waste products found.<sup>77</sup> Numerous ore sources were available including bog iron ore; iron-enriched layers in the soil (soil horizons, such as iron pans), and weathered rock surfaces below the glacial drift; iron ores from the inter-basaltic beds of Antrim, siliceous haematite in the Lower Palaeozoics and pyritic deposits in other rocks. Methods of extraction are uncertain, but iron mines are mentioned in the literary sources.<sup>78</sup>

Whereas iron-working was only one feature of the general agricultural economy of most raths specialization in metal-working seems to have taken place in the large triple-ramparted raths at Garranes and Ballycatteen. It is possible that these raths belonged to the Eoganacht kings to whose retinues metal-workers may have been attached, as suggested by Professor Hawkes.<sup>79</sup> Evidence

<sup>73</sup> P. W. Joyce (1903), II, 472-3.

<sup>74</sup> L. Start in 'Lagore crannog . . .', *Proc. Roy. Irish Acad.*, LIII c (1950), 203-224. For the general prehistoric background see A. Henshall, 'Textiles and weaving appliances in prehistoric Britain,' *Proc. Prehist. Soc.*, xvi (1950), 130-162.

<sup>75</sup> This stone is illustrated by H. C. Lawlor in *Nendrum* (Belfast, 1925), pl. xi, no. 88. See also L. Start, *op. cit.* in note 74, pp. 214 ff. and A. Henshall *op. cit.* in note 74, pp. 148-151.

<sup>76</sup> R. B. K. Stevenson, 'The later iron age in Scotland,' paper read at the September meeting of the Prehistoric Society, Edinburgh, 1954; H. O'N. Hencken, *Cahercommaun* (Dublin, 1938), p. 53.

<sup>77</sup> Cf. H. O'N. Hencken, 'Lagore crannog . . .', *Proc. Roy. Irish Acad.*, LIII c (1950), 230-4; M. J. O'Kelly, 'St. Gobnet's house, Ballyvourney, Co. Cork,' *J. Cork Hist. Archaeol. Soc.*, LVII (1952), 32 a.

<sup>78</sup> P. W. Joyce (1903), II, 288.

<sup>79</sup> C. F. C. Hawkes in 'Ballycatteen,' *Proc. Roy. Irish Acad.*, XLIX c (1943), 42.

to support this suggestion comes from the tenth-century *Book of Rights*, which records the giving of masses of iron to the kings as tribute.

Although iron was the main metal used for tools from at least the start of the Christian era, other metals continued to be of considerable importance, perhaps even of greater commercial value than iron. Of greatest importance was bronze, used for small castings of brooches and pins, as well as for rather larger objects such as harness-fittings, decorated mountings and bronze vessels.<sup>80</sup> The status of bronze-working in Ireland in the iron age has recently been reviewed by Jope,<sup>81</sup> who has emphasized the persistent undercurrent of late-bronze-age traditions in the later period, and has drawn attention to the contacts between Britain and Ireland from the first century A.D. Bronze-working was carried out on fewer rath sites than iron-working, yet it would be wrong to suppose that it was only in large 'industrial' establishments like Garranes and Ballycatten that such activities were practised, for normal rath sites like Carraig Aille 2 and Castle Skreen 2, which do not seem to have had connexions with local chieftains, have produced crucibles presumably used in bronze-working. Many sites have produced bronze pins, brooches and similar objects, indicating that such goods were fairly readily available, at least to the wealthier farmers. Some farmers in poorer areas, such as the occupants of the sites at Boho or Leacanabuaile, seem to have been able to afford few such luxuries as these, and, in general, it would seem as though the numbers and quality of the bronze objects found are a fairly good index of the prosperity of a particular site.

Of the other non-ferrous metals only lead was of fairly general importance. Perforated lead discs, perhaps for use as spindle-whorls, loom-weights or net-sinkers, and lead tops, possibly derived from Roman types, have been found. A lead ingot(?) from the rath at Feerwore suggests lead-working on this site at least.

Other industrial activities on a smaller scale were presumably carried out on many raths although scant evidence for this has survived. Iron saws, chisels and knives were presumably used for making objects of wood, bone, shale, jet, lignite, and horn. Bone was widely used for making such small objects as knife-handles, spindle-whorls, pins and hair-combs. Antler was less widely used and then mainly for knife-handles. Slightly hollowed out, and shaped or pointed bone objects have been found on several sites and variously interpreted as scoops, gouges, shuttles and ferrules. Some bone beads were almost certainly made on a lathe, although no direct evidence for this has survived. Use of a lathe for turning wooden vessels can be inferred from the waste fragments and chuck found at Lissue. On the same site, apart from finished bowls or other wooden vessels, a stave-built churn was found. This was made of oak staves and bound

<sup>80</sup> C. F. C. Hawkes, 'Bronze-workers, cauldrons and bucket-animals,' in *Aspects of Archaeology in Britain and Beyond* (ed. W. F. Grimes, 1951), pp. 172 ff.

<sup>81</sup> E. M. Jope, 'Chariotry and paired draught in Ireland during the early iron age . . .,' *Ulster J. Archaeol.*, xviii (1955), 37-44; *id.*, 'The beginnings of La Tène ornamental style in the British Isles,' in *Problems of the Iron Age in Southern Britain* (ed. S. S. Frere: London Univ. Inst. Archaeol., Occ. Paper, no. 11), pp. 69-83; E. M. Jope, and B. C. S. Wilson, 'A burial group of the first century A.D. from "Loughney", near Donaghadee, Co. Down,' *Ulster J. Archaeol.*, xx (1957), 73-95; *Id.*, 'The decorated cast bronze disc from the river Bann near Coleraine,' *Ulster J. Archaeol.*, xx (1957), 95-102.

with iron mounts. The staves were grooved near the bottom and the circular base of three joined pieces of oak was inserted into the groove. The oval mouth of the churn was fitted with an iron mounting to help in emptying it. This change in form from a circular base to an oval mouth indicates a very high standard of workmanship in the cutting and shaping of the staves. Such standards were probably general over much of the country and most domestic utensils were probably made of wood, as they are still in many peasant societies in temperate lands.<sup>82</sup>

Pottery was normally used only in the north-eastern counties of Antrim, Down, Armagh, Londonderry and Tyrone. This native pottery is of so-called souterrain ware, and has been found on all the rath sites excavated in these counties. One sherd of a shouldered pot probably of situlate shape has been found in association with souterrain ware at Glenloughan, and there were perhaps similar sherds from Drumena Cashel (Down).<sup>83</sup> Sherds of souterrain ware were also found at Lissachiggel in Armagh, but at Corliss, the only other site excavated in the extreme south-east of Ulster, only sherds from a medieval cooking-pot were found at a high level in the ditch filling, and, therefore, not clearly associated with the rath occupation.<sup>84</sup> No evidence of souterrain ware actually being made on any rath sites is available, although it presumably was so made: certainly the clays used were always of local origin. Imported wares dating to the centuries after the collapse of Roman power in Britain have been the only pottery found on several sites, while Roman pottery was in use during the occupation of the Rath of the Synods at Tara.<sup>85</sup>

## TRADE

Although raths were essentially self-sufficient farmsteads, trading played a small but significant part in their economy. Raw materials for the manufacture of many of the small objects found on these sites must have come from a distance—bog and other ores for iron-smelting, copper and tin for bronze-working, shale or jet for making bracelets and pendants. Glass beads, bracelets and enamelled objects, made on some of the specialized industrial sites, must have been traded, others perhaps being imported from elsewhere in the British Isles or even the continent. Trade contacts beyond Britain are suggested by the occurrence of post-Roman pottery, while literary evidence and the sporadic occurrence of Roman material in Ireland suggests trade between Ireland and Roman Britain. The extent of this trade is still uncertain, but a recent review of the types of boats available at this and the succeeding early Christian period makes it clear that boats capable of taking loads of about two tons weight were available.<sup>86</sup>

<sup>82</sup> E. M. Jope in *Problems of the Iron Age in Southern Britain* (*op. cit.* in note 81), p. 79, note 68, has emphasized the importance of wood even as a material for aristocratic work in early-iron-age Ireland.

<sup>83</sup> The finds from Drumena cashel are in the Geography Dept., Queen's Univ., Belfast, v. V. B. Proudfoot, 'Glenloughan,' to appear in *Ulster J. Archaeol.*

<sup>84</sup> O. Davies, 'Corliss,' *Co. Louth Archaeol. J.*, ix (1940), esp. pp. 340 and 343 and the ditch section.

<sup>85</sup> C. Thomas, *op. cit.* in note 16; S. P. Ó'Riordáin, *op. cit.* in note 15.

<sup>86</sup> G. J. Marcus, 'Factors in early Celtic navigation,' *Études Celtiques*, vi (1953-4), 312-327.

# COUNTY DOWN—ASPECTS OF PRE-MEDIAEVAL LAND USE

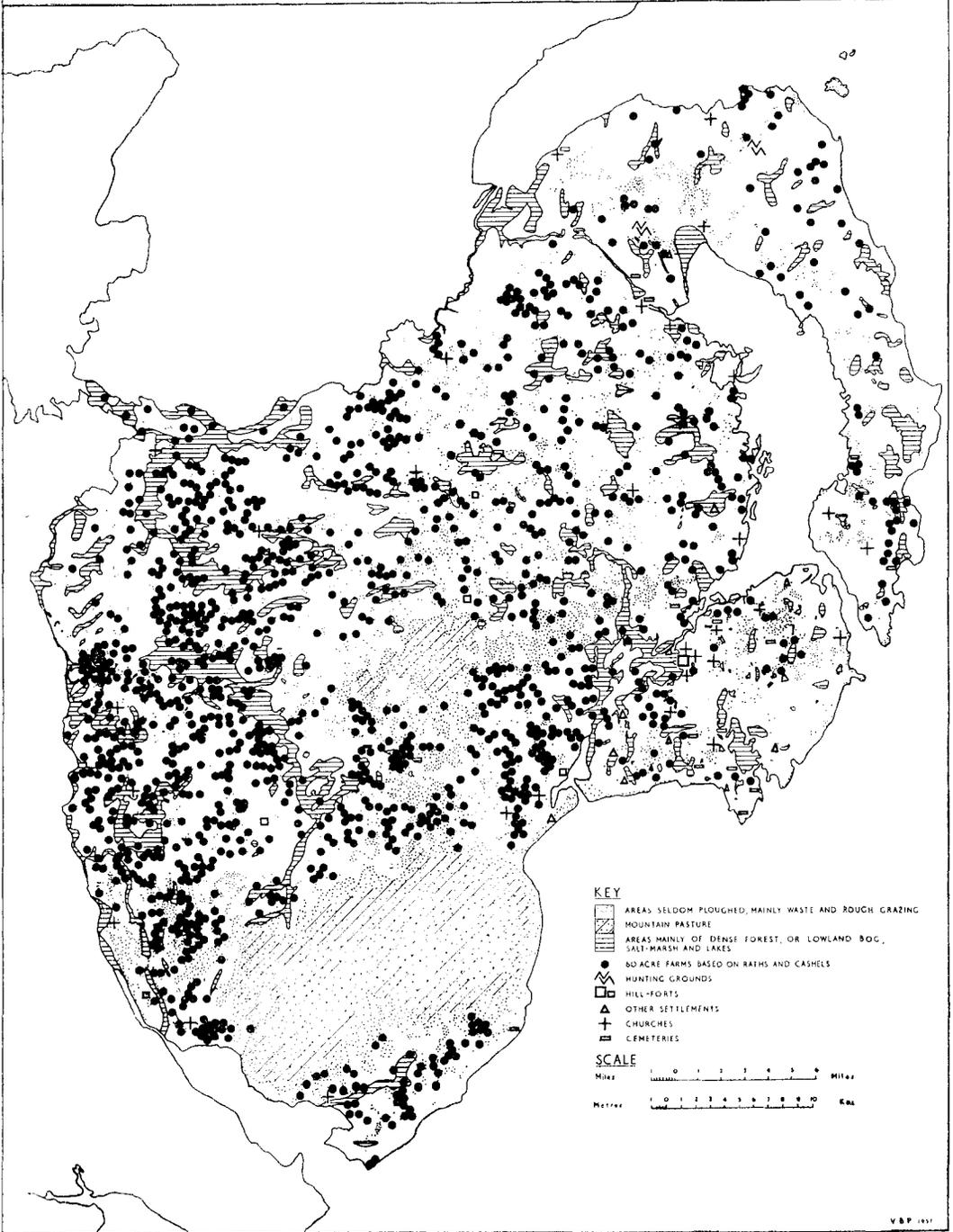


FIG. 33 (p. 119)

## DISTRIBUTION

From the foregoing description of raths and cashels and from the analysis of their economy it is clear that these sites were normally small family farmsteads based on an iron-using economy. It is not surprising, therefore, that their distribution is essentially restricted to the modern cultivated land in the lowlands, and valleys penetrating the uplands. Since few field boundaries associated with raths have survived, it is difficult to estimate the size of the areas farmed by the occupants of each site. Speculation can be based on a small family's dietetic requirements and estimating yields as slightly less than those of medieval times. Alternatively comparison can be made with similar peasant communities in pioneering areas of north America in the seventeenth and eighteenth centuries. The results of various speculations on these lines give figures of the same order, namely between 40 and 80 acres. A figure of 60 acres has been used in showing the possible distribution of farmland in county Down in pre-medieval times.<sup>87</sup> It is clear that even in those areas where the raths are densest there is sufficient farmland available for each farmer. This does not of course imply that all this land was farmed simultaneously, but merely that it could have been. Significantly, the distribution of raths in an area such as county Down cannot be explained in terms of differences of soils. Moreover, where raths are least dense, there are considerable areas of potentially valuable land unused by the rath farmers (FIG. 33). To redress the population-balance of the county as indicated on the distribution-map of raths, other forms of settlement which have left few if any traces must have co-existed.<sup>88</sup> Perhaps these were clustered, undefended settlements occupied by people of inferior social status to the free farmers of the rath. Such open clusters of settlement might well be the *baile* (*bally*) which have become incorporated so frequently in Irish place-names. If so the terse phrase in the Annals of Ulster under the year 1008 referring to the burning of the rath of Duneight with its *baile* takes on new significance.

## APPENDIX I

## BIBLIOGRAPHY OF EXCAVATED RATHS

<i>Site and name of county</i>	<i>Excavator</i>	<i>Reference to Published Report</i>
A. SMALL RATHS		
<i>Derry</i>		
1. Doon, Draperstown	McCourt, D.	Unpublished.
<i>Antrim</i>		
2. Sallagh Fort	Davies, O.	<i>Proc. Belfast Nat. Hist. and Phil. Soc.</i> , 1937-8, pp. 27-33.
3. Ballyaghagan	Evans, E. E. Proudfoot, V. B.	<i>Ulster J. Archaeol.</i> , XIII (1950), 6-27. <i>Ulster J. Archaeol.</i> , XXI (1958), 18-38.
4. Ballysillan	} Evans, E. E.	<i>Ulster J. Archaeol.</i> , xv (1952), 84-86.
5. Mount Royal		
6. Ballymacash		

<sup>87</sup> Further discussion in V. B. Proudfoot (1957).

<sup>88</sup> V. B. Proudfoot (1957), ch. 5; *id.*, 'Clachans in Ireland,' *Gwerin*, II, no. 3 (1959), 110-122, esp. 111-115; *id.*, 'Settlement and economy in county Down during the dark ages' (paper read at the annual meeting of the Institute of British Geographers, Cambridge, January 1959).

7. Lissac Bersu, G. *Ulster J. Archaeol.*, x (1947), 30-58; xi (1948), 131-133.
- Down*
8. Ballyfounder Waterman, D. M. *Ulster J. Archaeol.*, xxi (1958), 39-61.  
 9. Castle Skreen 1 Dickinson, C. W. and Waterman, D. M. *Ulster J. Archaeol.*, xxiii (1960), 63-77.  
 10. Castle Skreen 2 Waterman, D. M., and Dickinson, C. W. *Ulster J. Archaeol.*, xxii (1959), 67-82.  
 11. White Fort, Drumaroad Waterman, D. M. *Ulster J. Archaeol.*, xix (1956), 73-86.  
 12. Ballywillwill 1 } Waterman, D. M., and Collins, A. E. P. *Ulster J. Archaeol.*, xv (1952), 71-83.  
 13. Ballywillwill 2 }  
 14. Seafin Waterman, D. M. *Ulster J. Archaeol.*, xviii (1955), 83-104.  
 15. Glenloughan Proudfoot, V. B. *Ulster J. Archaeol.*, forthcoming  
 16. Lisnagade 2 Proudfoot, V. B. *Ulster J. Archaeol.*, forthcoming
- Louth*
17. Lissachiggel Davies, O. *Co. Louth Archaeol. J.*, ix (1939), 209-243.
- Armagh*
18. Corliss Davies, O. *Co. Louth Archaeol. J.*, ix (1940), 338-343.
- Fernamagh*
19. Boho Proudfoot, V. B. *Ulster J. Archaeol.*, xvi (1953), 41-57.
- Mayo*
20. Letterkeen Ó'Riordáin, S. P., and MacDermott, M. *Proc. Roy. Irish Acad.*, liv c (1952), 89-119.  
 21. Ardclon Rynne, E. *J. Roy. Soc. Antiq. Ireland*, lxxxvi (1956), 203-214.
- Wicklow*
22. Ballyknockan } Macalister, R. A. S. *J. Roy. Soc. Antiq. Ireland*, lxxiii (1943), 145-149.  
 23. Burgage Mor }  
 24. Lackan 1 } O'Connor, M. 5. *J. Roy. Soc. Antiq. Ireland*, lxxiv (1944), 53-60.  
 25. Lackan 2 }  
 26. Lackan 3 }
- Galway*
27. Feerwore Raftery, J. *J. Roy. Soc. Antiq. Ireland*, lxxiv (1944), 23-52.
- Limerick*
28. Carraig Aille I } Ó'Riordáin, S. P. *Proc. Roy. Irish Acad.*, lii c (1949), 39-111.  
 29. Carraig Aille II } Ó'Riordáin, S. P. *J. Roy. Soc. Antiq. Ireland*, lxvi (1936), 182.  
 30. Ballinamona Ó'Riordáin, S. P. *J. Roy. Soc. Antiq. Ireland*, lxvi (1936), 183.  
 31. Duntryleague Hunt, J. *J. Roy. Soc. Antiq. Ireland*, lxxxii (1951), 73.  
 32. Ballingarry Down Mitchell, G. F. *Proc. Roy. Irish Acad.*, lv b (1953), 245.  
 33. Cush Ó'Riordáin, S. P. *Proc. Roy. Irish Acad.*, xlv c (1940), 83-181.  
 39. Grange Ó'Riordáin, S. P. *J. Roy. Soc. Antiq. Ireland*, lxxix (1949), 126-134.
- Waterford*
34. Kiltera Macalister, R. A. S. *Proc. Roy. Irish Acad.*, xlili c (1935), 1-16.
- Cork*
35. Garryduff 1 O'Kelly, M. J. *Antiquity*, xx (1946), 122-126.  
*Int. Congrès Zurich*, 1953, p. 318.<sup>89</sup>  
 36. Garryduff 2 O'Kelly, M. J. *Int. Congrès Zurich*, 1953, p. 318.  
 37. Carrigillihy O'Kelly, M. J. *J. Cork Hist. & Archaeol. Soc.*, lvi (1951), 69-86.
- Kerry*
38. Leacanabuaille Ó'Riordáin, S. P., and Foy, J. B. *J. Cork Hist. & Archaeol. Soc.*, xlvi (1941), 85-91.

<sup>89</sup> *Int. Congrès Zurich*, 1953 = *Congrès Internat. des Sciences Préhist. et Protohist. Zurich 1950. Acte de III<sup>e</sup> Session* (Zurich, 1953).

## B. LARGER SITES

*Down*

40. Dundrum castle Waterman, D. M. *Ulster J. Archaeol.*, xiv (1951), 15-29; xxi (1958), 63-66.  
 41. Lisnagade 1<sup>90</sup> Jones, J. D. *Archaeol. Survey Co. Down*, forthcoming.

*Westmeath*

42. Togherstown Macalister, R. A. S., and Praeger, R. L. *Proc. Roy. Irish Acad.*, xxxix c (1931), 54-83.  
 43. Uisneach Macalister, R. A. S., and Praeger, R. L. *Proc. Roy. Irish Acad.*, xxxviii c (1928), 69-127.

*Clare*

44. Cahercommaun Hencken, H. O'N. *Cahercommaun* (Dublin, 1938).

*Cork*

45. Ballycatteen O'Riordáin, S. P., and Hartnett, P. J. *Proc. Roy. Irish Acad.*, xlix c (1943), 1-43.  
 46. Garranes O'Riordáin, S. P. *Proc. Roy. Irish Acad.*, xlvii c (1942), 77-150.

## C. MONASTIC SITE

*Down*

47. Nendrum Lawlor, H. C. *Nendrum* (Belfast, 1925).

## APPENDIX II

DETAILS OF HOUSE-STRUCTURES INSIDE RATHS AND CASHELS<sup>91</sup>

House, hut and building are used without any implied difference of function, hut generally being reserved for smaller structures, the terms being those used in the original excavation reports.

## A. SMALL RATHS

1. Doon Large round house.  
 Rectangular houses.  
 6. Ballymacash Central house about 28 ft. square, with porch added.  
 Roughly circular house of similar size.  
 Pent-house sheds.  
 7. Lissue Central house—rectilinear—stone kerb.  
 Rath entirely roofed over, diam. *c.* 100ft.  
 8. Ballyfounder Round or oval, diam. *c.* 20 ft.  
 Round hut?, 13 ft. diam.?  
 11. White Fort, Drumaroad Central house, 17ft. square (internally).  
 12. Ballywillwill 1 Hut? circular, 18 ft. diam.  
 16. Lisnagade 2 Square? house, 25 ft. square.  
 Rectilinear barn, 40 by 7 ft.  
 17. Lissachiggel Small huts—approximately circular, 4-10 ft. diam.  
 Rectilinear hut, 10 ft. square.  
 Lean-to structures against cashel wall, 12 by 5 ft., 12 by 7 ft., etc.  
 19. Boho Small oval and rectilinear huts.  
 20. Letterkeen Round house, 16 ft. diam.  
 22. Ballyknockan Pent-house sheds.  
 24. Lackan 1 Circular house?  
 25. Lackan 2 ?Long rect. buildings.  
 27. Feerwore Lean-to structures against bank?  
 Circular? hut, diam. 26 ft.  
 28. Carraig Aille I Rectangular huts, some built against cashel wall.  
 29. Carraig Aille II Original buildings curvilinear, later buildings rectangular—one 20 ft. long.

<sup>90</sup> At least one quernstone from Lisnagade is in private possession in Banbridge, perhaps as a result of the cleaning of the ditches in 1832 when a bronze cauldron, bronze spear, and arrowheads were reputedly found. Basset, G. H., *County Down Guide and Directory* (Dublin, 1886) p. 21.

<sup>91</sup> The rath numbers correspond to those in Appendix I.

33. Cush           Rath 1   Hut. Curvilinear or circular with possibly 1 straight wall—max. length 22 ft.  
                       — 3   Rectangular hut, 12 by 16 ft.  
                       — 4   Rectangular hut, 10 by 20 ft.  
                       — 5   Vague rectilinear buildings.  
                       — 5   ‘Circular house with dividing wall’—much more likely to have been recti-  
                           linear/oval with well rounded corners—26 by 20 ft. externally.  
                           Rectilinear house, 20 ft. by — ? ext.  
                           Oval house, 26 ft. by — ? ext.  
                       — 6   Rectangular house, 18 by 8 ft. internally.  
                       — 8   Divided house, rectilinear, with one arcuate wall 24 by 9 ft.  
                           Curvilinear houses, some with wattle walls.  
                       — 10   Rectilinear houses.  
 39. Grange           Circular house, 14 ft. diam. (internally).  
 35. Garryduff I       Rectangular houses.  
 37. Carrigillihy     Rectangular house, 32 by 18 ft. (internally).  
                           Square house, 16 by 16 ft. (internally).  
 38. Leacanabaile    Circular house, 14 ft. diam. (internally), partly corbelled.  
                           Rectangular, 20 by 23 ft. (internally).  
                           Building, 12 by 10 ft. (internally) against cashel wall.  
                           Rectilinear house, 28 by 12 ft. (internally) against cashel wall.
- B. LARGER SITES
42. Togherstown     Rectilinear buildings.  
 43. Uisneach        Stone-built houses, c. 16 ft. sq., c. 22 ft. sq. and 16 by 12 ft.  
 44. Cahercommaun   Rectilinear and curvilinear buildings, some built against cashel wall, 13 ft.  
                           sq., others about 20 ft. sq.  
 45. Ballycatteen    ? Lean-to sheds.  
 46. Garranes        Lean-to sheds built against palisade.  
                           Curvilinear hut?
- C. MONASTIC SITE
47. Nendrum         Huts—usually small and curvilinear, many built against cashel wall,  
                           e.g. 24 by 18 ft.

## ACKNOWLEDGEMENTS

This paper is largely based on work carried out at Queen's University, Belfast, during the years 1951-1959. I am deeply indebted to Professor Estyn Evans and Mr. Martyn Jope for much friendly advice, encouragement and criticism during that period and since. Mr. D. M. Waterman and Mr. A. E. P. Collins of the Government of Northern Ireland Archaeological Survey have been most generous in their assistance, and I am especially grateful to them for giving me access to unpublished material. Of those who advised me on specialized problems I am especially indebted to the late Mr. J. B. Arthurs (Seán Mac Airt) of the Celtic Department, Queen's University, Belfast, with whom I discussed all the literary and linguistic topics referred to in this paper. I am also indebted to the editors of *Ulster Folklife* and the *Ulster Journal of Archaeology* for the loan of blocks for FIGS. 29 and 30 respectively.

## REFERENCES

- M. V. Duignan (1944) 'Irish agriculture in early historic times,' *J. Roy. Soc. Antiq. Ireland*, LXXIV (1944), 124-145.  
 P. W. Joyce (1903) *A Social History of Ancient Ireland* (2 vols., London, 1903).  
 E. O'Curry (1873) *Manners and Customs of the Ancient Irish* (3 vols., London, 1873), I (by W. K. Sullivan).  
 S. P. O'Riordáin (1953). *Antiquities of the Irish Countryside* (3 ed., London, 1953).  
 M. and L. de Paor (1958) *Early Christian Ireland* (London, 1958).  
 Proudfoot, V. B. (1957) *Settlement and Economy in County Down from the Late Bronze Age to the Anglo-Norman Invasion* (unpublished Ph.D. thesis, Queen's University, Belfast, 1957).