PRECELTIC IRISH DESIGN

A discussion and evaluation of design in Ireland
from 9000 b.c to 2000 b.c

Dissertation Produced in Part Fulfillment of
Bachelor of Design in Industrial Design

And Submitted To

Faculty of Art and Design and Complimentary Studies

Author:
Philip J. Phelan

Department of Industrial Design.
Faculty of Design
National College of Art and Design
100 Thomas St.
Dublin 8.

Date: 13 March 1991

CONTENTS

LIST OF ILLUSTRATIONS

ACKNOWLEDGEMENTS

I would like to thank the following for their help and patience:

-Librarians of National College of Art and Design

-University College Dublin, Library

-National Museum of Ireland

-Mr. Paul O'Brien

-National Library of Ireland

Philip Phelan

PHILIP PHELAN

13.3.1991

INTRODUCTION

It must have been an impressive sight watching the capstone being laid on top of the great corbelled chamber at Newgrange, finally blocking out the light after perhaps 20 years of work. One can easily visualize the satisfaction that must have been on the faces of the people performing the feat, standing up to survey their surroundings atop what was then one of the world's largest artificially enclosed areas.

Whether these megalithic builders knew this fact or not is irrelevant, but what is relevant is the great driving force that lay behind the raising of many thousands of tons of material, the will to expend energy that had no apparent benefit for the builders, other than some ritualistic or religious gratification. Of course the reason behind the creation of this and other tombs of its kind are far more complex than this, and will probably never be fully realized. Despite this,one can relive the same human emotions that such an achievement must have provoked, the satisfaction in seeing the whole structure coming together as planned, the knowledge that must have been gained from it, the relief that the whole structure didn't collapse after construction when masses of earth were piled on top of the passage and corbelled roof.

This is design. The thousands of years of human creativity that led to this is also design. The progression of events that led from the first settlers flaking a piece of flint to the great organisational force that created Newgrange et al is an interesting chronological path of the advances in pre-metallic human activity, and is an ideal lesson in the

flexibility of materials in the hands of these ancient peoples. Foreign influences have played an important part in shaping the creativity of the Irish pre-Celts, but many design trends have remained insular after the initial introduction, and have been changed and modified to suit Irish environments, as in the case of the hollow scraper, which will be covered later.

The great pity of Irish archaeology is the dampness of the climate and the reshaping of the landscape by the glacier activity that have left little palaeolithic evidence of human activity here. The dampness of our climate forbade the survival of most organic artefacts from the Mesolithic and Neolithic eras. We must be content with stone, bone and shell artefacts in most instances. Nevertheless the insight offered by examining these alone is considerably beneficial in itself. For example some stone jewellery pieces are decorative imitations of actual wooden implements that would not in themselves have survived. Other jewellery pieces are of a nature that would seem to suggest that the megalithic tomb builders experimented with the metal rich ores of the Meath area, although there is no existing evidence to suggest that they ever found a workable metal.

Finally, the nurturing of these pre-Celtic peoples in the rich pasture lands of central and northern Ireland was paramount to the cultural growth of the region. In mesolithic times, when agriculture was not yet discovered, the availability of food such as deer and fish in a relatively small area meant that the tribes did not have to resort to an extensive nomadic lifestyle, which would have retarded their cultural growth. In the Neolithic period,too, the agricultural significance was important, because

people could be released from food-producing tasks to erect these megaliths and carve the numerous rocks around these sites while being sustained by the farming section of the group. The evidence left behind by these peoples and unearthed by the great archaeologists O'Kelly , Eogan and others is a testament to the unbridalled abilities of a culture stretching across six millenia of Ireland's earliest civilisation.

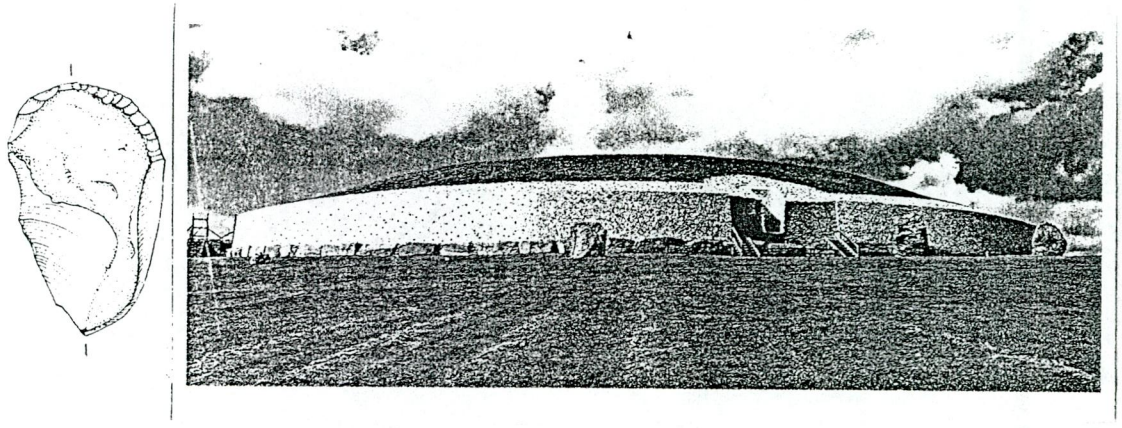


Fig.1 Bann Flake and Newgrange tomb, representative of the beginning and end of the pre-Celtic era

Chapter 1

The terrestrial patch of Earth which juts farthest west of the European mainland is Ireland, a fertile ancient land that lived quite peacefully for a long duration but a little less so in modern times. Nevertheless civilizations grew up and died here just as they did in numerous different sites across the globe in the first 10,000 years before the advent of Christianity.

During this time the landmass and configuration of the island changed because of the retreat of the vast ice sheets that extended to the coast of the Meditteranean before the dying stages of the last Ice age. There is some lack of agreement as to whether Ireland and Britain were joined by a landbridge in the northern Irish Sea at this time, but the coastlines were undoubtedly near enough for the most basic of sea craft to cross with little difficulty. Some oceanographers believe that the amount of water stored in the vast ice sheets during the last Ice age decreased the water levels in the oceans by 25 metres. Even if the water filled up to 50% of todays level during the great thaw, there must have been left a considerable amount of artefacts and other evidence of early human habitation hidden to the Irish Sea.

This may explain why evidence of British human activity dates from so much earlier.200,000 to 250,000 years ago there was human activity here during a temporary retreat of the ice sheet in an era called the Hoxnian interglacial. This was during the second from last retreat of the millions of tons of ice that have shaped the British landscape. In Ireland the anthropologists

Michael Herity and George Eogan have found evidence of human activity in Ireland in more recent times:

> A waste flint struck in Clactonian style was picked up on the surface of glacial gravel deposited as early as 20,000 B.C [9 p16]

Discovered in a sandpit near Drogheda, 40 kilometres north of Dublin, it was found that the strata in which the flint was found was once part of the Irish sea bed. Glacial activity redeposited the material in which the evidence was found from what was a fishing and gathering civilization somewhere off the Meath coast.

What was thought to have been Ireland's earliest human but now refuted, was the Kilgreaney B skeleton of the Cappagh caves in Waterford which was reputed to date back to 9000b.c. which was in the Old Stone Age and also in the last Ice Age.[Harbison p18].However detailed analysis through radio carbon dating has shown that the skeleton is Neolithic [O'Kelly p6]

At the time that this man might have lived, the southern part of Ireland was covered by a rich carpet of vegetation, including pine, oak and elm in a period known as the Boreal by biologists. Thus the countryside was a rich source of food and shelter with many wild animals such as the giant Irish deer, now extinct but a skeleton is on display of this magnificent animal in the Irish Natural History Museum, and wild boar also roamed and foraged.

The earliest inhabitants knew nothing of agriculture or the husbandry of animals, and were basically hunter/gatherers. These were a nomadic people who followed their food, such as the boar, and collected nuts and grain wherever they could find it. Since flint was only available in the North Eastern part of Ireland,

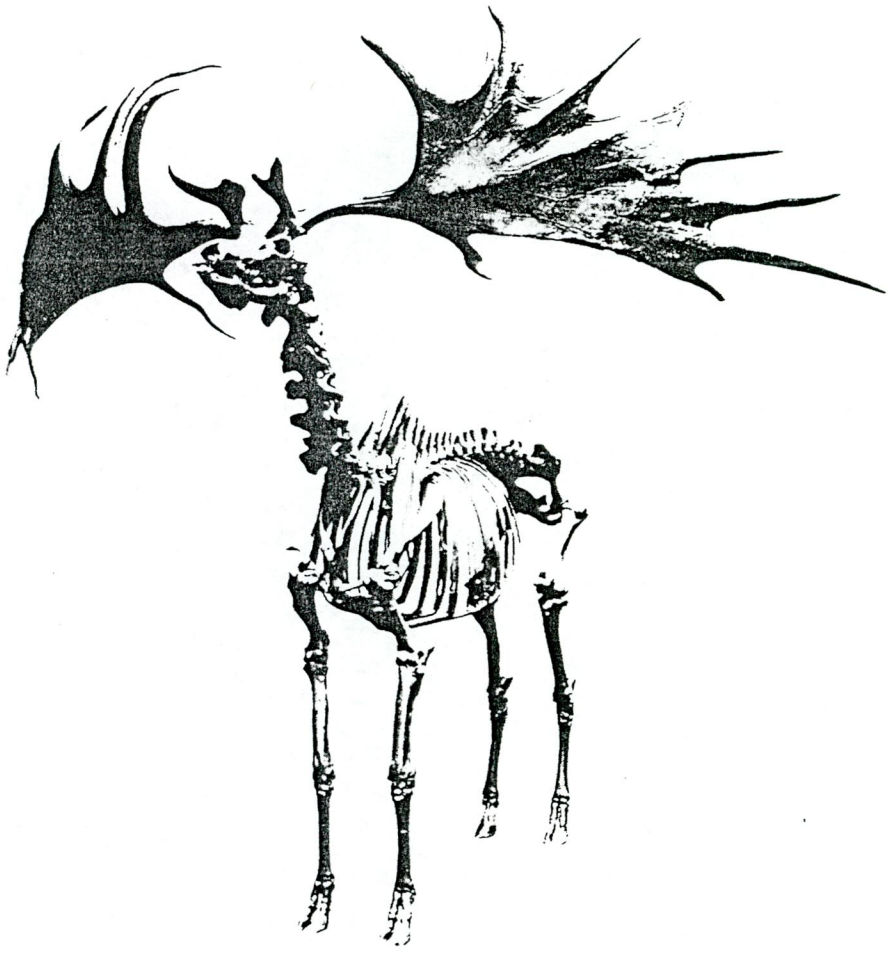


Fig.2 Irish Deer, with a massive 12ft antler span

around Larne in chalk deposits, most of the evidence that has been left by hunters is in that area, and it is highly probable that the main concentration of hunters was in this region, due to the properties of flint. It was much easier to hunt animals and dismember them with flint rather than set traps, which would have entailed a non selective kill, and cut them up with bone or inferior materials which would have been necessary outside this area.

This reliance on flint is quite significant in terms of the development of technology in the Mesolithic period. Flint is an

extremely versatile stone, and once it was discovered that flint 'cleaved' easily , the user could make sharp edges that were durable and easily reshaped.'Cleaving' is the ability of flint to split in cup-shaped pieces away from the main body of the stone, due to the internal structure of the material. The process of chipping this flint into the required tool is known as 'knapping'.

However flint was only one of the several different types of material available to the hunter. M.J. O'Kelly, the noted archaeologist notes

> Their tools would have been fabricated from stone, wood, bone antler and possibly shell, but unless the conditions were specifically favourable to their preservation, none other than the stone implements would survive [2,p13]

These organic materials could be fashioned into an number of different tools. It has been suggested that fire-hardened wood was extensively used by the mesolithic peoples, especially since the discovery of a fire-hardened spear tip at Clacton-on-Sea in Essex, England. This is the oldest surviving wooden artefact in the British Isles and has been dated to between 20,000 and 40,000

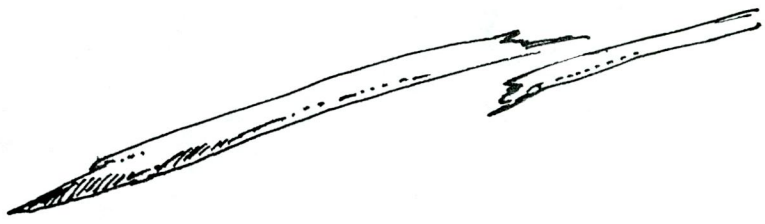


Fig. 3 Fire-hardened spear from Clacton-on-Sea preserved in peat for over twenty millenia

years ago. This was in effect a prehistoric method of surface hardening, a technique used today to make steels more durable.

Bone was quite a versatile material also. The early inhabitants would have needed to sew animal skins together to keep warm in a temperature that was considerably colder than today. Bone needles were ideally suited to this purpose and could be easily obtainable by splitting longbones or shaping them by scraping. The thread used in such garments may have been sinews or thin strips of leather.

Antler would have been used more as a weapon than as a domestic implement. With a sharpened edge it could be used to chop up game for consumption. As a bark stripper it would also have been a tool of considerable usefulness. However these applications are purely conjectural since little evidence of either fur or bone and antler tools has survived since the Mesolithic period. By recording data from the observation of present day and recently dispersed tribes in both Africa and South America it can be established that such uses would have been quite possible, since such tribes, like the Bushmen of the Kalahari, have used such techniques for thousands of years.

By virtue of the same technique it can be concluded that reeds were used quite extensively in wetland areas as they were used by islanders of the west coast to gather turf and seaweed in reed baskets. The complexity of the construction of some of these baskets may have been an evolutionary process stretching back to the early mesolithic. The use of these baskets could have spread with the maritime peoples who may have regularly fished along the coasts of Scotland around 5000 B.C. Once the weaving

principle became known it was quite possible to create large areas of flat surface, as in a wattle and daub house, or in more curved forms such as the frame of a coracle or curragh, vessels that were likely to have been used in mesolithic times.

Indeed the coracle is an application of several different areas of activity pooled to create a vessel capable of carrying humans - possibly the first manmade form of transport. The construction of a coracle is quite interesting. The builder measures out the frame size on soft level ground, the plan being usually semi-ellipsoid. Frame size is dependent on the size of the ox hide he has available. He then inserts long pointed hazel rods into the ground at span width intervals around the plan. Where the bow and keel are positioned extra rods are placed. A strong gunwale of smaller branches is woven through these to a height of half a hand span. Opposite rods are pushed over and lashed together. When the basket is pulled out ofthe ground the hide is placed inside and sewn to the gunwale. Smaller rods are bowed across the inside to keep the hide in position. [3 p234]

The coracle would be unlikely to have been made without the aid of flint. We will return to this material to discuss it more thoroughly. As stated already flint and other stone are amongst the only remaining evidence of human activity in early Mesolithic Ireland, and the mastery of these materials can be visibly seen as one progresses into the Middle and Late Mesolithic periods.

At the beginning of this Mesolithic period the range of tools found in Ireland was quite similar to those found in the rest of Europe, but as one progresses through the era one notices that

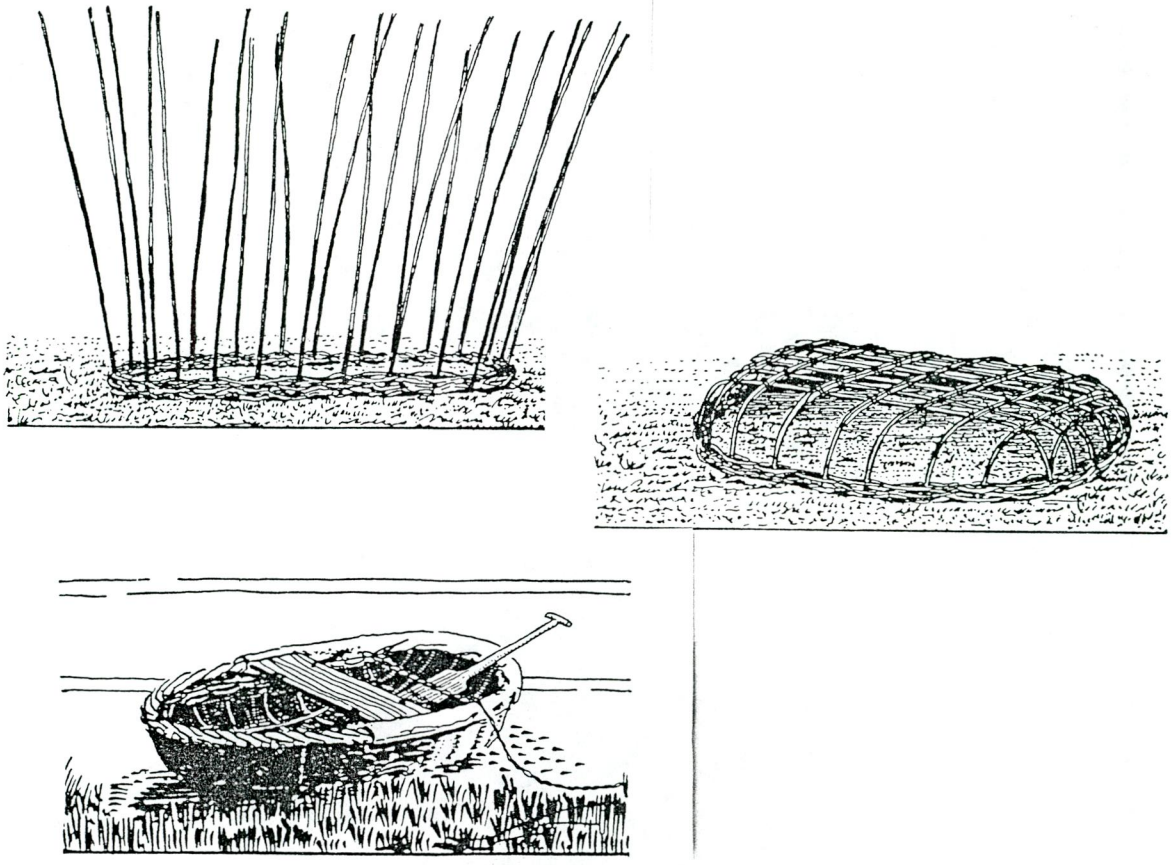


Fig.4 Boyne Curragh, brief construction technique

the style settles to a type not found widely elsewhere. In fact there was no introduction of new tools into the Irish Mesolithic 'toolkit', but rather the mesolithic peoples seemed to be satisfied with the equipment they had. In Scotland and on the western seaboard of France, for example, there were far more arrowheads of flint, and the lack of end scrapers ('burins' in archaeological terms) cold have meant that the Mesoliths may have used fire hardened spears or bone to tip their arrow shafts.

In creating a flint tool a suitable piece of flint was searched out with the desired surface features. If, for example, a flint blade was required for cutting up food or flesh a piece with a suitably flat surface was used. A sharp blow was given to this surface with another stone and the piece flaked off at that

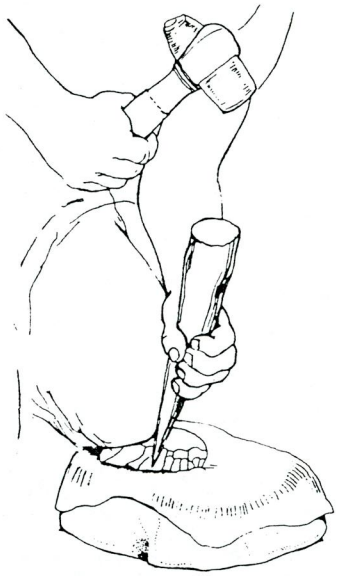


Fig.5 Flint production technique with hammer and quartz chisel point. The sharp edge created would last a considerable amount of time if it was used to skin an animal or cut vegetables. In the Mesolithic period this was the basic method of creating the desired implement.

In the Lower Bann valley an industrial flint making site has been found with over 15000 pieces of unfinished flint. This may have been a distribution site for flint requirements all over the North Eastern region of Ireland, since flint deposits are confined to that area of the country.

Although the flint knappers merged into a style seen across most of Ireland , there are slight variations and this is more marked in the early mesolithic phase. One example of this variation in early technology was the use of microliths. At Mt. Sandel in Co. Derry, which is one of the earliest inhabited sites yet excavated, there are many examples of this microlith application. The Mt. Sandel microliths, as described by M.J.O'Kelly, a Newgrange archaeologist:

Microliths were the commonest tool and consisted of small elongated blades in the form of scalene triangles,needlepoints, rods and micro awls.

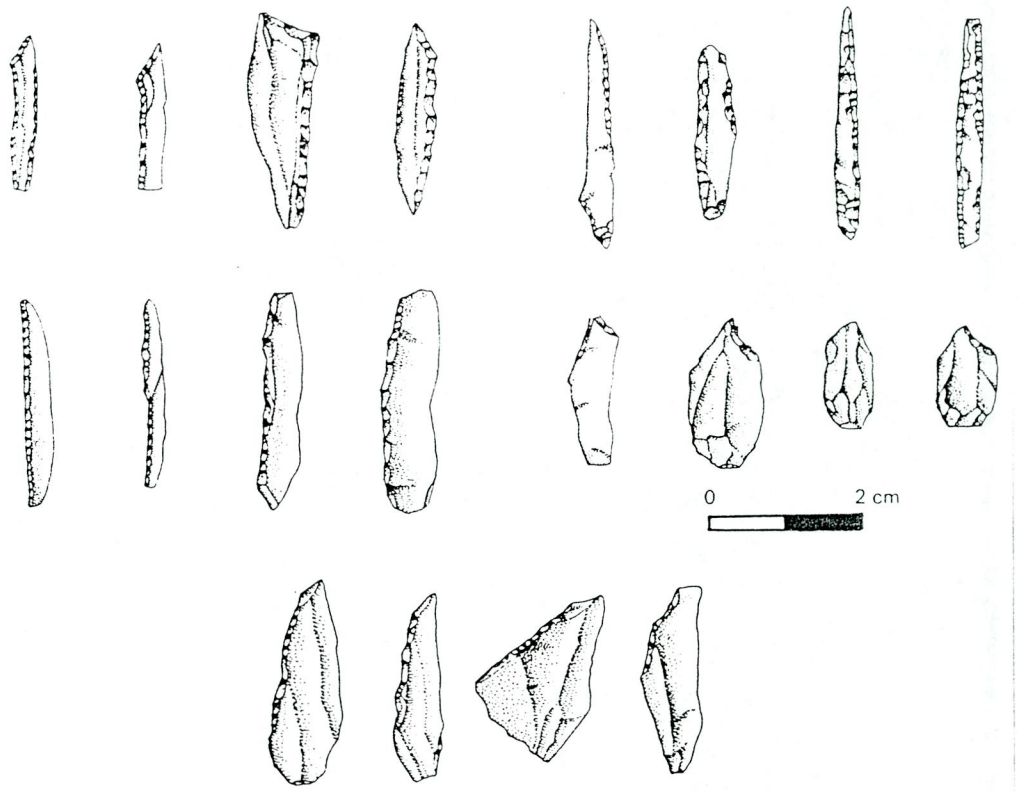


Fig. 6 Selection of microliths, used in composite tools.

Microliths are small shards of flint that are held in a frame of wood or antler. They were used for plant gathering, slicing, grating, fibre processing, snares, nets and traps, shell openers etc. David Clarke British Archaeologist writes:

> Not the least economy of the technique was its construction of composite tools in terms of small, rapidly replaceable and interchangeable, standardised mass produced units, manufactured in advance and kept in readiness for inevitable wear and tear [7,p13]

In fibre processing the microliths may have been used as a

kind of grater board. Ethnographic evidence suggests that such devices were used in rope manufacture. A board was implanted with many lines of tiny flint, sometimes up to 3000. In addition to rope manufacture it could have been used to grate food and process leather.

Microliths were also discovered in Lough Boora, Co. Offaly and Blackwater, Co. Cork, and show that these peoples travelled considerably, and may have represented the first explorers and developers of this territory.

The absence of any flint in either the Offaly or Cork sites meant that alternative materials had to be found in these areas to replace flint. This material is chert, a black stone that breaks with a flat fracture. It is mainly found in limestone quarries through Kildare and Offaly, with smaller deposits in Cork.

Flint implements were of many different shapes, suiting varied functions. Generally along the north eastern coastal regions the flints tended to be broad flat-bladed types probably shaped especially for fish processing. Once on travels inland far more processes are required, and so the variance in flint types is explained. Small knives were the most popular, tending to be between two and four centimetres long. Although there are very few arrowheads found in early mesolithic sites, there are long thin flint points that may have been simply lashed to the side of the shaft.

Few examples exist of early mesolithic architecture but data

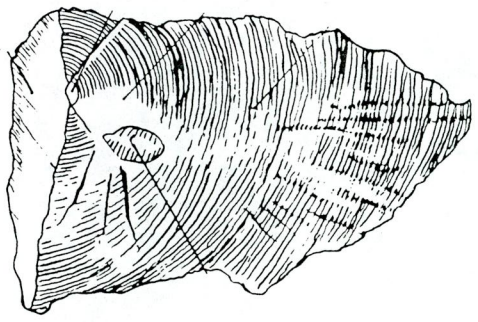


Fig.7 Flint Flakes, as used by the first settlers.

collected from the Mt. Sandel site gave some evidence of a very basic abode constructed from rods stuck in in the ground to a depth of fifteen centimetres in a circular plan. The rods were probably bent over and tied to each other, since their diameter would have made them too weak to support cross-members. There may have been subdivisions inside, and each hut had a central hearth. In size they were quite large, being on average six metres in diameter. It may have been this principle of construction that gave rise to the method of manufacture of the coracle.

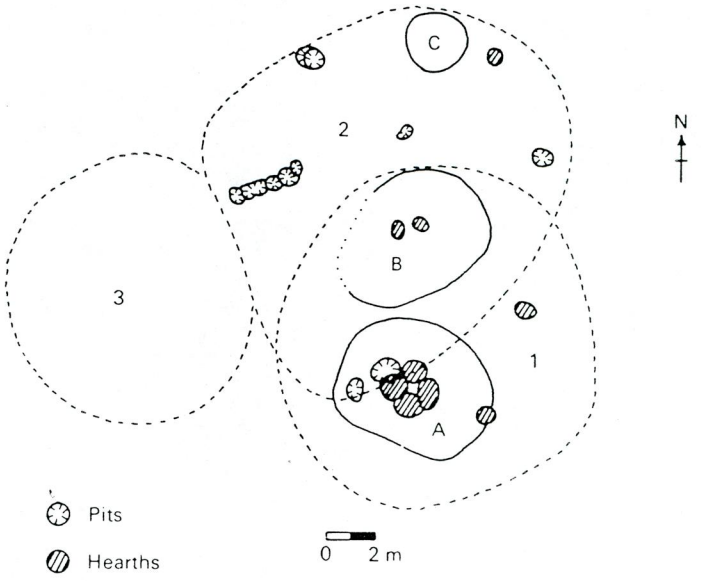


Fig.8 Mt.Sandel upper

Chapter 2

The most notable aspect of the whole Mesolithic era was the total absence of any pottery evidence in any site yet analysed in Ireland. Pottery is quite specialised relative to flint manufacture or shelter erection, and it is quite possible that overseas influences had not materialized at this time. Pottery will be discussed in the Neolithic section later where it's introduction into Ireland will also be covered.

The fact that the toolkit settled into a rather stable set by the later Mesolithic period suggests that there was little contact between the Irish and foreign civilisations at this time. The Irish toolkit had virtually no new implements introduced into it during this period, and in general the quality of the flint knapping was inferior to the early mesolithic.

The most notable introduction to the flint technology of the period was the Bann flake. This was a five to eight centimetre long, tear or leaf shaped flake that was retrimmed around the base on each side to produce a more durable edge. This modification around the 'butt end', in archaeological terms, was usually only two to five centimetres across. The function of such knives was probably for cutting up carcasses. Experiments have been carried out with flint on animal carcasses, and one archaeologist in Kenya proved the point by totally dismembering a cow in about six hours! [16p84]

Flint knives could be as detrimental to the user as much as to the object being cut, so most archaeologists surmise that the flint was either wrapped in moss or else was tied by some means to a handle. This allowed the user to carry on using the flint

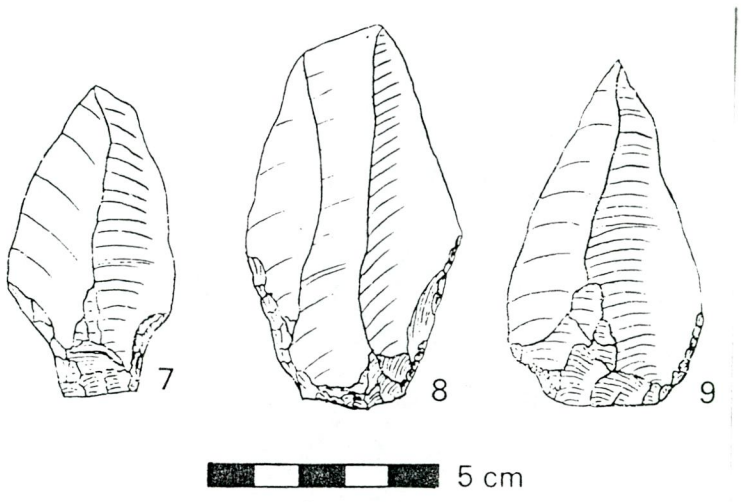


Fig. 9 Bann Flake. Note trimming around base, or 'butt end'

without discomfort to the hands. Hence the introduction of the first user friendly, or ergonomic knives.

Other features of the late Mesolithic period were the polished stone axes, borers and other heavy duty tools. The polished stone axe is a curious development in the mesolithic for a number of reasons. Firstly, why should they have taken such care in the outside appearance of the tool, when all that really mattered was the quality and size of the sharp edge? Secondly, it would have been more difficult to 'haft' a polished stone axehead to a

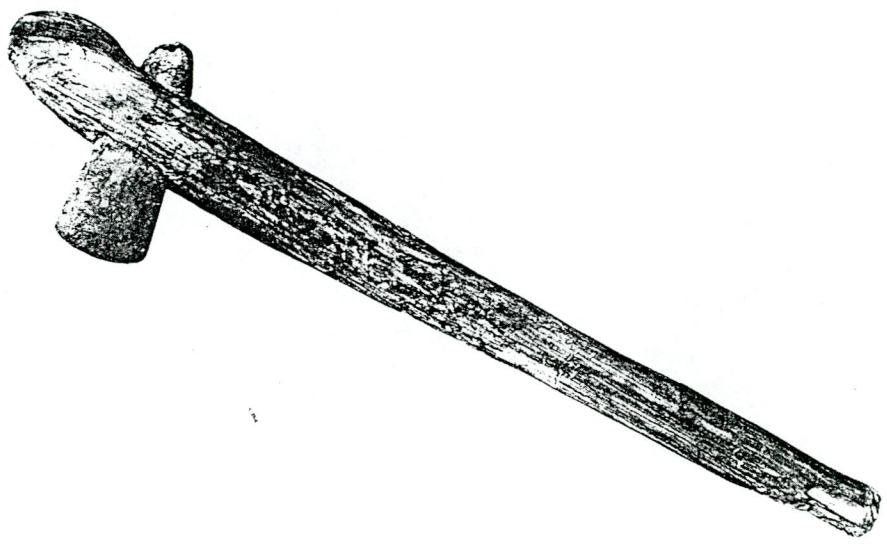


Fig.10 Hafted , polished stone axe, found in Fermanagh

handle since there would be less grip for any binding materials. The main theory is that polished axes would last longer since there was no weakness on the surface to stress the structure, which would cause splitting when the axe would have been used. The polished stone axes seem to have been finished off with a level of smoothness that would have made them very aesthetically pleasing as a design aswell. Perhaps the axe makers were trying to rival each other in the excellence of their product?

The late Mesolithic period was not marked by any exceptional advance in shelter or other architectural areas but the Mesolithic peoples were obviously beginning to take more care in interring their dead, and it is in this area that the Ultimate Mesolithic and Early Neolithic peoples first began the megalithic tomb building that was to continue for two millennia.

The late Mesolithic period overlaps with the Early Neolithic period in some sites. Called the Ultimate Mesolithic period it marks the transition from man the hunter/gatherer to man the agriculturalist/builder. The Mesolithic peoples were scattered over the whole of Ireland during this period and evidence can be seen from the North East at Larne and Mt. Sandel to the south west at Ballyferriter in the Dingle peninsula. The latter site was analysed in the mid '80's and in addition to flint and chert artefacts being found there were greenstone pieces, which were the most common type. This site is considered to be late Mesolithic in origin and dated from 5620 years ago. This is possibly one of the last Mesolithic sites to be discovered in Europe before the transformation to Neolithic culture.

Chapter 3

The Neolithic period was an especially important era for Irish history, and quit possibly tthe most important. Cultural advances were made in the space of two millennia, from 4000 b.c. onwards that are considered remarkable some of todays authorities on ancient civilisations. The visible evidence of this leaves us in no doubt that Irish designers were amongst the most advanced in the World.

The genesis of Neolithic Ireland was peculiar in the sense that an island that is traditionally noted for its fertility and farms was devoid of sheep, cattle or goats and the cereals with which to feed them. These were all introduced to Ireland through Scotland in the Neolithic period. Hence there is little evidence in the Early Neolithic of artefacts connected with either animal husbandry or agricultural activities. The majority of finds are in relation to refined Mesolithic instruments used for hunting or processing food and habited sites and tombs.

The advancement in the flint and stone technologies of the early Neolithic period can mainly be attributed to the necessity to clear forests for agricultural and pastoral purposes. Flint was heavily relied upon until the arrival of copper in Ireland 4000 years ago. The polished stone axe came into its own as a workhorse of the Neolithics. Other artefacts such as the end scrapers and querns allowed them to increase their productivity. J.D. Bernal, a researcher who writes extensively on ancient implements, stated:

> The important point is that through social conditioning man is able to have at his disposal at every stage of culture a

reproducible, practically standard set of implements [12 p 67]

The axe is the most influential of all early man's tools. The landscape of Ireland was changed quite extensively by it. William Watson, assistant keeper of the British Museum, stated on early axe technology

> [The axe] is an all-purpose tool in which maybe seen an effort towards standardization- the production of the ideal broken stone- rather than the adaptation to various specific uses.[8 p46]

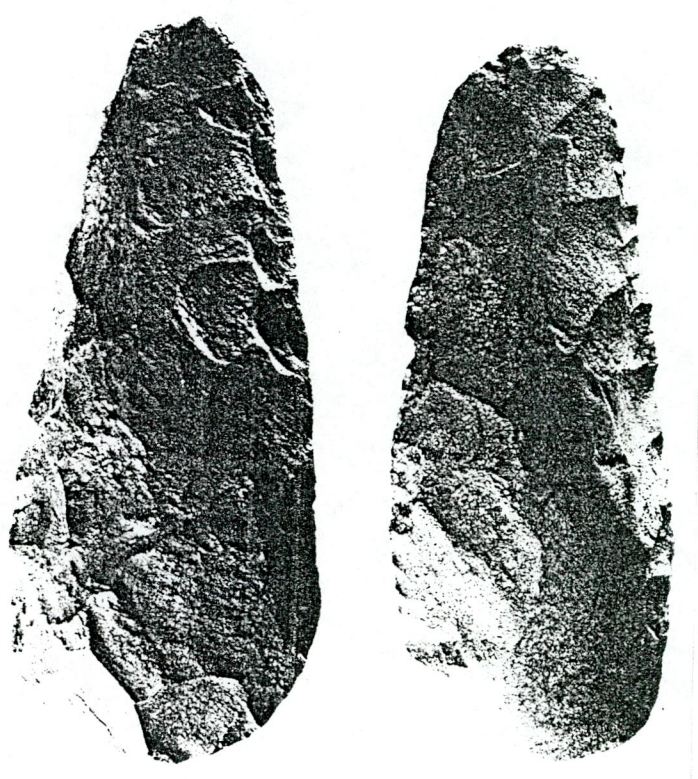


Fig. 11 Porcellanite axes found on Rathlin Island

He believed that one well designed multipurpose tool was better than the use of several specialised implements, and could be applied to various tasks with good effect. For the neolithic

peoples such a tool would have a considerable utility value since lesser tools would have to be made and therefore there would be more flint available. A neolithic economy may have grown around the manufacture and distribution of flint implements.

In relation to the stone axe being a multi-purpose tool there are several applications. A twenty five centimetre diameter coniferous tree takes approximately twenty minutes to fell, using a stone axe and polished axes were used to trim and split wood to make shelters. As a weapon the axe was an instrument of fear for those who infringed land rites or disobeyed the Druid's orders. P.A.O'Suiochain a historian on Irish mythology states-

> They did carry wooden stone capped weapons, but the stone was specially selected,then honed and sharpened to polished perfection. So efficient and sophisticated was the manufacture of stone axes that they continued long into the Bronze Age in competition with bronze axes [5,p81]

The Neolithic axe was hafted to the handle by carving the handle from a wood strong enough to take the stress, such as ash, and making a hole in it's base to enable the axehead to be slotted in place. The axehead was held firmly by binding it to the handle with rawhide, or by wedging into place with other pieces of wood and shrunk tight. There is also a possibility that the axehead may have been glued in place with resin from coniferous trees. (See fig.10)

Axes that were hafted perpendicular to the shaft were used for timber processing, if they had a short handle, or for tillage if the handle was longer, giving added leverage. The tillage version was called a mattock and was used for breaking up

hard or virgin soils,while the short version used for timber processing was called an adze. Adzes tended to have smaller axe-heads.

Porcellanite,which was mined at Tievebulliagh, Co.Antrim, was an extensively used material for axe-heads, possibly because it was easily grindable and polishable. Igneous and metamorphic rocks were preferred by other neolithic axe builders perhaps because of their location or else preference for other stone types.

As well as Tievebullagh, axe factories have been found at other sites in Northern Ireland, at Cushendall, Co. Antrim and Brockley on Rathlin Island. Here many rough axe forms were found, where there was probably a selection process to find the best specimens. These were then brought back to base camp for grinding with sand and water on a high friction base, such as sandstone or quartz. The timescale for the production of a stone axe, according to the French archaeologist Mohen was about an hour for roughing out a basic axe shape from a flint block and, and another hour to trim and refine it. Between two and four hours were needed to smooth it, and the most laborious of the processes, polishing, took between two and three days [10 p232]

Architecture in the early Neolithic period advanced somewhat aswell with a more geometric groundplan being the most notable change. A site at Lough Gur in Co. Limerick yielded rectangular plan structures. Some of them may have been for living while others may have been for the purpose of burial or rituals. Michael Herity, an archaeologist specializing in megaliths states

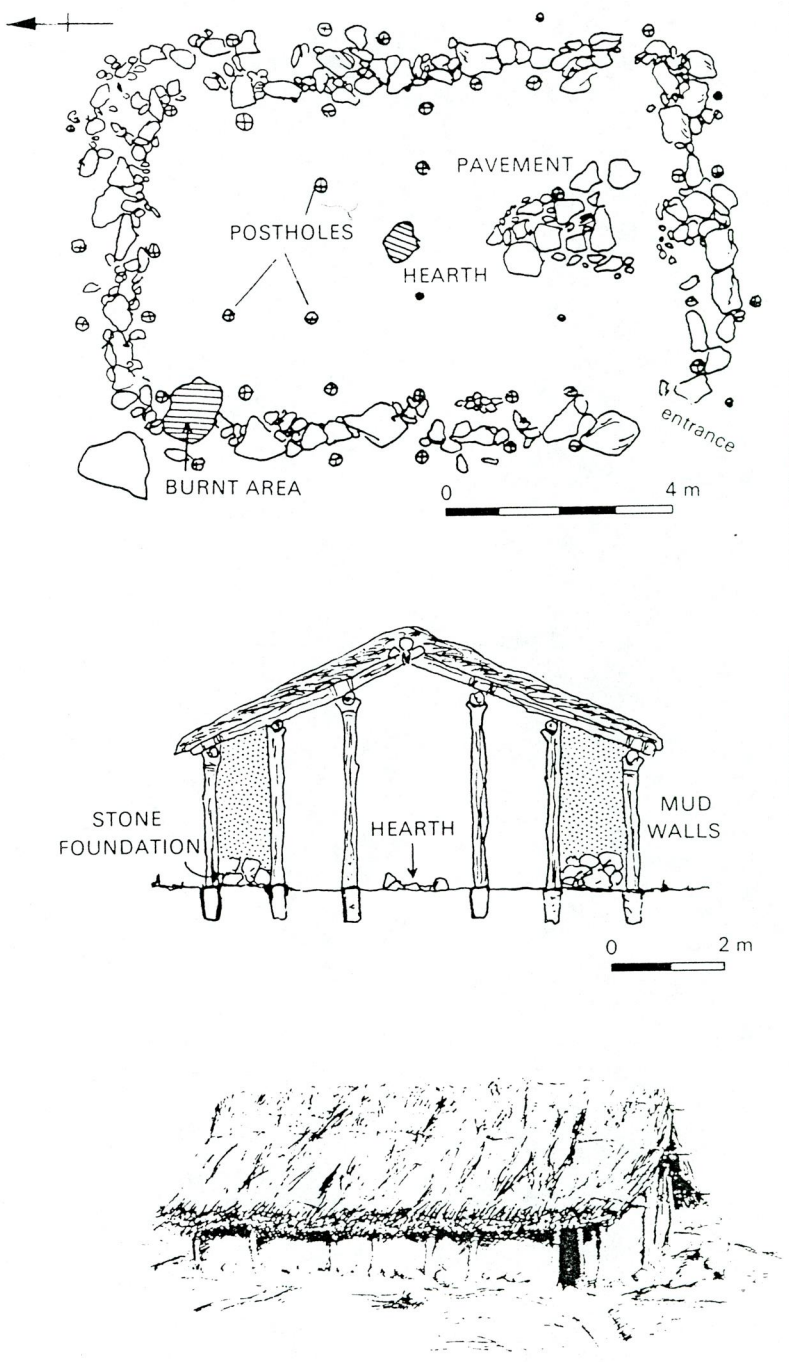


Fig. 12 Lough Gur, house 'A'. Note thickness of walls and stone foundations to keep mud dry

The definite linking of any group of houses with any one of the burial groups is difficult because of the differing function of the two kinds of sites and because of the

disparity in representation of the houses in relation to the more durable burial vaults [1,p33]

However the most impressive of the Lough Gur structures is believed to have been living quarters, since there are charcoal deposits in the central floorspace. The building must have been quite large as the surrounding walls measured approximately ten metres by eight metres. There were three aisles within the foundation plan which were divided between two lines of posts. The inner aisle was probably used for living and sleeping, , the outer aisles for food storage. The structure is believed to have been made from turf or sod walls, with supporting poles in the walls spaced about two metres apart. The roof could have been either a thatched structure or turves resting on a slanted frame. The rectangular stone foundation was a 'socle', or drainage base to keep moisture away from the turves. Houses like these could be seen during famine times in the 1840's when evicted tenants in Mayo and the west coast area built hovels of turf as temporary abodes.

A different type of construction was discovered at Ballynagilly, Co. Tyrone. This is one of the oldest inhabited Neolithic sites found, dating back 5600 years ago. It also had a rectangular structure, with postholes at each corner, each set about thirty centimetres deep. Radially split planks may have been used in the construction of the house, and would have been set vertically around the wall area, possibly plastered with clay daub to exclude wind and moisture. Two hearths were found within the floorspace area. In size the plan had six metre sides, and also had midfloor posts to support the roof.

A third site with oval shaped structures has been found in Carrowmore, Co.Sligo. This site is also a neolithic cemetery. The buildings consisted of two oval plan foundations of about seven metres by five metres and made of earth hollowed on the outside, and the material deposited on the inside to create a steady material in which to place the posts. The house would probably have looked like a wigwam in shape, with the posts meeting in the middle above the central area of the plan. The conical frame may have been covered with straw or animal skins.

The level of technology present in the habitations of the neoliths was far superseded by that used in the construction of the megalithic tomb builders, who have left behind hundreds of examples of their work. This will be discussed later but there is a wealth of other artefacts found in the early neolithic era that , despite scale difference, are just as important as the megaliths.

Chapter 4

Pottery is one area that deserves significant attention because this is one of the first composite materials to be used effectively by man.Little pottery has been found on any Irish Mesolithic site but as the Neolithic period begins to emerge we find a higher concentration of pottery shards. In later Neolithic sites pottery is almost always present. Archaeologists have classified the mass of pottery so far collected into groups of styles which vary both in physical and chemical form.

The main design groups are the round bottomed wares and the flat bottomed ones. The round bottomed versions are believed to be from earlier sites and tend to be less detailed in ornament as one progresses back to the earliest examples found. Although ornamentation may be lacking on quite a few of the earlier examples, the quality of the material used is generally high from the outset, which indicates that the technique may have been imported,possibly from Scotland, and once the basic technique was established, it would have been modified to suit different environments.

Herity sees pottery as being more than just pretty vessels:

> Combining as it does several diagnostic traits pottery is a sensitive indicator of the cultural status and relationships of its makers [4 p137]

This status, in Ireland, is concerned with both the living and the dead, because some of the pottery evidence is from habited sites while other fragments are from ritual and burial sites. Irish passage graves contained quite a large proportion of the pottery shards now housed in museums which is indicative of the

high respect the Neolithic peoples had for their dead and for ritualistic practices.

The pottery types found in Ireland are called Western Neolithic , because the same types are found both in Ireland and England. Probably the most notable of all Irish pottery types is Carrowkeel ware, which is a ritual type pottery found in fifteen sites around Ireland. Carrowkeel is a Megalithic cemetry and habited sites in Co. Sligo which will be discussed later.

Carrowkeel pottery is made from a coarse and heavy gritted clay containing a stabilizer of crushed shells and pebbles, and the characteristic shape is that of a hemispherical bowl, in most instances. A stabilizer is required to stop the pottery from

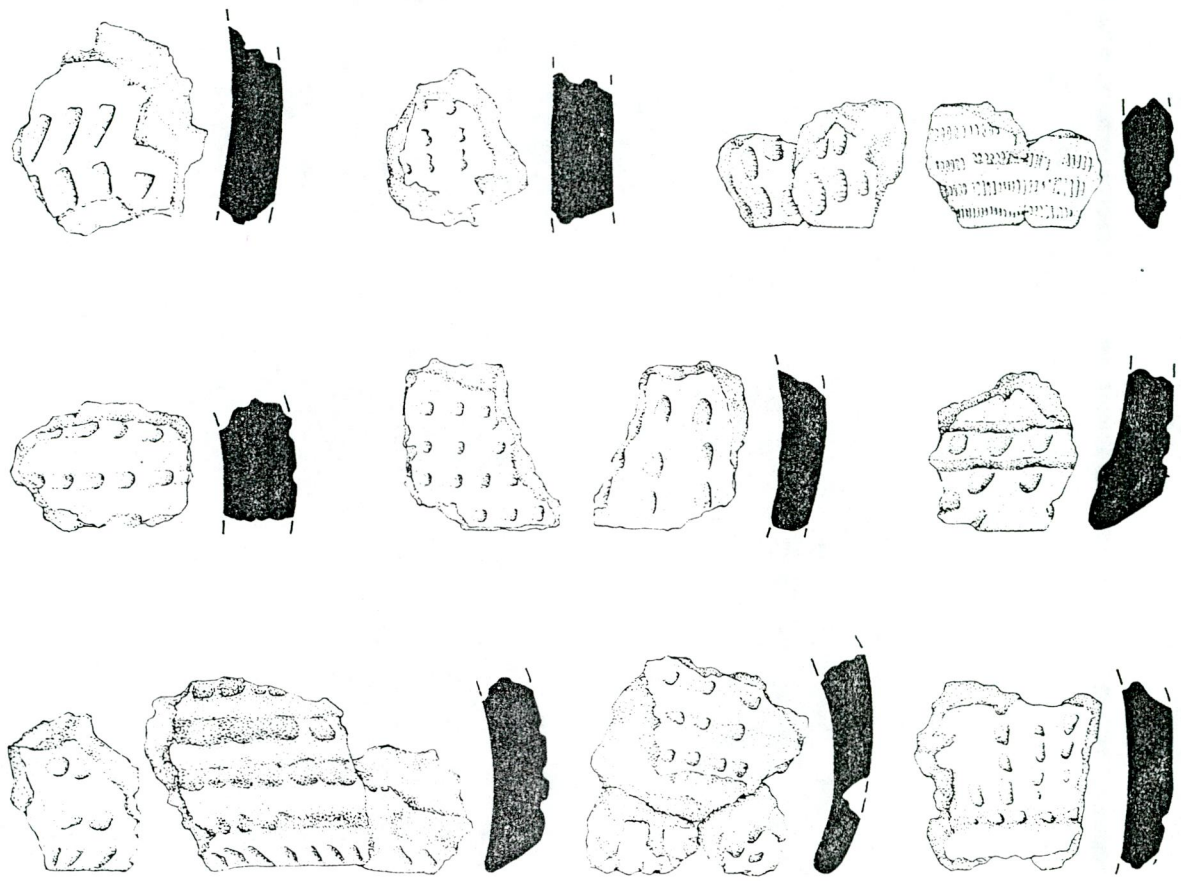


Fig. 13 Carrowkeel ware fragments with various impression types

cracking during firing, by slowing the contraction during moisture evaporation. The basic embellishment is of rough linear dimples in layers all over the outside surface and on the rim, but the final product looks quite well finished once the surface has been smoothed to disguise the rough texture of the interior. In diameter this type of ware rarely exceeds twenty five centimetres, and can vary in thickness between 1 cm and 1.5 cms. This limitation on size is probably accounted for by problems encountered with cracking in firing larger pieces.

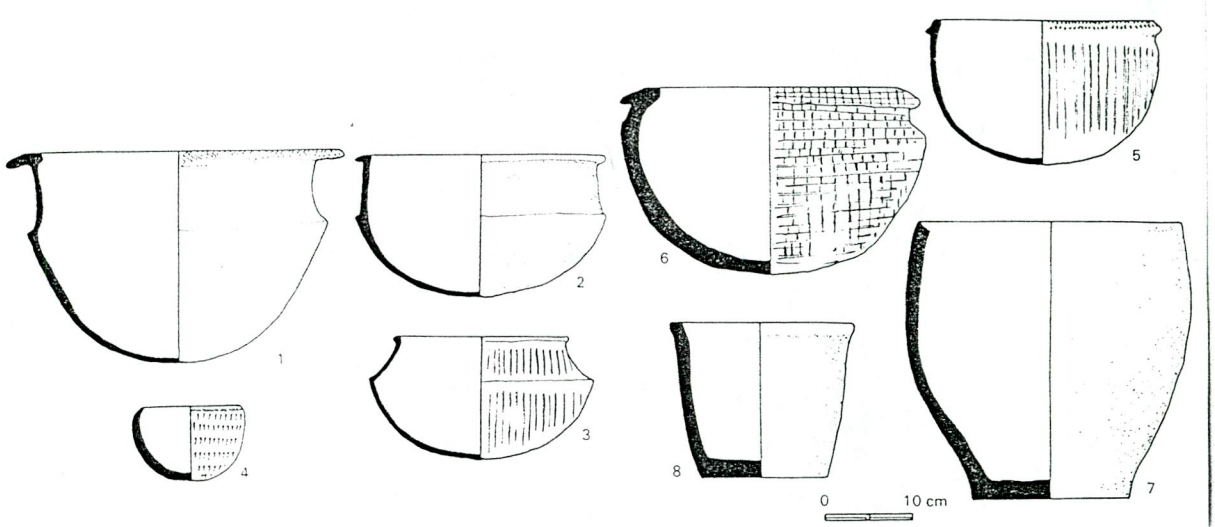
Some other styles are a variation on this Carrowkeel ware. Vessels found in Tara, Co. Meath are built of buff coloured clay with shell grit contained in the material. The style of embellishment is also a dimple type. On other shards found on the site decorations matched tomb engravings seen in Tara and elsewhere.

The pottery generally tends to be constructed by coils of clay wound in a spiral tower of the shape desired. These coils were then smoothed out into a plain vessel shape. Sometimes and uneven firing of the vessel can cause the spirals to split where they join, and this can be seen in some examples unearthed. This pottery would only have been suitable in domestic situations for storing dry foods, as the ware tends to be friable and soft, and not waterproofed. This may be why it is found more frequently in tomb sites. A technique that was often used was to cover the rough substrate with a smooth textured 'slip' of shell free paste, and it is this layer that would have been decorated.

Other pottery types were of higher quality materials than the Carrowkeel ware. Round bottomed Sandhills ware is of mid

Neolithic origins and is found in habited sites and in various court tombs. This ware is of Nordic influence and can also be found on the Antrim coast, where O'Kelly attributes it to the acculturated coastal Late Larnian people, a group that settled in Ireland from Scotland in the late Mesolithic period. [2 p56]

Flat bottomed ware has been found in Lough Gur and Rockbarton, both in Co. Limerick, and Kilcoyle, Co. Derry. The Lough Gur flat bottomed ware has the distinction of being found on the same site as the round-bottomed ware. The two are quite different both in size and shape. The flat bottomed ware is quite tall with very cylindrical sidewalls, with some examples containing a foot at the base to aid stability. Decoration on this type was kept to a minimum, perhaps because it was more of a domestic item rather than a ritualistic one. Kilcoyle ware was bucket-shaped and contained no embellishment at all.



1,2,7 Lough Gur;3 Ballyalton Bowl;4,Carrowkeel ware;5,Sandhills; 6,Linkardstown;8,Kilkoyle

Fig.14 Neolithic wares of various styles

In addition to pottery, other techniques developed in the early Neolithic which were to influence flint tool implements. One of the most effective was the use of a fine bone to 'pressure-flake' implements. This bone point was pressed against the flake and took small localised flakes from the core. By this

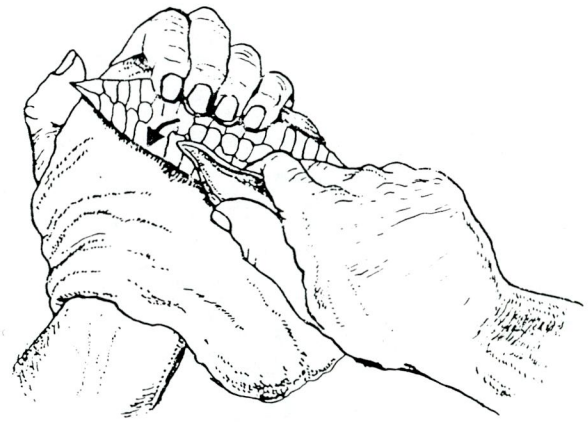


Fig.15 Pressure Flaking using a bone point

means very sharp and accurate objects could be made. There survives some excellently crafted examples of arrowheads, knives, hollow scrapers and end scrapers, which were products of this technique. Indeed the arrowheads themselves are several experimentations in form that were created by the knappers. Five basic types have been identified.

The petit tranchet, a long thin asymmetrical arrowhead which has been found in Newgrange and other megalithic sites, is rare in Ireland but is common in Iberia and Scandinavia, and is the main arrowhead type found in Brittany.

Kite-shaped arrowheads have been found in Glencolumbkille in Co.Donegal and Ballintoy, Co. Antrim. This type is native to

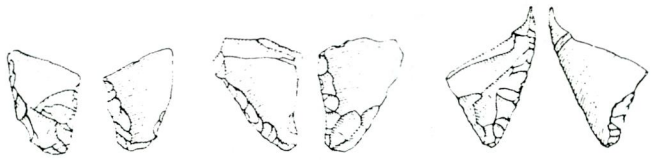
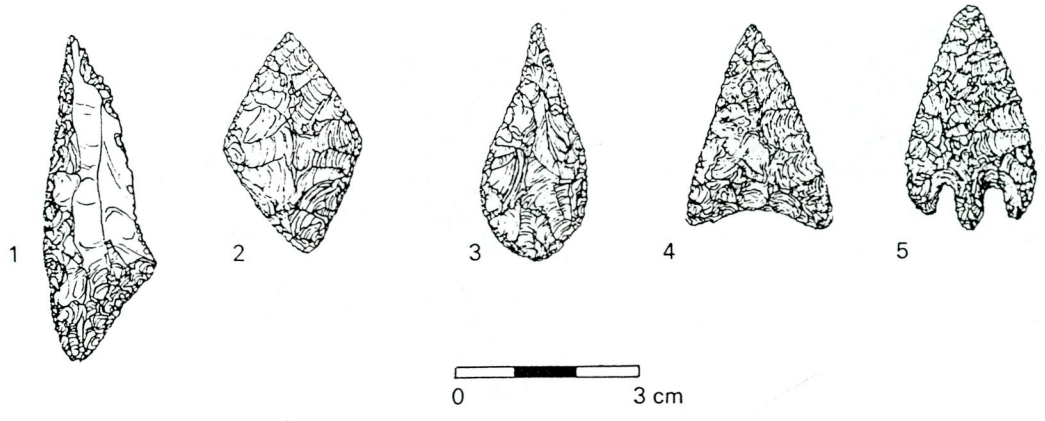


Fig.16 A selection of Petit Tranchet arrowheads

Ireland and is also found in the Boyne valley. Examples of the kite type have been discovered in Wales and at Finistere in



1. Petit tranchet derivative,;2,lozenge; 3,leaf; 4,hollow-based; 5,barbed and tanged

Fig.17 Arrowheads used in the Neolithic period

France. The kite is a derivative of the leaf-shaped arrowhead which is the most widely found in Ireland. As with the kite this has also been found in Wales, at Anglesey, where quite a number of Irish type artefacts have been found.

Hollow-based and 'barbed and tanged' arrowheads are also found but like the petit-tranchet,are also rare. There have been examples of hollow-based arrowheads in Carrowmore and Knocknarea, but examples are believed to exist on east coast sites. However the lack of excavations means that data on this has not yet been

collected.

The Barbed and Tanged arrowhead is the most difficult to make, but is also the most beautiful of the range. This design has even retained its form when the material switched from flint to bronze when the latter period arrived in the Late Neolithic. An example of this design has been found at Harristown, Co.Waterford. The barbed and tanged arrowhead is a design that surfaced here through either Breton migration to the south coast or may have been a gradual influence through Breton infiltration into British Neolithic styles which spread here.

Although one arrowhead type would have sufficed as a flesh piercing projectile tip, it is interesting to note the variations in styles that have been used through different social groups and also at different times in the Neolithic period. With slow and gradual experimentation and influence from external areas, these arrowheads eventually became standardised forms and became part of the workhorse toolkit of a people who were denied the knowledge of metalwork.

A feature of the flint industry that developed in Ireland during this period is the hollow scraper which is an implement rarely seen abroad. The hollow scraper is a thin section flint with a roughly semicircular notch cut into one edge and sharpened around its circumference. Such an implement may have been used as a kind of Neolithic spokeshave for arrow shafts, and perhaps for processing fibres. It is found in most Neolithic sites and also in court and portal tombs. One site, Carrowmore, yielded more hollow scrapers than any other

implement type, which indicated the importance of such a tool for different environments at that time.

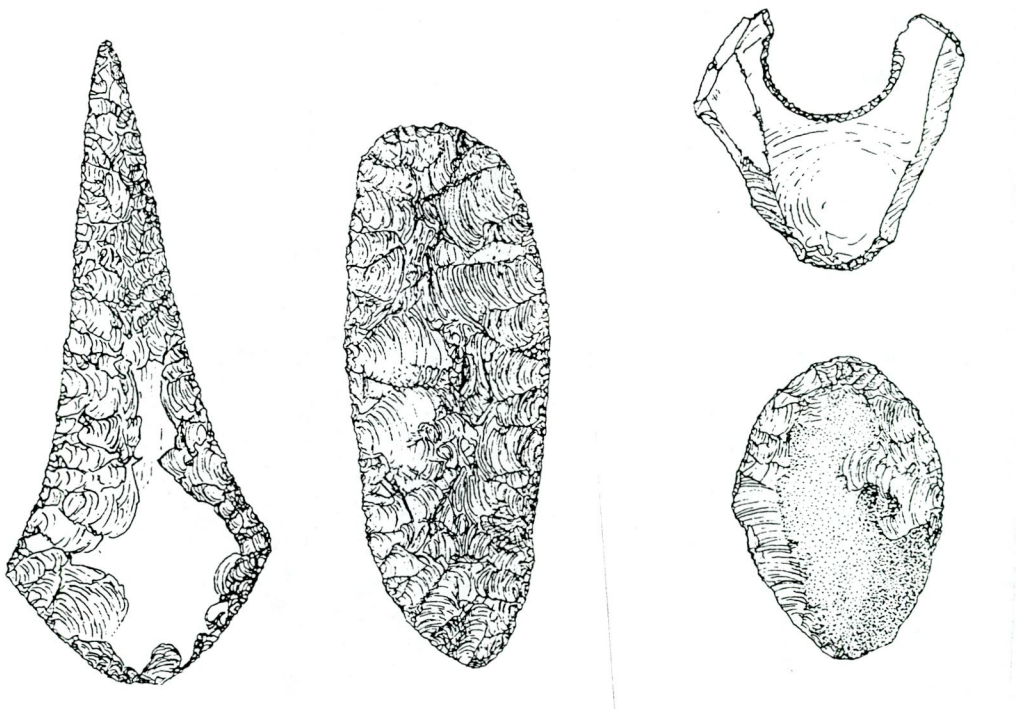


Fig.18 Javelin head,plano-convex knife, hollow and end scrapers

Also surviving through the ravages of time is evidence that the Neolithic Irish may have experimented in metallurgy without ever actually having produced a metal. Such indications are implied in the maul and pestle type adornments worn by peoples populating megalithic sites. Such experiments may have been influenced from abroad, where metallurgy was actually yielding workable metals at this time. The inconsistent quality of Irish ore bodies outside of Tara was probably major hindrance to their efforts. Herity notes that in reference to the absence of stone tools from burial sites that these peoples:

were effective also in excluding metal implements from the

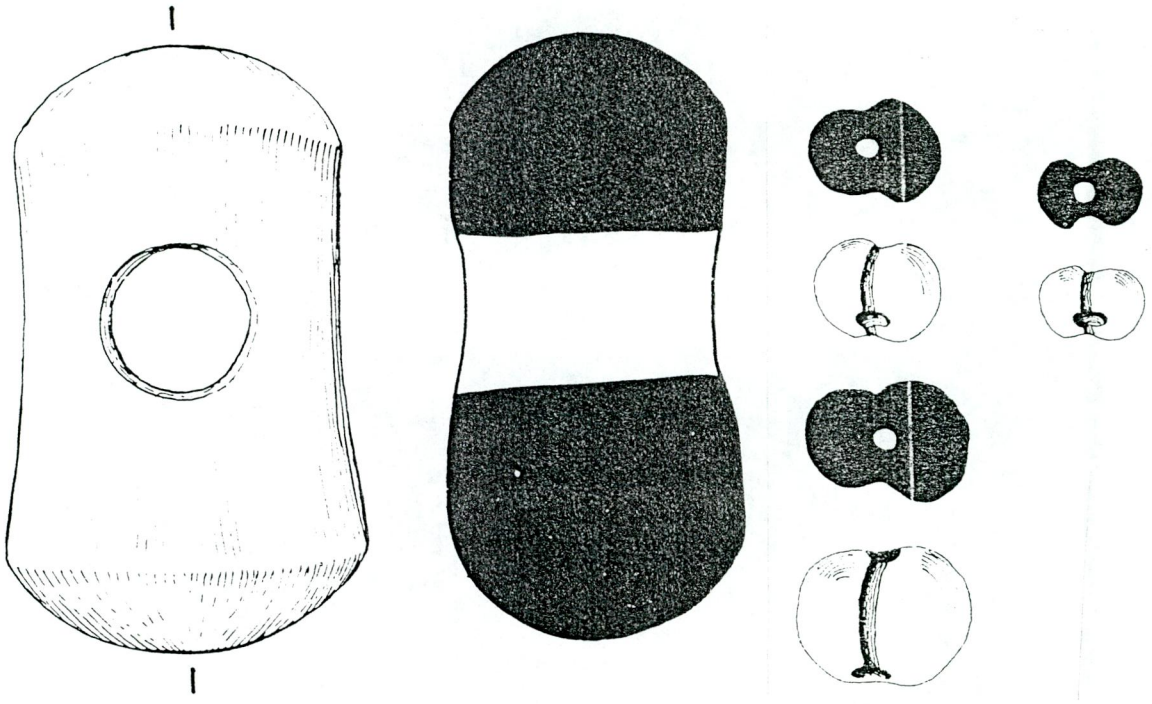


Fig.19 Actual size maul (left) with pendant versions. Groove is for string to hold them in position on necklet

burial deposits, but in the reasonably full record of habitation that exists for these peoples and other late Neolithic groups, no actual record of metal has been found. [1 p175]

In addition to the maul and pestle adornments quite a selection of other adornments have been excavated. These are concentrated in tombs and must have been grave goods or gifts to the dead, a custom carried out by many civilisations across the world during this period. The Irish ornament makers used a variety of semi-precious stones, antler, bone, clay, wood and chert to make ritual pieces and personal decorative wear. In choosing the materials for making such objects the crafter could be far more adventurous, since the substance did not necessarily have to contain the properties of flint or chert. Soapstone, for example, was quite a soft material and this was used in pendant

making, as were carnelian and jasper, both being of a semi-precious nature. In appearance these personal adornments must have been particularly striking, considering the wealth of multi-coloured stone beads and sculptural shapes that they wore about their persons.

Pendants often took the shape of every-day tools, such as the maul and pestle example cited above, and also borrowed the shape of tools of foreign origin, the Breton 'haches a bouton' being

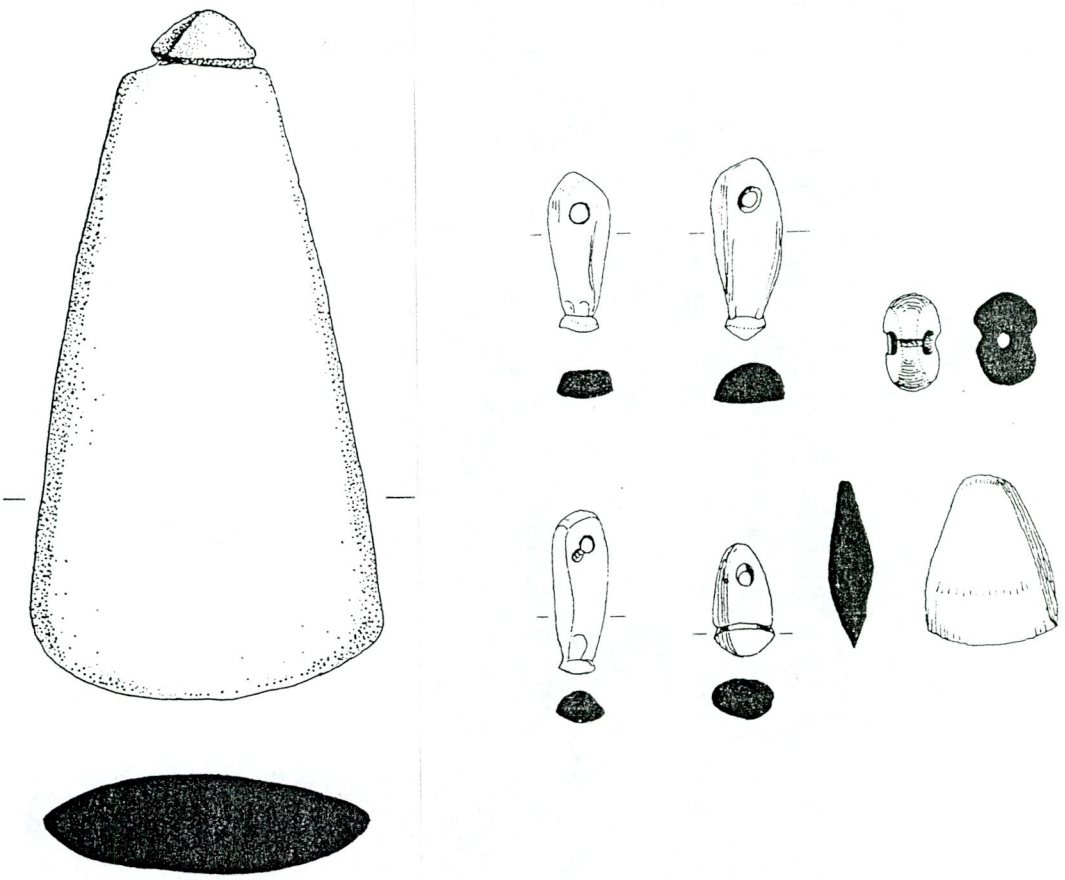


Fig. 20 Hache a bouton and other decorative axe pendants

the main example. This tool was possibly used as a modified hand-axe in normal use but as an adornment it almost encompasses a phallic form. However there are a number of deliberate phallic symbols used in the range of grave goods uncovered, these being

mainly made of antler pins or pierced stones. The range of shapes is quite formidable, and it is highly probable that fertility held a prominent position in these peoples lives. The wearing of such an object may have been meant to imbue the wearer with the ability to beget many children, who were not only important for the continuation of the lineage, but also for security of the parents in old age. The rich nature of the land made survival quite easy, and children were essential family elements in farming it.

The miner's maul or wooden lump hammer features quite widely in several scales of size and are pierced through the middle where a handle would fit on the real versions. A particular feature of these is a grooved band around the side where on the actual hammer the groove would have been a steady area in which to lash the handle. The basic maul shape was also borrowed for ceremonial practices, with the best examples coming from Knowth. Possibly the finest work of art created by the passage tomb builders of Western Europe is the ceremonial mace-head found found in the right-hand recess of Knowth's eastern tomb chamber.

The quality of carving and polishing in this flint example is extremely high. The whole object is 79mm long and has six elaborately decorated surfaces. On both top and bottom are a series of lozenge-shaped sunken facets, which terminate along two sides. Two of the long faces are decorated with the spiral motif so often seen on the walls of the tomb in which it was found. On the third face are two bands of three ridges, arranged to form a shallow U-shaped design. The main face contains

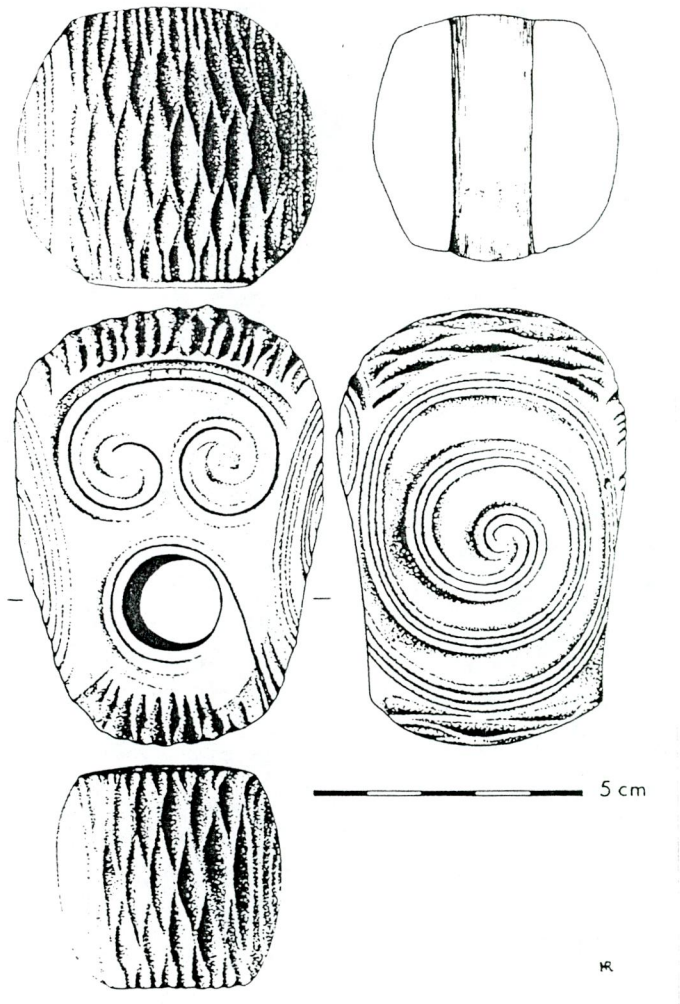


Fig.21 Knowth ceremonial mace-head. Possibly the finest example of Megalithic art in Europe

a 'pelta' motif, which are two counter-rotating spirals joining in a smooth curve , with a third spiral pattern around the hole through which the mace was hafted.

Indeed,if one wishes to stretch the imagination, this side has the appearance of a stylized human head, with hair, beard, eyes, mouth and spirals for ears all laid out in correct proportions [Eogan,the Knowth archaeologist,11 p142]

Other stone-based ornaments include stone and chalk balls, which are amongst the more peculiar finds in tombs and habited sites. The extremely spherical forms on these ornaments may

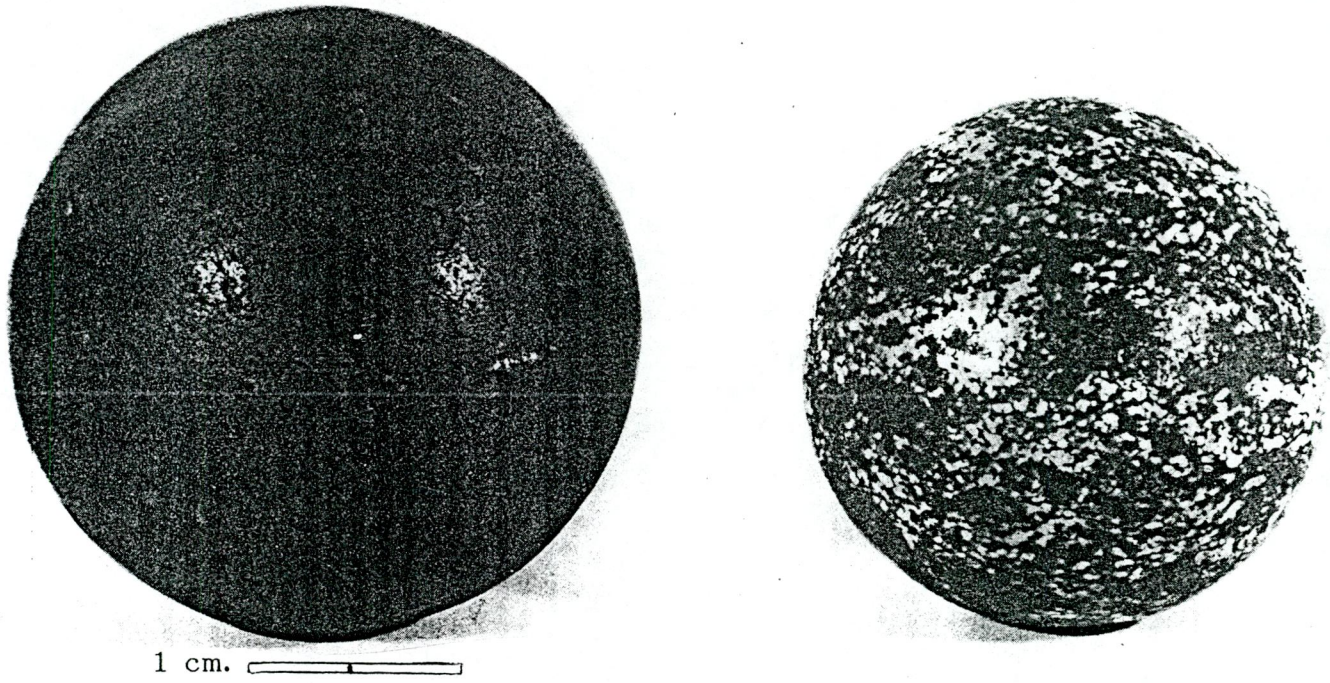


Fig.22 Chalk balls. Highly spherical form may suggest an astronomical significance, or could be a fertility symbol.

have been representative of the moon or the planets. Considering the astronomical connection of the passage tombs in the Boyne Complex, the spheres may have had a ritual function in this area.Some spheres have been found joined together and this would suggest a phallic reference, and may have been used for the same purposes as the antler pin examples mentioned above. The material used in making these spheres varies from site to site, but quartzite, chalk, grey marble, ironstone and basalt and even bone have been carved and polished into spheres ranging in size from 1 cm to 2.5 cm diameter, with an extreme case from Loughcrew reaching 8cm diameter.

Pins have been unearthed on most cairn sites. These are made mainly from antler and bone and are likely to have been used as closures on cremation bags, due to their close proximity to such remains in tomb sites. Phallic symbolism is present here also, indicating that there may have been a religious connection

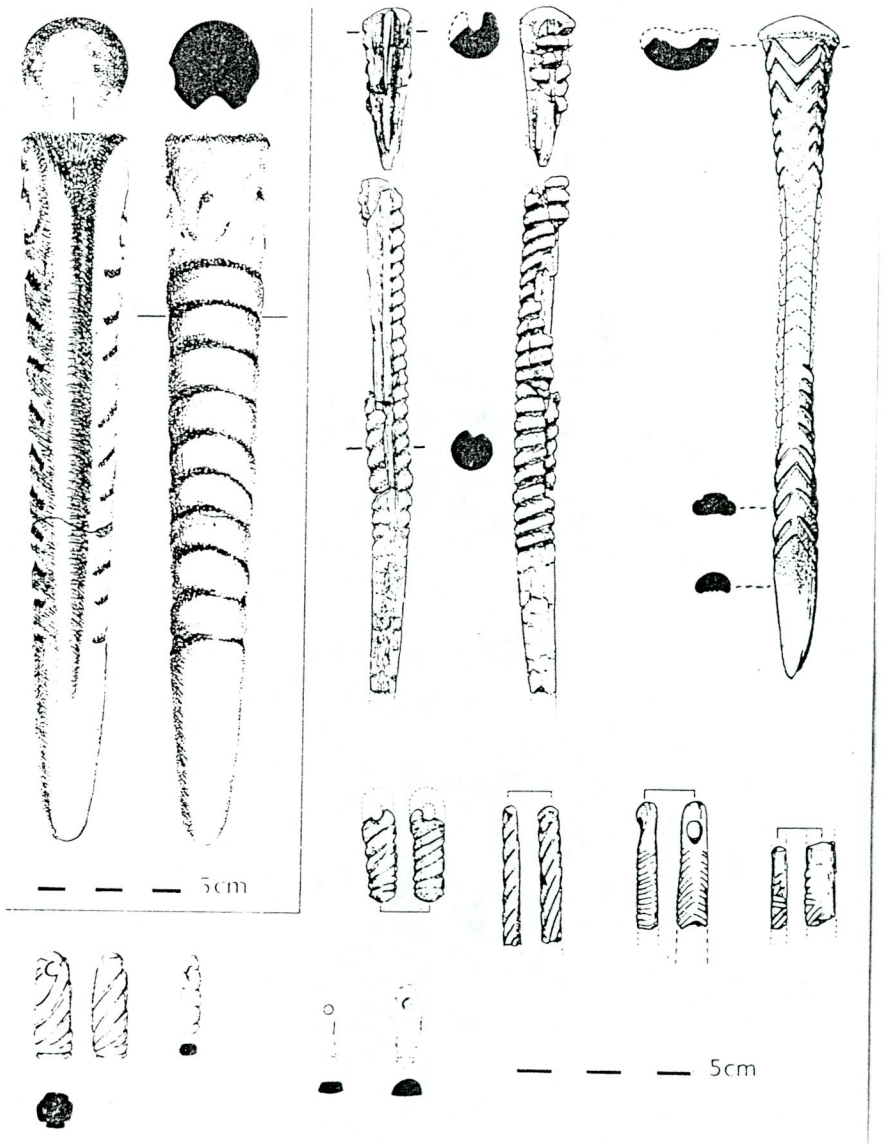


Fig.23 Intricately carved pinheads.

between fertility and death. Pin sizes vary widely but the most common length is 15cm. with a bulbous carved head, with the point tapering towards the lower end. They may also have been used as hairpins, or skewers for holding a hair bun in place. In view of the lack of precision metal carving instruments some of the pins are quite intricately detailed. The Neolithic peoples obviously stretched the abilities of flint and other stone implements to

their limit in creating other objects. An excellent example is a braided pin from Fourknocks in Co. Meath. This has a braided pattern along its length which has been carved with stone, possibly a microlith mounted on a wooden handle.

Smaller pins have been found with eyelets, which would indicate that they were used to sew materials, although no evidence of this material has survived the ravages of time. Excavations of 'bog people' from wetlands in Denmark have dated back 2500 years, and these people, who were perfectly preserved in the acidic soil, were wearing stitched garments that were probably similar to those worn by the Irish Neolithic peoples.

Other small artefacts found in the main megalithic sites and also on lesser sites where individual tombs have been found are necklets and beads, although, as with pendants the main concentration are at the Boyne Valley complex and Carrowkeel. They seemed to have been used to adorn bodies before cremation which may suggest why the number and quality of necklaces and beads around these remains is so low. Herity suggests:

> The small proportion of ornaments to the quantity of cremated bone in so far as this can be objectively assessed, suggests that not all the dead wore beads and might be taken as evidence of social or sexual differentiation [2 p132]

The beads used to make the necklets were made of the same material as the pendants: jasper, carnelian,steatite and and blue limestone, but baked clay and bone examples have been found at Tara. Some of the beads found have been carved by techniques unknown. A tube shaped blue limestone example found at Fenagh Beg

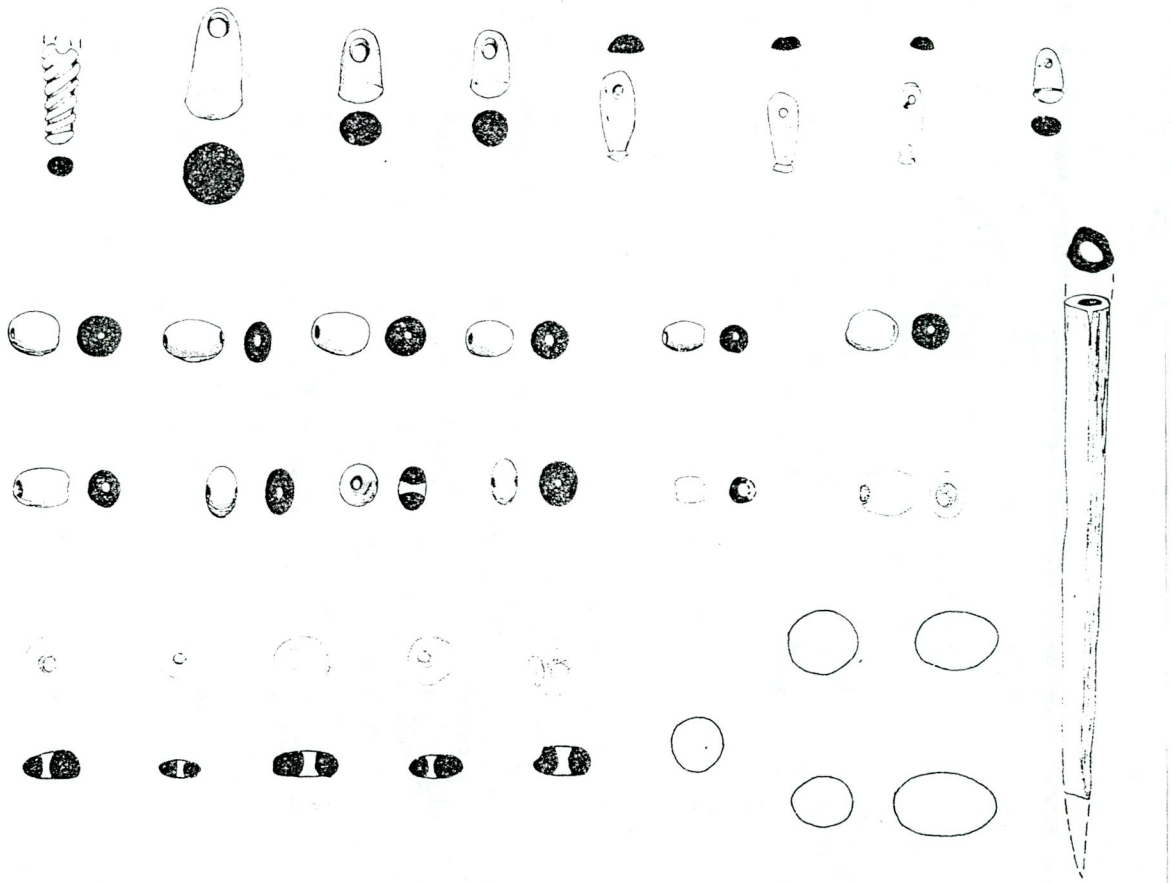


Fig.24 Carrowkeel beads and drilled pendant (right)

in Co. Donegal is one such necklet piece which is 4.7cms long with a 4 mm diameter hole bored through its longitudinal axis. This may have been drilled through using a bow drill and shaft with tiny quartz flakes bonded to its tip with vegetable mastic. If this is the method used then the level of workmanship is considerably higher than first envisioned. Of the main bead types most were approximately 1-2 cms long, with a perforation at one end which allowed the beads to dangle from a necklace.

The range and overall quality of the personal adornments found in Ireland is of a very high standard with only Scandinavia being of an equal standing in relation to these passage grave peoples. This high level of personal adornment is indicative of the

clothing being of a high standard also. Unfortunately we can only speculate what this clothing may have looked like, because they left no visual clues either in the form of cave paintings or engravings. It is unlikely that a neolithic corpse would be preserved in an acidic soil such as those found in the Danish wetlands, since the blanketing of the surface with dead vegetable matter is only wet and deep enough in areas such as the Bog of Allen, in which no evidence of this has yet been found. In addition the earliest example yet found is 2500 years old, which is still considerably later than that required for our purposes

Chapter 6

Despite the fact that few, if any representative images exist of recognisable human beings in the Neolithic period, there is a wealth of different symbols in the form of rock engravings,most of them connected with the Megalithic sites. Although these engravings do not seem to be a direct reproduction of anything in the physical world around us, they were nevertheless the main means that the Neolithic peoples had of communicating their ideas and images through the Neolithic period. The greatest collection of Megalithic art in Ireland is in the Boyne Valley complex, which, according to megalithic expert Martin Brennan:

> Contains,painstakingly engraved in the chambers and passages and on the kerbstones surrounding the mound, perhaps the largest collection of Neolithic art in the world.[6 p7]

Brennan explored the significance of the stones engravings in the Newgrange mound and in other passage tombs in Ireland such as Loughcrew,which is also very important as regards megalithic art. Few examples exist of Neolithic art that are not on megalithic sites, but Rock Art is one type and this will be discussed later.

But did these peoples engrave the rocks, and for what reason? The sheer effort involved in such feats must have been spurned on by some very deep and enthusiastic belief in magic and worship. One has only to visit Newgrange to feel that some very purposeful and strange rites and rituals must have been performed on the site. The vastness and sheer detail of the surroundings enforces one's belief in its purpose, just as when in a massive cathedral one may feel a prayer will be more effective than in a humble village church.

Possibly one of the most recognisable images of Megalithic Rock Art in Ireland is that on the entrance stone to the Newgrange mound. This is an imposing piece measuring 3.2 metres long by 1.3 metres high and is deeply carved with spiral and lozenge shapes which will be elaborated on later. The methods used by the megalithic builders to have engraved this and other rocks is in itself a considerable achievement considering the fact that there

Fig.25 Newgrange's entrance stone

was a total absence of any implement harder than the very rocks they were carving.

A distinct advantage of Irish megalithic art is that most of it is still relatively fresh, because some is contained in tombs or passage graves, while others were covered by a layer of peat. By looking closely at the engraved surfaces it is possible, with

experience, to determine how they were executed and how many stages were involved. Herity states:

> Though claims have been made for the use of metal chisels at Fourknocks [Co.Meath] and Newgrange...it appears that similar results could be obtained with appropiately claw-edged chisels of flint or quartz,indeed that the design of Kerbstone 67 [Newgrange] could be reproduced with a flint chisel has been ably demonstrated.. [4 p107]

One technique that has been applied to rock engraving, both in Ireland and abroad is 'plain picking'. The instrument used was a hard stone, most likely flint or quartz shaped into a chisel tip. When used in conjunction with a wooden mallet deep pits could be made in the rock surface, but the chisel tip would have needed to be resharpened constantly. Such a technique was used quite extensively in Loughcrew, and has been noted in Brittany and Iberia. Occasionally the image to be chiselled out was first executed in a very light fashion, just as in a preliminary drawing for a watercolour painting

A second technique, which is mainly found in the Boyne Valley complex is that of false relief, where the stone around the image was removed, raising the image above the stone surface by about 2-5mm. False relief has also been found on sites in Brittany. A variation on this is at Kerbstone 67 at Newgrange, where, instead of the background being chiselled back, the lozenge and triangles were carved into the rock, which is a reverse false.

There are modifications on both the false relief and plain picking technique in the many hundreds of examples found

Fig. 26 False relief technique, Knowth East

throughout the megalithic sites. There was a pain picking technique employed on the entrance stone at Newgrange which is rare in Irish megalithic sites. The spiral and lozenge patterns were chiselled into the stone to a depth of about a centimetre, and were then smoothed over by hammering. On a piece of this calibre there must have been several people involved, both in sharpening and making new chisels for backup and in the actual carving itself. Brennan describes a further refinement of the plain picking technique:

> pick dressing also developed in the Boyne area.The thin outer layer of stone was picked away to expose a new surface,

removing superficial irregularities and improving the colour [6 p128]

Some effort was made to plan out a carving before its execution, by preliminary scratching with a pebble, as mentioned above. O'Kelly says of Newgrange's entrance stone:

> ..an integral pattern of lozenges,spirals and concentric arcs was exactly fitted not only into the outline ofthe stone but also to its surface curvature. This carving is regarded as one of the great achievements of prehistoric art in western Europe [2 p111]

A geometry technique observed by Brennan on a spiral plain picked example seems quite advanced for its time and has been used to good effect-

> The form is an equable spiral which decreases in diameter by the same amount each revolution and the tangents to the spiral make a constant angle to the radius. This was probably achieved by revolving a string around a fixed central post, making the distance between the lines equal to the circumference of the post [6 p128]

This may indeed be one of the first examples of a mathematical drawing technique to be found in Ireland. It may be a refinement on the planning of ring forts in which the circular form was driven into the ground at a central point and a string tied to it and used to describe a circle of fixed diameter, on which the peripheral stones were laid.

The carvings themselves offer a greater challenge to archaeologists than their actual method of execution. There are a

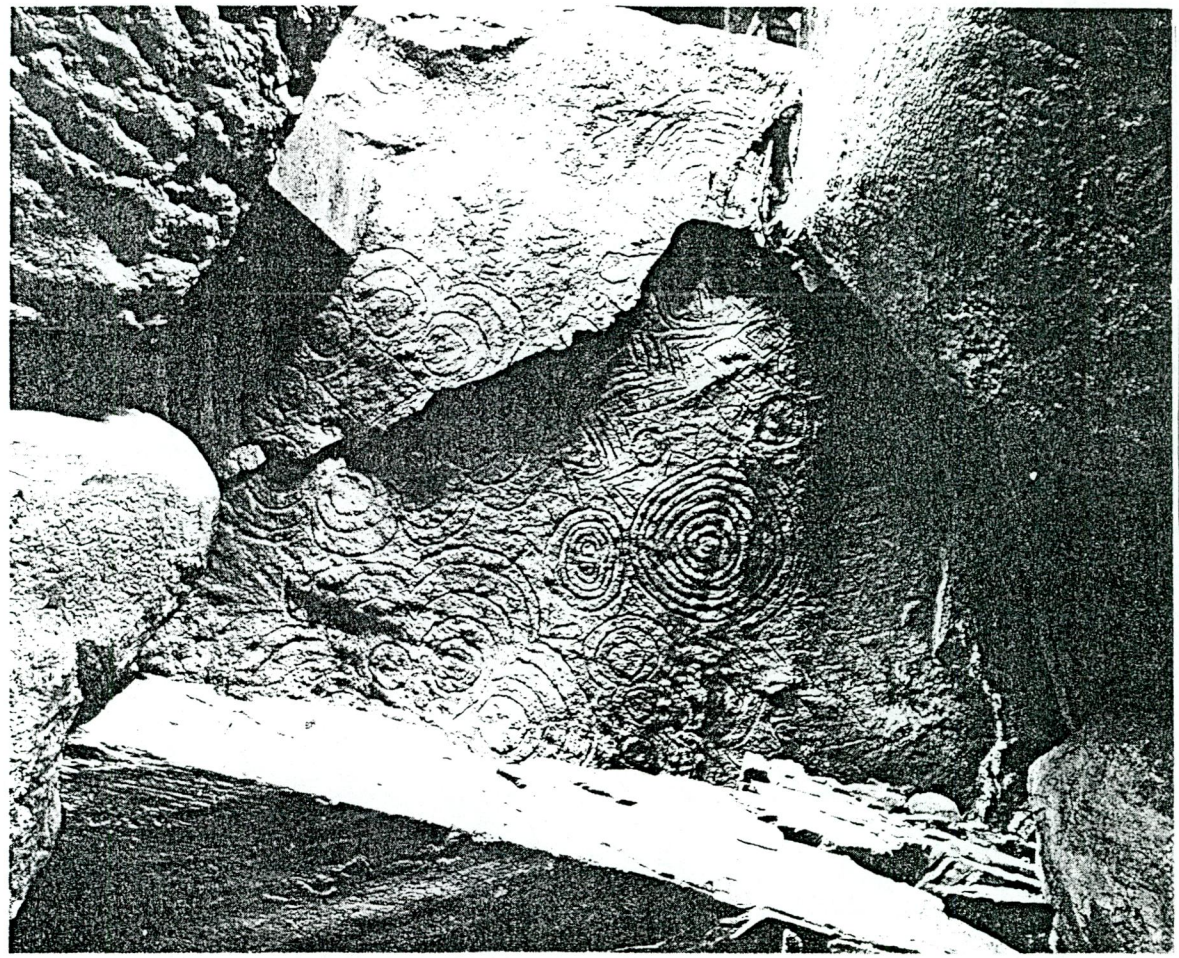


Fig. 27 Geometrical Spiral pattern on roofstone, Newgrange

set number of shapes outside of which there are few other variants. These shapes or styles are rather complex in themselves, so the megalithic artists certainly did not lack in imagination or energy. The subjects of this symbolism are quite varied also. Brennan believes, through twelve years of megalithic art research in Newgrange:

> Apart from luni-solar symbolism,light itself seems to be the chief focal symbol. There is also a deep concern with time. Many symbols seem to indicate numbers and counting, although because of the simplicity of the numbers involved and the

various ways of interpreting them, it is not always easy to determine precisely how they are used. [6 p 60]

The main patterns that can be identified in the passage mound areas are spirals, lozenges and triangles, chevrons, oculi (eye symbols), wavy (serpentine) lines and radial patterns. Some connections can be made between these patterns and those found in Brittanny and the Iberian peninsula. The main difference is that the art is found moreso in the objects within the tombs rather than on the walls, as is the case in Ireland. Such objects as vases, stone and bowl idols and plaques are usually the decorated elements in the Iberian and Breton examples.

However there are few similarities or even available images to be seen on tombs in the Iberian megalithic sites. Breton sites contain far more representational images than the Irish type, although parallel can be seen with rayed circles and wavy lines. There are only a few rare examples of the spiral motif in Brittanny, which is so common in Irish megalithic art. Of the Iberian and Breton sites the is more comparata with the Breton.In the main Irish megalithic art followed its own insular path, with the overseas influences being a starting point in some cases, from which a totally Irish style stemmed.

What is the significance ofthe spirals and lozenges and the other motifs? The spiral may have been the most important of all the symbols because it is this motif which occupies the end recess in the tunnel of the Newgrange mound. Since Newgrange seems to have been built with the specific objective of marking the lengthening of day after the winter solstice, when the morning sun of the 21 December hits this recess, the spiral is of

obvious significance. It is therefore likely that the spiral has an astronomical reference, and may reflect the fact that the sun moves around the sky in a clockwise direction, the same as the spiral's direction. Anticlockwise spirals could represent the movement of the stars, which also move around the sky in that direction.

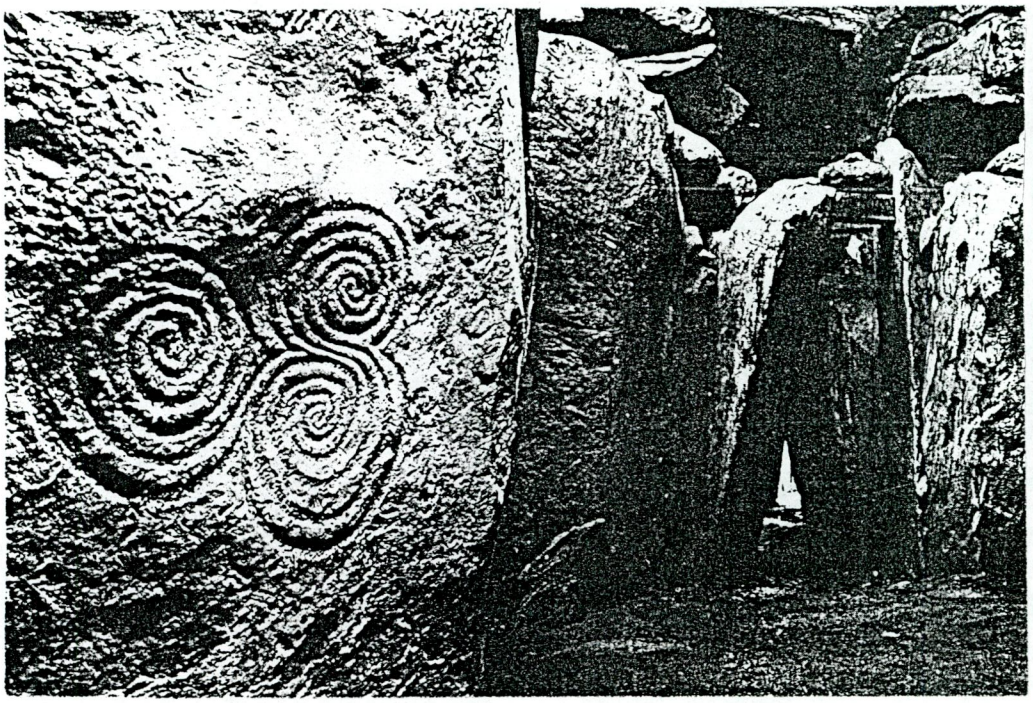


Fig. 28 Spiral detail on Newgrange orthostat

There are single, double and treble spiral types. Single spirals appear at Dowth and double spirals appear at Knowth. Both of these are passage tombs in the Boyne complex. The Triple spiral is present at Newgrange and in a more crude form at Carrowmore, Co. Sligo. It is this triple spiral which appears on the end recess of Newgrange's tunnel.

Circles are amongst the most prevalent motifs on megalithic rocks, which, in a study by Brennan, account for over 50% of

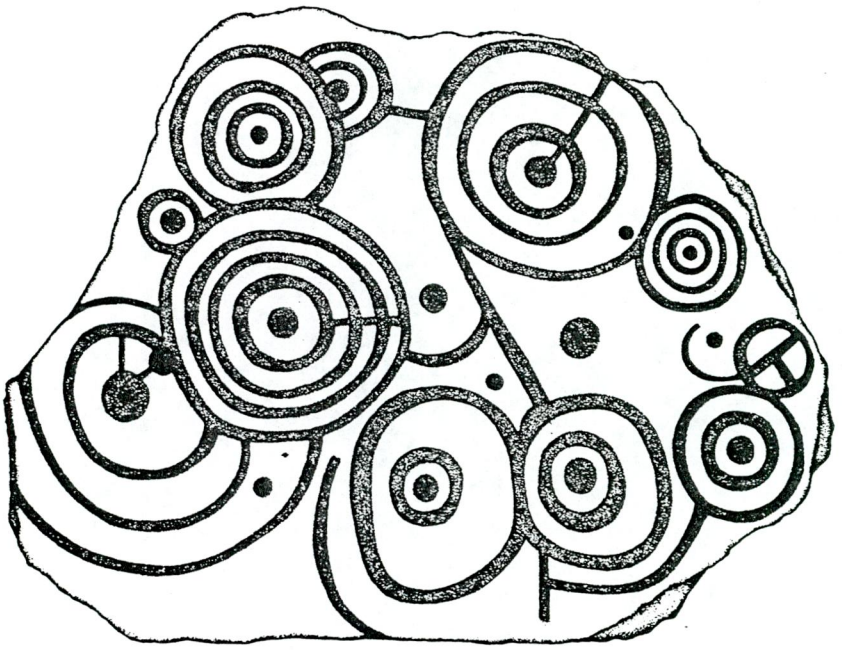


Fig.29 Circle detailing from Ballinvally rock

all motifs on the 390 stones he studied. If taking arches and semicircular engravings into this figure the percentage is nearer 60. The circle is perhaps one of the most fundamental and basic shapes that these people executed. It is easy to realise the significance of the circle in the everyday life of the megalithic peoples, in relation to the sun and the moon, ripples in water and other observations.The circle holds a fascination that makes it occur in such a frequent manner as to be almost standard when engraving.

Other symbols, while not having the simplicity and frequency of the circle, nevertheless do add a considerable amount of credit to the two dimensional abilities of the engravers. It is with such shapes as lozenges, quadrangles, and zig-zag patterns that most of the variations in texture have been used. The lintel above the entrance to the Newgrange mound has an example of a

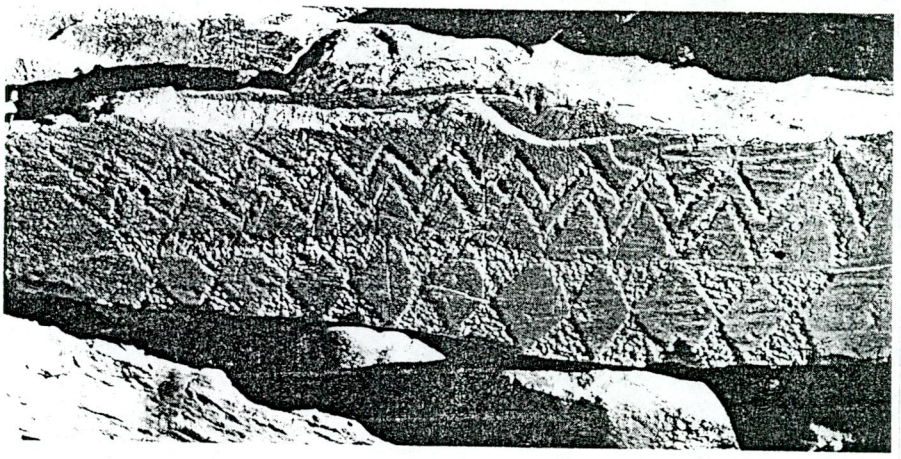


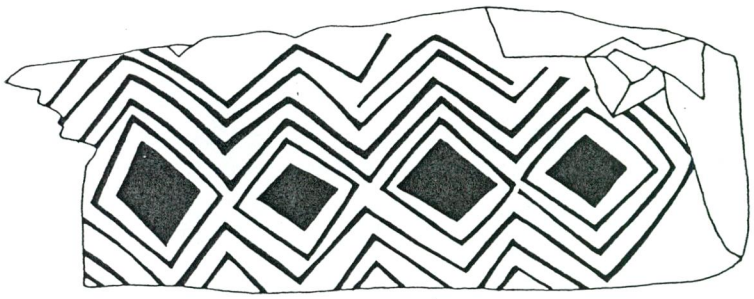
Fig. 30 Newgrange's Lintel stone

diamond and zig-zag relief, with the background cut back using the false relief method.There are both equilateral and isosceles triangles in the Newgrange and Loughcrew sites, but they have been less important in archaeological terms than the quadrangle, which is significant for reasons explained by Brennan:

> Sunrise, sunset, midday and midnight,the equinoxes and the solstices, and the four cross quarters days marking the seasons are all bound together in the unity of the symbol [6 p182]

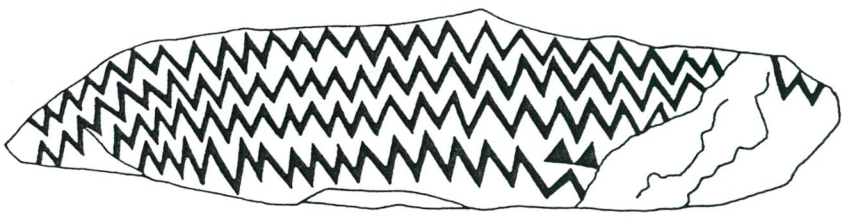
O'Siochain draws a comparison between the quadrangle and some of the pattern found on Aran knitwear jumpers, The crooked road stitch is overlapped in a diamond or quadrangle fashion, a traditional pattern dating back several millennia. A chevron or zig-zag stitch is also present on these sweaters, but the quadrangle is significant not just because of the shape but also because, in the Aran jumper the texture inside the quadrangle is so similar to that on the rocks in Newgrange.

A separate stone based art form, different from that of megalithic tomb art, is Rock Art. This type of art is found in



FOURKNOCKS, CENTRAL RECESS LINTEL

FOURKNOCKS, WEST RECESS LINTEL



FOURKNOCKS, ENTRANCE LINTEL

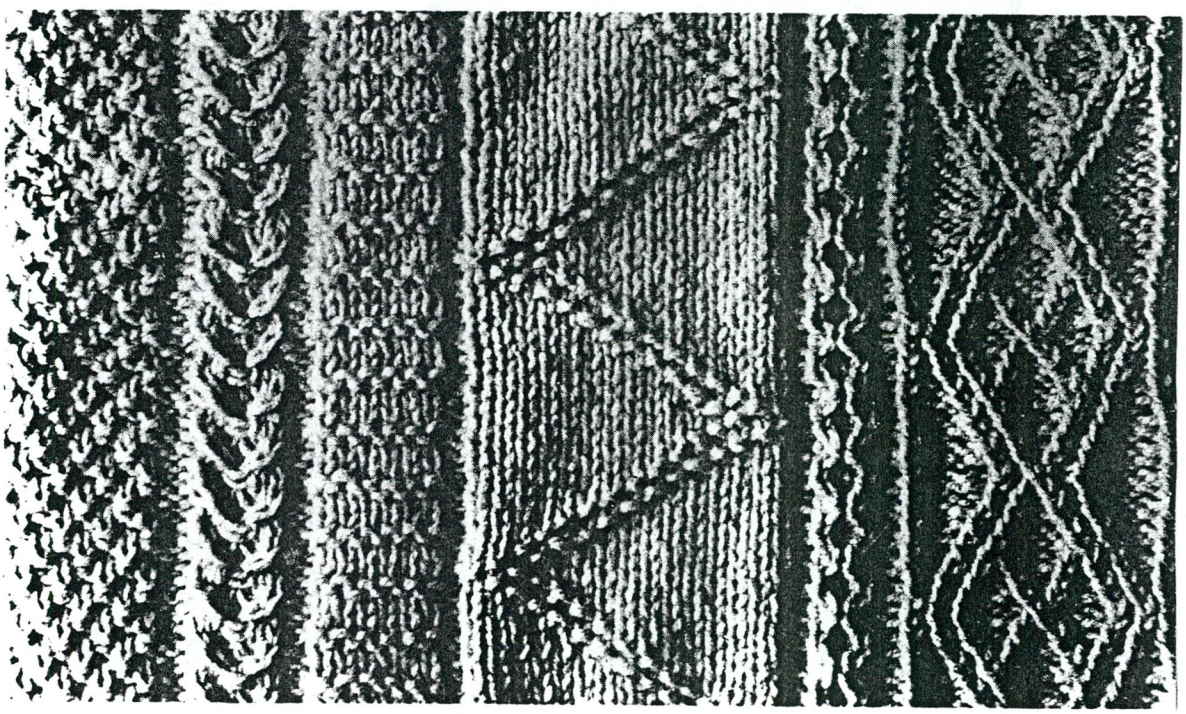


Fig. 31 Comparison between lozenge patterns and Aran knitwear stitches. The 'crooked road' stitch bears some similarity.

Cork and Kerry and on sites in Leinster. Although the art is of a

different style, some similarities exist in style between this and megalithic tomb art. The style consists of simple cupmarks and concentric circles of various sizes with lines of no

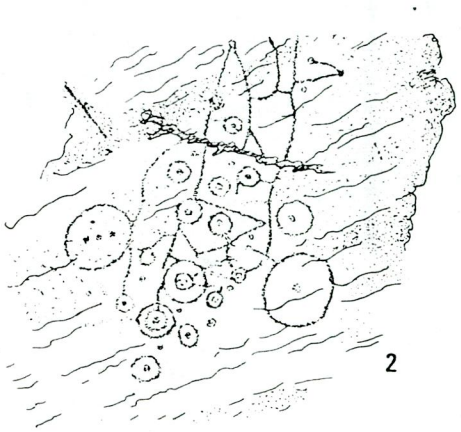


Fig.32 Rock Art locations and example from west Cork

coherent form being engraved around and through several examples, almost as if a map was being executed. There are over 80 examples of rock art around Ireland. Like the megalithic art, rock art has

also been linked to art forms in Neolithic continental locations. Galicia in North West Spain was the subject of a study by Elisabeth Shee and M.J.O' Kelly in 1973 which which proved fruitful.

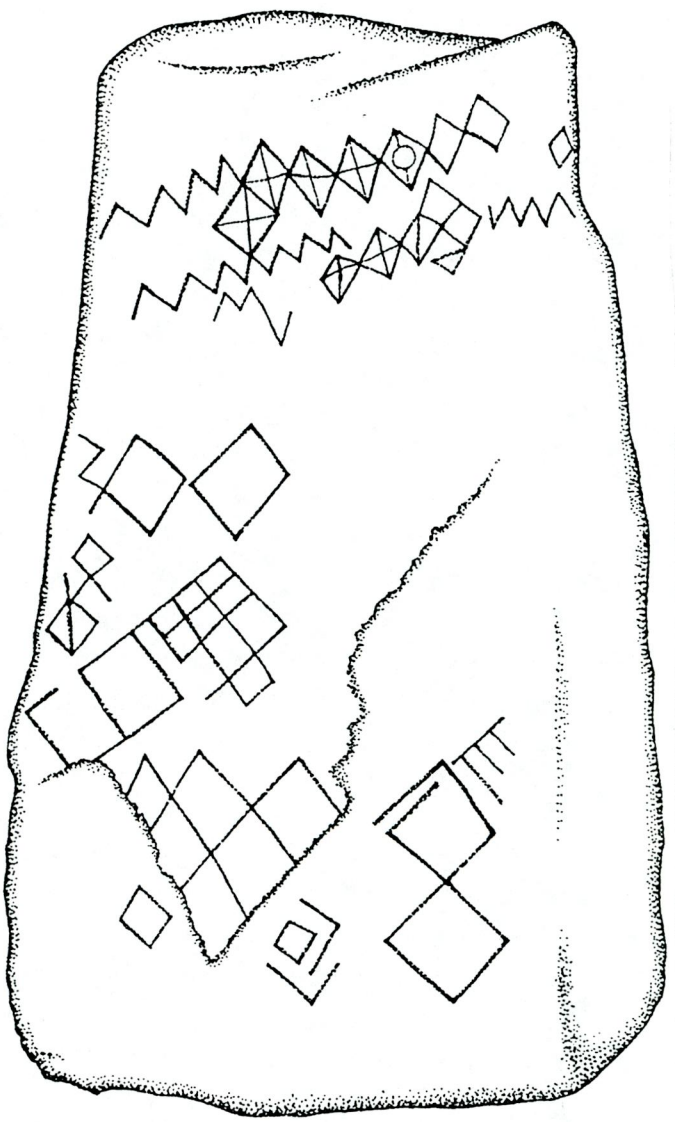


Fig.33 Quadrangle patterns from Loughcrew cairn stone

The last and undoubtedly the most impressive area of design in the Neolithic era is that of the Megalithic structures themselves. There are four main types as classified by archaeologists, and all of them are stone structures. They are court tombs, portal tombs, passage tombs and wedge tombs. Some of these tombs date far back into the early Neolithic and are amongst the oldest structures in Europe. In fact so magnificent was Newgrange that the Romans visited there when they invaded England and Wales.[4 p148] There are about 1200 tombs in Ireland, the main concentration being in the Northern half of the country.

The oldest of all the tomb types are the court tombs, built about 5000 years ago, by farmers originating in the midwest region of Ireland, and spread to the Antrim coast. The court tomb

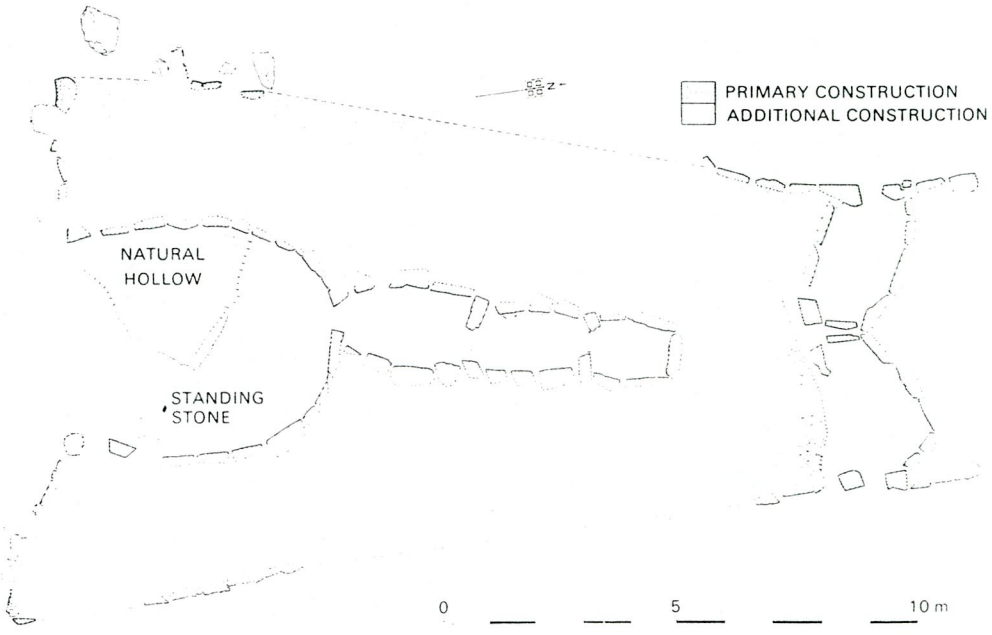


Fig. 34 · Plan view of a typical court tomb

is named for the open, court-like area in the centre of the tomb, which is surrounded by flat faced stones that are typically about

Fig.35 Court tomb at Creevykeel, Co. Sligo

one metre tall called orthostats. Most tombs are about 30 metres long, 15 metres wide at the front end and about 7 metres wide at the rear. The court area is normally divided into two sections by two tall jamb stones covered by a sill stone. The smaller chamber was sometimes covered by what is called 'corbelled' roofing. This technique uses several layers or coarses of flat stones that are laid in a circle above the chamber. Each course makes the hole

above the chamber progressively smaller and smaller, until, when there is only enough space for one or two stones, the capstone is laid on top. This technique has also been used in the Boyne valley complex on a far greater scale.

Court tombs are believed to have been burial sites for important members of the tribes that built them. Bodies found in the tombs were mostly male and cremated. These cremations were found in the smaller inner chambers, but unburnt bodies, sometimes eight or more in number, have also been found. There seems to be no continental equivalent of court tombs, and they seem to be mainly an insular development created by the fusing of several different cultural groups that made up the populace of Ireland at this time.

Portal tombs are more dispersed than court tombs , but there is a concentration of these tomb types in northern Ireland, south Leinster, and in Clare. Portal tombs were originally long tombs like court tombs, but they have only a single chamber covered by a capstone, which can reach 100 tonnes in weight, as in the Brownshill example in Carlow.These portal tombs are more generally known as dolmens. Most of the court tombs that have survived the years of farming that has occured around them are devoid of the cairn section, which is the part of the tomb consisting of large flat areas of stones, which usually surround the main structure. From what little evidence exists of these cairn features,they do not seem to have played an important part in the overall portal tomb structure. O' Kelly seems to think that the cairn and dolmen structures are two different phases of the building programme [p94]

Portal tombs are magnificent structures to behold, considering the extremely difficult task it must have been to lift the capstone into position atop three orthostats. The suggested

Fig.36 Portal tomb, or dolmen.Some have capstones weighing 100 t.

construction plan is similar to that thought to have been used in Stonehenge, where a type of wooden scaffolding was employed in combination with long levers to 'jack' the capstone into position.

Portal tombs functioned as burial sites also and,of the

excavations carried out to date, most contained cremation remains. These remains are usually contained in the ground under the chamber. Portal tombs normally face eastwards, and in height can reach five metres from the ground to the tip of the capstone as in the Kilmogue dolmen,Co. Kilkenny. The age of these portal dolmens is difficult to ascertain using present data, but a date of 4000 years BP (before the present) has been cited for a site at Ballykeel, Co. Armagh.

Passage tombs are the most massive preceltic structures and in number are estimated to be about 300. Mohen, a French megalithic expert remarked on passage tombs:

> The imposing bulk ofthe [passage grave] tumulus, the use of more and more massive blocks, and their deft, even scientific deployment , together convey an impression of real architectural daring; the builders seem to have been seeking an indestructability both materially and spiritually [10 p94]

This impression is even further emphasised when one looks at the sheer scale of the megaliths when actually being there and looking at one from the inside out, as in Newgrange.

Passage grave tombs are dispersed through the north but there is a concentration of the most important ones on a line between Dundalk and Sligo. These are the Boyne and Loughcrew complexes in Co. Meath and Carrowkeel and Carrowmore in Co. Sligo. All are built on hilltops , and unlike the other tombs, they were built as observatories rather than burial sites. The Loughcrew Complex was the largest site and originally contained between fifty and a hundred mounds in what is probably the best

preserved neolithic landscape in the world. Brennan did a significant study of the sites and found that seven of the sites are sufficiently preserved to allow a beam of light to be projected into their passage chambers and project onto the

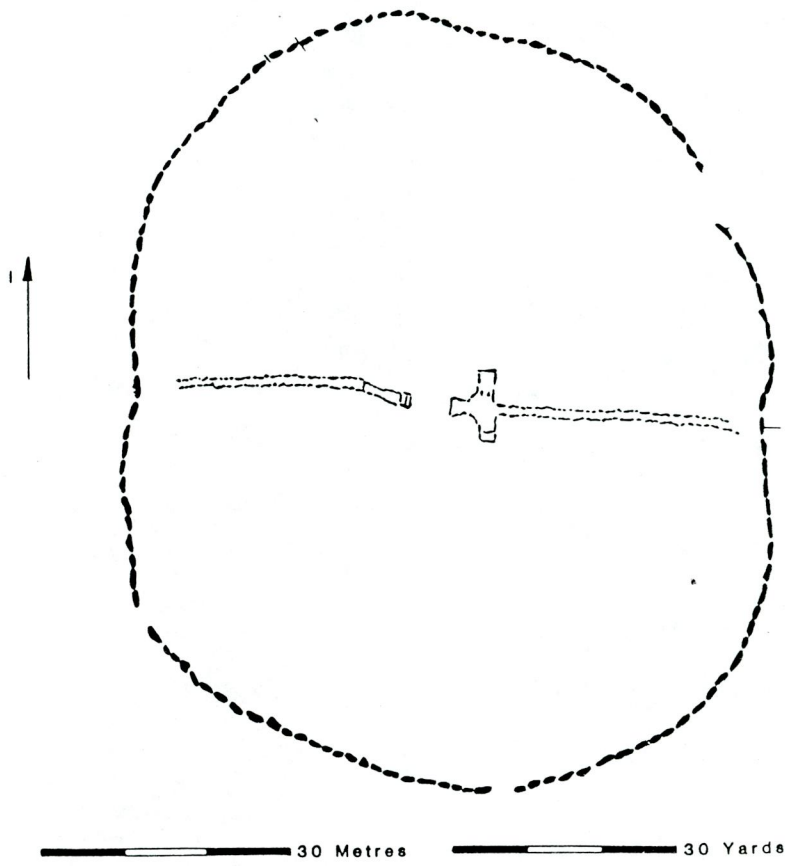


Fig.37 Cutaway plan view of Knowth, showing it's two passages

backstone in each. Brennan believes that tombs of these type are accurate sun chronometers that are a 'celebration of light and measurement' The wealth of megalithic art discussed earlier, and found in all the main sites were discovered to have a clear and distinct link with astronomical events.

The most magnificent of all the passage tombs is Newgrange, co. Meath, which is the largest in Ireland, and is one of the three passage tombs in the Newgrange complex, the other two being Knowth and Dowth. It is difficult to imagine how such a massive structure could have been built over 4500 years ago, and one has to look at the pyramids of Egypt, built almost 400 years later, to realise that it is possible.

The vital statistics of Newgrange are nevertheless extremely important as regards the achievements and ability of Neolithic peoples of Europe at this time. The diameter of Newgrange is 85 metres across the widest section, and the passage through which the sun shines is two metres high, 25 metres long and contains a large corbelled roof chamber at the end. This chamber is 6.5m wide, measured from recess to recess and is 6 metres tall at its centre. In effect the passage only reaches a third of the way into the mound. Piled over this passage is an estimated 200,000 tonnes of cairn material to a height from the mound floor of originally 15 metres, but now 11 metres, due to subsidence. Around its outer edge the tomb is girdled by 97 large stones or orthostats, each about 3 metres long. Originally thirty five standing stones stood around the mound at a distance of 16 metres from, each ranging in height from 1.5 metres to 2.5 metres. Twelve remain today.

The physical dimensions of Newgrange are only one part of the achievements of the builders of this passage tomb. The techniques employed by the peoples who massed together to create this monument to the pre-Celts were a culmination of several millennia of experience, beginning with the humble knapping of a flint

Fig.38 Corbelling technique used on Newgrange roof. Distance from capstone to tomb floor is over 6 metres

somewhere in what is now the Irish Sea. O'Kelly states that the tomb builders working in the northern half of Ireland at this time were known to each other, because of the similarities between sites. Techniques used to build a passage tomb would have also been used to construct a court tomb. Evidence of this lies in the Newgrange passage which is a transepted plan, like the Loughcrew tomb 'U', and Carrowkeel tomb 'G'

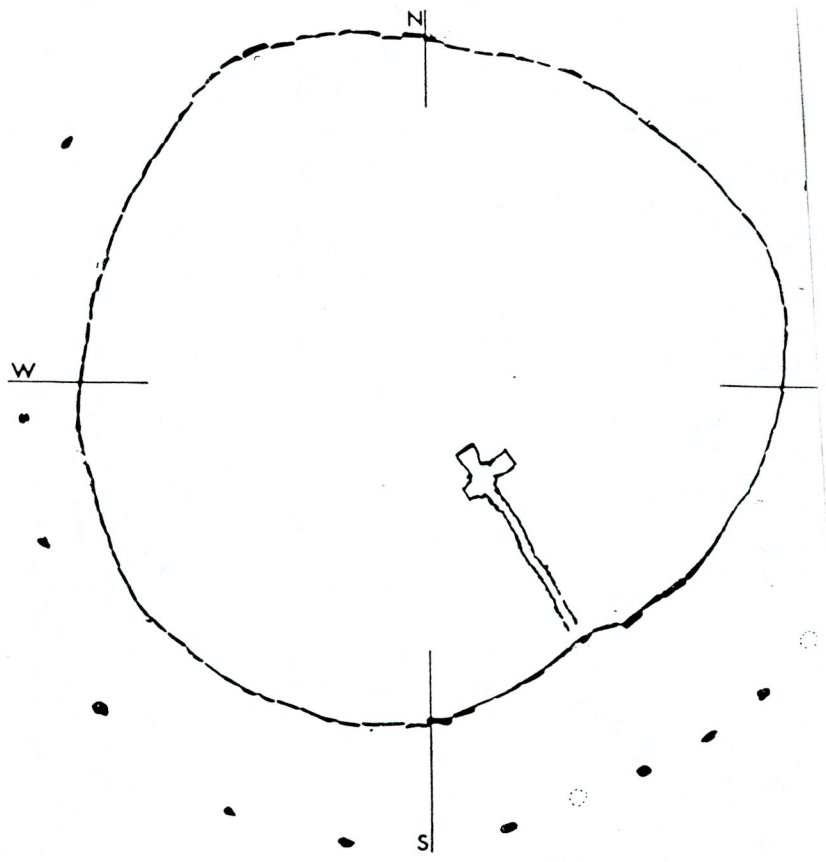


Fig.39 Cutaway plan of Newgrange, showing trancepted chamber

The manpower needed to build Newgrange and other megaliths must have been considerable. Herity offers an interesting

scenario of the social network required to get such a building project in motion:

> These feats were performed...by the free members of a hardworking township, compact enough to have controlled common purpose, yet large enough to provide the labour force to move and erect the massive megaliths and build the mound over them. Its members supported professional priests, architects, mastermasons and artists, as well as the chief or ruler. At a minimum, each of the three communities in the Boyne Valley depended on the labours of 500 able bodied workers to build the principal tombs over a generation of about twenty years. [4 p188]

The last of the Irish megalithic passage tombs was built approximately 2000 b.c., but the sites continued to be used for several hundreds of years afterwards as worship sites as can be attested by Eogan's excavations at Knowth, in which settlements at the mound extended into the early Christian period. Modifications were sometimes made to the tomb sites by later inhabitants, such as the digging of ditches and the removal of cairn material for other building purposes.

The wedge tomb was the final product of Megalithism, which was a style pursued by the pre-Celts before the advent of metals and the abandonment of large scale ritual architecture. Wedge tombs are named for the shape of their ground plan and the fact that the wider end is usually higher. It is this end that generally contains the entrance to the tomb, which leads into an ante-chamber. The main chamber, behind this tends to have parallel sides, with roof slabs resting directly on the orthostats in a

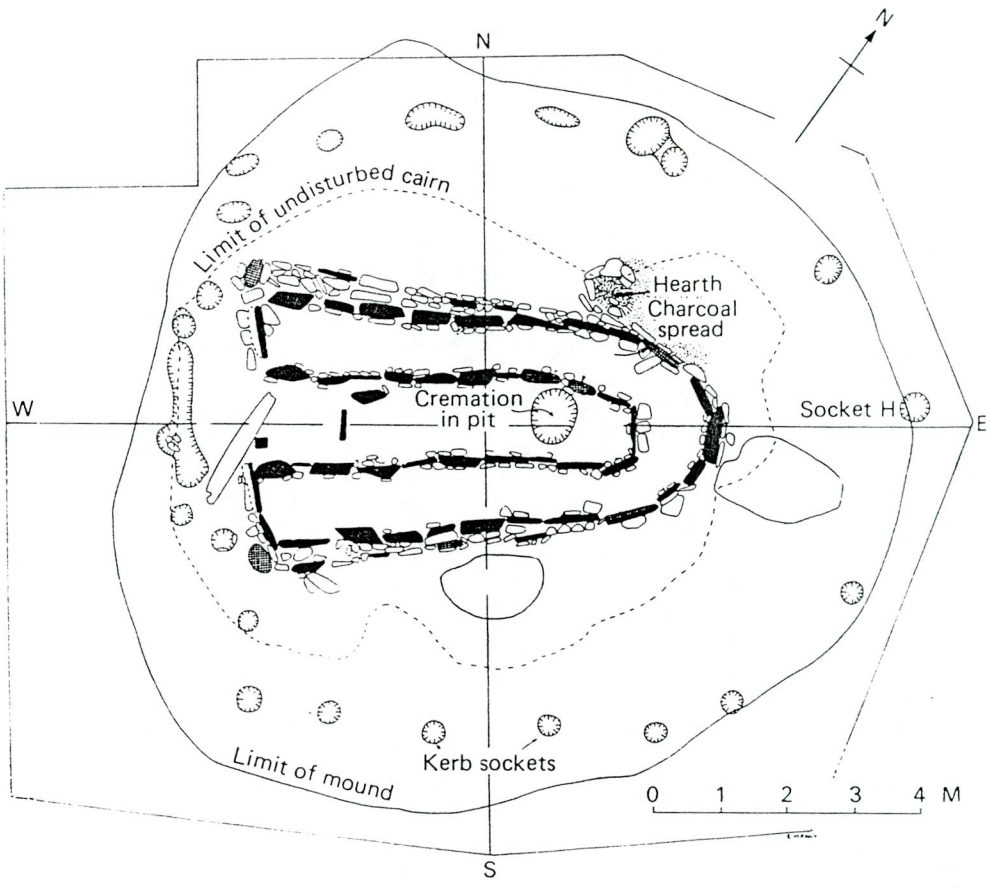


Fig.40 Plan of a wedge tomb in Island, Co.Cork

fashion somewhat similar to court cairns. Lines of external walls running parallel to the tomb chamber often occur. The length of wedge tombs vary quite considerably, but rarely exceed 10 metres.

Wedge tombs are distributed more widely than any other tomb type, and seem to be rare only in the midlands and Leinster regions. There are about 400 of these in Ireland with a very dense concentration in Co. Clare. All were built in the centuries after 2000 b.c., first on the peninsulas of the south-west, but later they spread to the western and northeren uplands. Herity believes that these peoples were metallurgists and stock breeders rather than agriculturalists [4 p3]. So here, after over

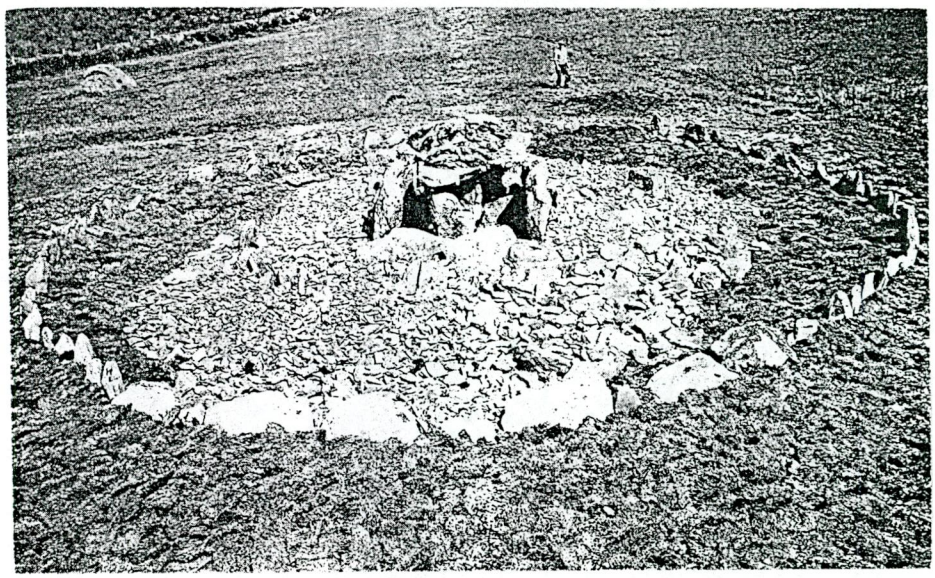
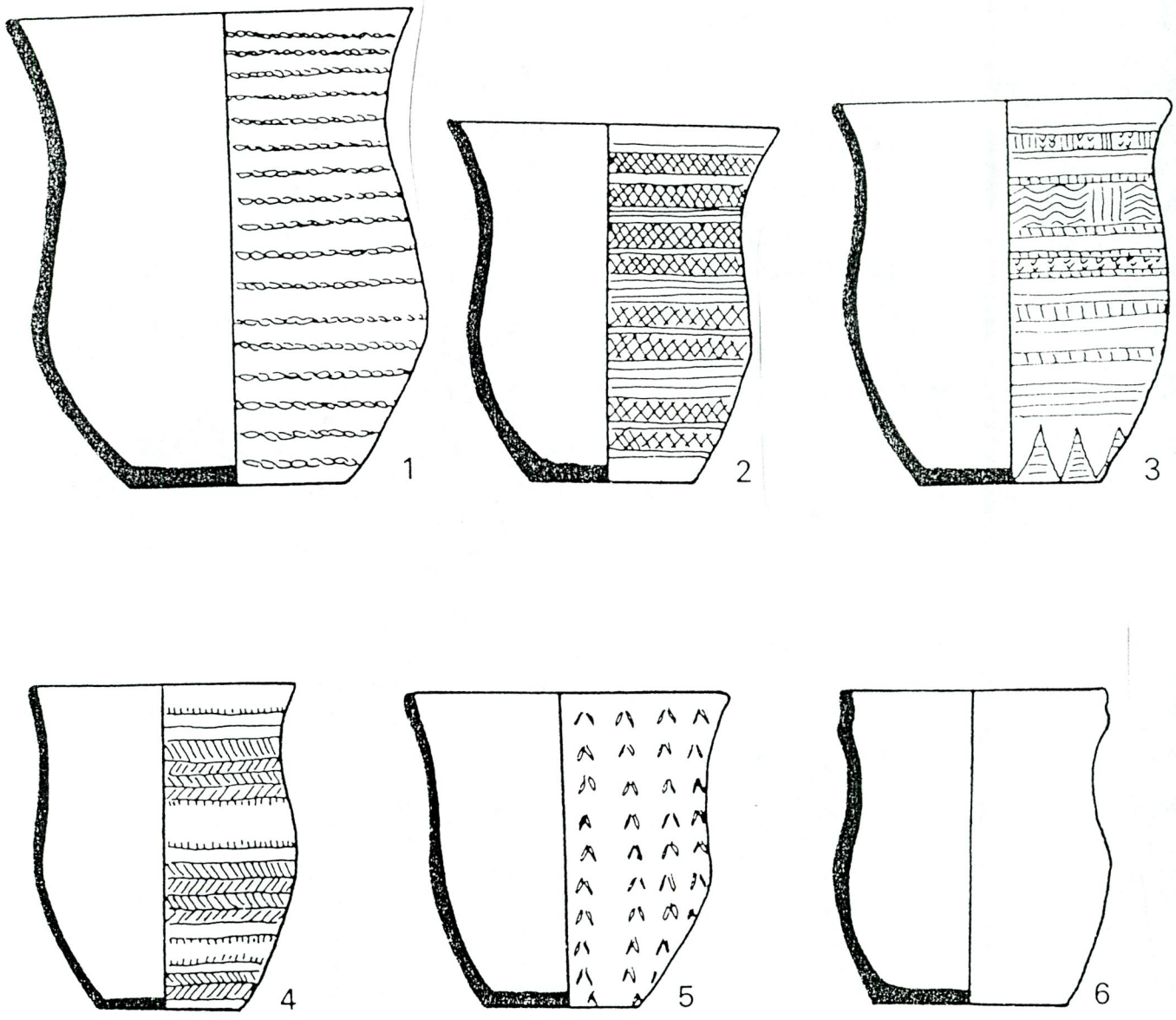


Fig.41 Wedge tomb in Bournadomeeny, Co. Kilkenny.

6000 years of stonework, are the first signs of a metalworking culture,and therefore the beginning of the end of the pre-Celtic era of Irish history.

The burial practices on these wedge tomb sites are not as clearly defined as they are with other megalithic styles. Cremation seems to be the main practice before inhumation, but unburnt burials have been found side by side with such cremations on several sites. Amongst the new introductions of pottery ware into Ireland at this time is that of the Beaker people, and this pottery type is found in over a third of the wedge tomb sites excavated.

The introduction of the Beaker ware marks then end of the Neolithic period and the beginning of the Beaker period and Bronze age. The term 'Beaker' describes the main pottery shape that these people made, a beaker type ware. This is an S-profile vessel, normally thin walled and well fired and well ornamented.



1.General type;2,Bell beaker, Ireland;3 Wessex/Rhine;4,Scottish, Rhine;5,6 Rusticated and Cordoned,Ireland.

Fig. 42 Beaker Ware from sites across Europe

Beaker ware has been found widely in Europe. The main theory as to why the Beaker people came to Ireland was to exploit our ore bodies, for these were an essentially metal oriented peoples. Throughout some of the wedge tomb sites this claim is supported

[2 p69, p120]. The Beaker influence did not change many of the practices of the Late Neolithic peoples but, according to Colin Burgess, archaeologist, was:

> Everywhere blended into local contexts alongside local artefacts, and the absence of any accompanying international social or economic system, house or settlement type, ritual or burial tradition, argues powerfully against a greater Beaker folk movement in the traditional sense [13 p63]

The effective end of the pre- Celtic and start of the Celtic eras is the subject of some debate but a widely recognised convention is to regard as Celtic whatever can be dated to the beginning of the second Millenium b.c.[14 p2] The Celtic era was not necessarily an influx of a new people so much as a rapid expansion of ideas and technology. As regards burial customs the changes were substantial.No longer were large tombs built to house the remains of the dead, but instead smaller simpler structures proliferated and this was in common with trends across Europe, although in France the megaliths remained large, but the numbers of dead interred in each tomb increased significantly.[10p272]

Mohen highlights the Tallaght cist as an example of the degeneration of Megalithic architecture in Ireland. This is a funerary urn containing cremated remains, found 10 km west of Dublin. The structure housing the urn is basically a slab-lined recess in an earthen bank, which is a considerable change from the neolithic practice of passage tomb building, which sometimes involved the transportation of over 100,000 tonnes of material [10 p278]

Fig.43 The Tallaght Cyst

The Celtic era was to bring a considerable change in many other aspects of Neolithic life. The energy that previously went into megalithism was now directed towards metallurgy and more intensive agriculture, because the Celts introduced copper, the swing plough and manure. Despite the relatively few notable architectural achievements of this new society, their achievements were exceptionally fine in the new technologies, which can partially be attributed to their attention to detail in premetallic materials, such as Knowth's ceremonial macehead (ibid) and the stone carving techniques on megalithic sites.

Conclusions

The early Irish were at a par with their European counterparts in most areas encompassed by this piece, and exceeded them during some contemporaneous periods, despite our insularity. This would seem to indicate that the independent creativity of the native population was of a level that would only be achieved in later times by the gold ornaments of the celts and the highly detailed works of Irish monasticism.

The initial introduction of humans to Ireland in about 8600 b.c. was accompanied by an already developed, albeit primitive, flint culture. With this as basepoint, the progress over the next 6600 years, from the Early Larnian to the Late Neolithic/Beaker would be considered by the layman to be extremely slow. Bernal states:

> the extreme slowness of change,as borne out by the archaeological record, shows how closely early man clung to traditions in all fields. This was possibly because they felt , implicitly the unity of all their cultures, and the danger of straying from tradition in any part of it. [12 p812]

However if one looks at the insularity of Ireland in terms of the the apparent lack of communications with continental counterparts for extremely long periods, then the fact that there was a progression in the flint industry and also in other fields, such as pottery, would seem to point towards a universal inbuilt human will to advance himself, without there being a 'keeping up with the Jones" syndrome. Indeed this insularity remained mostly intact, with the exception of some foreign arrowhead styles, until the fourth millenium b.c when agricultural and megalithic

principles began to be used, through influence from either Britain or France.

As we progress through the evidence left by the mesolithic and neolithic peoples we find that they were undoubtedly a thinking, intellectual people who showed both individual and communal motivation. As far as present data suggests, these were a factionless, peaceful people, and no defensive structures were built during the pre-Celtic period.

This mastery of flint and their innovatory application of it in art, construction and domestic use is of particular significance, since there are flint cultures here that have no parallel in Europe, such as the Bann Flake and hollow scrapers. This mastery peaked with Eogan's discovery of the ceremonial mace-head of Knowth. There are other techniques that obviously entailed the use of specialised equipment, such as the hollow tubular pendants of the Boyne Valley complex. Material selection too,was an area in which much experience was gained, possibly through trial and error until the ideal material was found, such as the greywacke stone in the passage construction of Knowth.

The non materialism of the pre-Celts is also evident when one looks at the architectural evidence. No surviving permanent dwelling structure has been found nor are there any objects of significant detail found on domestic sites, unlike the great stone basins and carved rock found in ritual sites. It may be that a separate, non grave good culture existed around organic materials and possibly pottery, although the finest pottery examples are still the funerary type. It is also quite possible that Neolithic times, that oxen or land was the most

representative of personal wealth, which would be more basic and influential than objects per se.

Although there was a steady advancement in technique from 8600b.c. onwards, there was a remarkable leap in knowledge with the advent of Megalithism, which spawned the knowledge of engineering, social organisation, and also the spread of the basic techniques. Of course megalithism itself was the product of several other areas. Undoubtedly the most important of these was agriculture, for without the mastery of this, the great mass of people required for the building of a tomb could not be massed without there being food supply problems.

This agricultural knowledge was not just knowing how and when to sow crops, but also the employment of land management techniques such as crop rotation and possibly fertilizing, in order to keep the land surrounding the megalithic sites as productive as possible. With this necessity to both feed a small village of perhaps 2000 individuals and construct a passage tomb such as Newgrange, the principles of delegation, specialisation and planning on a large scale were necessary, which helps to underline the farsightedness and visionary abilities of such groups,or in Aristotles'thinking 'the conceptualization of the result to be produced before its realization in the material.

Since the corbelled roofs of both the Newgrange and Knowth tombs are, in section, almost perfect arcs we can assume that they had more than a passing knowledge of stress calculation.[11 p217] and fabrication techniques. With the corbelling of such a quality it would seem that the amount of cairn piled on top was roughly predetermined.

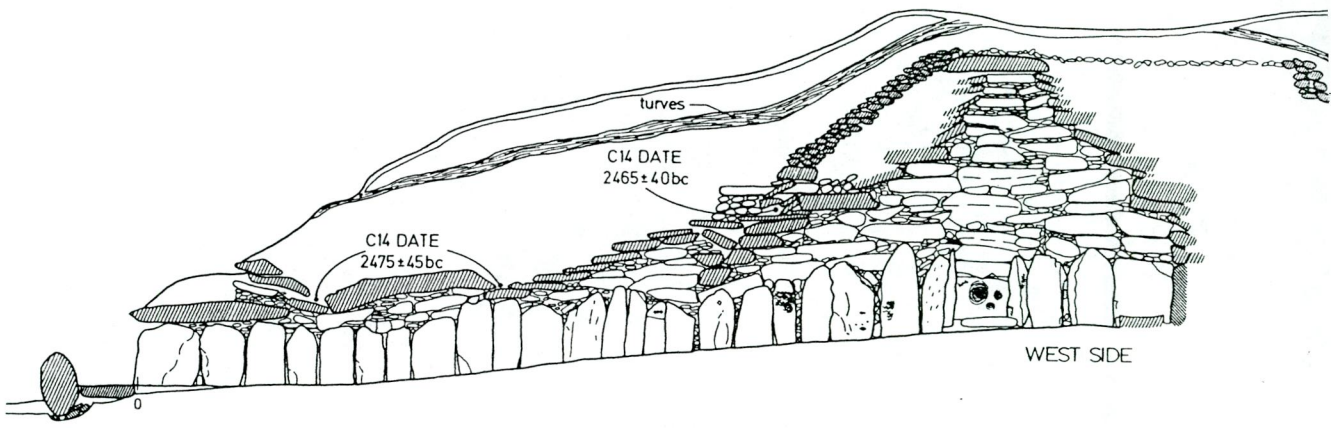


Fig.44 Cross-Section of Newgrange,showing detailing of corbelling

An intriguing aspect of megalithism is that the builders influence spread to the very areas that had probably introduced the Larnian culture to Ireland. Several millennia previously, namely Anglesea in Wales, Western Scotland, the Orkney and Shetland Islands. The megaliths, although not being an indigenous development,nevertheless developed into a highly insular style. It is theorised that the initial introduction came from Morbihan in Brittany, where comparada would seem to suggest that seminal megalithic methods derived from there.

I believe the astronomical element of pre-Celtic Irish design, which, although the least discussed, is one of the most influential. If the Morbihan theory is valid, then the peoples who navigated their vessels hare would have done so through observation of both sun, moon and stars. Thus the spiral pattern seen so commonly on Irish megalithic sites may be attributed to this source, imitating the course of heavenly bodies. The alignment of Newgrange towards the solsticial sun before it makes its northward course across the equator would suggest that the

primary purpose was not to inter the dead, but to celebrate the lengthening of the solar day. The solar observations were probably an anomaly that passed from generation to generation until eventually the great tomb was raised to the giver of life.

What we are left with today in our museums, and on the actual land itself is not just a few artefacts and weather-beaten structures, but he rich knowledge of a people who had a high aesthetic appreciation and whose ambitious and adventurous disposition will be appreciated through time as being one of the greatest eras of Irish culture.

Bibliography

1. THE IRISH SEA PROVINCES IN ARCHAEOLOGY AND HISTORY
Cambridge Archaeological Association, Cardiff 1970

2. EARLY IRELAND
M.J.O'Kelly Cambridge University Press 1989

3. IRISH FOLK WAYS
E. Estyn Evans Routledge and Kegan Paul London 1957

4. IRISH PASSAGE GRAVES
Michael Herity Irish University Press 1974

5. IRELAND, A JOURNEY INTO LOST TIME
P.A. O' Siochain

6. THE STARS AND THE STONES
Martin Brennan Thames and Hudson 1983

7. MESOLITHIC EUROPE: THE ECONOMIC BASIS
David Clarke Duckworth,London 1976

8. FLINT IMPLEMENTS
British Museum British Museum Publishing, London 1968

9. IRELAND IN PREHISTORY
M. Herity and G. Eogan Rutledge Kegan, London 1977

10. THE WORLD OF MEGALITHS
Jean Pierre Mohen Cassel Publishers 1989

11. KNOWTH AND THE PASSAGE TOMBS OF IRELAND
George Eogan Thames and Hudson London 1986

12. SCIENCE IN HISTORY VOL I THE EMERGENCE OF SCIENCE
J. Bernal Penguin London 1969

13. THE AGE OF STONEHENGE
Colin Burgess London 1980

14 THE CELTIC REALMS
M. Dillon and N. Chadwick London 1967.

15 THE ARCHAEOLOGY OF IRELAND
Peter Harbison The Bodley Head Archaeologies London 1976

16 THE MAKING OF MANKIND
Richard Leakey Michael Joseph Ltd., London 1981