Heather Smith
breccamerie@yahoo.com

Glass and amber beads. Novo mesto, Kapiteljska njiva, from various graves 6 – 4th century BC. (Panoramio ID: 24963448)

Preface: The Historical Importance of Bead Research

The study and research of European glass beads as a whole have yet to be attempted in great depth and the study of pre-historic, Celtic, Romano-British, or Roman beads and glass jewelry in Britain and Ireland is hardly any different. While this may be in part due to the great wealth of material to be researched, it does not excuse the lack of knowledge or the importance of glass beads in European history. The late Margaret Guido, once leading in the field of historical British glass beads, has attempted an extensive study on glass beads on the prehistory of British beads to the Anglo Saxon periods. While her books do cover the majority of British bead types, colors and locations of these finds from these time periods it can not be over looked that there is a great absence of knowledge on the actual glass and bead production and trade. This lack of knowledge has limited bead researchers such as Margaret Guido to "class" the beads only by color, shape, or design not necessarily location of manufacture or glass origin. Denise Allen in his book, Roman Glass in Britain, attributes glass origin complications to the glass usage in Britain and Ireland during these times. Due to the constant recycling of glass in these areas "attempts to identify the sources of glass vessels by chemical analysis are thwarted, as glass originally made at sites all over the Empire could end up in the same molten batch". (Allen 13) We can however, study the importance of the glass bead to the Celtic society from a social point of view.

Previously beads and jewelry were neglected by archaeologists and historians as trinkets overlooking their importance to defining complex trade routes, their association to certain regional styles, or even denoting social ranking. These small details color, in more ways than one, the culture from which they came. According to Margaret Guido, "it is time that La Tene glass beads were recognized not only for their artistic qualities but for their chronological and cultural significance as well". (Guido VI) In Thea

Haevernick's work further supports bead archaeology requesting research step away from the art historical perspective and support technological aspects in the field of bead research. (Haevernick 1) Alexis Jordon's research on Irish beads and glass embraces many of the most recent scientific investigations into Iron Age glass production noting that as bead researchers the different angels of bead archaeology need to be considered together to acquire a good understanding of this industry. While specific regional styles might point to a localized industry the chemical make up of the glass might hint to the glass importation which would suggest larger trade implications even if the beads themselves remained in the area. (Jordon 11-12)

The History of Glass and Glass Beads in Celtic and Romano Periods in Europe

Glass and amber beads from the Hallstatt period 4-5th century BCE found at Zavist Sanctuary, Bohemia in Czechoslovakia. Presently housed in the collection of Archeol. Ustav CSAV. (Celtic Art and Culture photo 216598)

Raw purple glass from the Manching Oppidum from the 1st Century BCE presently housed at Römisch-Germanisch Komission Des Deutschen Archäologischen Instituts in Frankfurt am Main. (Gebhard page 1: plate 61), Another piece of raw purple glass from Manching Oppidum. (Deutschen Archäologischen Instituts 'raw glass image')

Between the 3rd and 2nd century BC the oppidda civilization had begun to develop in Celtic societies. The Oppidum, so named by Julius Cesar when he conquered Gaul and later adapted by modern archaeologists, was characterized by a highly developed Celtic society that was deeply interested in defining long distance trade to obtain rare and exotic goods. The upper class used these goods to make their social standing more apparent. To accomplish this, these first city civilizations in Europe developed specialized and mass production for trade while they intensified their cultural and trade links with the Mediterranean area. The Celts imported such goods as textiles, wine, and both raw and manufactured glass items. In return, the oppiddas exported such items to the Mediterranean as amber and grain. Strabo, the Greek geographer and historian, also lists "cattle, iron, hides, slaves and dogs". (Blair 34) Later trade with the Mediterranean would create an incredible impact on the Celtic oppiddas by their introduction to the Roman Empire.

Rome emerged in the Second Century BC and developed into a dominant power over the Mediterranean and Europe till its collapse in AD 476. Between 100 BC and AD 400, Rome was at its prime and its mass manufacturing and vast trade with other cultures and empires reflected this power. These 500 years of Roman history are considered to be one of the great periods of ancient glass making. Roman Period glass production included workshops in Syria, Egypt, Italy, Switzerland, the Rhineland, France, and Britain. New techniques, larger hotter furnaces, refined purer glass, and the invention and replacement of core forming with blown glass techniques completely modernized the industry.

Starting as early as the Second millennium BC the oppiddas in the British Isles had begun to import beads and occasionally bangles from the Mediterranean. By AD 100, Roman innovations in the glass industry had made glass "widely obtainable, relatively inexpensive, and no longer reserved for the elite" so now everyone could enjoy glass. (Dubin 22) In the following nine-hundred years more glass would be produced then the previous fifteen-hundred years in glass making history. While the popularity of glass jewelry in Rome decreased due to its abundance, by AD 100 glass was at its peek in Celtic societies. The knowledge of glass working techniques was introduced with the onset of glass trade into the Celtic world which resulted in a higher demand for glass.

Glass Product Production and Trade in Britain

Top Right: Raw red glass from Fish Street Hill, London. These date to the Roman period and are presently housed at the British Museum. (Kornbluth BM PRB 1931,10-19,8) Bottom right: Raw glass from Riverside Field, Dryburgh, Mertoun, Berwickshire, Scotland. (University of Glasgow GLAHM B.1951.758)

The earliest evidence of glass from the Celtic Oppiddas came in the form of trade beads and bangles. However, by 700 BC and well into the Roman invasions, detailed decorated beads were both imported and manufactured at British sites. There is a great deal of archaeological evidence that suggest that glass production was common within the main land Celtic oppiddas, however no site in Roman Britain has surmounted enough evidence to suggest large or mass scale glass production. Several notable finds that may suggest glass manufacture in Britain include a "small pile of white sand from Wroxeter in Shropshire, and it seems that any use of this for glassmaking was experimental, and not very successful" and possible similar experimentation with raw materials at the Coppergate site in York dating to the late second or early third century AD. (Allen 15-16) While at many sites scattered glass working evidence has been uncovered, it appears that it was reserved for local consumption which included simple blown vessels, window glass, and beads manufactured from recycled and imported glass. During excavations at Hengistbury Head near Christchurch, Dorset lumps of raw unworked purple glass have been found which according to further research had been "coloured with manganese salts and contained a high percentage of tin". Due to these compounds there is a strong probability that this glass was imported from mainland Europe into England. While Hengistbury Head does have the evidence to suggest a large glass working industry, the location probably saw more trade than production. (Cunliffe 43) There is also some archaeological evidence that faience beads, and glass beads and bangles were being manufactured in Culbin Sands in Moray, Scotland from a factory that may have post dated the late first century AD. (Guido 34) While there is further archaeological evidence that suggest that raw glass was imported into the Britain Celtic oppiddas to be used to produce glass items, other evidence also points to the Celtic people recycled broken glass, or cullet, to manufacture other glass products. According to Denis Allen, "The Roman writers Tratius and Martial both describe a system akin to modern bottle banks, whereby broken glass vessels were collected and exchanged for barter". (Allen 13) This practice may explain the lack of broken vessels in Celtic and Roman refuse as broken glass vessels were being re-used to produce new glass items.

Glass Beads in Pre-Roman and Romano Celtic Society- Who, When, Why, Wear?

By no means was the glass bead in prehistoric Britain the first of beads for the Celtic people. As any culture, the early Celts would have made items of personal décor out of easily accessible and workable material such as bone, wood, stone and even seeds. Bronze and precious metal beads would have been made into beads as was shale and jet. (Johns 101-103) Amber, coral, sea shells, ivory and glass were imported as trade routes were established with main land Europe and the Mediterranean. Possibly after Agricola's victory in the north in the late first century "imported marbled stone or steatite" may have been manufactured into annular beads by native tribesmen to satisfy their desire for bright-colors. (Guido 89) The use of beads among the Celtic people in the British Isles was not limited to necklaces alone. According to Margaret Guido, "some were arranged on a panel on a child's breast in a grave at the Forum in Rome, others were used as decorations on ear-rings, as brooch-runners, or as hair ornaments". She goes on to further state, "beads were used as talismans attached sometimes to the sword hilt, others may have been used as finger-rings for the dead, sometimes, too, metal pins may be decorated with glass beads". (Guido 5) We can not ignore the value of beads as talismans either. Ludwig Pauli concluded in his research on European Iron Age burials north of the Alps that talismans are often discovered in the graves of children and young women which might suggest the necessity for protection against the high child morality and death rate of women during pregnancy and child birth. (Pauli 1975) If we are to believe that those Celtic people living in the British Isles valued personal adornment anything like their mainland brothers for whom they traded with, then we can assume that beads were not limited to women. Celtic men were not limited to talismans according to Guido who, quoting Dr. F. de Tompa in his writings in the *Catalogue of the Mecklenburg Collection,* states, "It goes without saying that horse-trappings…denote men's graves, and in the latter case this is corroborated by the fact that the tomb also contained ten arrowheads….This grave, moreover, was very rich in glass beads, and it would therefore be rash to assume that the discovery of many beads in a grave denotes it as a female". (Guido 5) Furthermore, archaeological evidence shows that while bead styles may have changed over the centuries older styles do show up in later collections as if the beads themselves were rediscovered or passed down as keepsakes.

Right: Bangle with beads from the Kelten Museum of Hallein. (Kelten Museum Hellein bracelet)
Left: Silver ring sporting a blue glass bead found during excavations at the Bath Gate Romano-British cemetery, Cirencester. Dia. 19mm. (Corinium Museum Photo 1980-109-16)

The Glass Bead- Neglected Celtic Art (Design and Manufacture)

Large Le Tene glass bead, 4 cm in height, Vicenice, near Klatovy, Czechoslovakia. Housed in the National Museum, Prague. (Poulik, Plate IX)

The Celtic people are well noted as a strong and colorful culture as reflected in their many great feats and creations. Celtic metal work, amazing even by today's technological abilities, is seen as a great classic art movement that has only been superficially copied during classic revivals. Their military strength and courage to their Roman adversaries was heroic, their surviving myths and legends still tantalize us all and their architecture and megaliths are overwhelming and immortal. It is hard to understand that with such research and interest on these proud, romantic and savage people how historians and archaeologists alike could omit something as beautiful and complex as Celtic glass beads from Celtic art books. Margaret Guido states, "Some of the La Tene Celtic beads, both on the Continent and in Britain, are of such exquisite craftsmanship that it is surprising to find hardly any reference to them in works concerning Celtic art". (Guido VI) The Greek historian, Poseidonius, traveled in the First century BC to Eastern Europe and referred repeatedly to the Celtic taste for unusual jewelry. "It is noteworthy that the Celts had, despite their close link to the Mediterranean and the early taste of their upper classes for exotic jewelry, their own distinctly Celtic design for glass jewelry." (Jargstorf 14) While many glass beads were imported from Rome and the Mediterranean, the Celtic people in the British Isles were defining their own complex and original style of beads. Several sites in Britain have yielded possible evidence that points to glass bead factories.

British Glass Factories and Other Places of Importance

Today early British glass works still elude historians and archaeologists alike, but one thing is certain, glass beads were made in the British Isles. Large concentrations of certain bead types in Britain, vastly individual and independent from Continental beads of the same time period, point to local glass working centers within Britain. These sites include Meare and Glastonbury in Somerset, Culbin Sands in Moray, Glenluce Sands in Wigtownshire, Traprain Law and Newstead in East Lothian, and Wilderspool between Chester and Manchester. However, while these areas do suggest a glass industry all archaeological evidence for production seems to be a small industry in the Isles which may have been influenced by materials and mobile artisans. What we know in the present record suggests that small glass production seems to be more likely centered in smaller villages than larger communities. (Henderson 112-120) Amazingly, recent studies using element analysis with LA-ICP-MS on a little over 100 Iron Age beads from different sites in Scotland concluded that while trace elements had been added to the glass with different color results, the basic glass was probably from one site in Levant in the Syro-Palestinian area, or similar sources of sand suggesting probably a Roman importation of glass which was changed to accommodate the needs of the artesian or the specific chemical fingerprint altered during recycling. (Bertini 16)

Meare

Speculations on the many glass beads from this side can be explained two ways. Either Meare, situated close to the coast, acted as a large import center for Continental goods or these beads were actually manufactured at this site. Of the beads found at this locality, the majority of beads were unlike any known Continental beads which seem to indicate a purely British design. Meare was recognized in Margaret Guido's studies for its production of translucent colorless glass beads often decorated with opaque yellow motifs. (See Meare Spiral and Meare Variant Beads)

Suggested Glass Bead Factories and Other Important Sites (Guido 32)

Glastonbury

This site lies close to Meare and was abandoned in the early first century A.D. Coins found in the area suggest that the Celtic tribe, Durotriges, may have occupied this area including Meare, while it is possible also that the Dumnonii and Belgae may have also lived in the area. While beads undoubtedly where traded between Meare and this site, Glastonbury's archaeological records have yielded completely different beads than Meare. Historical evidence suggests that Glastonbury was importing raw glass from Hengistbury Head, another possible glass works.

Culbin Sands, Moray

These sand dunes cover miles of cost line near the mouth of the Findhorn River in Scotland and were occupied in both prehistoric and Roman times. As early as 1871, historians began suggesting possible glass factories at this site. Guido quotes a letter from C. Innes to Major Chadwick referring to a bead necklace 'of glass or vitreous paste colored with oxide of iron' and mentioning 'some curious information from Dr. Gordon of Birnie of the remains of kilns near Elgin where such glass ornaments were manufactured'. (Guido 34) Fainence beads of star, quoit or segmented shapes, which have a notable Scottish distribution, may have been made in Scotland. Fifteen of these beads have been found in Culbin Sands where "analogous slag is also said to have been found". (Guido 34) Still other studies suggest that these beads were made in the Near East. No glass-making evidence has surfaced in Culbin Sand from between the mid-second millennium B.C. and the first century A.D. when the territory of Buchan, Moray and Mar possibly were held by the Vacomagi and the Taexali, the ancestors of the Picts, which merged into the Caledonian confederacy by the end of the second century. Evidence makes it clear that a glass factory in this area probably had been making beads and glass armlets for a hundred years or more before Agricola, a Roman Statesman appointed governor of the Roman providence of Britannia in 78 A.D., defeated the Ordovices of Wales and the Caledonians in Scotland in 85 A.D. (Microsoft Encarta) At that time marketing outlets or the acquirement of glass waste was stopped. Both unfinished beads and glass slag have been uncovered at Culbin Sands while its "highly individual" beads are described as "gay and colorful". Their limited distribution suggests little trade outside the area and perhaps a short production run. Guido suggests that the glass workers of Culbin Sands were not very skilled and their bead designs may have roots in the Meare spiral beads possibly traded through Great Glen. She further states that their imitations failed at obtaining the same colors of the Meare beads and the colors produced in Culbin Sands, "perhaps full of local fortuitous Impurities, were mostly 'black', green, brown or blue, all fairly dark, sometimes opaque, but all with yellow spirals". (Guido 35) Culbin Sands is also known for their annular beads that combine whirl and ray patterns (North Scottish Annular Beads) and their rather inferior annular beads with twisted cables. They also may have produced the long popular yellow annular bead.

Traprain Law and Newstead

This settlement was fortified many times originating as the capital of the Votadini tribe and used latter by the Romans as a line of forts. Both Roman and native artifacts have been found here and local industries thrived. Some metalwork located here stems from south-west English cultural traditions and seem to point to contacts between southern Scotland and the Somerset region. Fused lumps of colored glass have been uncovered at Trapain Law along with a number of crucibles containing colored glass. (Guido 36) Newstead, according to evidence, has produced glass armlets and cable beads as well as glass melon beads which may have originated from Trapain Law, forty miles away. Olive-green glass was not uncommon here. Guido suggests that the idea of the cable motif may have originated at either Glastonbury or Meare and have influenced Traprain Law beads later finding its way to Culbin Sands.

Wilderspool

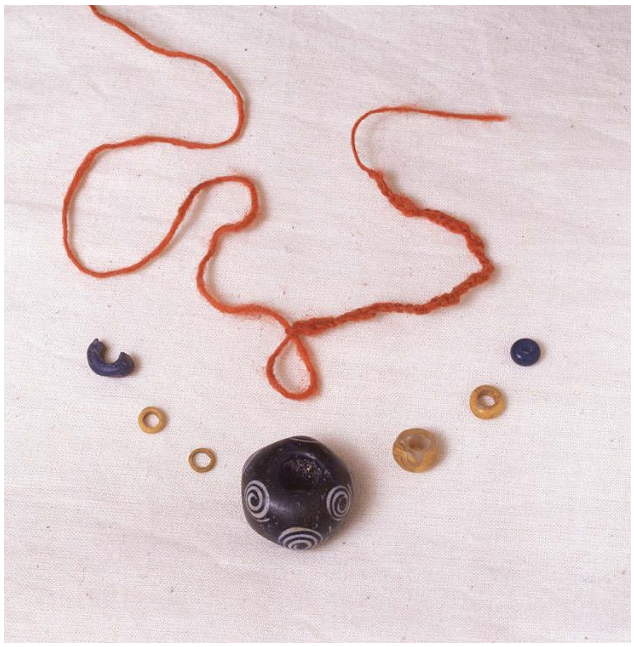
This site is in the territory of the Cornovii and stands beside the Mersey on the edge of Warrington between Chester and Manchester. Possibility the earliest occupation was that of Agricola's campaigns during the late first century A.D. Both cable and Oldbury beads found at this location hint to early occupation. By the end of the first century A.D. pottery and possibly glass bead industries had begun here. Lumps of glass slag and a small crucible with 'black' glass paste were found here along with a large number of beads. A possible unfinished bead of opaque white glass with red and blue patches was also uncovered at this site.

Other Sites

After the Claudian invasion, in 43 A.D., glass waste or imported metal was made up at innumerable sites. The natives in the hill-forts in Wales, Scotland and elsewhere must have frequently obtained bits of Roman glass. Glass bead making canes have been found at a number of sites and may represent the first stage of bead manufacture from refuse glass. (Guido 37)

Below: A rendering of a period Roman glass house based off of historical evidence and archaeological recreation experience. Painting by David Hill. (Roman glass makers, 2010 Illustration)

Iron Age Beads of British Origin or Design



Glass beads from Twyn-a-Gyer Iron Age hill fort, Cwmyoy and Glanbidno-uchaf, Llangurig, Wales. They include yellow and blue annular beads from Meare. Variant type A1, and an Oldbury bead. (Gathering of Jewels Reference Number 46850_2)

Small opaque yellow annular beads with flattened surfaces. (Guido 73-76)

These beads are classified in their own class, unlike annular beads of other colors, are extremely fine and thin seldom exceeding 12mm. in diameter. The main characteristics in this bead class consist of flattened upper and lower surfaces which often conceal the perforation and their namesake rather dull egg-yellow color. In England, Wales and Isle of Man these annular beads date around 300-150 BC. From Scotland several examples come from a number of domestic sites and forts in the latter part of first century to the second century A.D. A rather large and notable discovery of some 250 of this type from Culbin Sands in Moray, Scotland has been discovered furthering the evidence for a large bead making industry there.

These beads are similar Guido's 'Small Opaque Yellow Annular Beads' and are from the Late Iron Age in Slovenia; Vinica. These are presently housed at the Peabody Musuems Mecklenburg Collection. (Peabody Museum Number 40-77-40/11092)

Distribution of Small Opaque Yellow Annular Beads. (Guido 75)

Small opaque yellow annular beads. (Guido 73 and Plate II)

Annular beads decorated with two-color twisted cables. (Guido 77-79)

All of these beads are annular in shape and range in sizes between 20 to 30mm. in diameter and 10 to 15 mm. in height. They usually have a large perforation and with the majority of beads the multi-colored cable is at least 2mm. wide. Theses beads, while few have surfaced in Scotland, seemed to have been mainly manufactured in England. These beads have further been sub-divided by base color.

Type A Natural Translucent Greenish Glass With Colored Cables.

This base colored bead ranges in dates as earliest as first century B.C. to second century A.D. in England. In Scotland, several come from Roman and Romano-British sites dating from the first century A.D. while one other was found in a broch from this same time period. In Wales, only one dated bead of this type comes from a fort occupied from about 80 to 100 A.D.

Cable bead. (Guido Plate III)

Type B Cobalt Blue With Colored Cables.

Dates for this type of annular bead in England range from the first century B.C. to first or early second century A.D. depending on the find. In Scotland, the only fairly closely dated example is from an 80-200 A.D. context.

Cable bead from Chesterholm probably dating to the Roman period at Vindolanda housed at the Museum of Antiquities. (Scran 000-000-193-084-C)

Type C Brown or Golden Brown with Colored Cables.

This shade of annular bead was never as popular as the previous two. It seems to have been manufactured in the first century A.D. in both England and Wales. Scotland has never yielded a cable bead of this type of glass.

Annular beads with bi-colored cables. From Left: Type A, Type B, Type C. (Guido Plate II)

Annular beads with tri-colored cables. Upper row: 1. Tripontium, Warks. Natural greenish glass with red and yellow cable. 2. Moel-y-Gaer, Flints. Natural greenish glass overlaid with inky blue glass and marvered blue and white cable. 3. Wilderspool, Ches. Natural greenish glass. Two white bands and blue and white cable; lower row, 4. Newstead, Roxburghshire. Natural greenish glass with white wave and yellow and white cable. 5. Traprain Law, E. Lothian. Natural greenish glass with blue and white cables and white spirals in blue roundels. (Guido 76)

Distribution of Iron Age Cable Beads. (Guido 78)

The ‘Meare Spiral’ beads (Guido 79-81)

An enlarged example of a Meare Spiral bead. (Hunterian Museum, Native Glass Beads and their significance)

These beads are colorless and translucent and usually globular in shape. Some of the spirals were slightly flattened by rolling the hot bead into a sub-triangular shape. These beads vary from 9 to 14 mm. in height and 11 to 18 mm. in diameter with small perforations. The design consists of three spirals carefully wound into the base color with opaque yellow glass. According to Guido, these beads “are made in the majority of cases with such exquisite precision that one is tempted to think that the very fine examples may have been the product of one man, and most of the rest from the same workshop”. (Guido 79) This type of bead, despite extensive mainland searches, seems to be a uniquely Celtic bead produced only in the British Isles. The discovery of such large numbers of this bead in the Iron Age village of Meare in Somerset, England have suggest their manufacturing in that area. Dating for these type of bead starting from its earliest examples from Meare around the third century B.C. till about late second to first century B.C. in England and Wales. In Scotland, from Culbin Sands, date around first century B.C. or first century A.D. In Ireland, a ‘Meare spiral’ type bead was discovered in a necklace thought to be of mid-first century A.D. This bead has shown up at latter dated sites, but has been believed to be possible heirlooms. While the hey day of the Meare spiral bead lies with the date bracket of 250 B.C. to 50 A.D., an inferior and closely similar bead would show up at Culbin Sands at a later date.

Distribution of the Meare Spiral Bead. (Guido 80)

The Minehowe Mear Spiral Mystery

In 2005, discovery at the mysterious underground structure of Minehowe, at Tankerness, Orkney, Scotland suggests Iron Age trade with Southern England. A spiral bead, found in midden has been studied carefully by Martin Carruthers, a PhD student from Manchester University. According to Carruthers, "The bead appears to be an example of a particular type of glass bead decorated with spirals which is known as a Meare spiral bead. This distinctive style of yellow and black bead takes its name from Meare in Somerset, in south-west England an area that has yielded over 50 different types of glass bead." (Towrie) The bead dates as late as 100 AD and was made by applying vitreous glass onto the surface of the bead.

Top left: The Minehowe bead found in 2005 at Tankerness, Orkney, Scotland. (Towrie), left: another example of a Meare Spiral bead found in Stirlingshire, Gargunnock, Leckie broch in Scotland and dated to 250 BC to 50 AD. Presently housed in the Hunterian Museum. (University of Glasgow GLAHM A.1980.247)

Meare variant Beads. (Guido 81-84)

These beads, like the previous class, include the bulk of colorless glass beads decorated with opaque yellow designs. While these beads consist of completely different designs than their 'Meare spiral' counterpart, it is clear that they are closely related and may have been produced in the same workshops. Their dating falls possibly earlier or more likely later than the classic spiral bead. These beads have been sub-divided based on decoration.

Meare Variant beads. From top left: Type A1 and 2, Type B, Type C, Type D, Type E, Type F. Bottom left: Type G1 and 2, Type H, Type I, Type J. (Guido Plate II)

Type A Translucent with opaque yellow multiple chevrons.
This is the most common variety with 24 possible examples from Meare alone. This type has multiple chevron lines in opaque yellow that runs round the bead a right angle to the perforation cover the whole surface. Present hypothesized dates for this bead variant dates from 250 B.C. to the first century B.C.

Type B Translucent with opaque yellow herring-bone lines.
This bead variant has a yellow band running around the circumference with herring-bone lines radiating from it. It is a bit rarer and its dates tend to be less easily established, however while several have been found with Type A beads in Meare a possible similar date can be suggested.

Type C Translucent with two opaque yellow chevrons.
This bead variant has two circumferential chevrons. It may or may not be related to the previous two. Its base glass tends to be slightly colored compared to the other Meare variants and it is not impossible that it may have been an import from Brittany.

Type D Translucent with opaque yellow perpendicular bands.
This bead type has several bands running around the bead at right angles to the perforation. Only one example exists presently, from Meare and a similar date as Type A and B can be suggested.

Type E Translucent with opaque yellow trellis.
The type E bead is distinguished by a yellow repeated "X" or trellis over the whole bead. This bead also has only one present example from Overton Down in Wiltshire, England. It is presumed to be dated from first century B.C.

Type F Translucent with opaque yellow parallel bands.
This bead has yellow bands that roughly run parallel with the perforation. Only one partial piece exists presently from Meare.

Type G Translucent with opaque yellow parallel wave.
This bead is distinguished by a yellow wave that runs parallel with the perforation. A earlier date of fourth to third century B.C. is speculated for those Type G beads of slightly colored glass. Unlike the other Meare Type G beads, they tend to be the smaller in the Type G sub-class ranging between 10 and 12 mm. The Type G beads from Meare vary in sizes and are dated to the first century B.C. to first century A.D.

Type H Translucent with opaque yellow lines overlaid by looped design.
One example of this bead type comes to us from Meare. This bead has lines around the bead that are overlaid by a looped design running up and down the surface of the bead.

Type I and J Translucent with opaque yellow whirls.
These beads are possibly whirl beads related to continental origin. These two bead types are possibly restricted to Ireland where they were made at an unknown date or possibly manufactured at Meare in the last two centuries B.C.

Type K Translucent with opaque yellow spots.
This bead is decorated with opaque yellow spots and there is only one example know in its class.

Examples of Meare beads from the Meare Village East. All are of colorless glass with opaque yellow design with the exception of fourth on the top row, which has a translucent chrome green with opaque yellow wave Top row from left: Type A2: Dia. 13mm., Ht. 10.5 mm., Hole Dia. 5mm., Meare spiral: Dia. 13.8, Ht. 7.2 mm., Hole Dia. 7-7.3 mm, Meare spiral: Dia. 12-11.5 mm., Ht. 10 mm., Hole Dia. 4.4-3.8 mm., Type G: Dia. 9.6 mm., Ht. 7.8 mm., Hole Dia. 5 mm., Bottom row from left: Type B: Dia. 13 mm., Ht. 10.5 mm., Hole Dia. 5 mm., Opaque yellow annular bead (see annular beads) Dia. 10-9 mm., Ht. 2.8 mm., Hole Dia. 6.4 mm., Type A1: Dia. 14-15 mm., Ht. 10 mm., Hole Dia. 6.5 mm., Type A1: Dia. 12 mm., Ht. 10-9.5 mm., Hole Dia. 5 mm. (Bulleid, Vol. 1 and Meare Colour Plates)

Distribution of Meare Variants. (Guido 83)

Stud Beads. (Guido 84-85) No Map.

These unique beads are defined by their rather "modern collar stud" appearance which presently is another uniquely British Isle bead. Only two stud beads exist in archaeological record, one from Meare and the other found in Wiltshire. Archaeological context points to both beads belonging to approximately the third or second to first century B.C.

Stud beads. Left, Meare, Somerset. Right, Lidbury Camp, Wilts. (Guido 84)

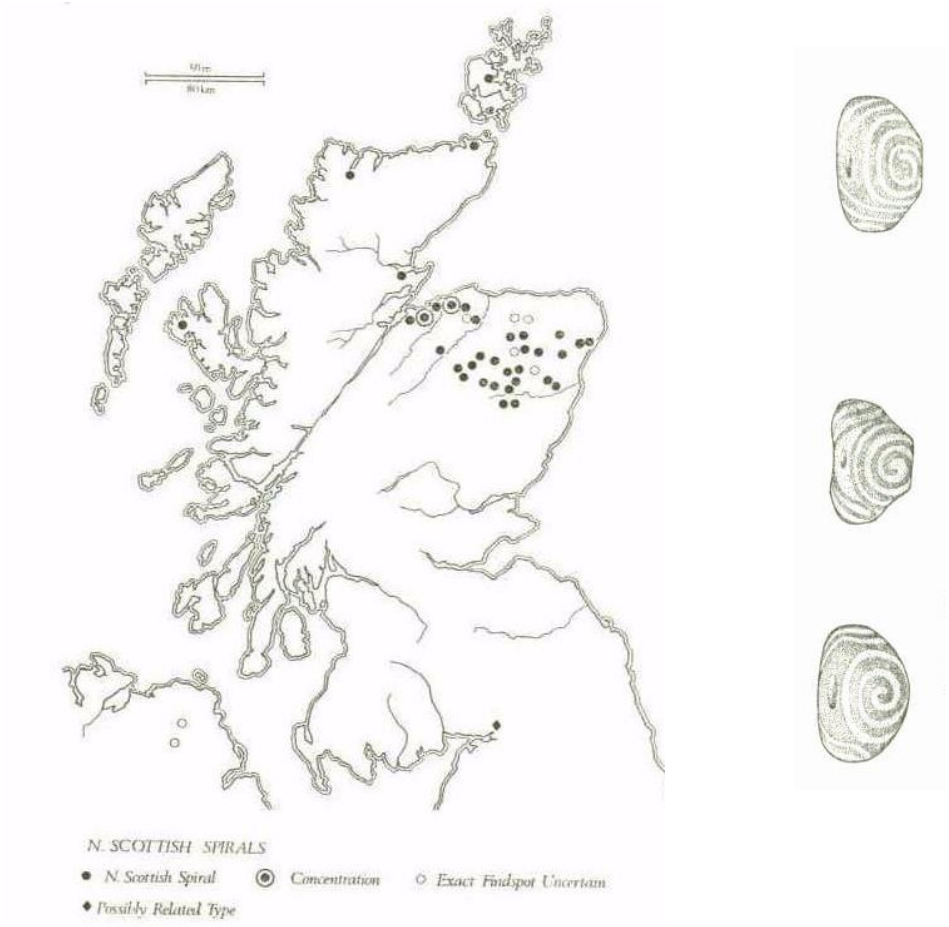
North Scottish Spiral-Decorated Beads. (Guido 85-87)

Right: Found in Ireland this could be an example of a North Scottish Spiral that had been imported into the Island. (University of Glasgow B.1951.2704/1) Another example of this type found in Culbin, Dyke, Morayshire, Scotland. Presently part of the Hunterian Museum. (University of Glasgow Collection Number B.1951.971/3)

These beads, while manufactured at a latter date than the 'Meare Spiral' beads, are a rather seemly inferior version. They differ from the 'Meare Spiral' beads in two noticeable aspects. These beads are more of a angular shape probably due to the rather roughly marvered spirals and unlike their earlier counter part, tend to have colored base glass in greenish, dark blue, brown or some other dark color. Again we find the spirals are invariably yellow and the perforations tend to be small. These beads tend to be of similar size ranging between 11-22 mm. in diameter and 10-18 mm. in height. While similar continental beads have been found both north and south of the Alps, they belong to a period several hundred years earlier. And the most convincing explanation for this Scottish group of beads seems to be that trade with England may have introduced the 'Meare Spiral' beads to Northern Scotland and resulted in local imitation. All of these beads are concentrated in Aberdeenshire and the neighboring counties by the Moray Firth with a few exceptional instances that may have been carried by individuals or intended as trade beads. There is some evidence that Northern Scottish bead factories may have been manufacturing these and several other style beads out of local sands, possibly from Culbin Sands,that may have contained impurities coloring the otherwise colorless glass. These beads date from presumably the early first century A.D. or only shortly before, but there is in sufficient evidence to determine whether they continued to be manufactured after the Agricolan invasion later in the century.

Left: North Scottish Spiral beads. (Guido Plate III)

Distribution of North Scottish Spiral Beads. (Guido 85 and 86)



Examples of Scottish Spiral and annular beads. (Bertini Fig. 1)

North Scottish Decorated Annular Beads. (Guido 87-89)

These beads, while vastly different in size, decoration, and coloring, were grouped under this class only after close study and immediately apparent localized distribution that defined them as being manufactured from the same workshops. The one notable and defining feature, while not necessarily invariable, is their annular shape. These beads vary in sizes from a few mm. to over 30 mm. in diameter and their perforation is sometimes of rounded hour-glass form. Their decoration appears to be derived from two elements: whirls, rays, or ladder patterns which are in effect imitations or cables. These beads appear to be dated at the same time and manufacture as the North Scottish Spiral-decorated beads.

Above: North Scottish decorated annular beads. (National Museums Scotland ID 000-190-004-068-C)

Distribution of North Scottish decorated annular beads. (Guido 86)

Beads of Continental Origin or Inspiration.

Arras Beads Types I and II. (Guido 45-48)

About 12 mm. in diameter and 10 mm. in height, they are invariably dark blue and decorated with white rings around blue eyes. Type I has few and larger eyes that often fall out leaving a round grove in the bead. Type II has more eyes. These may possibly be the earliest Iron Age beads that have found their way into the country. These beads have been found at South British sites at their dates are rather difficult to pin point ranging from fifth century B.C. to first century B.C.

Above Right 2 diagonal potos of same bead: Iron Age blue glass bead from Swallowcliffe Down, Wiltshire, England with decoration in the form of multiple eyes. (Wiltshire Heritage Museum Accession number: DZSWS:2006.29.56) Bottom let to right: Blue glass bead from Chester-le-Street, Durham, Beads of blue & clear glass, shale and bronze. c. 400 - 100 BC. Found in graves of the Arras cemetery, East Yorkshire , A set of blue glass bed necklaces from the Arras burials East Yorkshire. British Museum. (Sheshen Eceni)

(Distribution of Array Type I and II beads. (Guido 46 and Plate I)

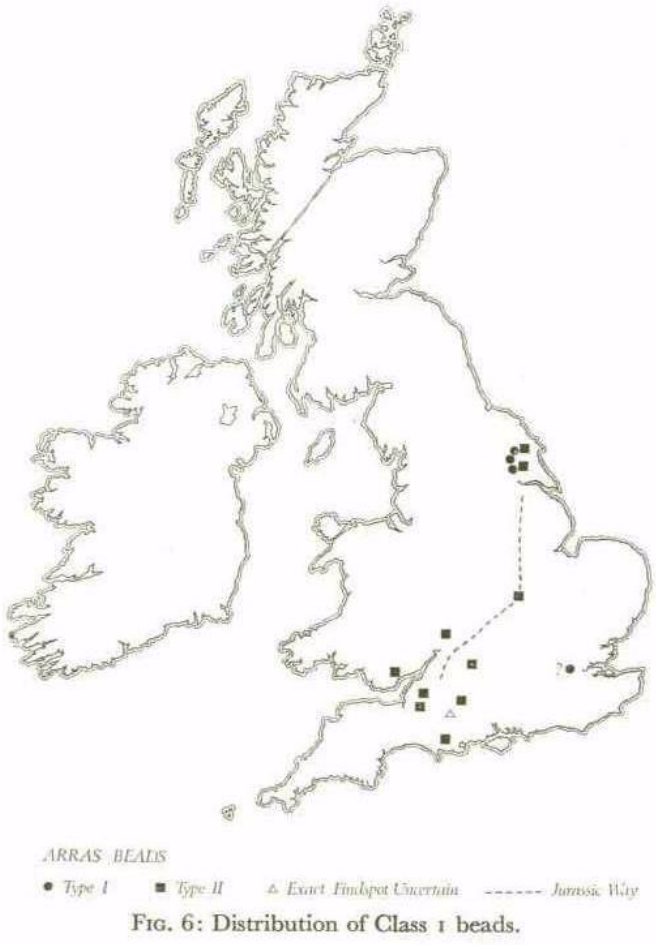


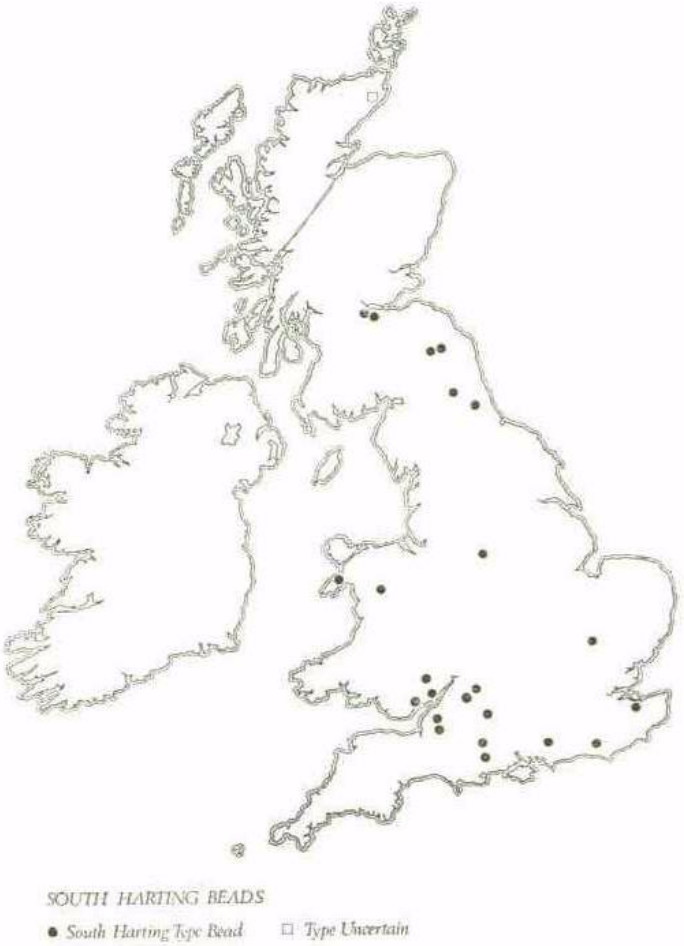
FIG. 6: Distribution of Class 1 beads.

Welwyn Garden City Bead- Half of a blue glass bead with white 'eye' decoration 30 mm. dia.. from Wiggonholt, Sussex, England. Possibly of Iron Age date between 1st century B.C. to 1st century A.D. Presently stored at the Worthing Museum and Arts Gallery. (Romans in Sussex 'Glass Bead')

Welwyn Garden City Beads. (Guido 48-49)

These beads, for which we presently have only two examples, come to us from Hertfordshire and Sussex. They are rather large and globular and are made out of dark blue glass into which two rows of eyes have enclosed by two irregular white circles have been pressed. While they date between the last quarter to the first century B.C. to the first to second century A.D., these beads might have been highly prized keepsakes dating from a earlier time. They possibly originate from Italy or the head of the Adriatic, but the lack of evidence keeps us from affirming this.

South Harting Beads. (Guido Plate I)



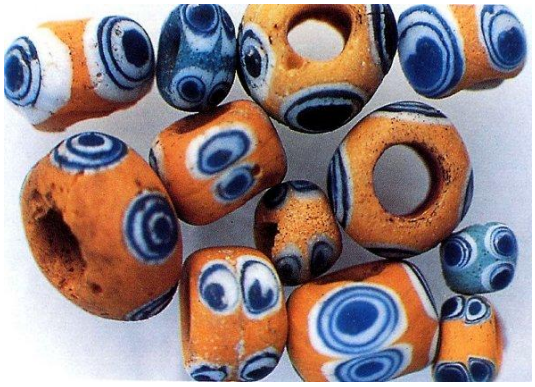
Distribution of South Harting Beads. (Guido 50 and Plate I)

These are fairly large annular beads with a diameter of about 20-30mm. and a height of about 15-20 mm. Almost always this class of beads are made of dark blue glass and generally have three centralized eyes that are of different colors but are always surrounded with an opaque white ring. Occasionally there are only two eyes. The majority of these beads fall within the Romano-British time period and probably did not survive into the third century A.D. These beads are not Roman, but possibly have ties to the Gauls across the Channel. There is still the possibility that these beads were manufactured in the country because they seem to be quit popular during this time frame.

Opaque yellow beads with two superimposed rows of blue and white eyes- Findon type. (Guido 50-51)

This bead class is very popular on the Continent, but only a few examples have been found in the British Isles. While two of three found examples from England, only one may be vaguely dated to probably the fourth or third century B.C. Due to their absence in the vast majority of late pre-Roman sites indicates that they were only surviving as rare keepsakes as late as the first century B.C. Their original production may go back as far as the sixth century or even earlier in the Mediterranean area.

Similar beads are found from the Mediterranean area and are composed of sections of overlaid glass cane and date from no earlier than the fourth century B.C. Some have been excavated from the island of Rhodes from a bead shop active in the second half of the third century B.C. Other examples have been documented from excavations on the Greek island of Delos and date from the late second to the early first century B.C. (Wolf, 198).



Top left: Eye beads which date to 400 BC which were found with human bones in a sinkhole cave near Egloffstein. Presently kept at the Museum of Natural History in Nurnberg. (Natural History 'Eye Pearls') Right top and bottom: Layered eyes beads discovered in Upper Franconia, Bavaria Germany which date to the end of the Hallstatt period. (Landschafts Museum Photos 8 and 9)

Clear colorless annular beads with opaque yellow around the inside of perforation- Hanging Langford type. (Guido 51-53)

The bead was 25mm x 8 mm and it was discovered in a Late Iron Age gully which was probably a foundation for a building within a settlement located in Yaverland, Isle of Wight, just of the coast of southern England. The bead is molded glass and has an irregular and discontinuous band of opaque yellow glass (or vitreous paste) around the inner side, applied in such a way that it glows through the colorless glass. This type of bead is a northern French import and dates from second century BC to first century AD, dying out with the Roman conquest. Very few have ever been found in Britain. (Isle of Wright History Center 'bead photo')

These annular beads usually are about 20mm. in diameter and about 6 mm. in height. The perforation measures about 10mm. across and around the perforation on the inner side of the bead, an irregular and alternating band of opaque yellow glass has been add in such a way that it glows through the clear colorless glass like its prototypes which may have been gold foil enclosed to give the same shining effect. It is possible that the smaller 'armlets' (sometimes under 50mm in diameter) and these beads were hung from torcs. While there are different speculations on the way these beads were manufactured, the exact application of the yellow glass is unknown. The earliest British examples may be around the second century B.C. while other examples may range to the first century A.D. dying out after the Roman conquest. By present research, the hypothesis is that the Hanging Langford Class beads were imported into the south-west of England and perhaps from northern France or Brittany. Subsequently, they may have been copied in Britain probably, if feasible, at Meare.

Distribution of the Hanging Langford Beads. (Guido Plate I)

FIG. 12: Distribution of Class 5 beads.

Large blue annular beads with white or yellow spirals (Oldbury type) Sometimes with swags between the spirals (Colchester type) (Guido 53-57)

The 'Oldbury' type bead is roughly 25-30 mm. in diameter and rather more annular than globular with about 15-20 mm. in height. The perforation is approximately 10 mm. wide. The glass, with few exceptions, tends to be dark, almost opaque blue appearing sometimes black. It is decorated with three and sometimes two rows of trailed and pressed spirals. These are made in opaque white or less commonly yellow glass around the circumference of the bead often on small raised areas. Both these types belong to a well known Continental Celtic type that can be dated to 150 years or so B.C. and tend to be particularly common during the later first century B.C. and have been dated into the first century A.D., but seem to fall out of use after the Roman conquest. Ireland does have a few examples that are with out a provenance or date, but are thought to be trade beads or could have been carried by refugees moving northwards. It is also possible that local Irish glass factories may have been imitating this Continental bead class. These beads spread from England in to Northern Ireland and south and west into Scotland perhaps between A.D. 43 to 71 if not before. Ultimately, these beads date between 150 B.C. and 50 A.D. One of the Colchester type was found in Heppenheim, Rheinhessen, from a grave with a warrior's iron sword. According to the context of the find, the bead was attached to the sword hilt where it may have acted as a loop for a strap to draw the sword firmly to the scabbard rather than a talisman. Some colorless examples with yellow spirals may be Irish copies or perhaps made at Meare.

Beads above from top: 3 Oldbury beads (Guido, Plate III) , Second and third from top: two other examples broken Oldbury beads (Portable Antiquities Scheme Unique ID: LIN-3A9556 and Unique ID: SF-62EB92), bottom left: an example of an Oldbury bead with white spirals from Lough Ravel Crannog, Co Antrim, Ireland. (Limerick City Council photo 19800022) second from bottom right: Example of an Oldbury bead found near St. Brides Major in the Vale of Glamorgan, England. (Portable Antiquities Scheme, news letters 2), Bottom: from Craigsfordmains, Earlston, Berwickshire, in Scotland from the Hunterian Museum. (University of Glasgow GLAHM A.1905.2)

Distribution of Oldbury and Colchester Beads

Above: Oldbury and Colchester type beads. (Guido Plate I)

FIG. 14: Distribution of Class 6 beads.

Below: 2 fragments of aOldbury Type glass beads late Iron Age or Roman date, 300BC to 400AD and 100BC- 100 AD. (Portable Antiquities Scheme Unique ID SWYOR-EBF2F4 and LVPL-26BA21)

Large annular beads with whirl or ray design in contrasting colors-Celtic whirl and ray types.

(Guido 57-59 3 beads right 58)

These two varieties of decoration are generally applied to large annular beads on a blue, purple, brown, or light yellow ground and they may have a rounded hour-glass or straight perforation. Whirls and rays emerge from the hole and in addition, some of these beads have circumferential bands of a contrasting color, usually underlying the whirls. These beads have been sub-divided into several types by color and design:

Type A Blue or purple annular bead with contrasting whirl or ray.

This bead type is recognized by either its blue or purple background and is the most common of the three types. Several of these parallel Continental Celtic sites and the earliest date for English examples come from 210- 290 B.C. There is a likelihood that some of these may have been produced in Meare and their importance probably ended after the Roman occupation in southern England. This bead does seemed to have survived maybe as keepsakes during 130 to 230 A.D., but ultimately the bead dates between 150 B.C. and 50 A.D. They originally arrived through the Bristol Channel and were scattered up the Irish sea coast and around the Thames estuary.

Type B Brown or yellowish-brown annular bead with contrasting whirl or ray.

The three dated examples of this type support a date in the first century B.C. This bead is defined by its brown or yellowish brown base color.

Type C Various other colored annular with contrasting whirl or ray.

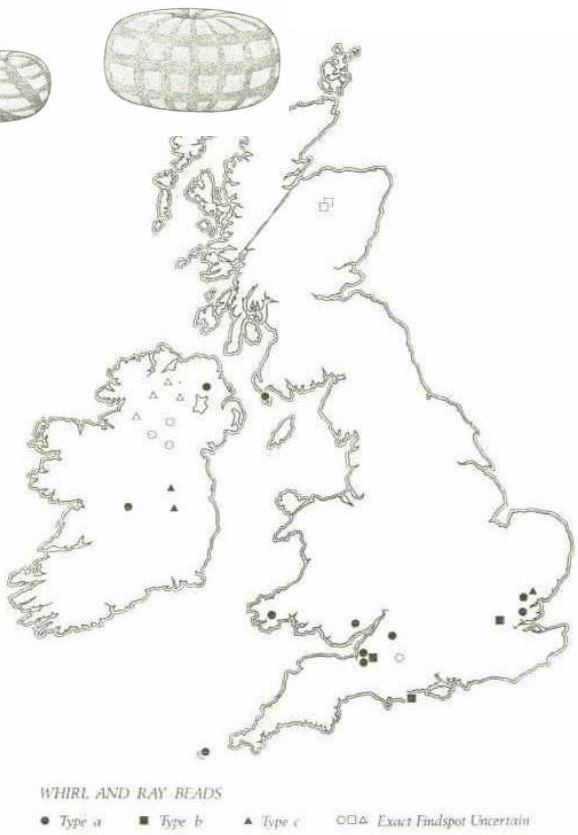
Type C beads have base glass of various other colors. This type group includes beads with green, white or colorless glass. Green and colorless glass examples come from Ireland and are not closely datable. The Colchester bead, with an opaque white ground, pale blue circumferential bands and purple whirls is said to have come from a burial of mid-first century A.D. The two Irish beads with yellow whirls on colorless glass might have been made at Meare where such a combination of colors was a

Top left: Example of a whirl bead from Haliburton Mains, Berwickshire, Scotland. (University of Glasgow GLAHM B.1951.608) Second from bottom: Whirl bead probably of continental design which is dated to 150 BC and 50AD. Found in the Norsey Wood Park in Essex, England and presently housed in the Chelmsford and Essex Museum in Chelmsford. (Norsey Wood Park 'late iron age bead') Bottom right: Mainland example of a late whirl-ray "ring perelen" from the The Heidengraben Projekt. (Heidengraben Projekt Bead Picture)

specialty. Continental parallels for this class are easily found from a wide variety of Celtic oppidas where the bead sizes are almost always large and the colors range from blue, gray, brown, indigo, black, crimson, ect. The Continental beads share a date of second to first century B.C.

Example of whirl bead from Culbin Sands in Moray, Scotland. Presently in the Elgin Museum, Scotland. (ARCH top bead picture)

Distribution of Whirl and Ray beads. (Guido Plates I and III)



Whirl and ray beads. Upper: Billericay, Essex-blue and yellow whirls; Left, Salisbury Plain, Wilts.-'black' with yellow rays; Right, Kirkmaiden, Wigtownshire-dark cobalt blue and yellow criss-cross; Lower, Colchester, Essex-opaque whitish with purple whirls and light blue bands. (Guido 57), Glass ring-beads of the La Tene period from Němčice nad Hanou, Sweden. (6_rechts)

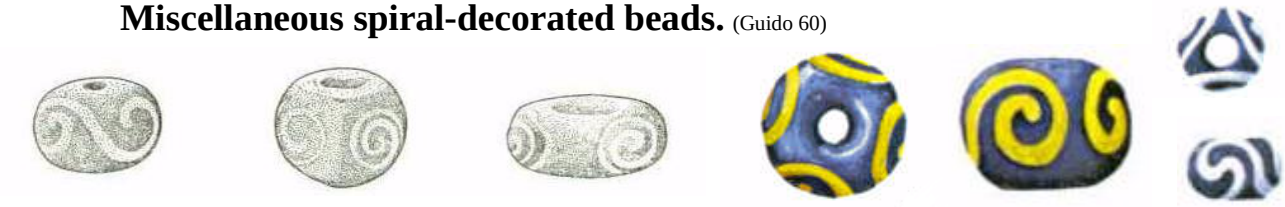
These ring beads and glass bangles were found in Celtic graves at Basel gas works in Switzerland. From 800-30 BC. (Basel Archaeology 'glass photo') Another example of a ray bead found in the Heidengraben Oppidum in Germany in it's heath ditch. (Heidengraben Oppidum 'bead pic')

Decorated or Undecorated Group (Both Iron Age and Roman in Date)

Large or medium annular beads with streaky or mottled design. (Guido 59-60)

These beads are common on the Continent and their ground color is usually blue which is then splattered with white or yellow dots of varying sizes. They vary in size from 22-45 mm. in diameter and 9 to 19 mm. in height. Continental types were probably reaching the British Isles between 50 B.C. and 50 A.D. though their Continental date is from the first century B.C. Their import was rather sporadically soon after manufacture and some may local imitations or keepsakes into the Roman period. Others may be of Irish origin dating from as late as the sixth to ninth century A.D.

Miscellaneous spiral-decorated beads. (Guido 60)



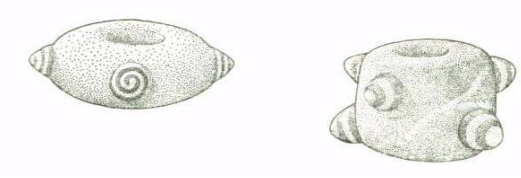
Miscellaneous spiral-decorated beads. (Guido 60 and Plate I)

Not much is given on this variety of beads other than the majority of these beads have a base blue glass and either white or yellow spirals. They differ widely and seldom have exact counterparts. Beads of this type must be dated according to the context of their individual find, but we do know that those annular beads, often opaque, with a spiral around the whole bead's upper and lower surfaces in pale blue or another color are of Saxon date and date much later.

Bottom: A blue glass bead with a yellow spiral decoration, 20 mm. dia., possibly of Iron Age date 1st century B.C. to 1st Century A.D. From Worthing, England and presently stored in the Worthing Museum and arts Gallery display. (Romans in Sussex 'blue bead')

Miscellaneous horned beads, some with eyes or spirals. (Guido 60-61)

Horned beads. (Guido 61)



These beads do not form a 'class' but seem to have been imported from unidentified workshops on the Continent. Guido dates the Newstead, Roxburghs and the Tarporley, Cheshire beads, made both of natural greenish glass with decorated horns of blue on white spirals, within the early Roman period which in Newstead ran from 80 to 120 A.D. A slightly later date is suggested for the two beads of blue base glass with yellow eyes on horns from Silchester, Leics and Chesters Fort, Northumberland which was dated 122 to 383 A.D. While the horned bead on the Continent is not at all a rare find, they are indeed rare in Britain and continue in use as keepsakes possibly, into the Frankish period.

Left: Example of a horn bead with spirals from Glenny Gate, Co. Down Ireland from the Hunterian Museum. (University of Glasgow Catalog Number B.1951.2654)

Compound eye beads with small eyes set in roundels. ('Garrow Tor' type) (Guido 61-62)

These beads are not common in the British Isles and are usually more annular than globular. They are about 15mm in diameter and the classic base color is turquoise and more rarely, dark blue. Pressed onto this are three fairly large mustard-colored roundels which are then inserted with white rings. Inside these rings lies "like eggs in a nest" regularly placed blue eyes ringed with white. A fourth century B.C. ancestral Continental type was found accompanied in a princess's burial from Reinheim, Kr. St. Ingbert. These beads tend to be a bit larger than their later English counterparts, but are perhaps manufactured in the same workshops. Introduction into Britain took place around the fourth to third century B.C. and these beads may either have continued to be imported from the Continent until the first century B.C. or in rarer cases, have survived into Roman times. After several centuries, they seem to be reinterpreted by Irish glass workers sometime after the fifth century A.D.

(Guido 61 and Plate I) Photos of similar Continental beads are from the Reinheim 'Princess' grave in Reinheim (Saarland), Germany dating from the mid-4th century B.C. (Celtic Glass Reinheim necklace)

Miscellaneous wave decorated beads. (Guido 62-65)

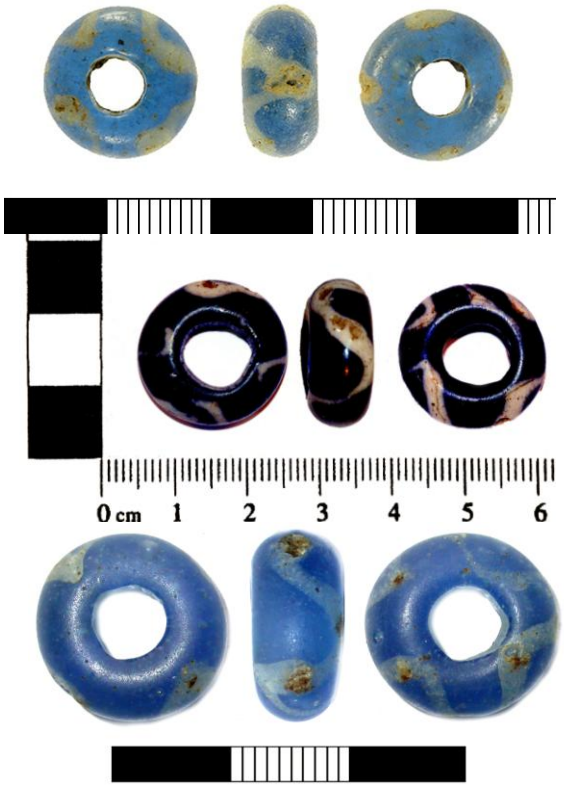
(These beads have been sub-divided by color, shape and design.)

Left: Examples of wave beads from the Mecklenburg Collection found in Vinica, Slovenia which date to the late Iron Age. (Harvard University ID 40-77-40/10951)

Type A Blue annular or globular with opaque white or yellow wave.

Below: (Guido Plate I)

These beads are characterized by their translucent blue annular or globular beads with opaque white or yellow waves. These beads have such a long history of use starting in England at Arras, Yorkshire from graves dating between the fourth and third centuries B.C. Not much later examples were dated from Meare from the third to first century B.C. The 'wave' on these earlier beads are fairly even and carefully applied. During the Roman and post-Roman periods the size of the bead may be larger at about 16mm. or so in diameter and the color tends to be a bit darker. Occasionally yellow, but more often white, has been so thinly drawn out during its application that it may have broken while being rolled and pressed into the bead. The waves are haphazard and sometimes produce knots or bows. This can possibly be regarded as the lesser skill in later craftsmanship. These beads do not occur commonly on the Continent, but are used or reused as Romano-British beads and are newly produced in the Teutonic areas of Northern Europe into the sixth and seventh centuries. The popularity of this type of bead makes dating difficult.



Top Right: Blue wave beads from Mecklenburg Collection which date to the Early Iron Age from Sticna, Slovenia (Harvard University ID 40-77-40/13845) Middle right: Iron age bead found in Isle of Wright, England. Private collection. (Portable Antiquities Scheme Unique ID: IOW-75C683) Second from bottom right: Roman period wave bead found in Outwood, Surrey in England. (Portable Antiquities Scheme Unique ID: SUR-0EAD67)

Type B Opaque blue annular or globular with blue or purple wave.
Right: (Guido Plate I)

These beads are composed of opaque blue glass as either an annular or globular bead with a blue or purple wave. Because the lack of contrast between these two colors of glass, these beads tend to be rarely made. The two known examples belong in all probability to the second or first century B.C. The are concentrated, like many other pre-Roman bead types in Britain, in the south-west.

Type C Green or translucent green annular with white, yellow, or blue wave.

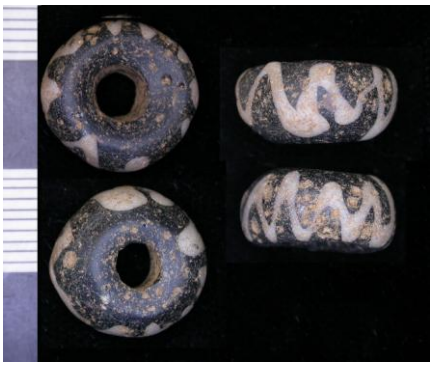
These beads are typed by their green or natural translucent greenish glass. They are annular beads with a white, yellow, or blue wave. This collection is more of a miscellaneous grouping found at Arras.

Type D 'Black' annular and globular with colored wave or scrawl.

Above Wave decorated beads from Left all Type D. (Guido Plate II), Bottom left: Black ring bead with an applied white wave dating to the Iron Age or Roman period found in Ayston, East Midlands in England. Private collection. (Portable Antiquities Scheme Unique ID: LEIC-F568D3)

These beads are recognized by their base color composed of very dark glass that appears black. In this category there are four sub-types of beads. These include annular beads with a white wave, annular beads with an irregular yellow scrawl, annular beads with various colored waves, globular beads with a yellow wave, and opaque yellow annular beads with a colored wave. Those annular beads with colored waves, in both terracotta red and light sky-blue were popular during the early migration period and possibly some

Right: Black bead dating to late Iron Age or Roman Period from Private collection. (Portable Antiquities Scheme Unique ID: LEIC-F568D3)



of these Teutonic or Frankish beads begun to reach the British Isles during the fourth century or a little before. This hypothesis is supported by few examples from datable contexts likely to fall between 350 to 450 A.D. or so. The Globular beads with yellow waves have been separated from the group only because of questions over the dating of these beads. It is suggested that these might be imported Sarmatian beads of the Roman period, however more evidence is required.

Above: Black bead with a white wave dating to the Roman or Anglo Saxon Period found in Melton, East Midlands in England. Private collection. (Portable Antiquities Scheme Unique ID: LEIC-F568D3)

Type E Opaque yellow annular with colored wave.
Left: (Guido Plate I)

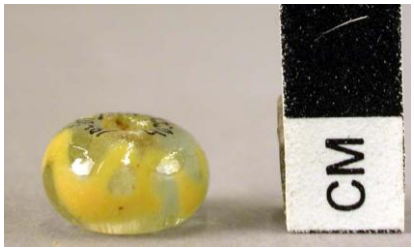
These annular beads are composed of opaque yellow with a colored wave. Several beads in this group may be closely related to the yellow annular beads of British origin as they appear identical with the exception of the wave design in blue or green. These beads probably are also manufactured in Britain. One came from Meare itself and one from a Iron Age cemetery in Burton Fleming in Yorkshire. These beads probably date from the third to the first century B.C.

Type F Opaque white annular with yellow wave.
This bead is of an opaque white glass wrapped with a yellow wave. It dates from the 4th century B.C. and was found in Oxfordshire, England.

Type G 'Amber' reddish-brown with yellow wave.
This bead is described as a translucent 'amber' or reddish-brown bead with a yellow wave. The one bead we have from Scotland is about 19 mm. in height and 8mm. in diameter with a 10mm. perforation. It dates from the early Roman period of first to second century A.D. (Guido 139) The only other example dates from a brooch factory in Cornwall around the second century A.D. It is described as a rust colored, possibly originally translucent, bead that has a yellow wave that sometimes doubles on itself. It is 8 mm. in diameter and 3 mm. in height and contains a 4mm perforation.

Bottom Right: Amber bead with a yellow wave found in Vinica, Slovenia. (Harvard University ID 40-77-40/10509)

Type H Translucent colorless with yellow wave.
This bead is simply described as translucent colorless beads with a yellow wave.



Right: Example of a clear globular bead with a yellow wave from Vinica, Slovenia dating to the late Iron Age now in the Mecklenburg Collection (Harvard University ID 40-77-40/10461)

Type I Translucent greenish-gold with a yellow wave.

This bead is described as a translucent greenish-gold bead with a yellow wave. A bead of this type was found in a settlement in Carrawburgh dating from 122 to 383 A.D. (Guido 13)
Left: (Guido Plate I)

Other examples of wave beads. From top left: 1. Caerleon, Mon.-Blue with white wave. 2. Almondbury, Yorks- dark greenish-blue with yellow wave. 3. Meare (East Village), Somerset- translucent green with yellow wave. 4. Glastonbury, Somerset- salty blue with blue-black wave. 5. Hamworthy, Dorset- opaque blue with purplish wave. 6. Mildenhall, Wilts- shiny black with unmarvered yellow wave. (Guido 63)

Undecorated annular beads. (Guido 65-69)

(These beads have been sub-typed by size and color.)

Type A Large beads of various colors. (*ringperlen*)

These beads were never really made or imported into Britain on a large scale, while those that have been found point to a date within the third to first centuries B.C. They seemed to have died out after the Roman conquest when trade was discontinued with the Continent. Nearly all these are over 30 mm. in diameter, blue, and are confined to the southern part of Britain.

Right: Undecorated annular beads. (Guido Plate II)

Type B1 Medium annular natural greenish translucent glass and Type B2 small annular beads of similar glass.

An overwhelming number of these beads came from Roman sites. These beads range in sizes from 15 to 30 mm. in diameter for the medium sized beads to under 15mm. in diameter for the smaller ones. While very few examples date from the third to first centuries B.C., the majority of these beads run through the Roman period and are possibly composed of recycled Roman glass imported from continental sites. Similar beads are dated about 450 to 550 A.D. where they were found in Anglo-Saxon cemeteries in Oxon and Berks.

Type C1 Medium translucent green, greenish-gold or greenish-brown and Type C2 small translucent yellow or greenish-gold.

These beads range in sizes from 15 mm. to 30mm. for the medium types to under 15 mm. for the smaller beads. It is suggested that the greenish-yellow beads are made from imported glass ingots about the second or first century B.C. in the south at such sites as Worth Down, Hants and Bulbury Camp, Dorset. The rest of the beads in this group were the varieties of greens and yellows are imports of around the first century B.C. to the first century A.D. but lingered on sporadically through most of the Roman period. Pre-Roman distribution is mostly centralized in Britain south of a line from Chester to the Wash. Two examples of from this date reached Western Scotland.

Right: Distribution of Iron Age blue annular and globular beads. (Guido 67)

Type D1 Medium annular translucent or opaque blue beads and Type D2 Small annular blue beads.

These two groups are considered together as their history seems to be similar. Both types began to be imported around the sixth century B.C. and are present at several Iron Age sites of this date. The distribution of these beads in sites strongly suggest a south and southwestern entry as these beads continued to be imported throughout the Iron Age possibly up the Briston Channel and the Irish sea or possibly they were manufactured or distributed from Meare and Glastonbury in the third Century B.C. One or two examples reached the very west of Scotland. They are comparable with the small opaque yellow annular beads of British

Above: Ring beads of yellow, white and blue dating to the Early Iron age found in Sticna, Slovenia; now part of the Peabody Museum's Mecklenburg Collection. (Harvard University ID 40-77-40/13708)

origin, but their popularity lasted for a shorter time. These blue annular beads are very common on Roman sites, but it is apparent that where they occur a native British element is noticeable from the culture. In Ireland, these beads appear to belong to the seventh to tenth centuries A.D. These beads continued in use (either possibly British or Continental) into post-Roman times on into the eighth century A.D.

Type E Small translucent 'amber' (reddish-brown) colored annular beads.

This type of glass seems to be used only to produce these beads. They clearly pre-date the Roman conquest on certain sites from the first century B.C. till around 40 A.D. while some lasted into the early Roman period. While this glass has been used in a few other beads, it was either not very popular or difficult to obtain.

Left: Small Amber ring beads from dating to the late Iron Age from Vinica, Slovenia presently in the Mecklenburg Collection, Peabody Museum. (Harvard University ID 40-77-40/10736)

Type F Small opaque terracotta-colored beads.

Very rarely made into this shape, two opaque terracotta colored beads were found in Croft Ambrey, Herefordshire and Meare, Somerset in pre-Roman contexts. The bead from Meare was manufactured as a yellow or cobalt blue core with the terracotta colored glass as a second layer implying that this glass was rare. They range in size from 15 mm. in diameter or smaller.

Type G Small opaque or translucent sky blue annular beads.
These beads, are 15 mm. or smaller in diameter, are not very common and do not seem to pre-date the first century A.D, the earliest dating at about 80-200 A.D.

Type H Small annular beads of other colors.
Very rare, and notably yellow, beads of this type are of British origin and 15 mm. in diameter or smaller.

Right. Small yellow ring bead from the 1st Century BC found at Argyll, Tiree, Dun Mor Vaul broch Scotland. Presently kept in the Hunterian Museum. (Hunterian Museum Catalog Number A.1965.195)

Type I Small 'Black' annular beads.
These beads tend to appear black, but are usually of some dark unknown color and tends to be under 15 mm. in diameter. They appeared Before the second or first century in places like Meare. Some of these beads have appeared in Roman sites while two have been discovered in Scotland from a later date and may be of Irish origin where large collections have been found. The scarcity in both pre-Roman and Roman sites possibly reflects a limited interest for this color as both shell and jet were made into beads at this time also.

Type J Colorless glass beads.
This type of bead is an "annular half-bead" came from an Iron Age settlement of about second to first century B.C. I was probably manufactured at Meare where this type of glass is fairly common. It is 2.3 mm. in diameter, .6 mm in height, and 1.5 mm. at the perforation.

Undecorated globular beads whose height is more than half their diameter. (Guido 69-71)

These beads have been sub-typed by color and size.

Type A large globular beads in various colors.
These large beads are over 15 mm. in diameter and evidently reached the British Isles in the last century or so B.C. This type was never really popular during the Iron Age or in Roman times. Nothing can really be noted about these beads who do not share color of locations except that some of them came to Britain before the conquest. They have appeared in blue and brownish-yellow in England while several others have been found in Scotland.

Left: Large and medium globular beads from Denholm, Cavers, Roxburghshire, Scotland. Presently at the Hunterian Museum. (University of Glasgow Catalog Number B.1951.1198) Right: Undecorated globular bead. (Guido Plate II)

Medium and small globular beads from Ruberslaw, Cavers, Roxburghshire, Scotland. These are presently kept at the Hunterian Museum. (University of Glasgow Catalog Number B.1951.1227)

Type B Medium and small globular beads in natural greenish translucent glass. The majority of examples point to a Roman date between 130 to 290 A.D., while others date between second to fourth century A.D. Poor examples could have been easily made from Roman waste glass in Roman and post-Roman times. They tend to be rarer in Ireland, though some examples have been found.

Type C Medium and small translucent or opaque green globular beads.

These beads range in size from 15 mm. or smaller. The earliest example is that of a dark semi-translucent bottle green from just pre or post-conquest context. The remaining ones are only very vaguely dated and probably are Roman. Many green beads of this type come from post Roman context and can generally be recognized by their bad craftsmanship. The majority of these green beads tend to be third century A.D.

Type D Medium and small blue translucent and opaque globular beads.

Left: Examples of small blue globular beads from Sticna, Slovenia dating to the early Iron Age now in the Mecklenburg Collection. (Harvard University ID 40-77-40/13464)

This is a common form of bead ranging in sizes of 15 mm. or smaller which not so unexpectedly had a very long life. There are a few native sites from which these beads have been found of Iron Age dates. While it is difficult to date such a common and un-notable bead, several have been context dated in several time ranges. These range from second to first century B.C. in Meare, to just pre-

or post conquest as in Bagendon, Gloucestershire, and early fist century A.D. at Bredon. The rest are probably Roman and continued to be made for several centuries.

Type E Medium and small opaque and translucent sky blue globular beads.
In this category there are very few of these beads, ranging again from 15mm. or smaller in diameter, that are not Roman as this color of glass was common during in the earlier Roman occupation period.

Left: opaque sky blue bead found at Culbin, Dyke, Morayshire, Scotland. Now housed at the Hunterian Museum. (University of Glasgow Catalog Number B.1951.971/19)

Type F Medium and small yellow or 'amber' (reddish-brown) translucent or opaque globular beads.
There are very few examples of this type of bead which ranges from 15 mm. and below in diameter. These beads tend to be rare on pre-Roman sites and occasionally are found on throughout the Roman occupation into post-Roman times. One of these post-Roman beads, made of the same type of glass as the yellow annular beads, comes from Meare between the second to first century B.C. The Roman examples are composed of a amber or translucent yellow glass.

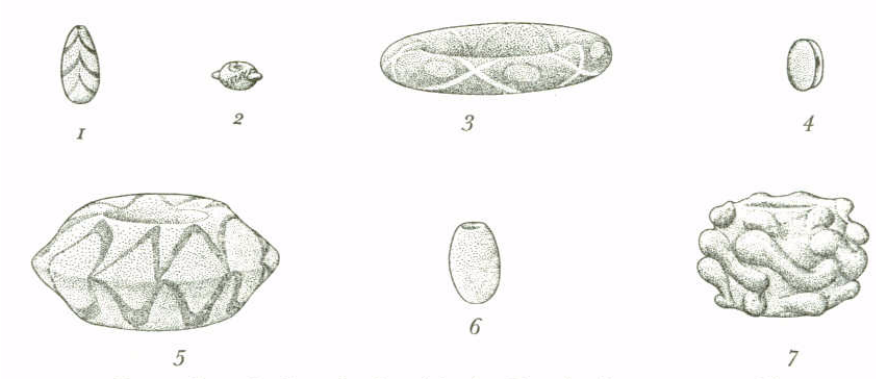
Type G Opaque terracotta-colored globular beads.
There are few examples of this type of bead which also, like the terracotta-colored annular beads, have come from Meare. These tend to also be very small, one at 1.5 mm. in diameter.

Type H Medium and small 'black' opaque globular beads.
Like their 'black' annular cousins, these beads were never very favored so date ability is rather scarce. The earliest example if from and probably has a pre-Roman date, the rest are either Roman or post-Roman. Again, the 'black' color may in fact be of another dark concentrated opaque color that appears black.

Type I Small bright red opaque globular beads.
These beads are rather small and extremely rare in Britain. A number have come from the Roman villa at Kingscote, Glos. and are "sealing wax red". These date from the first century A.D.

Exotic beads of Iron Age date. (Guido 71)

These beads are original design which may at a later date have parallel analogies either on the Continent or from British glass-working centers. These beads range in size, shape, color and design so very little has been presented here.



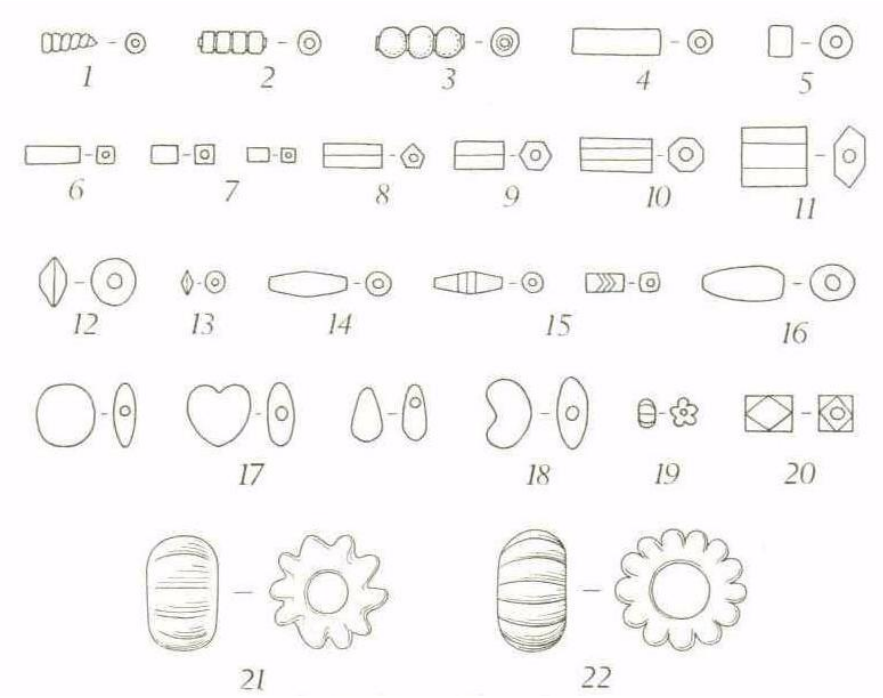
Examples of beads of Iron age date (Guido 176-178):
Upper row:
1. All Cannings Cross, Wilts., England. Long drop shaped bead of yellowish-green glass with dark blue chevrons. Length at 12 mm. and width at 5 mm. very small perforation. Dated to and Iron Age settlement with a long occupation.
2. Loughey, Donaghadee, Co. Down., Ireland. Small blue bead with yellow and blue cable and three tiny opaque yellow horns. Dated at first century B.C. to first century A.D. (Guido 126)
3. Trevelgue, Cornwall, England. Translucent blue-green ring bead decorated with a white double swag with opaque yellow spots between them. Diameter at 38 mm. and height at 8 mm. perforation at 24 mm. Dated to 200 B.C. to the Roman period.
4. Badsey, Worcs., England. Small pale blue "pulley like" bead from a site occupied from third to first century B.C.

Lower row:
5. Hunsbury, Northants., England. Large bottle glass biconical bead with raided running swags of translucent blue glass above and below carination. Diameter 40 mm. and height at 19 mm. perforation at 19 mm. Dated perhaps around second to first century B.C.
6. Clevedon, Somerset, England. Eight barrel shaped thin clear glass beads, coated in red glass. Hand molded and of varying sizes. About 13 mm. long and 7 mm. in diameter at end and 11 mm in center. Possibly from Meare.
7. Boxford, Berks., England. (Large blue annular bead with blobs and swags, 30 mm. in diameter and 16 mm. in height, perforation 11 mm. in diameter. Dated at second half of first century B.C.)

Example of a rare 'herring bone' bead fround at the hillfort Dunadd Kilmartin in Argyll and Bute, Scotland which dates to the Iron Age. Presently housed at the Universtiy of Cardiff. (Scran ID: 000-000-481-790-C)

Roman Period Beads.

Roman beads far surpassed much on the British Isle craftsmanship and despite the Celt's individual taste in beads, were undoubtedly valued. The following, because the information on Roman beads is so vast, is just a rough sketch of what has been found and may have been offered to the British Isles.



Forms of Roman beads. (Guido 92)

Small segmented beads

(A) Various colors, generally but not always opaque. (beads 1 and 2)

Below: This segmented glass bead excavated from Piercebridge Roman Fort is very similar to Guido's Roman type 1 bead though it is slightly large. (Bowes Museum Accession Number: ARC/HS/78/2814)

There are bone, fossil bone, and faience prototypes for this form of bead, however the original glass segmented beads probably were produced by 'gathering' a tube of glass and introducing a bubble of air which then was drawn out to form a hollow glass rod. This rod then could be crimped and regular intervals and may be then broken into smaller segments. This bead type varies from two to five or six segments and is only about 0.3 or 0.4 cm. in diameter. Another possible manufacturing technique included winding a thin glass rod around a metal wire which would be removed leaving a tapering. These rods have been found at both British and Continental sites and may have been used for similar wound beads, for the production of Millefiori or mosaic glass. The commonest colors of manufacture included very dark 'black' glass, opaque terracotta red, yellow, green or blue, and most

often opaque. This bead became popular in Northern Europe at an early Roman date which grew at late and post Roman periods. The majority of archaeological finds from Britain, absent in Ireland tend to be late third or fourth century examples. They continued in popularity well into the Viking and Frankish periods in Britain.

Right: Examples of segmented beads found in Cist, Knowe of Moan, Moan, Harray, mainland Orkney Scotland. Presently at the Hunterian Museum. (University of Glasgow Catalog Number B.1914.524/1)

(B) Segmented beads occasionally wrapped around gold or white metal foil (bead 3)
These beads are made of colorless transparent glass wrapped around some type of foil which gives off a pale golden or white color. Guido quoting G.C. Boon states that "'the working procedure was evidently to draw out a tube of glass over a wire core; metal foil was wrapped round this tube and coated with a thin protective layer of glass'". "The completed ensemble was then threaded upon a narrower wire to be crimped at intervals into the segments which could be broken apart for use as single or multiple units." (Guido 93) This type of segmented bead, while they were produced early in the Mediterranean, they are mainly found in late or post-Roman graves between the second and fourth century.

Cylinder beads **(A) Blue (Bead 4)**
These are very simple cylinder beads made of either opaque or translucent blue glass. The average length, which varies greatly, is around 15 mm with a width of about 4 mm. The perforation is usually small. They have been found through out the Roman period, but seem to be more popular after the second century. These beads, with the exception of one bead from the Isle of Man, have a southern distribution. It is possible that these may have been produced at an undiscovered glass works in Southern Britain.

(B) Green cylinder of Cylinder Segments (Bead 5)
These beads are common from the third century to the eight century in Britain. The earliest example was discovered in a first century burial in Suffolk and from a 'Belgic' level of a first century B.C. or A.D. at Maiden Castle in Dorset. This very Roman form is about 4 mm. long and 2 to 3 mm in diameter.

(C) Cylinder Beads in Other Colors (Not pictured)
Cylinder beads of other colors are rare in Britain, but some examples in 'black' have been found dating from a Roman date. Opaque terracotta colored cylinder beads have also been found in combination with annular beads decorated with cables of British origin.

Square Sectioned Beads either Long or Cubed Shaped (Beads 6 and 7)

These beads date from third to fourth century, but at least one example may be earlier. They are composed of bright opaque turquoise blues and greens. A slightly different type has tapering ends, but is popular during the same times.

Long polygonal beads including hexagonal, pentagonal or octagonal (beads 8, 9 and 10)

These are almost always light green and opaque in color and appear to be manufactured from the same type of glass mentioned in the beads above. They may be intended to be imitations of emeralds. Blue ones are less common with possibly a post-Roman date. The earliest example from Britain was recovered from a Belgic burial in Mount Bures in Essex and dates from 10 B.C. to 55 A.D. The green types of these beads had seen a long popularity growing ever more so into post-Roman dates, blue examples seem to be confined to the later Roman period and may have entered Britain with non-Roman people.

Prism shaped beads (Hungarian *prisma formiga* beads) (Bead 11)

These beads are rare and have been found in Richborough in Kent, Chesters Fort in Northumberland, and Verulamium in Hertfordshire. These beads tend to be six sided with two long sides which are flat in section and have angular ends. They usually are plain green, however the beads discovered at Verulamium were of a green and white glass mix which are thought to be of Sarmatian origin according to Professor Sulimirski. These slightly different or *prisma formiga* beads could have easily been introduced to Britain by the 5,000 Sarmatian horse men who were among the Roman troops sent to Britain in the late second century. (Guido 97)

Small Biconical Beads (Beads 12 and 13)

(A) Blue

These beads, translucent and medium to dark blue, appear in two different sizes. The first variety, between 5 and 7 mm. in diameter and around the same width or slightly more, are from mainly a late Roman date though occasionally they appear at an earlier date. At Maiden Castle in Dorset these beads were dated from 25-7- A.D and anther is dated from Holcombe villa in Devon at late second century. These beads are fairly popular on the Continent on Sarmatian sites where some from South Russia date from the second to third century A.D. The smaller examples of this type of Roman bead, between 3 mm. in diameter and 2 mm. in thickness or less, sometimes comes in other colors. They have been found in a fourth century cemetery at Lankhills in Winchester and are fairly consistent with a late Roman date.

(B)and (C) Other Colors, Mostly Very Small

These beads are found in a very small form dating from the fourth to fifth century A.D. in graves at Lankhills and Cirencester. The most common are the opaque green type made of the same glass as green cylinder beads. Translucent yellow (rare and dating 300 to 340 A.D.) , 'black', and amber colored ones are also known to have been found. These beads, yellow, opaque green and blue, have been dated to the last third or the fourth

century in South Bavaria and seem to be abundant in Northern Germany and Belgium. In Hungary, these beads have been dated from the first to second century A.D. in Sarmatian graves.

Long Biconical Beads (Bead 14)

These beads are commonly made of opaque blue glass, however other colors such as terracotta, turquoise and bottle green have also been recorded from the Continent. Two colorless translucent ones were discovered in a late Roman burial at Poundbury, Dorchester. These beads are very Roman and where already current by the second century. Their popularity continues into the third century but are rather absent from fourth century.

Long Blue Biconical or Square Sectioned Beads with Bands or Chevrons in Opaque White with a Red Line in the Center (Bead 15)

These beads tend to be carelessly made and are rather square like in section. There can be one or more chevrons and bands. It is unlikely that these were made in Britain, but rather imported from North Africa or the Eastern Mediterranean. The British examples, when dated, range between third to fourth century. Larger and similar beads with a straight band rather than a chevron, were occasionally found among Teutonic beads but they date much later. The post-Roman examples tend to be larger than the Roman ones.

Oblong Beads with Round Sections (Bead 16)

These beads are all opaque sky blue and varying from 1.1 to 1.8 cm in length. They belong to the Roman period in Britain.

Miscellaneous Undecorated Heart or Pear shaped Beads and Oval or Round Beads with Flat Sections (Bead 17)

This type of bead varies greatly in shape and color that presently they are of Roman date in Britain, though several pear shaped beads do date from earlier periods.

Small Gadrooned Beads (German, *Gerippte*) (Bead 19)

Only one example of this type was found in Britain at Winchester. These, however, are known from South Bavaria and belong to the middle third of the fourth century. Three small opaque blue examples come from Culbin Sands .

Diamond Faceted Beads (Bead 20)

Very few of this popular European bead appears in Britain; a cubed shaped translucent blue glass bead measuring 6 mm. by 4 mm. with a diamond shaped facet on the two long sides come from a late Roman burials at Cirencester in Gloucestershire, Lankhills, near Winchester, Lufton and Lamyatt Beacon in Somerset. These date between 330 to 390 A.D. depending on the site. There is evidence that suggests that these beads where imported from Rhineland, Poland or the Low Countries with other Germaninc beads and metal objects. The overall date for this type of bead including Continental sites date from 300 to 900 A.D.

Left: Found at the Newstead Roman Camp, Newstead, Borders Scotland. Presently stored at the Hunterian Museum. (University of Glasgow Catalog Number B.1914.521/16)

Glass Melon Beads (Beads 21 and 22)

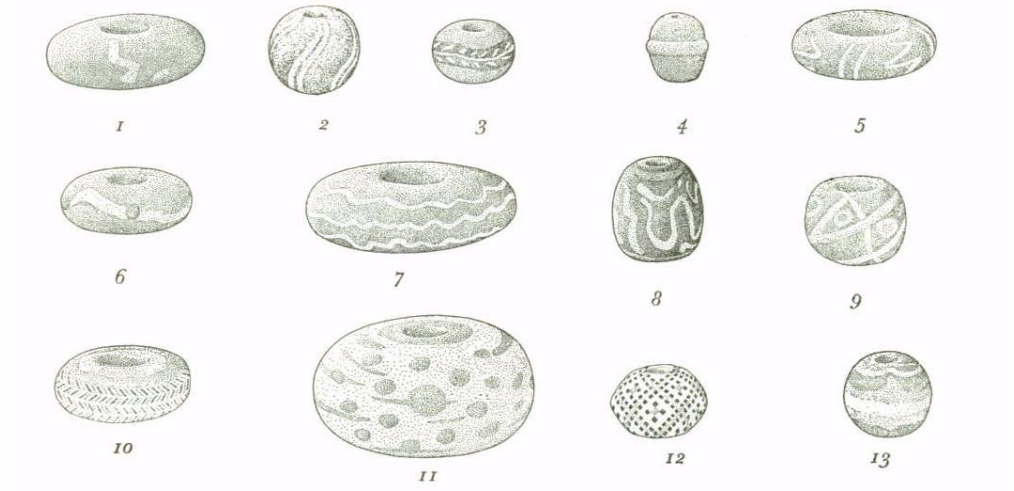
These beads are so common and are usually blue, green, or turquoise in varying sizes. They are long lived making it is difficult to date them, however they are not common in Britain before the Roman period of occupation. True Roman Glass melon beads were imported into Britain from Claudian to Antonine times and seems to be restricted to the first and second centuries. They may have been imitated at Castleford and some other British locations.

Above: A blue glass melon bead 22 mm high from Chichester, (Noviomagus) 2nd century A.D. Melon beads are not uncommon finds on Romano-British sites, and were probably parts of necklaces. (Romans in Sussex, melon bead)

Left to right: Roman melon bead excavated from Binchester, England (Bowes Museum database Accession Number: ARC/BIN/1985/22)

Exotic Roman Beads

These individual beads receive a class of their own due to their inability to fit into the previous classes of Roman beads.



These beads are upper row as follows: (Guido 101) 1. Colchester, Essex 2. and 3. Newstead, Toxburghshire 4. Kenchester, Herefordshire 5. Colchester, Essex; Center row: 6. Caernarvon, Segontium 7. Willinghame, Cambs. *. Aldborough, Yourks 9. Barnsley, Glouc.; Lower row: 10. South Shields, Durham. 11. Caerleon, Mon. 12. Colchester, Essex 13. Bromham,Wilts.

Roman Mosaic and *Millefiori* (Mosaic glass beads)

During the Hellenistic and Roman eras, 300 B.C. to 400 A.D., mosaic beads, also called Millefiori or "thousand flower" beads, became very popular. (Jenkins 10) Archaeological evidence points to the invention of mosaic glass in western Asia. These very detailed and complex designs were constructed by arranging glass canes into bundles which created patterns in the cross sections. This may have been done by arranging heated rods on a marver, or a smooth heat proof surface for which hot glass can be rolled or laid upon, and then rolling hot glass attached to a gathering iron across the heated rods. Another possible method may have used strips of leather or clay to tie glass rods together into bundles that then could be annealed or fired. (Roman Glass Makers Newsletter 4, pg 5) This cane could then be stretched to miniaturize its design and then sliced or broken. These slices could then be used in the production of mosaic items such as glass containers, boxes, jewelry and beads.

Above: An example of a millefiori bead dating to the Iron Age found in Culbin Sands, Moray, Scotland. Presently kept at the Elgin Museum, Scotland. (ARCH middle photo)

While glass rods have been found at some British sites, there is little proof that mosaic glass ever saw major production runs in Britain, but some Roman mosaic items had been imported. I have yet to identify a mosaic face bead in my research from Britain, but that is not to say that that type of mosaic bead could not have been imported or worn by the Continental Celts, however other types of mosaic beads have been identified in archaeological findings. One such bead was found in Colchester, Essex which was probably of a late Roman date.

According to Mark Taylor and David Hill who own a glass works in England that reproduces Roman glass, there are three basic types of mosaic canes, those with concentric rings, those with many tiny rods dispersed in the matrix and those with a pattern resembling a spoked wheel. Elements of each of these can be combined to form hybrids. Concentric patterns are the easiest to produce and involve repeated gatherings of colored glasses to build up the patter. (Roman Glass Makersl Newsletter 4, pg 2)

Glass basic mosaic slices with concentric rings, may tiny rods dispersed in the matrix and spoked wheel patterns. (Roman Glass Makers Newsletter 4, pg2)

Hybrid mosaic slices composed of component rods. (Roman Glass Makers Newsletter 4, pg2)

A second type of mosaic cane is described by Taylor and Hill in their 5th Newsletter. These canes are Hellenistic and can be divided into three different types: rectangular rods, circular canes and network canes. Rectangular rods can be subdivided into three further types: single color rods, by-color rods with one or more thin lines running vertically through the cross-section and bi-color rods with a thin layer of one color, usually white or yellow, backed by or sandwiched between another color. Circular canes come in two basic patterns including spiral and star. Network canes are basically a bi-colored rod.

Hellenstic florets: Stars. (Roman Glass Makers Newsletter 5, pg 5)
Hellenstic florets: Spirals. (Roman Glass Makers, Newsletter 5, pg 5)

Mosaic glass bar from which beads could be manufactured easily were an important trade commodity in the Roman world. Beads could be produced by piercing the slice of cane.

Left: This glass slice was manufactured between 100 B.C. and 100 A.D. and is 2.9 cm. high. It is now housed at the Corning Museum of Glass. (Dubin 25)

Detailed mosaic face beads, probably of Roman or Phoenician origin. Top left bead' 1.2 cm. in diameter. Private Collection. (Dubin 24)

Roman and Celtic Beads of Other Materials

Faience Beads

Left: Faience beads from Culbin Sands. (Findhornbay 'Culbin Sands') Below Middle: from Culbin Sands, Moray and Luce Sands, Wigtownshire between 2000 and 1500 BC, Bottom: From Birse, Aberdeenshire Between 80 and 200 AD at the National Museums of Scotland. (National Museums Scotland ID 000-190-004-052-C)

Faience is a type of sudo-glass made from a paste of a silica-rich material which can be made of ground sand, quartz pebbles or flint and is mixed with water and with small amounts of an alkaline material such as plant ash and additionally calcium carbonate from such sources as limestone, shells or shell sand. The use of faience in Britain recently has been dated to the 19th century BC based on a set of faience-associated radiocarbon dates. The actual process of manufacture is believed to have been introduced from the Near East, but not from Egyptian or Mycenaean traders who had begun to trade faience to the early British natives in the 14th century BC. It seems that the early Britains were introduced to faience through their trade links with central Europe in the early 2nd millennium BC that that had already been defined by demand of tin from south-west England for the central European Bronze industry. Several possibilities support the belief and archaeological evidence of the local British production of faience. A composite necklace found in a bog at Exloo in the Netherlands contained beads made out of tin along with faience, amber and bronze. Several of the tin beads are shaped like segmented faience beads. These reflect the well-known, but lost, segmented tin bead found at Sutton Veny in Wiltshire, England and illustrated in 1812 by Richard Colt Hoare. Another necklace made up entirely of similar tin segmented beads was recently discovered in a female's grave in Buxheim, Bavaria and dates to around 2000 to 1800 BC. It is believed that these recent finds, while yet scientifically undocumented, are tin copies of segmented faience beads probably produced in Wessex, England. Further evidence points to this localized faience production. "Faience beads of star, quoit or segmented shapes which have a notably Scottish distribution may have been made locally in Scotland" and at least two hundred and fifty of these beads came from Culbin Sands alone suggesting localized production. (Guido 34) Measuring the tin to copper ration of these local finds suggest that most of the faience beads found in Britain and Ireland seem to have a higher tin content than that of their European and Near Eastern counterparts. (Sheridan 2003)

Right: 'melon' faience beads from a 5th century Gallo-Roman site in the provenience of Metz, France. Presently at the Musee d'Art et d'Histoire, France. (Lessing Photo Archive ID 10-05-03/69)

In addition, Andrew Shortland, author of "Making a Talisman-How Faience Was Produced" notes that the particular composite of low magnesium and high potash associated with English faience differs remarkably from the alkali composition used in the manufacturing of Near Eastern and Mediterranean faience. (Shortland 2003) Interestingly, new research on faience conducted by all three national museums in Britain, along with Andrew Shortland from the Oxford University's Research Laboratory for Archaeology and the History of Art along with Stanley Warren, a faience veteran formerly of Bradford University, are revealing that faience may have had a talismic importance to natives defined by this localized use of tin. In all actuality tin does not improve the condition of faience unlike its use in glass production where it acts as an opacifier to deepen color, but tin may have been valued by natives who may have held special importance for its ability to transform from a matt black substance to a silver, shiny metal. (Sheridan 2003) A recent urn discovery in Findhorn Bay, Scotland dates to 1880–1520 BC and constitutes the largest single faience discovery in Britain and Ireland which also is the only instance in which segmented, quoit and star-shaped beads have been found together. "The necklace echoes the fashion, seen particularly clearly in Wessex and other parts of southern England, for multi-bead necklaces of precious materials. It adds to the growing body of evidence showing that southern English fashions were being emulated in Scotland at this time." (Shepherd 111) Roughly made and of irregular shape they appear to be the crudest found yet in the Isles which included 11 beads over 24 mm long and one over 39.9 mm long which makes them presently the longest segmented fainece beads in Britain and Ireland. (Shepherd 113) The finding suggests that the segmented beads had been made by manufactured by winding a paste around a piece of straw or other organic material while the star shaped beads were produced similarly they were scored to produce their shape with a blunt object. These were dipped in a glaze and possibly fired only once.

Coral and Shell Beads

Right: Example of an Iron Age coral bead dated to the last four centuries BC. This bead was found at Broxmouth in East Lothian, Scotland. A Mediterranean import which supports long distance aristocratic trade. (National Museums Scotland ID 000-100-103-239-C)

Mediterranean red coral was occasionally imported as an exotic good before the Roman occupation in Britain. It was mainly used as inlay or mounted on bronze with much the same result as the red enameling that was so popular in the Celtic world. It was also used as ring settings and occasionally for beads. Coral seemingly, according to the archaeological record, appears fairly early in Eastern Europe from the Mediterranean around the 5th century B.C. and continues almost unfazed by trade changes until the 2nd century B.C. During this time it has an extensive geographical distribution turning up as far north as Yorkshire, England. (Collis 2001) While it was undoubtedly an expensive trade item, coral has been found not just in rich burials, but also in some poorer graves. One grave in Lankhils near Winchester contained a bronze chain with glass beads of different shapes and colors and at least one coral bead. (Johns 99) A second was found in a late Roman grave at Felixstowe. A less historically documented trade commodity that of sea shells.

There has been no in depth study of the importance of marine and riverine shells as Celtic trade items or for use in jewelry. They do occasionally make the historical record where they sometimes have been used for decorative purposes. A site at Aulnat, France dating to the Hallstatt period produced a local freshwater mussel, Unio tumidus, that had been pierced to produce a pendent. Four species of shells were discovered at the site, while only one of these, the Common Oyster, seems to be associated with later Roman consumption. The rest help support trade for the shells themselves. The common cockle (Cerastroderma edule), is the most frequent find and in one case it to has been drilled for adaptation as a pendent. A fragment of a pilgrim's scallop (Pecten cf. jacobaeus) was also discovered at this site. During the Late Hallstatt period in Thuringia, freshwater mussels that contained red ochre were found in the form of pendants often placed in the graves of young females. Cowrie shells have been found in Le Trou de l'Ambre in Belgium and in some burials in southern Germany and Durrnberg in Austria. Cockle Pendants also occur in Early La Tene burials in Ardennes. (Collis 2001)

Right: Beads of glass, coral, rock crystal and a seashell used as a pendant from tomb no. 53 at Pilismarot-Basahac, Hungry dating from the 4th century B.C. (Bujna 308)

Amber Beads

Amber was being mined and worked in southern England very early and later, was an important trade item from the Baltic Sea where it still is found along the beach. Citing The earliest worked pieces of amber were discovered in Southern England, near the Cheddar/Creswell crags in Gough's cave. These beads date between 11,000 and 9,000 years B.C. (Grimaldi) During the Bronze Age the first Baltic amber reached British Isles in the form of raw or possibly pre-worked beads. It was already quit valued by the mainland Celts who treasured amber possibly for its color and unusual static ability. Like coral, amber appears in both rich and poor contexts and its trade also appears to decrease in later historical contexts. (Collis 2001) Amber occurs occasionally in Roman jewelry from Britain, but was never common. One fine amber ring with a head of Minerva in high relief was found at Carlise. (Johns 70)

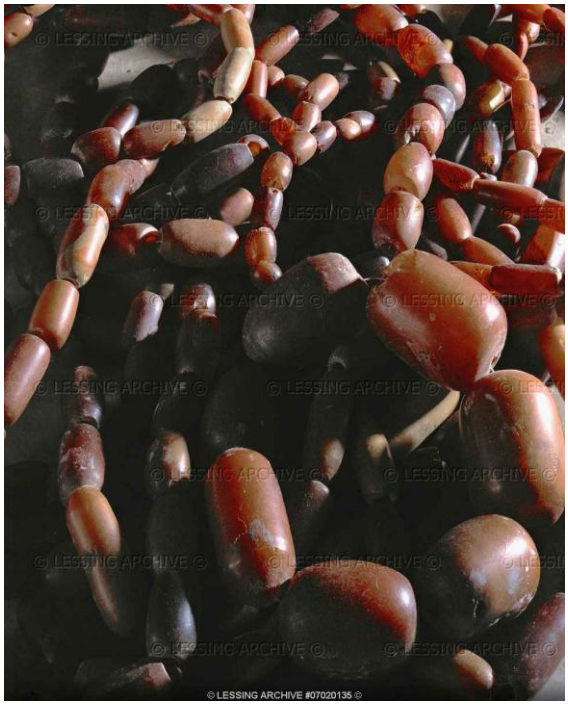
Left: A necklace containing 390 amber, bone, and stone beads. It was discovered in a 6th or 5th century B.C. Duerrnberg, Hallein, Austria grave 67. Presently housed at Keltenmuseum, Hallein, Austra. (Frey 91)

Left: Amber from the Reinheim Princess' burial from Reinheim (Saarland), Germany dating from the mid-4th century B.C 124 preserved beads, the largest 7.6 in Diameter. (Celtic Glass 'amber')

Right: An amber necklace from tomb no. 63 at Pilismarot-Basarhac (Hungary) date from the 4th Century B.C. (Almagro-Gorbea 328)

Above: Necklaces of amber and glass beads from tomb no. 48 and no. 40, both from Saint-Suplice (Vaud) dating from the second half of the 5th century B.C. Presently at Musee Cantonal d' Archeologie et d' Histoire. (Daire 254)

Amber Jewelry from Novo Mesto, Slovenia which date to the Iron Age. These pieces are presently kept at Dolenjski Museum in Novo Mesto. (The Slovenian "Jewelry made from Baltic amber")



Right: Amber beads from the 2nd-1st BC from Szarazd-Regoely, Hungary. Presently at the National Museum, Budapest, Hungary. (Lessing Photo Archive ID 07-02-01/35)

Rock crystal and Quartz, Agate, Chalcedony, Carnelian, and Other Precious Stones

Rock crystal and quartz, agate, chalcedony, carnelian and other precious stones were often popular with the Romans and the Romano-British who used them in a variety of different jewelry settings. They were engraved and set into rings or carved as cameos. One example of a carved chalcedony ring, which was engraved with two clasped hands, was found near the Romano-Celtic temple site at Hayling Island, Hampshire. These stones when used as beads and pendent drops were not normally engraved, but rather carefully shaped and drilled. "Emeralds were left in their natural crystalline form, a hexagonal prism, and indeed green glass beads in this shape, obviously intended to imitate the precious stone, are quite common." (Johns 86)

Above top right: Roman jewelry found at Canterbury, Kent. Gold chains with green beads (top), emeralds (middle) and garnets (bottom). (Canterbury Archaeological Trust 'Roman jewellery found at Canterbury') Bottom left: Speckled stone bead from the Princess of Vix Grave, dated to the late 6th c. to early 5th c. BCE. Presently housed in the Museum du Chatillonnais. (Whitt 'amber and stone beads') Bottom Center: 3 stone beads from Monquhitter, Aberdeenshire, Cnoc Rioch, Oronsay, Inner Hebrides dated between 0 and 400 AD. Presently stored in the National Museums of Scotland. (Scran ID 000-100-035-856-C)

Banded agate was very popular with ancient peoples including the Romans, if fact, so much that it was often imitated perfectly by ancient glassmakers. The beads in the left column are stone, while those on the right side are glass imitations. Most of the stone beads pictured are from Persian, Parthian and Roman periods dating from 249 to 300 A.D. A few date from the 1st millennium B.C. The glass examples are from the Roman period with one exception which may date from 800 B.C. All beads shown were found in Iran. The left hand bottom bead is 4.5 cm. in length. From the Henry Anavian collection. (Dubin 23)

Jet and Shale

Jet is a hard compact variety of lignite, a type of coal between peat and bituminous coal. It commonly occurs in Whitby, England where it was widely mined in the Celtic world which often exported both Whitby jet in raw and carved pieces to the Roman Empire. Jet takes a high polish and can be easily carved in detail which often copies or reflects metal pieces. It has been suggested that jet had a supernatural value because of its static properties. Pliny the Elder (23?-79AD), a Roman writer and utmost authority on science in ancient Europe, wrote of the magical properties of jet:

"When it is burnt it gives off a smell like that of sulphur. What is remarkable is that it is ignited by water and quenched by oil. The kindling of jet drives off snakes and relieves suffocation of the uterus. Its fumes dect attempts to simulate a disabling illness or a state or virginity. Moreover, when thoroughly boiled with wine it cures toothache and, if combined with was, scrofulous tumours. The Magi are said to make use of it in what they cal 'divination by axes'; and they assert it will not burn away completely if a wish is destined to come true"-Loeb, Book 41XXXVi, 34,

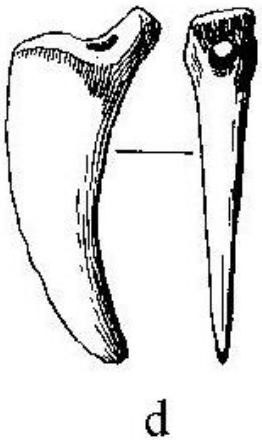
Above: Bronze age jet and amber beads from Bedd Branwen burial site, AngleseyJet and amber beads which were discovered at the burial site known as 'Bedd Branwen' [Branwen's Grave], near the river Alaw, Llanbabo, Anglesey. (Gathering the Jewels Item: GTJ16700)

One type of jet bead necklace found in Britain was composed of flat disc beads perforated in the center to produce something of a flexible cord. Another popular type of jet bead, both in Britain and in the Rhineland, was that of large jet beads of plano-convex section which often had two perforations. They are carved with a ribbed or other relief decoration and could have been used as pendants or necklaces and bracelets composed entirely out of this type of jet bead. Jet was also used for cameos and pendants, bracelets and hair pins. In 2000, a site in Scotland, at Rameldry Farm in Fife, was excavated and yielded a remarkable find. A cist at this site contained the body of an 40-50 year old arthritic man and carbon dating of the burial dates the body to 2280-1970 BC. He was wearing a jacket adorn with six V-perforated buttons, five of which were composed of Whitby jet that had been brought from 250 km away. One of these jet buttons was decorated with a cruciform design made by dulling the surface and inlaying tin which probably was imported from south-west England. The sixth button was of made of a steatite-like stone called lizardite from Cornwall. (Sheridan 2003)

Kimmeridge shale is a type of sedimentary rock occurring widely in Britain that was often used in the manufacture of beads and bangles and other functional items. In 1826, spontaneous combustion of the shale along the cliff in the Ringstead Bay area burned for four years coining its name, the Burning Cliff. Undoubtedly, this phenomenon occurred in ancient times and may have aided in the popular use of this stone. In prehistoric and Romano-British times a source of this shale in the isle of Purbeck, Dorset England was widely exploited.

Left: A jet and glass bead necklace of different shapes and a series of bronze pendants which originally held green glass beads. The large jet 'pendent' was originally a bracelet slide. From Exning, Suffolk and now housed in the British museum. (Johns 102) Right: Jet bead from Piercebridge Roman Fort, Durham, England. (Bowes Museum Piercebridge Roman Fort Accession Number: ARC/HS/79/3869 and ARC/HS/79/3688)

Beads and Pendants of Other Materials



Left: Boars' tusk pendant from the Romano-British site of Nroth Wraxhall, Wiltshire, England dated 1st-4th century A.D. Originally these two tusks were joined by three riveted bronze sheets that were lightly embossed with a hunting scene. Only one sheet remains. (British Museum P&EE 1861.3-7.1), Second Left: Beaver tooth pendant from the 7th century Anglo-Saxon barrow at Wigber Low, Derbyshine, England. This incisor has been set into a delicately ribbed gold tube with a small loop so that it could be hung as a pendent. (British Museum PS342162), Second right: Bear claw pendent from from the Iron Age cemetery of Magdalenska gora. (Hencken Figure 117D)

Undoubtedly the Celtic people used other substances for the manufacturing of beads, but like many perishable substances do not stand the hardship of time. Catherine Johns suggest that, "Wood must have been used, and it is more likely that natural objects such as dried lentils, shells and even animal teeth may also have been employed. Wooden and bone beads could have been easily colored to resemble glass or stone, and such color seldom survives even if the bead itself is made of robust material." (Johns 103) Perforated wolf's teeth were found at the Hallstatt Iron Age site of Choisy-au-Bac (Oise) and perforated bear's teeth were discovered at a cemetery of Mont-Trote in the Ardennes. (Green 45) A noted bear claw pendent was discovered in Grave 11, of Tumulus V of Magdalenska gora in Iron Age Slovenia. Other instances of animal canines show up through out the archaeological record where they were used for beads, pendants and toggles.

Left: Tooth 'toggle' from an unknown area presently housed at the Kettering Museum which dates to the Iron Age. (Kettering Roots KETTKM : LSM17) Tooth pendent or toggle from South Shields, England presently at the Museum of Antiquities. (Scran 000-000-193-085-C)

Top: Ring beads and ammonite pendants from an early Urnfield cemetery in. (Landschafts Museum Abb. 1), Right: Sketch of an ammonite pendent found at Meare Lake Village, in Somerset, England dating to around 100 AD.

Some rich early Bronze Age graves (2400-1500 BC) in Wessex, England yielded some interesting beads manufactured from fossil crinoids, a segmented aquatic plant that breaks into concertina-shaped disks. Another notable rare type of bead was discovered in a Bronze Age grave at Stockbridge Down in Hampshire. These quoit-shaped beads were manufactured from fragments of stalactite from a Mendips cave and it is suggested that they may have held supernatural importance as an otherworldly item. (Sheridan, 2003) Fossil ammonites, probably prized for their spiral shape, have been found in multiple areas including the Celtic oppidiums of Meare Lake Village in England and Manching in Germany.

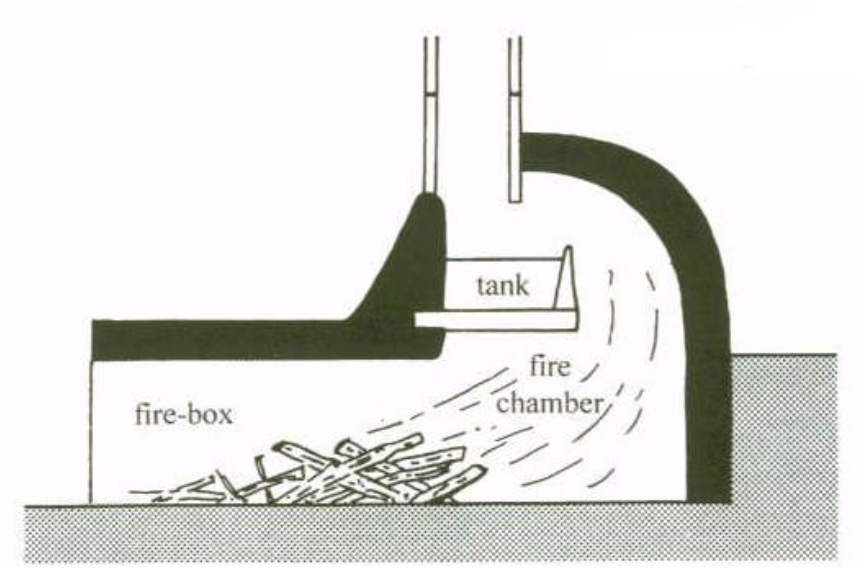
Bronze, gold, and silver beads where indeed manufactured, however the later two show up in richer Romano-British and Roman contexts.

The Process of Glass Working During the Iron Age and Today

Glass was probably first produced in the 'cradle of civilization' in western Asia in what is now Iraq and Syria between 3,000 and 2,500 B.C. It might have been originally used to imitate precious and semi-precious stones, a function that not only was practiced by the Romans and the Celts, but is still in use today. In ancient times the manufacture of glass was a simple procedure which involved the mixture of fine sand or silica and soda. Soda can be acquired either from natural desert deposits of natron or from soda-rich plants such as salicornia. Lime was also used in the manufacturing of glass as a hardener to prevent the glass from dissolving in water and could be obtained from limestone or from sea shells. (Allen 6) Guido adds to this mix as being composed of a mixture of oxides, the main ones being rarely less than 60 percent silica, lime, soda and potash, alumina is usually present and is derived from clays in the sand. Magnesia and iron oxide are rarely if ever absent and traces of oxides of lead, antimony, barium may also be present. (Guido 9) Pliny the Elder, a Roman scientist and writer, describes in his *Historia Naturalis* a very interesting, though rather unreliable, explanation to how man came upon the creation of glass.

> "One a ship belonging to some traders in natural soda put in here (mouth of the river Belus, south of Ptolemais on the Phoenician coast), and they scattered along the shore to prepare a meal. There were no stones to support their cooking pots, so they placed lumps of soda from the ship under them. When these became hot and fused with the sand on the beach, streams of an unknown transparent liquid flowed, and this was the origin of glass" (Allen 6)

A variety of colors were popular in both pre-Roman and Roman Britain. Margaret Guido lists the most common of these colors during the Iron Age as follows, "translucent or seemingly opaque blue (a variety of shades but mostly 'cobalt'), opaque yellow, and opaque white (which was reserved for decoration of applied waves, spirals, eyes, and so on). Terracotta red (Pliny's *haematium*) and occasionally, but rarely, glass which appears 'black' may also have been in use before the Roman conquest. Translucent greenish-blue glass was introduced before the Romans… After the conquest opaque emerald green became increasingly popular for cylinder and polygonal beads. Purple may be created by adding manganese while deep blues are usually the result of cobalt though copper may also result in blue hues in glass. Copper, or iron in a reduced state, can also produce pale blue-green. Horse manure, sulphur and or a carbon compound in combination with iron can produce reddish amber color and some browns. Yellow was produced by adding lead oxide. Deep greens, browns, and ruby red can be composed by adding copper. Dark bottle-green glass can be obtained by substituting certain igneous stones in place of sand. The opacity of some Roman and Celtic glass may be caused by the presence of stannic oxide or dispersed cuprous oxide, or intense colorization caused by the presence of a high proportion of Iron. It may also be caused by insufficient heating to disperse bubbles. (Guido 9)



A sketch section through a reconstructed glass furnace. This is a small keyhole-shaped furnance that is about 1.5 meters long with a suspended tank for molten glass. This is based on archaeological findings from a 2nd century A.D. site in London. (Allen 16)

Reconstruction of Viking bead making at the Post Office site, Ribe, Denmark. Everyone now agrees that the fire would have been enclosed. (The Bead Site, Ancient Glass Beads in Europe 2)

The remains of a glass furnace at Troyes, France. (Roman Glass Makers 'Furnace picture')

Margaret Guido, noting Van der Sleen's notes on glass production, states "Glass is made in thick earthenware crucible containers from 2 to 200 lb. of mixed pulverized quartz or sand quartz with some lime and soda, potash or nitre, sometimes lead. Generally before heating, iron or copper, manganese or cobalt coloring is added. The ingredients are then thoroughly mixed and heated in one or more firings to a red-hot, viscous state. A 'gathering' of the glass is then drawn out to make a shiny glass rod which quickly solidifies. These rods or canes are then cut down to useful lengths for making the oldest and simplest kind of beads—wound beads." (Guido 9) In addition to the plethora of evidence for wound beads recent research suggests the use of molded beads as might be the case with the Meare spiral beads which was suggested by their discovery close to mold fragments. (Henderson 1982: 94-95).

The glass furnace was very much akin to the pottery furnaces used by both Continental and British Celts with the exception of a suspended tank used to melt the glass. This type of furnace could be used for both glass vessels and wound beads. Glass furnaces are still used by glass blowers and casters much like ancient man.

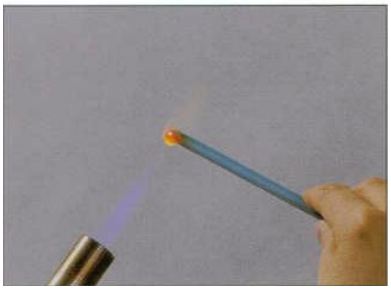
David Hill and Mark Taylor working glass into a Roman reproduction bowl at their glass studio in England. (Roman Glass Makers, Hellenistic and Roman Mosaic Glass 3)

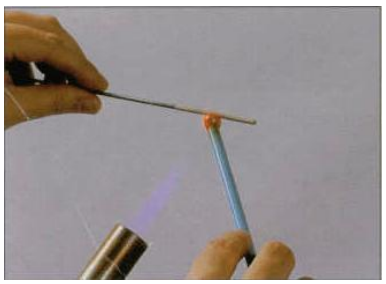
Recently Jacqui Wood, who runs the experimental Celtic Village in Cornwall in England, suggested that ancient ceramic 'cheese molds' might have been used rather as Bunsen burners. This type of burner has been used successfully in experimental archaeology as a rather portable torch not just in domestic applications, but also in the manufacture of lampwork beads. (Wood 2012) Today, bead artists use a torch usually powered by propane, propylene, or MAP gas to melt their glass rods and occasionally anneal (heating and slow cooling to strengthen the glass) the bead in a kiln.

The Manufacture of Wound Beads

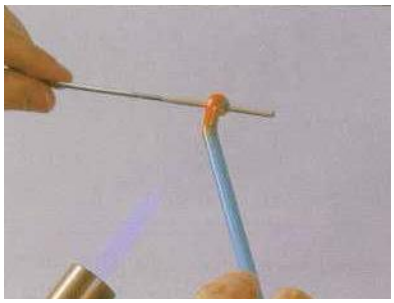
As then, today glass rods are used to make wound beads by heating the end of one rod and wrapping it around a round a metal wire that has been pre-coated with a 'bead release' or possibly a clay or manure mixture. (The coating allows the glass bead to be

removed from the metal wire after the bead has fully cooled causing the perforation for which the bead may be strung.) The finished bead must then be put into a ceramic blanket to allow a slow cool that will not stress the glass and possibly fracture it. After it cools, the bead may be twisted off the mandrel.





The stages of creating a glass bead: melting the glass, rolling the melted glass on a heated mandrel, and nesting the finalized bead in a ceramic fiber blanket. (Jenkins 31-32)



A collection of Roman glass fragments including ribbon, mosaic, and spiral twisted glass rods dating from the 1st century B.C. to the 1st century A.D. (Christie's 94)

References

Allen, Denis, Roman Glass in Britain, ed. James Dyer (Great Britain: Shire Publications LTD, 1998)

Almagro-Gorbea, Martin "The Celts of the Iberian Peninsula", The Celts, ed. Venceslas Kruta, (Italy: Rizzoli International Publications Inc., 1997) pp.

(ARCH) Archaeology for Communities in the Highlands, News Archive, *Culbin Beads*, Article posted April 1, 2011. http://www.archhighland.org.uk

Bertini, Martina, and Andrew Shortland, Karen Milek, Eva M. Krupp, "Investigation of Iron Age north-eastern Scottish glass beads using element analysis with LA-ICP-MS". *Journal of Archaeological Science* xxx (2011) 1e17.

Blair, Peter Hunter, Roman Britain and Early England 55B.C.-A.D. 871, ed. Christopher Brooke and Denis Mack Smith (New York: W.W. Norton and Company, 1963)

Bowes Museum, Collections, Object Search, last updated 2006. http://www.thebowesmuseum.org.uk/

Bujna, Jozef and Miklos Szabo "The Carpathain Basin", The Celts, ed. Venceslas Kruta, (Italy: Rizzoli International Publications Inc., 1997) pp. 302-311.

Bullied, Arthur L.R.C.P., F.S.A. and Harold St. George Gray, M.A., F.S.A., The Meare Lake Village- A Full Description of the Excavations and the Relics From the Eastern Half of the West Village, 1910-1933 (England : By the Authors, Taunion Castle 1948/1953/1966) -A free copy of this text may be found at www.gallica.co.uk/meare/

British Museum, Explore- Collection Database, last updated March 3, 2012. http://www.britishmuseum.org

Canterbury Archaeological Trust, Learning About the Past- Image Galleries, Roman Discoveries at Kent, last updated 2012. http://www.canterburytrust.co.uk

Celtic Glass, Reinheim *"Princess" Necklace*, Last update unknown. http://www.unc.edu/~jmathes/main.html

Collis, John "Coral, Amber, and Cockle Shells: Trade in the Middle La Tene Period", *Newsletter of the Prehistoric Society*, University Collage of London- Institute of Archaeology, Number 38, August 2001.

Corinium Musuem, "Gallery Display" Last updated December 11, 2011. http://www.cotswold.gov.uk/nqcontent.cfm?a_id=9945&tt=cotswold

Cunliffe, Barry Hengistbury Head Dorset. Volume 1: The Prehistoric And Roman Settlement: 3500 BC-AD 500", (Oxford University Committee for Archaeology, Monograph No. 13, Oxford 1987).

Daire, Marie-Yvane "Armorica", The Celts, ed. Venceslas Kruta, (Italy: Rizzoli International Publications Inc., 1997), pp. 248-264.

Deutschen Archäologischen Instituts, The Oppidum of Manching, Last updated 2011. http://www.dainst.org/en/project/manching

Dubin, Lois Sherr, The History of Beads, Concise Edition, ed. Maria Miller (New York: Harry N. Abrams, Inc., 1987)

Findhorn Bay, "Culbin Sands", Article no longer available. www.findhornbay.net/history/archaeology/culbin.htm

Frey, Otto Hermann "Celtic Princes" in the Sixth Century B.C., The Celts, ed. Venceslas Kruta, (Italy: Rizzoli International Publications Inc., 1997)

Gathering of Jewels, "Searchable Database" Last updated April 8, 2009, http://www.gtj.org.uk/en/

Gebhard, Rupert, DerGlasschmuck Aus Dem Oppidum Von Manching, (Germany: Steiner Franz Verlag, 1989)

Green, Miranda, Animals in Celtic Life and Myth, (USA and Canada: Routledge, 1992)

Grimaldi, David Amber-Window to the Past, (New York: Harry N. Abram, 2003).

Guido, F.S.A., Margaret, The Glass Beads of the Prehistoric and Roman Periods in Britain and Ireland, (London: The Society of Antiquaries of London, 1978)

Haevernick, T.E. Die Glasarmringe und Ringperlen der Mittel und Spätlatènezeit auf dem europäischen Festland. (Rudolf Habelt, Bonn. 1960).

Harvard University- Peabody Museum, Collections on line-Mecklenburg Collection, last updated 2009. www.peabody.harvard.edu/

Heidengraben Oppidum, home page, last updated 2007. http://www.heidengraben-oppidum.de/

Hencken, Hugh, Mecklenburg Collection, Part II- The Iron Age Cemetery of Magdalenska gora in Slovenia, Bulletin 32, American School of Prehistoric Researched, Ed. Peter S. Wells, (Harvard University, Cambridge, MA 1978)

Henderson, Julian
1991 “Industrial specialization in late Iron Age Britain and Europe”. *Archaeological Journal* 148: 104-148.

1982 “X-Ray Fluorescence Analysis of Iron Age Glass” Ph.D thesis, University of Bradford.

Isle of Wight History Center, Monthly News Archives Oct-Dec 2001, “Rare Iron Age Glass Bead from the Yaverland Excavation”, posted December 2001.
http://freespace.virgin.net/roger.hewitt/iwias/newsoct1.htm

Institute of Archaeology of the Academy of Sciences of the Czech Republic., Prague, V.V.I., last update unknown.
http://www.arup.cas.cz/en/vyzkum_en/anotace_keltove_v_evrope_en.html

Jargstorf, Sibylle, Glass beads from Europe, (Pennsylvania: Schiffer Publishing LTD, 1995)

Jenkins, Cindy, Making Glass Beads, ed. Leslie Dierks. (New York: Lark Books, 1997)

Johns, Catherine, The Jewellery of Roman Britain: Celtic and Clasical Traditons, (England: University of Michigan Press, 1996)

Jordan, Alexis “A Preliminary Study of Iron Age Glass in Ireland, With Particular Emphasis on the Glass Beads” Thesis Paper, University of Wisconsin-Milwaukee, May 2009.

Kelten Museum Hallein, Museumsrundgang, Die Kelten kommen. Last update 2012.
www.keltenmuseum.at/de/

Kettering Roots, Museum Archaeological Collection search engine. Last update 2012.
www.ketteringroots.co.uk

Kornbluth, Genevra Kornbluth Photography, Last updated January 15, 2012.
www.kornbluthphoto.com.

Landschafts Museum, Archäologisches Lexikon- Augenperlen, last updated unknown,
http://www.landschaftsmuseum.de/Seiten/Lexikon/Augenperlen.htm

Lessing Photo Archive, searchable museum collections database, last update unknown.
www.lessing-photo.com

Limerick City Council, Limerick City Museum’s searchable database, Last updated 2011.
http://www.limerickcorp.ie

Museum of Natural History in Nurnberg, Permenant exhibits, Prehistory. Last updated 2012. www.naturhistorischesmuseumnuernberg.de

National Museums Scotland, Collections and Research, Last updated January 30,2011. http://www.nms.ac.uk/collections.

Norsey Wood Society, History index- "Late Iron Age Glass Bead", last updated unknown.
http://www.norseywood.org.uk.

Panaramio Photo Hosting, User Zavod za turizem Nov…, photo uploaded July 27, 2009, http://www.panoramio.com/user/2335365.

Pauli, Ludwig Keltischer Volksglaube: Amulette und Sonderbestattungen am Dürrnberg bei Hallein und im eisenzeitlichen Mitteleuropa. (Munich : C.H. Beck'sche Verlagsbuchhandlung. 1975)

Portable Antiquities Scheme, Database-artifacts, Last updated 2012. www. finds.org.uk

Poulik, Josef, Prehistoric Art, tran. R. Finlayson Samsour (London: Spring Books by Artia)

Roman Glass Makers, Articles, 'Haud credibile posso quae non Roman est'
or: 'I can't believe it's not Roman!' and News Articles 4, 5 and 6. written summer 1998 and updated 2002. www.romanglassmakers.co.uk

Romans in Sussex, "Sites and Objects Database" Last updated August 3. 2001.
http://www.romansinsussex.co.uk

Scran, Bead Search, Last updated December 2011. www.scran.com.

Shepherd, Ian A G, Alexandra N Shepherd with contributions by A McDonald, F Powell, J A Sheridan and P Wilthew "A Cordoned Urn burial with faience from 102 Findhorn, Moray "*Proc Soc Antiq Scot*, 131 (2001), 101–128.

Sheridan, Alison, "Supernatural Power Dressing", British Archaeology, May 2003
www.britarch.ac.uk/ba/ba70/feat3.shtml

Sheshen Eceni, Iron Age and Celtic Photo Gallery, Last updated 2011.
http://www.sheshen-eceni.co.uk/index.html

Shortland, Andrew. "Making a Talisman", *British Archaeology*, May 2003.
www.britarch.ac.uk/ba/ba70/feat3.shtml

Tomažic, Ivan "Veneti in Slovenia", *The Slovenian* Edited March 2005.
www.theslovenian.com/articles/tomazic.htm

Towrie, Sigurd, "Mesolithic disappointment at Minehowe, but bead hints at long-distance connections" *Orkney Archaeology News*, Posted August 18, 2005. http://www.orkneyjar.com/archaeology/2005/08/18/mesolithic-disappointment-at-minehowe-but-bead-find-hints-at-more-long-distance-connections/

University of Glasgow -Hunterian Museum, Online Collections Archaeology, Ethnography and Historical collections, last updated 2012. http://www.gla.ac.uk/hunterian/

University of North Carolina, Celtic Art and Culture searchable photo database. www.unc.edu/celtic/imagesindex.html

University of Tübingen, Heidengraben Projektm, Last update unknown- document no longer available. www.uni-tuebingen.de/

Wiltshire Heritage Museum, Museum Gallery Library, Last updated 2009. http://www.wiltshireheritage.org.uk/collections.

Witt, Constanze Maria, Barbarians on the Greek Periphery? Main sites- Vix. http://www2.iath.virginia.edu/Barbarians/bar.html

Wolf, Ernesto, Early Glass of the Ancient World- 1600 B.C.-A.D. 60, (New York: D.A.P., 1994)

Wood, Jacqui "Bunsen Burners or Cheese Molds?"- a transcript from an article in *Current Archaeology* no 191. Saveock Water Archaeology, Last updated January 2012. http://www.archaeologyonline.org