



TINY TRAVELLERS:

Study of West Asian Beads from Merovingian Burials in Dutch Limburg in Relation to International Exchange Networks.

ANNELY A.A.H. ARENDS

ABSTRACT:

The focus of this article is the international exchange of beads during the early Medieval period, with an emphasis on the relationship between West Asia and the south-eastern Netherlands (Limburg). The bead assemblages of seven sites are examined to provide an insight into the actual numbers and percentages of West Asian beads in the research area. The origin of these beads is determined by their production technique and raw material, which can be traced to regions and sources in West Asia. The distribution patterns of the beads reflect the availability of West Asian beads, and thus the changes and continuity in exchange networks in which they circulated. The results of this study show a higher occurrence of West Asian beads before the seventh century, followed by a decline. This phenomenon has already been attested in North-France and Belgium by C. Pion. The distribution patterns display a higher number of West Asian beads at the studied seven cemeteries near major rivers, especially in the vicinity of Maastricht. These observations suggest a change in the exchange network around the end of the sixth century. At the end of the seventh century, the West Asian beads have disappeared from the Merovingian grave contexts in the Dutch Meuse Valley.

KEYWORDS:

Early Middle Ages, Northern Gaul, Jewellery, Grave goods, Connectivity

Corresponding author email: a.a.h.arends@umail.leidenuniv.nl

INTRODUCTION: Merovingian Bead Research

Beads are an ancient element of human material culture. They can hold multiple connotations, besides their decorative function. A single string of beads can contain a diversity of materials, production techniques, shapes, origins, generations, values, and meanings (Pion 2014, 34; Degryse and Shortland 2019, 2; Mannion 2015, 90). Beads can be associated with communal and individual ideologies (Mannion 2015, 91; Sciamia 1998, 17; Bos 2016, 142). Numbering in the hundreds of thousands, they are a regular occurrence in Merovingian cemeteries (400-750 CE). Therefore, they can give us much information about the social and economic aspects of the Merovingian population (Langbroek 2021, 278). Specific techniques or raw materials can be traced back to a place of origin, enabling the reconstruction of connections within, and between regions (Arends 2022, 19-33; Pion and Gratuze 2016, 53-54; Pion et al. 2020, 833). The study of the Merovingian period has proven that artefacts, including beads, from foreign origins are present in the Merovingian assemblage of Northern Gaul, but the exact numbers and distribution in the Netherlands were never documented (Pion 2014, 34; Degryse and Shortland 2019, 2). No comparative study of the distribution patterns of West Asian beads in Merovingian graves from different areas in the Netherlands has been made. The study of Merovingian beads in detail is fairly new to the Netherlands. A typochnology for Dutch Medieval beads is forthcoming¹, based on the typochnology by Pion (2014) on beads from Belgium. West Asian beads were identified by their colour, decoration, shape, production technique and raw material. This article presents the exact numbers and distribution patterns of beads from West Asia, found in Merovingian graves in current Dutch Limburg. Based on the results, the connections between the research area and West Asia are discussed to answer the question: *What can West Asian Beads recovered from Dutch Merovingian cemeteries convey about early medieval international connections?* The following sub-questions will provide the information necessary to answer the main research question: 1. *How many beads of West Asian origin are present in cemeteries within the research area?* 2. *Do the West Asian beads show change or continuity in their numbers and types throughout the Merovingian period?* 3. *What is the distribution of West Asian beads in the research area?* 4. *Are any additional relationships between the West Asian beads visible in the identified types and numbers of beads?* Most West Asian beads can only be assigned to a general area of origin, however, for several bead types the location of bead production is more certain (Neri et al. 2019, 1107; Pion 2014, 198-199). This study will use the term 'West Asia' to refer to the region of the Syria-Palestine coast, Iran, Iraq, the Armenian highlands, Jordan, the Arabian Peninsula, Anatolia, and the southern Caucasus. For this study Egypt will also be included in this term.

METHODOLOGY

This article is based on a bachelor thesis. The original research studied the West Asian beads in relation to exchange networks, identified from the bead assemblages from twenty funerary sites dating from the Merovingian period located in the southeast of the Netherlands, including the regions of Noord-Brabant, Gelderland, Utrecht, and Limburg (Arends 2022, 9-10). Only the results of Limburg are free of publication restrictions, and therefore the focus of this article. The study area contains burials from the entire Merovingian period. According to earlymedieval-europe.org, 106 Merovingian sites of which forty-five are cemeteries were excavated in the region of current Dutch Limburg. The study incorporates seven selected burial sites, Sittard-Kemperkoul, Posterholt-Achterste Voorst, Maastricht-Vrijthof, Maastricht-Pandhof, Echt, Obbicht-Oude Molen, and Stein-Groote Bongerd (fig. 1). These sites were selected because they are well documented and published. This was essential as, due to covid-19 restrictions, physical collections were not available for study. The cemeteries of Maastricht-Vrijthof and -Pandhof, both part of the St. Servaas complex, will be treated as two different sites since they were separately studied, and published. The study material contains 3,829 available glass and non-glass beads derived from 127 graves. The beads were identified as clearly as possible using pictures from publications (De Haas and Theuws 2013; Theuws and Kars 2017; Kars 2011; Kars et al. 2016). Thus, the reference images of several typologies were essential. The identification of glass bead production techniques is primarily based on the typochnology established by Pion (2014), updated in 2018 by Vrielynck, Mathis and Pion. Additional typologies include those of Siegmund (1997) and Koch (1977). However, these typologies categorize beads based on colour and shape, not technique, and are less suitable for present bead studies. Pion's typochnology is suitable for the beads from the sixth century and the early seventh century. Nevertheless, the information on the beads from the second half of the seventh century are less reliable since the typochnology includes only one cemetery from this period. Ongoing studies are striving to close this research gap. Pion categorizes beads based on their production technique and further divides them by colour, shape, decoration, measurements, raw material, chemical composition, age, and place of origin. The West Asian beads discussed in this study are types of beads which are proven, or highly likely, to be produced in West Asia or Egypt (Francis 2001; Pion 2014; Gratuze in Pion 2014; Pion et al 2020; Pion and Gratuze 2016; Spaer 1993). These bead types will be introduced below.

¹ Research on a Dutch typochnology was performed under the supervision of Langbroek. Beads from the Merovingian sites of Dommelen-Kerkkokers, Geldrop-Zesgehuchten site C, Uden-Schepersweg, Veldhoven-Huysackers, Veldhoven-Oeienbosdijk, Bergeijk-Fazantlaan, Meerveldhoven, Lent-Lentseveld, Wijchen-Centrum, Elst- 't Woud, Apeldoorn- 't Loo and Echt have been determined and studied by Teunissen-van Manen (2021) and Langbroek (forthcoming). West Asian beads from the Merovingian graves of Alphen-Chaam Molenstraat, Hoogeloon-Broekeneinde, Sittard-Kemperkoul, Posterholt-Achterste Voorst, Obbicht-Oude Molen, Stein-Groote Bongerd, Maastricht-Vrijthof and Maastricht-Pandhof and some from Lent are determined and studied by Arends (2021-2022).

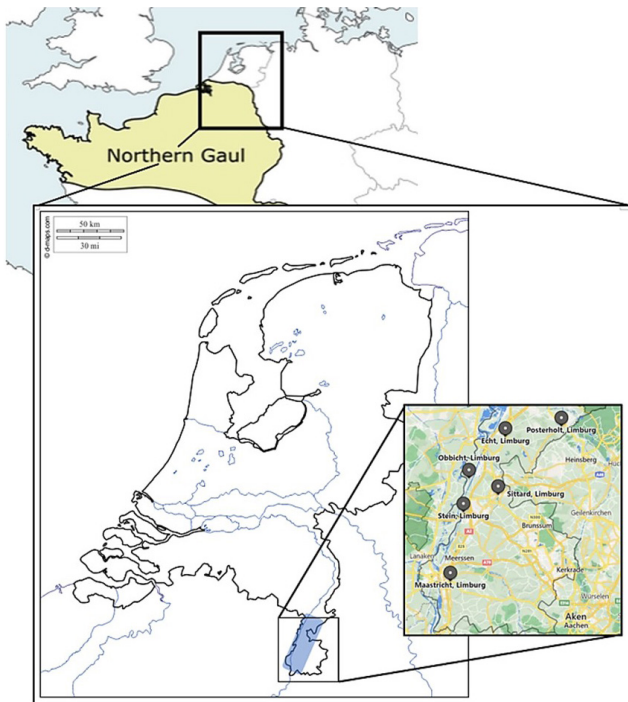


Figure 1: Map of the research area with the selected sites containing Merovingian burials (adapted from: collectingancientcoins.co.uk, d-maps.com, and Microsoft Edge Maps).

Drawn beads (A1.2, A2, A3, A4)

No traces of production sites of drawn beads have been found in western Europe. The few known workshops are all situated in the Eastern Mediterranean. A key site has been found in Alexandria, Egypt. Here, moulds were recovered that were supposedly used for shaping drawn segmented beads. The knowledge of producing drawn beads has been maintained in Indo-Pacific regions for several centuries. Therefore, the drawn beads found in Dutch Merovingian graves (fig. 2) were produced in West Asia and transferred to the European mainland (Pion 2014, 198-199). According to Pion, they predominately occur during the late fifth and sixth century CE (Pion 2014, 135-140). Within the category of drawn beads, there are two types with a specific production location. Pion type A1.1 beads (high alumina soda glass) originate from India (Pion 2014, 201; Pion and Gratuze 2016, 55-56). When beads of this type were determined they were left out of the study. Pion type A1.2 beads (high manganese glass) originate from the region of the Euphrates and Tigris (Pion 2014, 217) and are included in the study. A special category of drawn beads are the so-called metal foil beads (Pion type A4.2, see fig. 2). These three-layered beads consist of two glass layers with a thin layer of gold or silver metal foil in between (Pion 2014, 47). The production technique remained in use from 300 BCE till the thirteenth century CE (Greiff and Nallbani 2008, 359). There is evidence that they were produced in Egypt (Greiff and Nallbani 2008, 372, 374; Pion 2014, 42, 199; Spaer 1993, 12). According to Pion, metal foil beads are characteristic for the oldest periods of Merovingian cemeteries in Belgium (Pion 2014, 135-141). In Europe they disappear from the archaeological record around 600 CE, only to be revived as a larger type after 700 CE. During the Carolingian period the metal foil beads often occur together with mosaic beads, perhaps indicating a common place of origin (Greiff and Nallbani 2008, 360-361).

Wound beads (B6.1-01C/D and B10.1-1/2)

During the early medieval period wound beads were produced in Great Britain and continental Europe, including the Netherlands (Sablerolles et al. 1997, 293-313; Dijkstra et al. 2010, 175-199). Besides the exception of two specific wound types, this category will be left out of the study. The first exception is the confetti bead (Pion type B6.1-01C/D). Earliest attested during the late second century in the Mediterranean, they have a cobalt blue main body with dots in multiple colours. Confetti beads were likely created by rolling the hot bead through small pieces of coloured glass (Pion 2014, 191-192). They have a strong similarity with 'end of the day' beads known from East-African (including Egypt) and Venetian contexts (Bos 2016, 134; metier-magazine.nl). Confetti beads occur in the Merovingian record around the late fifth century and the beginning of the sixth century. While evident in Noord-Brabant (Theunissen van Manen 2021, 73; Arends 2022, 140) they are not identified in Limburg. The second exception within the category of wound beads are types B10.1-1/2 (fig. 2) within the reticella bead types (Pion type B10.1-B10.4). The exact place of origin of Reticella beads is still debated since no production place is known. Some reticella beads were local, Anglo-Saxon, productions (B10.2-B10.4). The more complex ones are believed to be imported together with mosaic beads (discussed below) from Egypt or the Eastern Mediterranean (Pion 2014, 227-228; Matthes et al. 2004, 114-116).

Folded beads (Pion bead type C1-3)

Folded beads (fig. 2) are more common in the Eastern Mediterranean than in Europe. In the Eastern Mediterranean, this technique is known since the third century BCE (production centre at Rhodos, Greece) and until the thirteenth century CE (production centre at Fustat, Egypt) (Francis 2002, 93). The main production consisted of cordiform, fusiform and cylindrical shaped translucent blue beads. Some folded beads have a mosaic inlay (Pion type C2). Folded beads comparable to those found in Gaul during the late sixth century have been found in a cemetery in Khirbat Yajuz, Jordan (Eger and Khalil 2013, 166-168). The prismatic beads (types C1.1-01/04) date to the second half of the sixth or seventh century (Pion 2014, 222-223).

Perforated beads (Pion bead type D)

For this technique relatively low temperatures are required (600-800°C). A piece of glass can be heated and fabricated into a bead by piercing an iron mandrel through the glass (Pion 2014, 73). Perforated beads (fig. 2) emerged during the second part of the sixth century and disappeared at the end of the century (Pion 2014, 219). Some perforated beads have a mosaic inlay (Pion type D2). Pion assumes that the perforated beads share a common West Asian origin with the drawn beads with warm cuts. This assumption is based on their shared colour pattern, their brief period of use, and their particular techniques and morphology (Pion 2014, 219). Folded, perforated, mosaic, and drawn beads have been found together in late Roman and Byzantine graves in Khirbat Yajuz (Eger and Khalil 2013, 166-168). Archaeometry shows that the perforated beads were made of reused (Roman) glass (Pion 2014, 219).

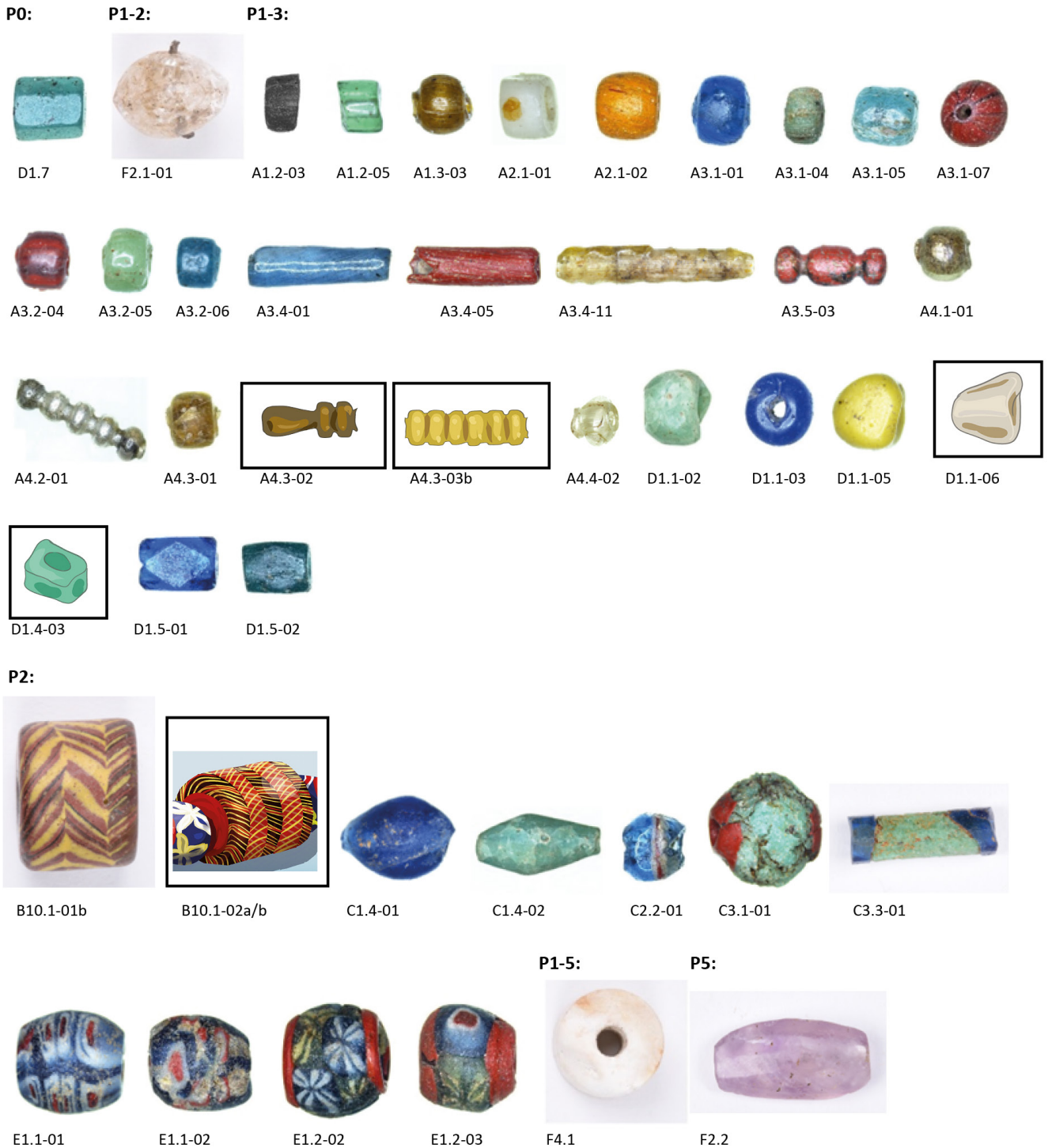


Figure 2: The overview of the common types of West Asian beads in the research area, divided in periods after Vrielynck et al. 2018 (pictures made by Langbroek, drawings in black frame made by Arends; edited by Arends).

Mosaic beads (Pion bead type E)

Merovingian mosaic beads (fig. 2) are fabricated from multiple layers and individual tiny inlays (Volkman and Theune 2001, 525-526). The technique originates likely in Assyria (Volkman and Theune 2001, 523). The red glass on the edges of some mosaic beads reveals a chemical composition that differs from wound red beads made in Europe (significantly less iron oxide)

and thus suggests a different production location (Matthes et al. 2004, 141,144). The Merovingian mosaic beads with red edges appear similar to mosaic beads known from Egypt, produced during the second and third centuries CE (Petrie Museum catalogue object 22739 and 22768). Presumably, the mosaic beads found in Merovingian cemeteries were produced in Egypt (Volkman and Theune 2001, 528; Pion 2014, 226).

Non-glass beads (Pion bead type F2.1, F2.2 and F4.1)

Beads made from amethyst, rock crystal, and Meerschaum with a West Asian origin are included in the study (Drauschke 2010, 52; Drauschke 2008, 414; Siegmund and Weiss 1989, 301). There are examples of beads made from other (precious) stones (Langbroek, forthcoming; Pion 2014, 105) and warmwater oyster shells (Siegmund and Weiss 1989, 301) in Merovingian graves that originate from the Eastern Mediterranean or farther, however, these were not identified in Limburg and thus not discussed. The amethyst beads (Pion type F2.2, see fig. 2) were made in the Byzantine Empire. A production location is found in Alexandria. Viable options for the origin of the raw material are the areas of south India and Sri Lanka, Egypt, Ethiopia, or West Asia (Pion 2014, 229; Drauschke 2010, 52). According to Willemsen (2014, 150) amethyst beads originate from Egypt. These beads occur in graves in Northern Gaul in the sixth and seventh century. They are rare during the Merovingian period, however their distribution is wide across Europe (Willemsen 2014, 150; Drauschke 2010, 55). At the site with amethyst working remain in Alexandria, remains of rock crystal working have been found as well. Hence it can be assumed that these beads (Pion type F2.1, see fig. 2) came from the same location. The raw material occurs at several locations within Europe (the Alps and Ardennes), the Mediterranean and farther away. Rock crystal could be imported from India together with other gemstones (Drauschke 2010, 52). Meerschaum, or sepiolite, is occasionally found as cylindrical beads in the Merovingian graves of the sixth century (Pion type F4.1, see fig. 2). The suspected origin of the material is the Eastern Mediterranean. A large source exists in Turkey, however no production centres from the sixth century have been found (Drauschke 2008, 414). It is difficult to differentiate meerschaum and shell from other chalk or limestone materials, and it is possible that they occasionally have been misinterpreted.

Documentation and data management

The database, consisting of individual tables, images, and graphs for every site and the complete area, is created by the author in an excel format. The study is divided into two stages. First the individual sites were examined, focussing on the number and type of West Asian beads in every grave. Additionally, the dates of the graves and overall cemetery were documented. The graves are divided into three chronological periods to examine the possibility for a chronological change in deposited bead types during the Merovingian period: the period before the seventh century (400/510-590/610 CE), the transition period between the sixth and the seventh century (460/510-650/680 CE), and the seventh century and later (610-680/750 CE). The transition category was created because more than forty graves are dated very broadly by their excavators and could not be assigned to either the sixth or the seventh century. Secondly, the collected information was combined to create an overview of the sites of Limburg to answer the research questions (tab. 1). To examine the identified types and numbers of beads of the seven sites, the changes, and continuities, of specific West Asian bead types through time are documented in separate tables (tab. 3,4,5 and 6). This data can display a preference for, or availability of, specific bead types. The beads are not individually dated, but chronologically divided according to the date of the grave

as provided in the site publication. The answers of the subquestions will be used to discuss the main research question in the discussion (aided by additional data from Arends 2022).

RESULTS: the (studied) Merovingian bead assemblage of West Asian origin

The research has revealed a collection of the most common West Asian beads for the region of Limburg (fig. 2). The bead assemblage could contain beads made in India since the small drawn beads from West Asia and India cannot be distinguished based on pictures, but only with a stereomicroscope to identify the production technique, or through chemical analysis. In this research 1,281 beads of West Asian origin are recognized, which relates to 33.46 percent of the total studied bead assemblage (tab. 1). Only the seventh century cemetery of Echt contained no West Asian beads. The two cemeteries of Maastricht stand out, not only in the high number of burials and beads, but also because 43 percent and 55 percent of the bead assemblages of the sites consists of West Asian beads (tab. 1). This is remarkable as the number of graves which contain beads is comparable with Posterholt and Sittard, yet these bead assemblages contain only 3 percent and 5 percent of West Asian beads. With a West Asian bead percentage of 93.98 for the two cemeteries combined, the cemeteries of Maastricht are an outlier in the results (tab. 1). The West Asian beads from Maastricht seem typologically like those of the other cemeteries. Their high number in the transitional period is perhaps caused by graves of the Maastricht-Pandhof site, that could be dated to both the sixth and the seventh century. This creates a bias towards the transitional period, rather than reflecting their actual chronological distribution.

The data displayed a clear correlation between the chronological division of the graves and the attested number of West Asian beads. The West Asian beads from the fifth and sixth century make up 51,52 percent (459 of 891) of the total bead assemblage of the graves, all occurring in graves from Maastricht and not elsewhere (tab. 2 and 4, fig. 3). Of the West Asian beads 29,84 percent (752 of 2520) dates to the transitional period (tab. 2 and 5, fig. 3). The West Asian beads in the graves from the seventh century and later make up 14,05 percent (42 of 299) of the total bead assemblage of this period (tab. 2 and 6, fig.3). The bead assemblage indicates a peak occurrence of West Asian beads in the fifth and sixth century, and a decline during the seventh century.

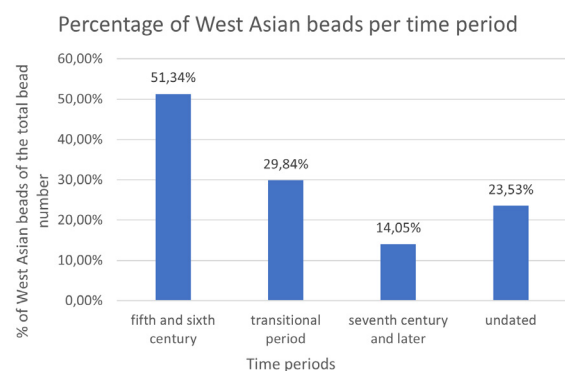


Figure 3: The percentages of West Asian and non-West Asian beads of the total examined bead assemblage of Limburg.

Table 1: The results of the sites of Limburg in an overview table.

SITE	TOTAL NUMBER OF GRAVES	NUMBER OF GRAVES WITH BEADS	% GRAVES WITH BEADS OF TOTAL NUMBER OF GRAVES	NUMBER OF BEADS ORIGINALLY DOCUMENTED	NUMBER OF MEROVIGIAN BEADS AVAILABLE FOR STUDY	NUMBER OF WEST ASIAN BEADS	USAGE PERIOD OF CEMETERY	% WEST ASIAN BEADS OF TOTAL NUMBER OF STUDIED BEADS
SITTARD-KEMPERKOUL	88	20	22,72%	926	875	47	c. 550-700	5,37%
POSTERHOLT-ACHTERSTE VOORST	92	27	29,35%	186	183	5	c. 580-750 AD	2,73%
MAASTRICHT VRIJTHOF	341	37	10,85%	1039	1039	446	c. 510-680	42,93%
MAASTRICHT PANDHOF	1000+	24	??	1393	1393	758	fourth century till end seventh	54,42%
ECHT	??	2	??	67	67	0	First part seventh century	0,00%
OBBICT-OUDE MOLEN	68	9	13,24%	260	176	23	c. 510-670	13,07%
STEIN-GROOTE BONGERD	72	8	11,11%	118	96	2	c. 510-680	2,08%
TOTAL	At least 661	127	19,21%	3989	3829	1281		33,46%

Table 2: All examined beads from the cemeteries of Limburg.

TIME PERIOD	SITTARD-KEMPERKOUL	POSTERHOLT-ACHTERSTE VOORST	MAASTRICHT VRIJTHOF	MAASTRICHT PANDHOF	ECHT	OBBICT-OUDE MOLEN	STEIN-GROOTE BONGERD	TOTAL NUMBER OF BEADS	NUMBER OF WEST ASIAN BEADS	PERCENTAGE OF WEST ASIAN BEAD OF TOTAL
FIFTH AND SIXTH CENTURY	0	0	204	687	0	0	0	891	459	51,52%
TRANSITIONAL PERIOD	812	118	698	669	0	171	52	2520	752	29,84%
SEVENTH CENTURY AND LATER	63	36	88	0	67	4	41	299	42	14,05%
UNDATED	0	29	49	37	0	1	3	119	28	23,53%
TOTAL NUMBER OF BEADS	875	183	446	1393	67	176	96	3829	1281	33,46%

Table 3: Total number of dated and undated West Asian beads.

CATEGORY	UNCERTAIN	DRAWN	WOUND	FOLDED	PERFORATED	MOSAIC	ROCK CRYSTAL	AMETHYST	OTHER	TOTAL
DATED	140	786	3	34	199	29	5	56	1	1253
UNDATED	2	16	0	2	6	0	1	1	0	28
TOTAL	142	802	3	36	205	29	6	57	1	1281

Table 4: Attested West Asian bead types in Limburg dated to the fifth and sixth century.

SITE	DRAWN	WOUND	FOLDED	PERFORATED	MOSAIC	ROCK CRYSTAL	AMETHYST	TOTAL
MAASTRICHT VRIJTHOF	87	1	7	17	6	0	1	119
MAASTRICHT PANDHOF	283	1	1	47	0	3	5	340
TOTAL	370	2	8	64	6	3	6	459

Table 5: Attested West Asian bead types in Limburg dated to the transitional period (late fifth till late seventh century).

SITE	UNCERTAIN	DRAWN	WOUND	FOLDED	PERFORATED	MOSAIC	ROCK CRYSTAL	AMETHYST	OTHER	TOTAL
SITTARD-KEMPERHOUL	0	40	0	0	0	0	0	1	0	41
POSTERHOLT- ACHTERSTE VOORST	0	0	0	0	0	2	0	1	0	3
MAASTRICHT VRIJTHOF	4	192	1	0	57	5	1	27	1	288
MAASTRICHT PANDHOF	136	131	0	12	78	16	1	21	0	395
OBBICT	0	23	0	0	0	0	0	0	0	23
STEIN-GROOTE BONGERD	0	2	0	0	0	0	0	0	0	2
TOTAL	140	388	1	12	135	23	2	50	1	752

Table 6: Attested West Asian bead types in Limburg dated to the seventh and mid-eighth century.

SITE	DRAWN	FOLDED	TOTAL
SITTARD-KEMPERHOUL	6	0	6
MAASTRICHT VRIJTHOF	22	14	36
TOTAL	28	14	42

All the production techniques that relate to West Asia are present in the studied assemblage (tab. 3 to 6). The tables 3 and 5 contain a category labelled ‘uncertain’, which consists of one possibly shell disk bead, one folded or perforated bead, and 140 tiny drawn green beads that could be from West Asia or the Indian peninsula. These beads are left out of further analysis. The distribution patterns indicate that several bead types are more widespread or more widely available in the research area than others. The diversity of bead production techniques is significantly higher in Maastricht-Vrijthof and Pandhof, compared to the other sites (tab. 4,5 and 6). The West Asian bead assemblage predominantly consists of small drawn glass beads, which were identified in every studied cemetery. The second and third largest categories are the perforated beads, followed by the non-glass beads. Translucent green drawn beads and segmented metal foil beads occur very frequently. However, no specific bead type occurred in all six sites (to the extent that could be determined from the published photographs). Amethyst and

mosaic beads are mainly concentrated in Maastricht. Moreover, reticella beads are only present in Maastricht. Chronological examination has indicated that the perforated, wound, mosaic, and gemstone beads (tab. 4,5 and 6) are well attested in the sixth century. They show a peak occurrence in the transitional period, followed by a sharp decline in the seventh century. An additionally attested pattern in the West Asian bead assemblage is the relatively high occurrence of monochrome drawn and perforated beads, especially in various shades of green and blue (fig. 2).

Interpretation of the seventh century West Asian beads

The few West Asian beads that have been recognized in seventh century graves do not include new types from West Asia but are the same types as the beads of the sixth century. This suggests that several West Asian beads remained in circulation

after the sixth century before they were deposited in the graves. This can be illustrated with the folded beads (Pion type C1.4-01/2 and C2.2-01, see fig 2) from the seventh century grave 166 of Maastricht-Vrijthof. These beads are 50 to 100 years too old for the graves they were deposited in. Such chronically misplaced beads are called heirloom beads (Mannion 2015, 92-93; Volkmann and Theune 2001, 543-544). Furthermore, it is known that graves were occasionally reopened during the Merovingian period to retrieve beads and wear them again (Aspöck 2011, 299-300; Van Haperen 2017, 149; Langbroek 2016, 81-82). This suggests that these beads were significant for the Merovingian population.

The sixth and seventh centuries compared: changes in international early medieval exchange networks

The sixth century cemeteries are situated near the major Meuse River. The amount and typological diversity of West Asian beads are higher at sites in the vicinity of Maastricht. The centre is well connected to international and long-distance exchange networks during the Merovingian period, as it was in the Roman period (Tys 2020, 771; Theuws 2020, 897, 906). The attested West Asian beads of this study are comparable with beads found in Merovingian graves in the current Netherlands, Belgium, France, Germany, and England (Arends 2022, 138; Langbroek 2021, 278; Pion 2014, 13-14). The high quantity, and diversity of beads of West Asian origin in the graves indicates a continuous demand and supply of beads from West Asia during the late fifth and sixth century. The West Asian beads from the oldest (late fifth/early sixth centuries) graves bear a resemblance to those found in the tombs of the Late Roman Empire. The number of beads and types of adornment increases in the second half of the fifth century. The majority are monochrome drawn glass beads (Pion 2014, 135-138). The frequent occurrence of West Asian beads in rural cemeteries supports the theory that in the sixth century, the rural population of Northern Gaul was connected with not only a road-based, but also a river-based exchange network. This suggests that the active elite control in the research area on exchange networks and objects from West Asia was presumably limited (Theuws 2020, 889-890, 897, 906; Tys 2020, 771). Towards the seventh century, life-stage rituals, including burial practices, became more associated with the church instead of families (Theuws 2020, 887; Theuws and Van Haperen 2012, 163-165; Knippenberg and Theuws 2019, 10; Effros 2003, 117-118). As population numbers increased, local craft production, including bead-making, developed (Pion 2014, 180-181). These developments were combined with the expansion of structured elite control over rural dwellers, their properties, and local exchange connections (Theuws 2020, 899; Theuws and Van Haperen 2012, 164, Hodges 2012, 122). This could be the result of the increasing influence of Christianity, or another undetermined factor. European beads could have become more accessible than those transferred over a considerable distance by fluvial and maritime connections from West Asia (Volkmann and Theune 2001, 538-40; Pion et al. 2020, 849-50). The Byzantine Empire was a powerful Mediterranean force during the sixth century and presumably played a leading role in the exchange between West Asia and western Europe (Lailou and Morrisson 2007, 35). Thus, when the economic and political position of the Byzantine Empire weakened from the second half of the sixth century, its exchange networks declined (Burbank and Cooper

2010, 68-69; Lailou and Morrisson 2007, 23-24). The regions of Egypt and the Levant are considered the main production areas of the attested West Asian beads in this research (Pion et al. 2020, 833). After these areas were no longer under Byzantine rule in the seventh century, but annexed by the Sassanian Empire, and later the Rashidun Caliphate (Lailou and Morrisson 2007, 24), their connections with Europe seemed to decline. Chronologically, this corresponds with the decline of West Asian beads in studied cemeteries in Limburg. It is generally assumed that during the early medieval period long distance networks slowly disappeared, but the reasons remain speculative (Langbroek 2016, 138; Pion and Gratuze 2016, 62). A shortage in natron available for glass production from the seventh century onwards could be a possible reason (Shortland et al 2006, 527-528). An observation, similar to the one made in this study, was made by Pion in his research on Merovingian beads in Belgium and France. He suggests that West Asian beads are a sixth century phenomenon (Pion 2014, 135-143). In this study, most types of West Asian beads occur in every studied chronological period, though in different numbers. The bead variation from the late fifth till the late sixth centuries is higher compared to the data from during the seventh and mid-eighth centuries (tab. 4,5 and 6) (Arends 2022, 130-131). It should be noted that the decrease of West Asian beads in Merovingian graves could have been a deliberate choice by the population. However, it seems plausible that the availability of West Asian beads is affected by political and economic developments in West Asia from the late sixth century onwards.

CONCLUSION

This research has attested that detailed examination of Merovingian beads from Limburg and of production techniques can give an insight into early medieval exchange connections with West Asia. The results indicate an exchange network among the sites near the Meuse River in which the rural population is active, with a higher percentage and diversity of West Asian beads around the centre of Maastricht. The types of West Asian beads are diverse with a clear main category of monochrome drawn glass beads. Chronological classification has indicated a decline of West Asian beads in grave contexts during the seventh century. A combination of local and international developments from the late sixth and seventh century onwards reduced the transfer of beads from West Asia to Merovingian Gaul. Hypothetically, the reduced availability of West Asian beads in western Europe is associated with the weakened position of the Byzantine Empire and the loss of direct contact with the main production areas in Egypt, and the Syria-Palestine coastal area. The results of this research can serve as a stepping stone to examine West Asian beads throughout other areas in the Netherlands, and the region of Northern Gaul. The bead assemblages of the sites of Limburg need a physical, and microscopic examination and identification to contribute to a more thorough study, which is now based on published photographs. For instance, a study on the potential Indian beads would create a more comprehensive picture. Further research on the appearance and disappearance of certain West Asian bead types is recommended, to provide a more accurate image of the connections with different regions in West Asia during the early medieval period.

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BIBLIOGRAPHY

Arends, A., 2022. *Tiny Travellers. Study of the Near Eastern beads of Merovingian cemeteries from the south-eastern Netherlands in relation to international exchange networks*. Leiden (Unpublished bachelor thesis, Leiden University).

Aspöck, E., 2011. Past 'disturbances' of graves as a source: taphonomy and interpretation of reopened early medieval inhumation graves at Brunn am Gerbirge (Austria) and Winnall II (England). *Oxford Journal of Archaeology* 30 (3), 299-324.

Bos, J., 2016. *Egypt's Wearable Heritage*. Zandvoort: BLKVD publishers.

Burbank, J. and F. Cooper, 2010. *Empires in world history: the power and the politics of difference*. Princeton: Princeton University Press.

Degryse, P. and A.J. Shortland, 2020. Interpreting elements and isotopes in glass: a review. *Archaeometry* 62 (1), 117-133. <https://doi.org/10.1111/arcm.12531>

Dijkstra, M.F.P., Y. Sablerolles and J. Henderson, 2010. A traveler's tale. Merovingian glass bead production at Rijnsburg, the Netherlands, in C. Theune, F. Biermann, R. Struwe and G.H. Jeurte (eds), *Zwischen Fjorden und Steppe. Festschrift für Johan Callmer zum 65. Geburtstag*. Rahden: VML Verlag Marie Leidorf (Internationale Archäologie Studia Honoraria Band 31), 175-199.

Drauschke, J., 2008. Zur Herkunft und Vermittlung „Byzantinischer Importe“ der Merowingerzeit in Nordwesteuropa, in S. Brather (ed), *Zwischen Spätantike und Frühmittelalter*, RGA-E 57, 367-423.

Drauschke, J., 2010. Byzantine Jewellery? Amethyst Beads in East and West during the Early Byzantine Period, in N. Adams and C. Entwistle (eds), *"Intelligible Beauty": Recent Research on Byzantine Jewellery*. London: British Museum, 50-60.

Effros, 2003. *Merovingian Mortuary Archaeology and the making of the Early Middle Ages*. University of California Press. <https://doi.org/10.1525/9780520928183>

Eger, C and L. Khalil, 2013. Bead Jewellery of Late-Roman and Byzantine Time in the Province of Arabia. *Zeitschrift für Orient-Archäologie* 6, 156-181.

Francis, P., 2002. *Asia's Maritime Bead Trade: 300 B. C. to the Present*. Honolulu: University of Hawaii Press.

Greiff, S. and E. Nallbani, 2008. When metal meets beads: Technological study of early medieval metal foil beads from Albania. *MEFRM* 120 (2), 355-375.

Haperen, van, M.C., 2017. *In touch with the dead: early medieval grave reopenings in the Low Countries*. Enschede: Gildeprint-Enschede.

Hodges, R., 2012. *Dark age economies: a new audit*. London: Bristol classical press.

Knippenberg, S. and F. Theuws, 2019. Wonen en begraven in Uden: Opgravingen van een Merovingisch grafveld en middeleeuwse nederzetting langs de Schepersweg, gemeente Uden. *Archol Rapport* 428. Leiden: Archol.

Kars, M., 2011. *A cultural perspective on Merovingian burial chronology and the grave goods from the Vrijthof and Pandhof cemeteries in Maastricht*. Amsterdam (published Ph.D. thesis University of Amsterdam).

Kars, M., F. Theuws and M. de Haas, 2016. *The Merovingian cemeteries of Sittard-Kemperkoul, Obbicht-Oude Molen and Stein-Groote Bongerd*. Bonn: Habelt-Verlag (Merovingian Archaeology in the Low Countries 3).

Lailou, A.E. and C. Morrisson, 2007. *The Byzantine Economy*. Cambridge: Cambridge University Press (Cambridge Medieval Textbooks). <https://doi.org/10.1017/CBO9780511816727>

Langbroek, M., 2016. *All that is Gold does not Glitter: A study on the Merovingian use and exchange of amber or 'northern gold' in the Benelux and the German Lower Rhine area*. Leiden (Unpublished research master thesis Leiden University).

Langbroek, M.B., 2021. Beads and beadmaking in the early medieval settlement of Oegstgeest, in J. de Bruin, C. Bakels, F. Theuws (eds), *Oegstgeest. A riverine settlement in the early medieval world system*. Bonn: Habelt-Verlag (Merovingian Archaeology in the Low Countries 7), 278-293.

Mannion, M., 2015. *Glass Beads from Early Medieval Ireland classification, dating, social performance*. Oxford: Archaeopress.

Matthes, von, C., M. Heck, C. Theune, P. Hoffmann and J. Callmer, 2004. Produktionsmechanismen frühmittelalterlicher Glasperlen. *Germania* 82. Frankfurt: Verlag Philipp von Zabern, 109-157.

Neri, E., B. Gratuze and N. Schibille, 2019. The trade of glass beads in early medieval Illyricum: towards an Islamic monopoly. *Archaeological and Anthropological Sciences* 11, 1107-1122. <https://doi.org/10.1007/s12520-017-0583-5>

Pion, C., 2014. *Les perles mérovingiennes Typo-chronologie, fabrication et fonctions Volume I: Textes*. Brussel (Unpublished doctoral dissertation Université libre de Bruxelles).

Pion, C. and B. Gratuze, 2016. Indo-Pacific glass beads from the Indian subcontinent in Early Merovingian graves (5th–6th century AD). *Archaeological Research in Asia* 6, 51-64.

Pion, C., B. Gratuze, P. Périn and T. Calligaro, 2020. Bead and Garnet Trade Between the Merovingian, Mediterranean, and Indian Worlds, in B. Effros and I. Moreira (eds), *The Oxford Handbook of the Merovingian World*. Oxford: Oxford University press. <https://doi.org/10.1093/oxfordhb/9780190234188.013.51>

Sablerolles, Y., J. Henderson and W. Dijkman, 1997. Early medieval glass bead making in Maastricht (Jodenstraat 30), The Netherlands. An archaeological and scientific investigation, in U. v. Freeden and A. Wiczorek (eds), *Perlen. Archäologie, Techniken, Analysen. Akten des Internationalen Perlensymposiums in Mannheim vom 11. bis 14. November 1994*. Bonn: Dr. Rudolf Habelt GmbH (Kolloquien zur Vor- und Frühgeschichte 1), 293-313.

Sciama, L.D., 1998. Gender in the Making, Trading and Uses of Beads. An Introductory Essay, in L.D. Sciama and J.B. Eichler (eds), *Beads and Bead Makers Gender Material Culture and Meaning*. Oxford and New York: Berg, 1-46.

Shortland, A., L. Schachner, I. Freestone and M. Tite, 2006. Natron as a flux in the early vitreous materials industry: sources, beginnings and reasons for decline. *Journal of Archaeological Science* 33, 521-530.

Siegmund, F. and M. Weiss, 1989. Perlen aus muschelscheiben im merowingerzeitlichen Mitteleuropa. *Archäologisches Korrespondenzblatt* 19 (3). Mainz: Römisch-Germanisches Zentralmuseum, 297-307.

Spaer, M., 1993. Gold Glass Beads: a review of the evidence. *Beads* 5, 9-25.

Teunissen van Manen, A.F., 2021. *De pareltjes van Brabant. Een overzicht van Merovingische kralen uit Oost-Brabant*. Deventer (Unpublished bachelor thesis Saxion Hogeschool).

Theuws, F., 2020. Long-Distance Trade and the Rural Population of Northern Gaul, in B. Effros and I. Moreira (eds), *The Oxford Handbook of the Merovingian World*. Oxford: Oxford University Press, 882–915. <https://doi.org/10.1093/oxfordhb/9780190234188.013.39>

Theuws, F. and M. van Haperen, 2012. *The Merovingian Cemetery of Bergeijk-Fazantlaan*. Bonn: Habelt-Verlag (Merovingian Archaeology in the Low Countries 1).

Theuws, F. and M. Kars, 2017. *The Saint-Servatius complex in Maastricht, The Vrijthof excavations (1969-1970)*. Bonn: Habelt-Verlag (Merovingian Archaeology in the Low Countries 4).

Tys, D., 2020. Maritime and River Traders, Landing Places, and Emporia Ports in the Merovingian Period in and Around the Low Countries, in B. Effros and I. Moreira (eds), *The Oxford Handbook of the Merovingian World*. Oxford: Oxford University press. <https://doi.org/10.1093/oxfordhb/9780190234188.013.26>

Vrielynck, O., F. Mathis and C. Pion, 2018. *Vers une typo-chronologie des perles mérovingiennes en Gaule du nord*. Namur.

Volkman, A. and C. Theune, 2001. Merowingerzeitliche Millefioriperlen in Mitteleuropa. *Ethnographisch Archäologische Zeitschrift* 43 (4), 521-554.

Willemsen, A., 2014. *Gouden Middeleeuwen: Nederland in de Merovingische wereld, 400-700 na chr.* Zutphen: Waldburg pers.

ADDITIONAL SOURCES

www.merovingianarchaeology.org, accessed on 20 April 2022.

www.earlymedievaleurope.org, accessed on 15 January 2023.

Petrie Museum catalogue: www.collections.ucl.ac.uk/error?aspxerrorpath=/detail.aspx, accessed on 15 October 2021.

www.Metier-magazine.nl, accessed on 15 February 2022.