

## RADIOCARBON AS A TOOL FOR MODELING THE DIACHRONIC ANALYSIS OF THE OCCUPATION PHASES AT THE VELZEKE SITE (BELGIUM)

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**ABSTRACT.** The oldest traces of Velzeke go back to the Late Bronze Age and Early Iron Age, followed by a Gallo-Roman settlement and a later medieval village. Although the excavations document the history of the site in general, radiocarbon was used to clarify the successive phases within each feature. The results showed that the ditches at the Roman settlement and the neighboring temple area were already used during the Late Iron Age. The filling up of the ditches could be  $^{14}\text{C}$  correlated to a Gallo-Roman occupation phase. The oldest Christian cemetery at the site of the medieval church predates the construction of an important Carolingian stone building (9th to 10th centuries.). The stratigraphically lowest sediments of the ditches, surrounding the Carolingian church, are synchronous with the latest fill of the Iron Age ditch. According to historical and toponymical sources the area of the Iron Age ditch becomes at that time part of a medieval agricultural field system.

### SITE DESCRIPTION

The archaeological site of Velzeke (50°53'N, 3°47'E) is situated on a plateau, northeast-southwest oriented, between two brooks, the “Molenbeek” to the south and the “Passemarebeek” to the north. Both brooks flow into the Zwalm, a confluent of the river Scheldt. The plateau is situated 50–60 m above sea level. The site is located at the beginning of a hilly region, called the “Flemish Ardennes”. Pedologically, the soil at the site is a dry loamy ground (Figure 1.4). The valleys of the “Passemarebeek” and of the “Molenbeek” have strongly hydromorphous alluvial soils (Figure 1.3).

Since the 16th century, the village of Velzeke has been renowned for its Gallo-Roman found-archaeological objects (Van Durme 1983). Scientific archaeological research started only after World War II by excavations of the Seminar for Archaeology of the University of Ghent (De Laet and Nenquin 1953) and the Provincial Archaeological Museum of South-East-Flanders (De Mulder 1999).

The oldest traces of human occupation go back to the Neolithic. There is a gap of information until the Late Bronze Age. Two urnfield cemeteries (Figure 1.6) from the Late Bronze Age–Early Iron Age were investigated. Based on ceramic typology, the oldest necropolis dates from the beginning of the Late Bronze Age (around 1100 BC) and stops during the Early Iron Age (around 750–450 BC). The second cemetery starts at the early-beginning of the Early Iron Age and stops before the end of this period (De Mulder and Rogge 1995).

The Late Iron Age (around 450–50 BC) was poorly documented until now. Based on ceramic typology a few pits could be dated to the transition of the Late Iron Age/Early Roman period (De Mulder et al. 1996).

The first traces of the Gallo-Roman settlement go back to the reign of the emperor Augustus (27 BC–AD 14). One of the key elements in the growth of Roman Velzeke is the presence of a postulated Augustean fort (Figure 1.1) and a small civilian settlement at the end of the first century BC (Rogge 1980). Due to its location at the crossing of two roads this nucleus developed into a regional center (*vicus*) (Figure 1.2). Characteristic of the settlement was a rudimentary planned network of streets, orientated on the main Roman road from west to east (Figure 1.10). Two Roman sanctuaries, one of them dated between late 1st to mid 3rd centuries, show that the Gallo-Roman *vicus* had also a reli-

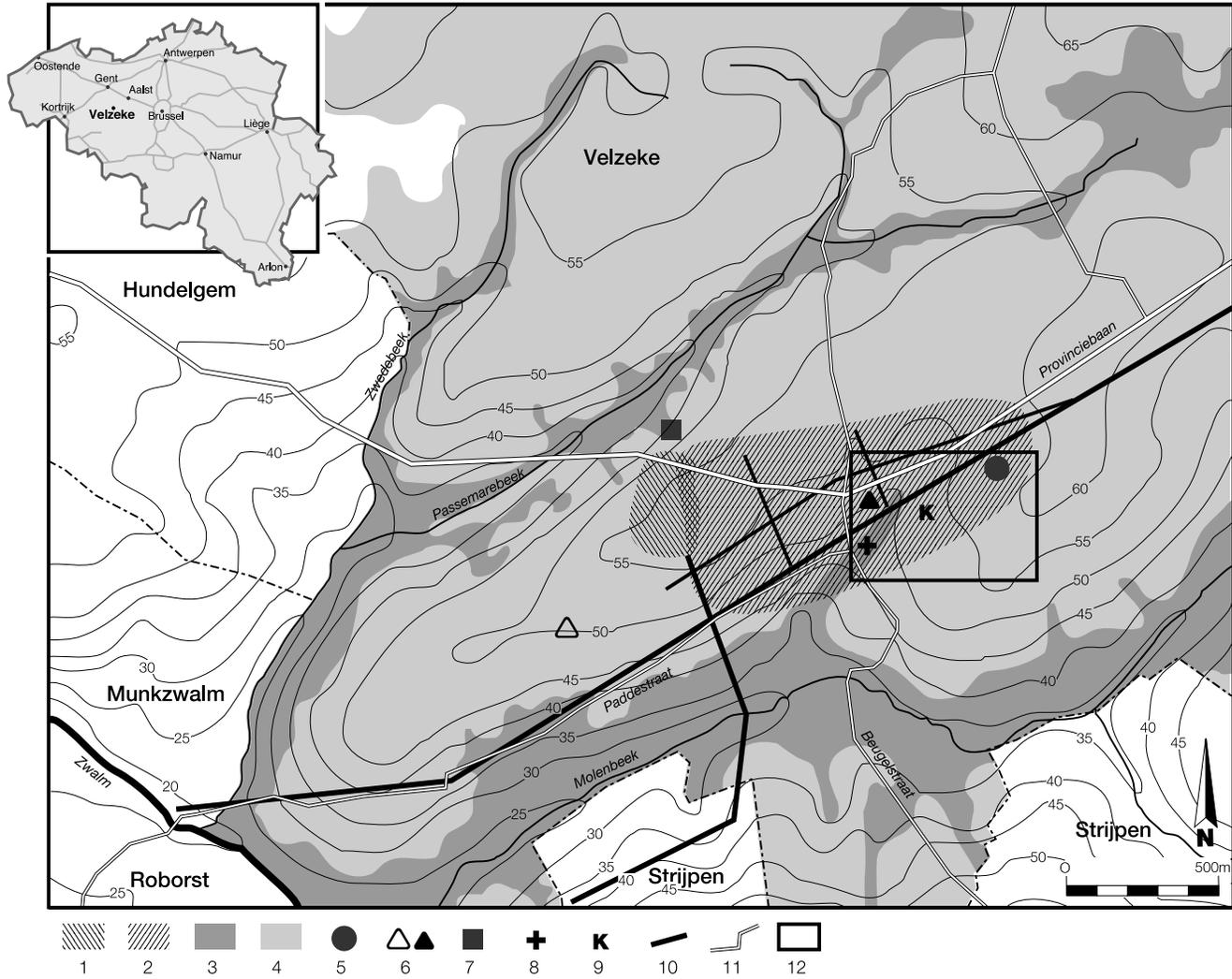


Figure 1 Localization of the site: 1. Augustean military camp, 2. Gallo-Roman settlement (*vicus*), 3. Alluvial soils, 4. Loamy soils, 5. Temple area, 6. Urnfield cemeteries, 7. Merovingian cemetery, 8. Church site, 9. Southeast sector of the Gallo-Roman site (Kwakkel excavations), 10. Roman road, 11. Modern road, 12. Southeast sector.

gious function. The settlement was destroyed in AD 260–267 by Germanic raids (De Mulder and Deschieter 2001).

Renewed occupation is attested by a Merovingian cemetery (late 5th–first half of the 6th centuries) (Figure 1.7). According to the interpretation of historical sources there was an important medieval center (county of Biest) at Velzeke during the Early Medieval period. This could explain the existence of an important stone church (Figure 1.8), which dates before the AD 1000 (Van Durme 1986).

### SAMPLE DESCRIPTION AND DATING RESULTS

Table 1 lists the results. The recent excavation (Figure 1.9) and dating project focuses on the southeast sector of the site (Figure 2) Only single entities of charcoal (cc), wood, and bone are dated. Samples are pretreated according to routine analyses (acid base acid treatment for wood and cc and the Longin [1971] collagen extraction for bones). Samples were selected in order to investigate the correlation between the different occupation phases and the extended survival of some archeological features.  $^{14}\text{C}$  was not used to investigate the archaeologically well-dated constructions and cemeteries.

Table 1 Radiocarbon dates of the different archaeological features

#	Lab nr <sup>a</sup>	Age (BP)	$\delta^{13}\text{C}$ (‰)	Sample description <sup>b</sup>
Iron Age ditch from Roman temple area				
a	UtC-6532	2070 ± 40	-26.1	cc from ditch I 100 cm below surface
b	UtC-6237	1770 ± 40	-26.9	cc from ditch I 60–90 cm below surface
c	UtC-6740	1155 ± 35	-25.3	cc from ditch I 40–50 cm below surface
Southeast <i>vicus</i> area				
d	UtC-8806	10,420 ± 50	-25.3	cc from ditch II 120–50 cm below surface
e	UtC-8803	2050 ± 45	-24.6	cc from ditch II 150–120 cm below surface
f	UtC-8804	1900 ± 35	-23.5	cc from ditch II 100–60 cm below surface
g	UtC-8805	1880 ± 35	-24.3	cc from ditch II 100–60 cm below surface
h	UtC-9026	2020 ± 40	-25.9	cc from ditch II 100–60 cm below surface
i	UtC-9027	1880 ± 35	-26.9	cc from posthole B 116–80 cm below surface
j	UtC-9025	1795 ± 35	-29.9	cc from posthole A 80–40 cm below surface
k	UtC-9028	1790 ± 45	-26.2	cc from posthole B 80–40 cm below surface
l	IRPA-1100	1750 ± 40	-26.3	Sapwood and hardwood from construction beam at bottom of well
m	UtC-3042	1690 ± 80	-22.7	Horse bone from bottom of well, 1200 cm below surface
n	UtC-3043	1570 ± 80	-20.8	Pig bone from well, 900 cm below surface
o	UtC-9931	1230 ± 30	-25.7	cc from posthole C 81–75 cm below surface
Church site				
p	UtC-4853	1320 ± 30	-25.9	cc from inhumation grave a 230–206 cm below surface
q	UtC-4855	1275 ± 30	-26.0	cc from inhumation grave b 210–200 cm below surface
r	UtC-6236	1165 ± 40	-25.3	cc from ditch 1 trench 2, middle layer 134–110 cm below surface
s	UtC-9933	1160 ± 30	-25.4	cc from ditch 1 trench 3, upper layer 54–28 cm below surface
t	UtC-10067	1140 ± 45	-26.0	cc from wall plaster of Carolingian-Ottonian church choir
u	UtC-9935	1045 ± 45	-25.5	cc from ditch 1 trench 3, middle layer 90–60 cm below surface
v	UtC-5369	940 ± 25	-26.0	cc from ditch 2, bottom layer 150–110 cm below surface
w	UtC-10066	625 ± 35	-24.0	cc from small side-door in the choir
x	UtC-9934	200 ± 30	-27.1	cc from oven within former church cemetery, 116–112 cm below surface

<sup>a</sup>AMS samples prepared at the Royal Institute of Cultural Heritage, Brussels (IRPA) and measured at the Van de Graaff laboratory, Utrecht, The Netherlands (UtC). LSC samples prepared and measured at IRPA.

<sup>b</sup>cc = charcoal.

## DISCUSSION

### Phase I: Late Iron Age

The Early Iron Age urnfield cemetery is solely dated on the basis of the urn typology. Sample a and samples e and h come from respectively the filling up of two Late Iron Age ditches (Figure 2.1). Ditch I is situated in the east end of this sector, in the so-called temple area (Figure 1.5). This ditch, approximately 140 m long, has a northwest-west–southeast-east to northeast-southwest orientation. The width of this feature varies from 0.84 to 1.84 m, the depth from 0.38 to 0.98 m. The preserved form also differs from a U-shape profile to a flat or rounded bottom with a broad, fanning wall. The filling up consists of two to three layers. The oldest has a rather natural character of loam with some cc fragments (De Mulder and Braeckman 1999). Sample a dates this phase to cal 181 BC–AD 18 (2- $\sigma$  range). Ditch II, 100 m long, is situated 280 m west of ditch I and has a northwest-southeast orientation. The width varies between 2 and 2.4 m and the depth from 1 to 1.4 m. This feature shows a weak V-profile. Two different phases of in-fill are attested (Deschieter and De Mulder 1999). The lowest layer dates to cal 200 BC–AD 60 (sample e) and cal 160 BC–AD 80 (sample h). In both ditches no ceramics were found. Other traces of human settlement from this period are lacking in this area. For the moment the two ditches are interpreted as part of a field boundary system. Scarce indications of a Late Iron Age/Early Roman period settlement are attested 750 m to 1 km west of the ditches.

### Phase II: Roman Period

Based on artifact typology the Gallo-Roman settlement at Velzeke goes back to the end of the 1st century BC, while the southeast area of the site became fully incorporated in the dwelling area of the *vicus* during the Flavian period (AD 69–96) (Figure 2.3). Before the second half of the 1st century AD the southeast sector was an outlying zone. The human occupation area is closed off by a system of small ditches with an east-west orientation. Only north of this archaeological feature is a well-planned and organized expansion of the habitation area. This system remains in use during the whole Gallo-Roman period. The area east of the settlement gets a religious/sacral character, proved by the erection of a Gallo-Roman temple (Figure 2.5) and another stone building. Both these structures have the same northwest-southeast orientation. The archaeological research dates these buildings to the 2nd and 3rd centuries (Meex and Mertens 1973; Braeckman et al. 1997). The separation between the human and the sacral area is further accentuated by a natural depression in the landscape.

During this period, ditch I loses its function. The middle layer dates between cal AD 147 and 388 (sample b), as is confirmed by Gallo-Roman pottery. A pedological study showed that the ditch has been filled up deliberately.

A series of other samples (f, g, i, j, k, and m) represent a changing in the internal structure of the settlement. These changes are historically linked with the crisis of the Roman Empire during the second half of the 2nd century. The samples f and g come from a reuse of ditch II. <sup>14</sup>C dates this new phase to cal AD 20–220 (sample f) and cal AD 60–240 (sample g). This information is confirmed by the archaeological finds, dated at the end of the 2nd to the 3rd centuries. The samples i, j, and k represent two postholes from a wooden palisade protecting the settlement west of it. To the east of this defensive system, the former *vicus* area loses its housing function. About 200 m to the north of the new organization of the settlement a well has been excavated (Rogge 1989) (Figure 2.4). The construction of this stone well dates to cal AD 130–410 (sample l). It shows that there was still habitation outside the protected area.

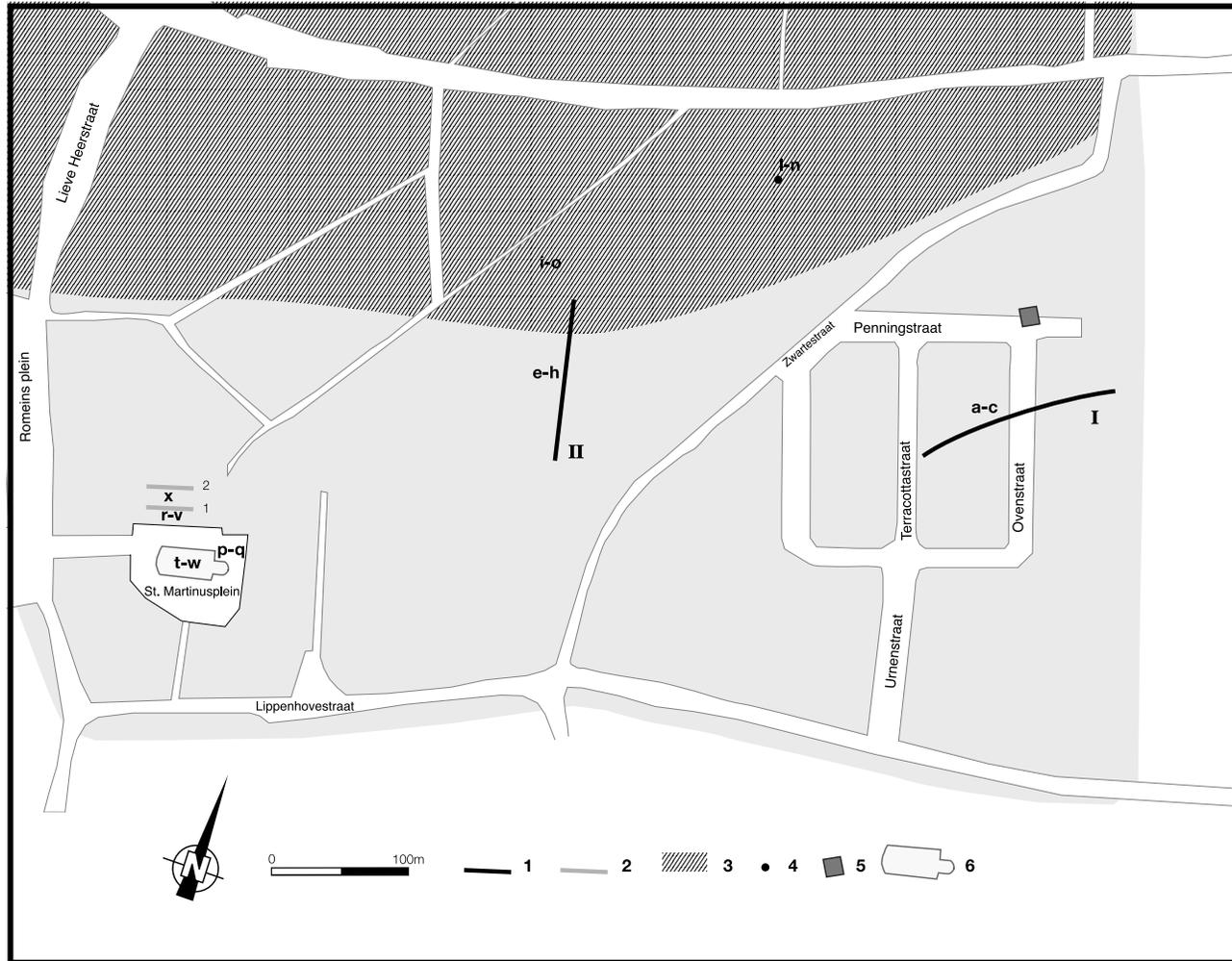


Figure 2 SE area of the archaeological site of Velzeke: 1. Late Iron Age ditches, 2. Medieval ditches around the church, 3. Gallo-Roman settlement, 4. Gallo-Roman well, 5. Gallo-Roman temple, 6. Present-day church. The  $^{14}\text{C}$  samples are indicated in small letters.

### Phase III: Late Roman–Early Merovingian Period

The *vicus* fell to the destruction by Germanic incursions during the third quarter of the 3rd century. At present, the archaeological data give no clear evidence of human occupation of the site during the end of the 3rd and the 4th century. Resettlement is attested by a small Merovingian cemetery (late 5th to first half of the 6th centuries) (Van Durme 1969; Rogge 1994). Toponymical research and scattered archaeological finds indicate the possible presence of a small Late Roman settlement (Van Durme 1995).

At the bottom of the well, part of a horse skeleton was found (sample m: cal AD 130–540). The plant and small animal remains in the lower 9 m of the deposits show a regeneration of the wood with thick underbrush, indicating that the area was deserted. At a depth of 9 m a pig skeleton was found (sample n: cal AD 260–650). The upper part of the well was filled, probably in one action, with construction debris. The interpretation of the <sup>14</sup>C age of the two animal skeletons in the well is hindered by the large standard deviation of the dates.

However, taking in account the slow natural sedimentation rate in the well, an age difference of 100 ± 20 yr between the deposition of the horse and the pig is expected. Taking this into account the deposition of the pig is synchronous to the Merovingian cemetery (late 5th to the first half of the 6th centuries). The insect fauna of that layer supports the hypothesis of a new clearance of the land for agriculture by new groups of Germanic immigrants.

### Phase IV: Late Merovingian–Early Carolingian Period

Phase IV attests the beginning of the modern village. Samples p (cal AD 661–773) and q (cal AD 671–857) date two graves under the present-day stone church (Figure 2.6). The stratigraphical position of the inhumation graves and the lack of funerary gifts suggest that they are part of an older Christian cemetery (De Mulder and Rogge 1997). The cemetery must have been centered around a—so far not detected—small church building.

A posthole, from the former Gallo-Roman settlement area, was dated to the same period as the graves (sample o: cal AD 690–890). Together with a few archaeological features the date suggests the human use of this sector, outside the presumed Early Medieval settlement.

### Phase V: Carolingian–Ottonian Period

According to historical sources Velzeke was an important center during the Early Middle Ages. Presumably Velzeke was the seat of the Carolingian “county of Biest”. Written sources testimony of the existence of an important stone church before AD 1000. The choir of the present-day building is the only possible remnant of this church (van den Bossche 1973–1975). Charcoal (cc) extracted from a piece of wall plaster (sample t) dates between cal AD 770–990. Using the dates from the underlying graves (end of the 7th to mid 9th centuries) as TPQ the construction of the church is attributed to the Carolingian–Ottonian period (9th to 10th centuries). Further confirmation comes from Badorf ceramics (end 8th to end 9th centuries) recuperated in the foundation trench.

A system of two ditches delimits the sacred area of the church and its cemetery (Figure 2.2). Some of the deposits in the ditches are natural (samples v and r), while others must be considered as reworked occupational debris (samples s and u). Ditch 1 is <sup>14</sup>C dated (sample r) cal AD 785–975 and is synchronous with the construction of the Carolingian–Ottonian church (De Mulder and Deschieter 1999).

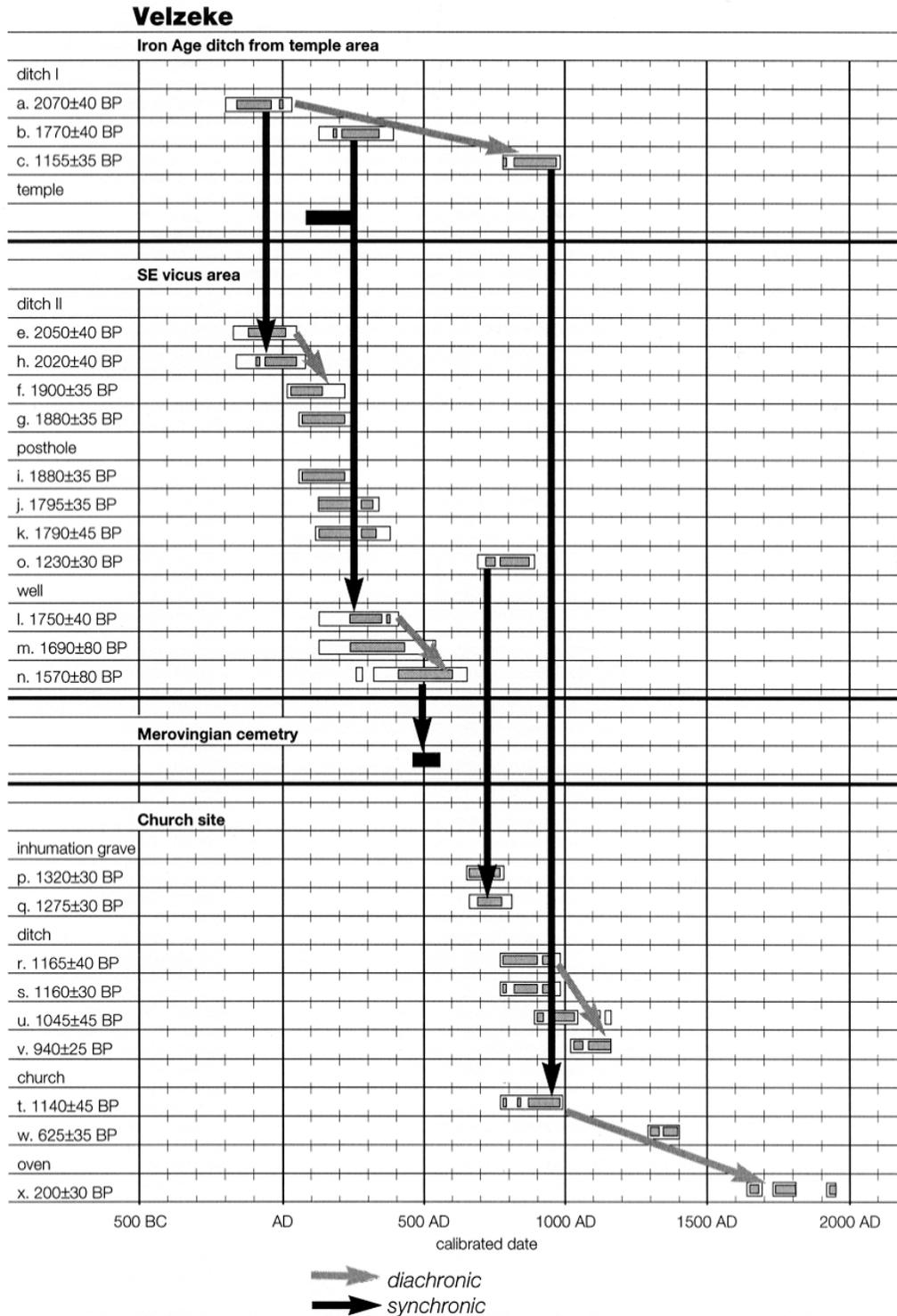


Figure 3 Calibrated radiocarbon results and archaeological dating of the temple and the Merovingian cemetery

Ditch 2 has been dated cal AD 1030–1163 (sample v); Pingsdorf pottery fragments and a local imitation of this ware confirm this date. The construction of the second ditch can be connected by a new extension of the cemetery. This can possibly be correlated to an enlargement of the church during the Romanesque period.

Sample c (cal AD 791–977) defines the last phase of the filling up of the Late Iron Age ditch I in the temple area. At some parts the upper layer of this ditch is mixed up with a medieval plough layer. The date indicates that the remainder of the Late Iron Age ditch I must have been visible in the landscape until medieval times. Part of ditch II still marks the boundary between two fields.

#### Phase VI: Late–Post Medieval Period

Two <sup>14</sup>C samples from the church area are of a younger date. The first one (sample w: cal AD 1290–1400) comes from a piece of wood in a small door in the choir used to bring in the dead. Although the architectural style of this door belongs to the Carolingian–Ottonian building phase of the church, the date suggests rebuilding activity.

Charcoal fragments found in a thin layer under the rubble of a destroyed oven (sample x: <AD 1640) suggest a secularization of the area around the church.

#### CONCLUSION

<sup>14</sup>C has demonstrated that the abandoned Iron Age ditches were partly reused in the Roman period and remained visible in the landscape as a relic until the middle Ages. This reuse dates from the temple phase, as well as the construction of the palisade and a stone well. These features are part of the reorganization of the southeast sector of the Gallo-Roman settlement (2nd to 3rd centuries). Between the Roman period and the Merovingian cemetery there is a phase of abandonment. Neither artifacts nor datable material could be found between the Merovingian cemetery and the earliest Christian graveyard. From then on it is possible to follow the evolution of the church site. An important Carolingian–Ottonian church was constructed during the 9th to 10th centuries. At the same time, a ditch system developed around the sacral area. The date of the oven marks the reduction of this religious area at the end of the Middle Ages.

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