

## SETTLEMENT SITE SELECTION IN DRENTHE IN LATER PREHISTORIC TIMES: CRITERIA AND CONSIDERATIONS

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*Nowadays more and more research is applied to trying to understand the criteria which played their several roles in prehistoric times in the selection of sites for settlement. After a short summary of some of the more recent ideas and hypotheses, three settlement sites in the north of the Netherlands are discussed. None of the theories summarized explains the choice of each single site completely, and no one model is shown to have dominant validity. Nevertheless elements of several theories and models appear to be helpful in gaining insight. Especially in the later period (from the Iron Age onwards) there are indications that, apart from agricultural needs, the relationship of the location in question to the system of communications (mainly the road system) would certainly have been taken into consideration, and to some extent also the presence of signs of former habitation (burial monuments).*

Interest in settlements and settlement patterns has increased considerably since the 1960s. Chang's "*Settlement Archaeology*"<sup>1</sup>, containing Trigger's contribution on "*The Determinants of Settlement Patterns*"<sup>2</sup>, appeared in 1968. A meeting held at the Institute of Archaeology in London in 1970 resulted in the publication of an extensive volume entitled "*Man, Settlement and Urbanism*"<sup>3</sup>. No longer do we mainly have books with titles like "The prehistory or archaeology of this or that country" or that or such as "Man's Early History" or "Prehistoric Man and Culture", but now also quite a number whose titles indicate that settlement structure and settlement patterns are the main interest. To name just a couple: "*Lowland Iron Age Communities in Europe*"<sup>4</sup> and "*Das Dorf der Eisenzeit und des frühen Mittelalters*"<sup>5</sup>, while a long article like "*Agrarian Development, Settlement History and Social Organisation in South-west Norway in the Iron Age*"<sup>6</sup> is also relevant. Often specific attention is paid to the ecological relations or the effects of the agrarian economy on the landscape as in: "*Man-Land Relations in Prehistoric Britain*"<sup>7</sup> and "*Untersuchungen zur eisenzeitlichen und frühmittelalterlichen Flur in Mitteleuropa und ihrer Nützung*"<sup>8</sup>.

The questions which are now being asked con-

cern organizational aspects of settlement and housing but also relate to more fundamental questions: Why did that group select just this specific site? Which environmental or other qualities were people looking for?

Is it possible to answer these questions in a generalized way? And if it is and if there was any preference in a certain period, when and why did changes occur? Let us see if there is a kind of common strategy in the tackling of these problems and any similarities in the existing ideas or the hypotheses which are generated.

First we have to explain what is meant by the term settlement pattern. According to Trigger (1968, p. 55) we can conceive of settlement patterns in terms of three levels: individual buildings (which I will not discuss), the arrangement of these buildings (the layout) within single communities and the manner in which communities were distributed over the landscape.

We will reserve the term settlement pattern for the distribution of sites (the areal pattern). The term settlement structure will be used for the arrangement of buildings (the site pattern).

One of the contributors to "*Man, Settlement and Urbanism*", Irving Rouse (1972, p. 96), leaning heavily on Trigger's analysis, states that "by a settlement pattern is meant the manner

in which a people's cultural activities and social institutions are distributed over the landscape". Such a pattern to him "embodies all three kinds of systems, cultural, social and ecological, and provides a record of the relationship among them".

Peter Gathercole, (1972, p. 56), referring to the situation in Polynesia, says that most archaeologists working in that area would regard settlement patterns as an interpretative aspect of what Kennedy - an archaeologist from New Zealand - has termed "the spatial organisation of a human group, which is held to reflect economy, social organisation and the resources of the physical environment".

Before I continue and try to state precisely the question we want to answer, I will give you the opinion of a "non-believer", namely Taylor (1972) of the Royal Commission on Historical Monuments in England. He believes that "the recovery of the pattern of settlement of pre-Saxon society in Britain is something that archaeologists cannot achieve". First there is the incompleteness of the recorded pattern, due to large-scale destruction which has been specifically apparent in recent years. The destruction had started already in late Roman times, however slowly. Second it is unknown what the percentage of the recovered remains is compared to the total original pattern. Third there is the uneven distribution of the evidence, dependent on the interest and activities of local archaeologists and on discoveries made by pure chance. Even greater problems, according to Taylor, arise when an attempt is made to assess the size, function and relationship of the component parts of the pattern of settlement. It is hardly ever possible to excavate a specific site completely. Also it is now clear that there was much variety in size, form and organisation even within a limited time span.

More enthusiasm and optimism is apparent in the American southwest, where a group called SARG (Southwestern Anthropological Research Group), was conceived in 1971. This large group of southwestern archaeologists decided to devote a part of their research

towards the testing of hypotheses of general interest to the group. To be of such interest the question had to be of a general and fundamental nature. Such a question was: "Why do people live where they do?" An announcement of their program is in the June 1974 issue of *World Archaeology*<sup>9</sup>.

More precisely formulated the major question was: "Why are population aggregates located where they are? Ancillary themes being: why do population aggregates differ in size, why do locations differ through time, and why does a single population aggregate (or individual site) grow or decrease in size?" (SARG, 1974).

As to the major question, emphasis was laid on explaining the variability in the spatial distributions of prehistoric human settlement sites i.e. on the description and explanation of the distribution in space. That is to say that the emphasis was on synchronic variability, although the long term goal included explaining change in locational patterning as well.

Within settlement systems several types of sites can be distinguished: besides real habitation sites there is a wide variety of so-called "special purpose" or "limited activity" sites. However the description of the site type in space was not the chief research object. Of basic importance to the SARG members is "the relationship of sites and settlement systems to significant natural and social regional variability. Sites may be located with respect to various natural resources, for example; or they may be located with respect to each other [but] sites are components of settlement systems, and ultimately cannot be explained... without reference to the entire system...". The thrust of our current effort, SARG says, is "to test specific propositions regarding the determinants of site location within settlement systems". It is an attempt to discover which variables are critical.

"Three propositions currently form the core of the research design...:

- A. Sites were located with respect to critical on-site resources;
- B. Sites were located so as to minimize the effort expended in acquiring required quantities

of critical resources;

C. Sites were located so as to minimize the cost of resources and information flow among sites occupied by interacting populations”.

Proposition A suggests that sites will tend to be located at resource locations;

B. that sites be rather located in intermediate positions with regard to resource locations;

C. introduces the importance of the social environment and of positions which have advantages from the point of view of communication and communicating.

In the first stage the three propositions will be tested by the SARG members with respect to the following three variables or determinants: plant community, landform and water resources.

In the February 1978 issue of *World Archaeology* there is an article by Geoffrey Conrad (1978) based on research carried out in South America, more precisely in the Viru Valley of Coastal Peru. Its title includes “Models of compromise in settlement pattern studies...”. It can be related to the discussion of the determinants of prehistoric settlement pattern, activated in the southwestern United States by Plog and Hill, which also resulted there in the SARG-program mentioned above.

Conrad concludes that at least in the case of complex societies the opinion that individuals and populations act either to maximize certain resources or to minimize the effort needed to obtain these resources is incorrect. As he says “behaviour that maximizes gain or minimizes effort for some resources may tend to minimize gain or maximize effort for others. Complex societies, which must balance a variety of resources against numerous and diverse needs, cannot confine their attention to several of these factors and ignore the rest. Accordingly, the settlement patterns of such societies are not intended to optimize exploitation of a few resources; instead, they represent attempts to arrive at a workable compromise among many determinants”.

Three of these factors or determinants have been identified by Conrad and tested:

- a. maximization of arable land;
- b. minimization of agricultural effort;
- c. maintenance of socio-political control.

As to a. it is to be expected that “if agricultural land is to be maximized, sites should not occupy arable tracts and settlements should be restricted to zones outside the limits of cultivation”.

As to b: “a settlement pattern can optimize agricultural effort for instance by minimizing the amount of time a farmer must spend travelling from home to field”, so the fields are located adjacent to the settlement or vice versa.

And as to c: “the optimal settlement pattern for maintaining social and political control is a hexagonal central place hierarchy”, of the type Cunliffe (this volume) shows us. As a result of the testing the rank order in this case, in order of increasing importance, proved to be a-b-c.

Conrad’s general conclusion is that it is impossible to predict the specific compromise that has been made in a certain area at a certain time.

A further element in the discussion on the study of settlement patterning is introduced by the Canadian archaeologist Philip Smit (1972).

As traditionally accepted determinants of settlement patterning he lists:

- the environmental factors such as soil, water, terrain;
- religion and relationship to larger political units;
- thirdly, but of primary importance, the mode of subsistence and the way it is exercised, involving the quantity of cultivable land and the ease of working it.

However Smith diverges from the traditional point of view which as he says sees “the cultivation systems in use, and particularly the degree of intensification of cultivation as largely determined by the variations in soil and climatic characteristics and by the technological capacities of the cultivators”. It is his opinion that “the various levels of exploitation have usually been considered as relatively static adaptations to local environmental conditions combined with the available techniques, and the agricultural systems themselves as rather stable and fixed

in the absence of external cultural influences or environmental changes". The point he wants to make is that it "is too frequently overlooked... that each agricultural system often reveals sub-systems with much diversity and that the pattern of land use is normally highly flexible and adaptable in the face of stresses". As he says "the different types of agricultural land-use are in fact not primarily adaptations to local geographical conditions but, within certain limits, reflections of decisions by the cultivators regarding food-production and labour input;... resilient in the face of demographic pressures, caused by high man-to-land ratios".

So the different types of agricultural land-use and the differences in the levels of intensification are now considered to have as an important determinant the demographic circumstances.

Philip Smith is, as he admits, clearly inspired by Boserup's model of land-use types, which sees land-use as flexible and fluctuating in response to factors other than soil quality, technological level or cultural preference, but first and foremost responding to demographic changes. In Boserup's classification 5 levels of intensity of cultivation are recognised: forest fallow, bush fallow, short or grass fallow, annual cropping and multicropping<sup>10</sup>.

"Where the ratio of cultivated land to fallow land is high and population pressure exerts itself on the available land there is a tendency not only for the fallow periods to be shortened in response but also for the villages and compounds to become almost or completely permanent sites" (Smith, 1972, p. 145).

To conclude this first part, I will mention two other remarks of Smith which may also be of interest. Repeated occurrence of warfare or hostile actions may result in larger and more nucleated settlements which may have the similar effect as demographic pressure and result in shorter fallow periods.

Longer residential occupation tends to lead to closer identification of people with a particular locality. Fixed cultivation as a result of this longer occupation can lead to the assertion of individual control over the land.

Before we are able to draft even the concept of a model of the settlement patterns in Drenthe, a province in the Northeastern part of the Netherlands (fig. 1), in the different periods of prehistory, we should have the basic information on the main determinants of settlement location in this area. Which factors determined the selection of the settlement site? Acquiring a picture of the natural landscape in our area is seriously hampered by the extremely poor properties of the sandy soils with regard to the conservation of organic material.

Something that may be of help here is the concept, formulated by Hawke-Smith, in a book entitled "*Man-Land relations in Prehistoric Britain*"<sup>10</sup>, and borrowed from the palaeo-economic school, "that human economies ... habitually depend on a combination of complementary resources drawn from two or more ecological communities which together constitute an economic 'niche'" (Hawke-Smith, 1979, p. 3).

As soon as agriculture becomes the main means of subsistence of prehistoric man, these ecological communities gradually lose their original characteristics and the success of human exploitation to a large degree seems to be determined by the abiotic qualities of the environment, climatic and edaphic. Climatic differences can be neglected within the restricted area which we will consider now (that is the province of Drenthe).

In the habitable part of this area, roughly 60 x 60 km, differences in elevation are of a magnitude of up to about 25 m.

Of more importance are the edaphic factors, the geomorphology, the texture and structure of the soil, the hydrological properties and the translation of these in agricultural terms: natural fertility, workability and drainage qualities. Information regarding these properties could be directly useful in gaining insight into prehistoric man's behaviour, in this case an insight into the question as to which qualities he preferred in the process of settlement site selection.

Detailed soil maps are now available for a large part of our area. The main natural ele-

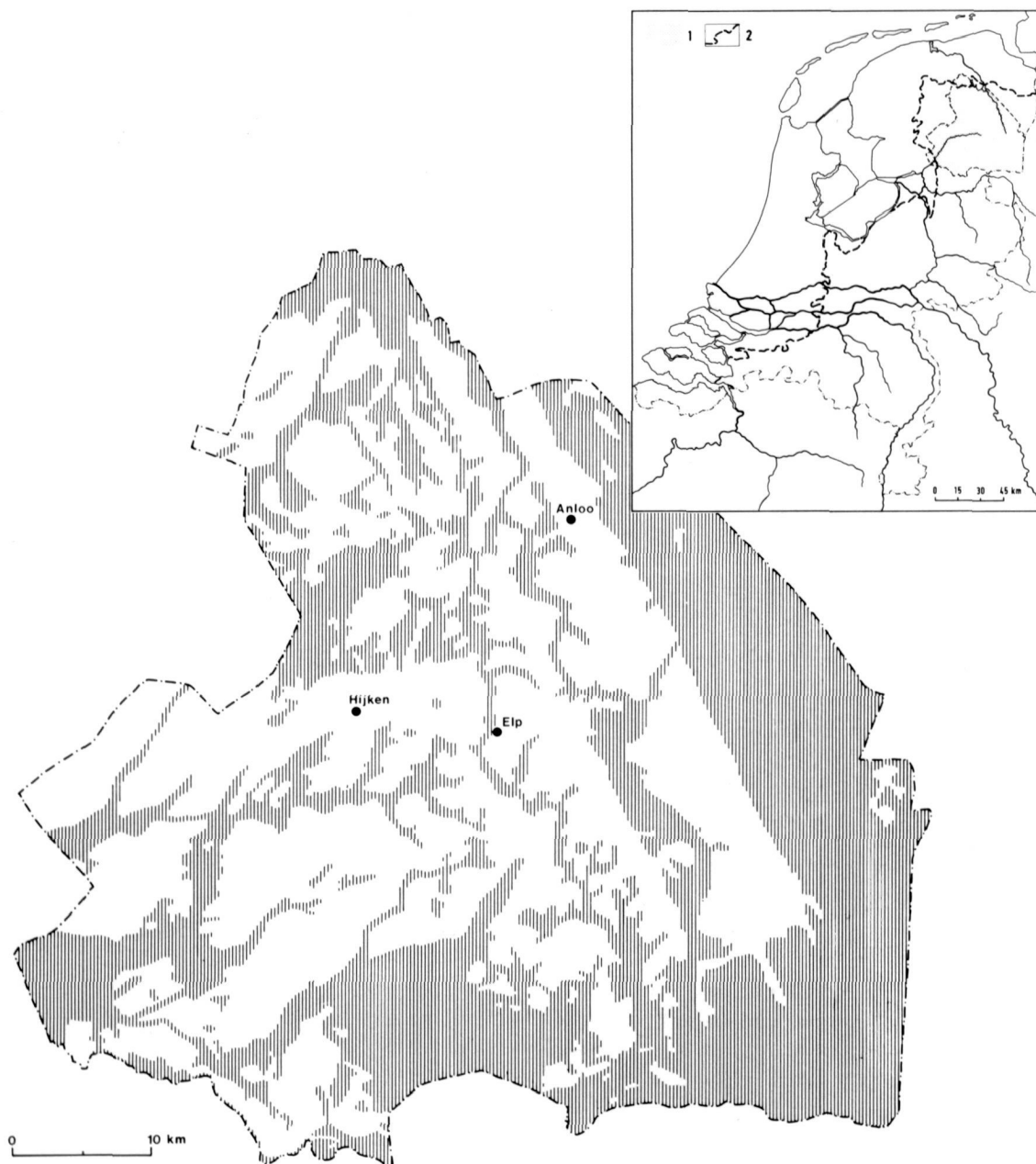


Fig. 1. Province of Drenthé, the Netherlands, with the main sites mentioned in the text (the inhabitable parts are hatched). Inset: the Netherlands and the surrounding area. 1 = Drenthé; 2 = 1 m + N.A.P. contour-line.



Fig. 2. Anloo, TRB settlement (Middle TRB) with the fence of the first period and pits filled with settlement refuse material (cf. Waterbolk, 1960).

ments in the province of Drenthe are of Pleistocene age: glacial deposits, namely sands and boulder-clays from the Saalian glaciation, covered by wind blown sands (cover-sands) from the (end of) the Weichselian period. The surface topography and the properties of the soil for agricultural usage are mainly determined by the depth of the boulder-clay and the thickness of the cover-sand deposit.

In the detailed system of soil classification elements are incorporated resulting from intensive human influence in rather recent times, e.g. intensive cultivation, reclamation or anthropo-

genic vegetation. As a result a large number of podsollic soils have been distinguished, several of which fitted prehistoric man's requirements quite, if not equally, well.

Let us see now which elements can be distinguished at the location of habitation sites from three different periods in Drenthe: the Neolithic, the Bronze Age and the Iron Age.

The Neolithic site is near Anloo in the middle of the eastern part of Drenthe, in an area with a dense concentration of megalithic monu-



Fig. 3. Anloo, TRB settlement with double fence of the second period (first period shaded).

ments. It is the structure which has been known as the cattle-kraal since its excavation in 1957/1958 (Waterbolk, 1960). In my opinion it is a two-period settlement of the TRB culture with a single and a double fence, dating from the earlier and later period respectively (fig. 2 and 3). The site is in the middle of an area with a relatively low groundwater table notwithstanding the presence of boulder-clay beginning at a depth between 0.40 and 1.20 m. The contour map (fig. 4) of an area of 2 x 3 km surrounding the site shows considerable difference in elevation and explains the hydrological situation. The

site itself is a little above the 17+ contour-line, on an eastward facing slope that starts at +19 m, 500 m west of the site, to +10 m, about 1 km east of the site. As a result of the difference in elevation there is little or no stagnation of ground-water even where the boulder-clay is not far below the surface.

Near the site soils with the best agricultural qualities, especially a higher loam content, are located in the western part of the boulder-clay area. There is an area with brown podsollic soils surrounded approximately by the 18 m contour-line (fig. 4). The settlement site is at some dis-

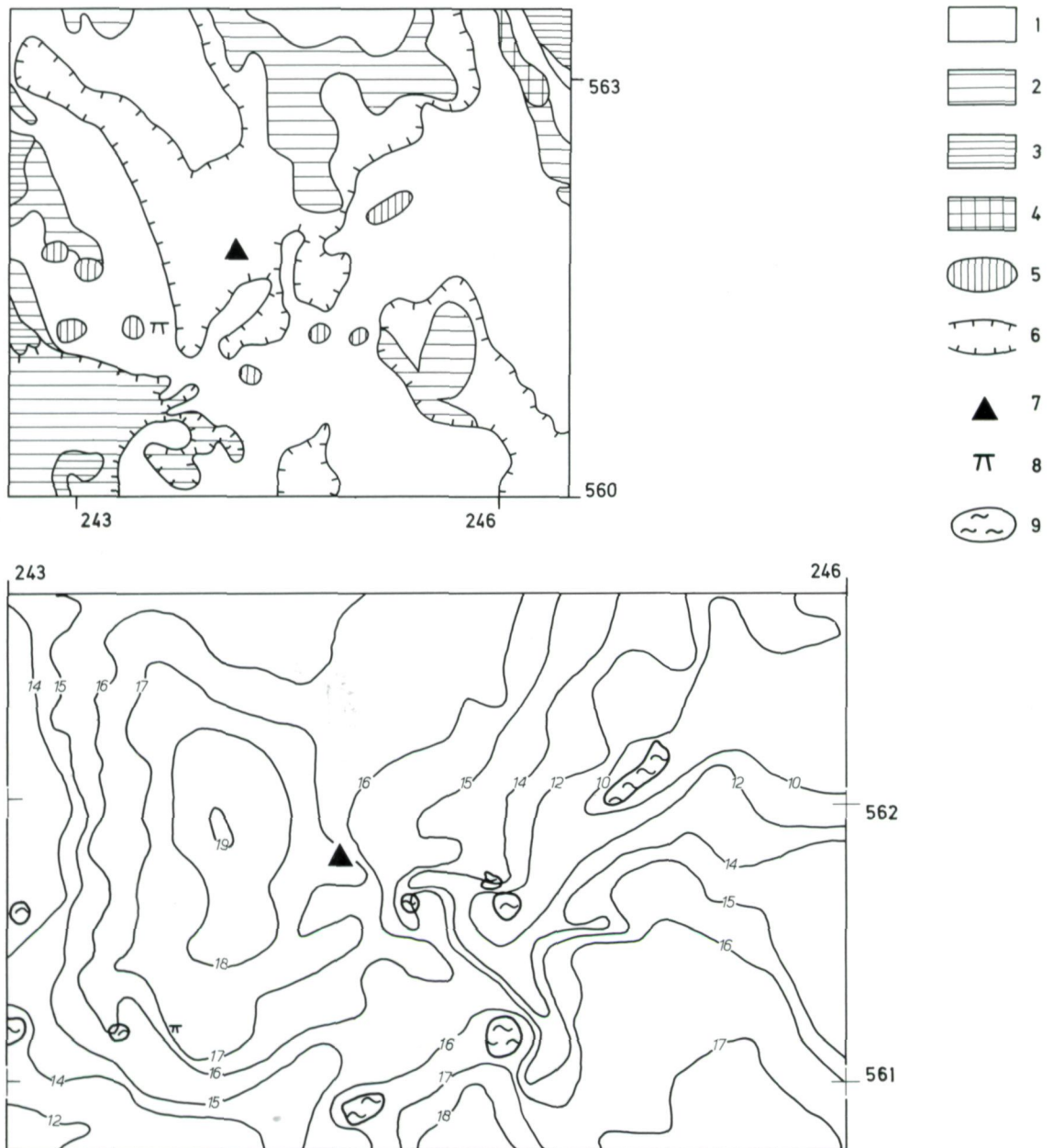


Fig. 4. Anloo, soil map (top) and contour map of the area around the TBR settlement site; scale 1 : 50.000 and 1 : 25.000 resp. (distance between successive coördinates 1 km).

1 = dry sandy soils; 2 = moderately dry sandy soils; 3 = wet sandy soils; 4 = peaty sidements; 5 = waterlogged depressions; 6 = boulder-clay beginning between -0.40 m and -1.20 m; 7 = site of TRB settlement; 8 = megalith; 9 = 5.

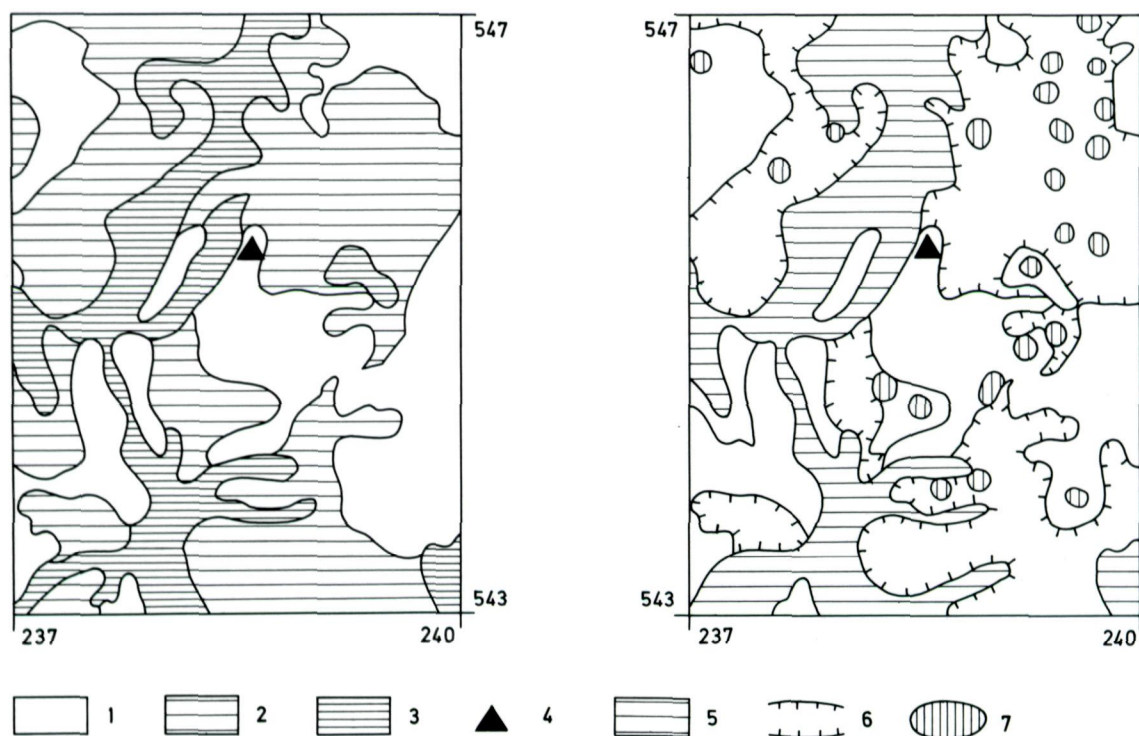


Fig. 5. Elp, soil maps of the area around the Middle Bronze Age settlement; scale 1 : 50.000.

1 = dry sandy soils; 2 = moderately dry sandy soils; 3 = wet sandy soils; 4 = site of Middle Bronze Age settlement; 5 = peaty valley sediments; 6 = boulder-clay beginning between  $-0.40$  m and  $1.20$  m; 7 = waterlogged depressions.

tance from the best arable land. Its position can be seen as intermediate between the area with the best agricultural qualities, a few hundred metres to the west, and some small depressions to the east, one of which, at a distance of about 600 m, would have contained water permanently.

The location of the Middle Bronze Age settlement of Elp (Waterbolk, 1964), seems easier to understand. According to the soil map and the groundwatertable map there are dry sandy soils immediately to the south, somewhat less dry soils with boulder-clay beginning at a depth between  $0.40$  m and  $1.20$  m to the east and north-east and wet soils with peaty valley sediments to the west and north-west (fig. 5). This

situation completely answers the general description of Hawke Smith, an economic "niche" being composed of several ecological communities.

In agricultural terms we have sandy soils to the south that are rather poor but dry and easy to work, and soils that to the east are richer and loamy but wetter and with agricultural possibilities probably restricted to the highest part, on and closely around the area enclosed by the  $17.5$  m contour-line (fig. 6). The area to the west will have supplied water and probably firewood. Alder woods would have been present here until well after medieval times.

Near Hijken, in the middle of Drenthe, we meet one of the largest Celtic fields in this province,

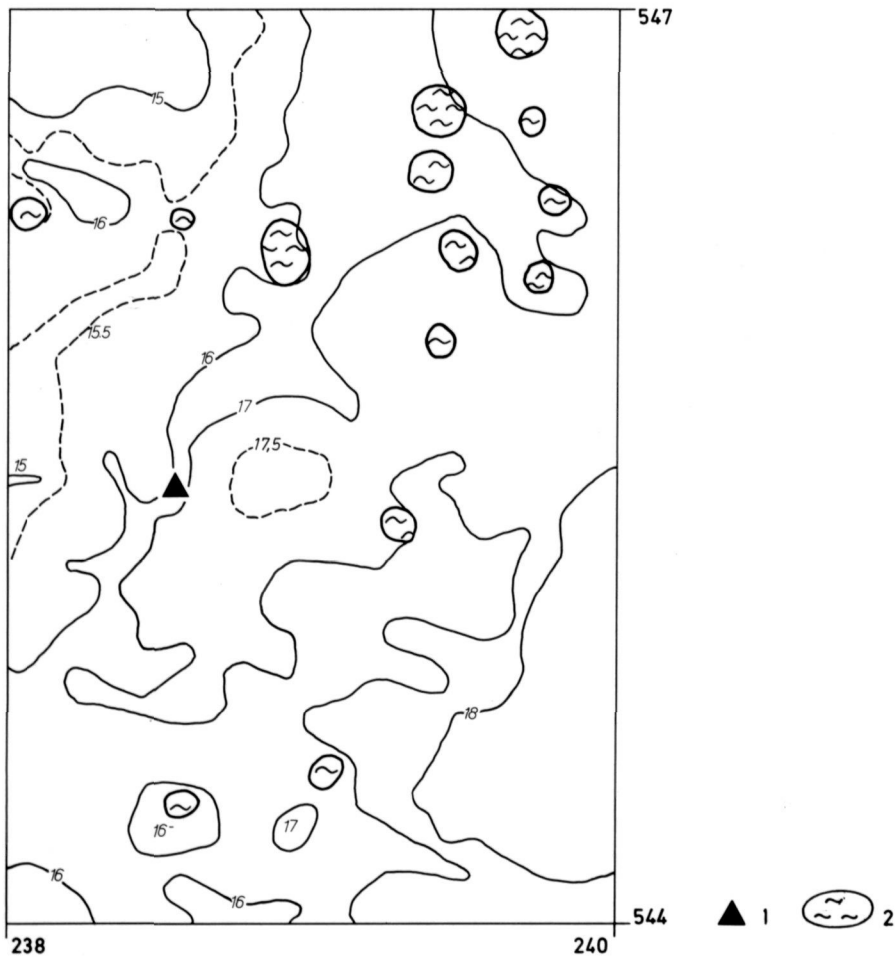


Fig. 6. ELP, contour map; scale 1 : 25.000.

1 = site of Middle Bronze Age settlement; 2 = waterlogged depressions.

ca. 90 ha or a little less than 1 km<sup>2</sup>. It extends in a roughly southwest-northeast direction for about 1850 m, with a maximum width of 750 m (fig. 7). In the southwestern part contemporary Iron Age farm-buildings have been excavated, each one inside a single Celtic field plot, which constitutes the homestead (fig. 9) (Harsema, 1980a, b).

There is reason to believe that Brongers' opinion as to the Celtic field structure in Vaassen (Brongers, 1976) also applies to the Hijken

field. The NW-SE field banks are the principal ones. They divide the system into long strips, and all the plots in a single strip were probably used by one and the same farmer. This farmer could subdivide his strip and select his house site within it according to his own preference. Neighbouring strips had different users/occupants. However the 10 plots that could be found at most in a single strip were insufficient to meet the demands of a normal family. At least one strip but probably two in another part of the

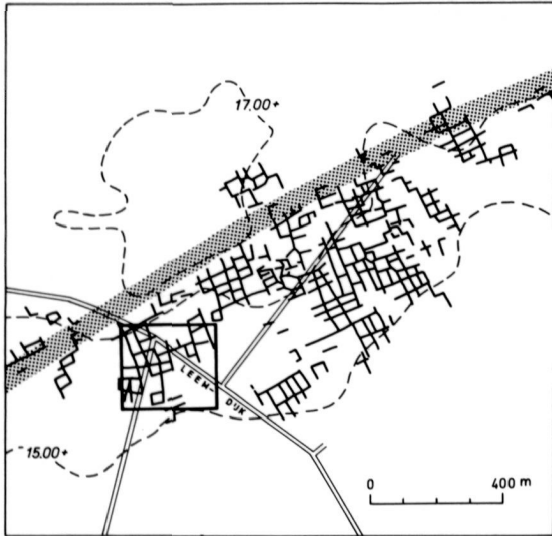


Fig. 7. Hijken, Celtic field plan based on air-photographs and terrestrial survey (cf. Brongers, 1976). Shaded is an important road that ran along the northwestern border until the 19th century. Within the large square considerable parts of settlements from the Middle Bronze Age and the pre-Roman Iron Age have been excavated (cf. fig. 8).

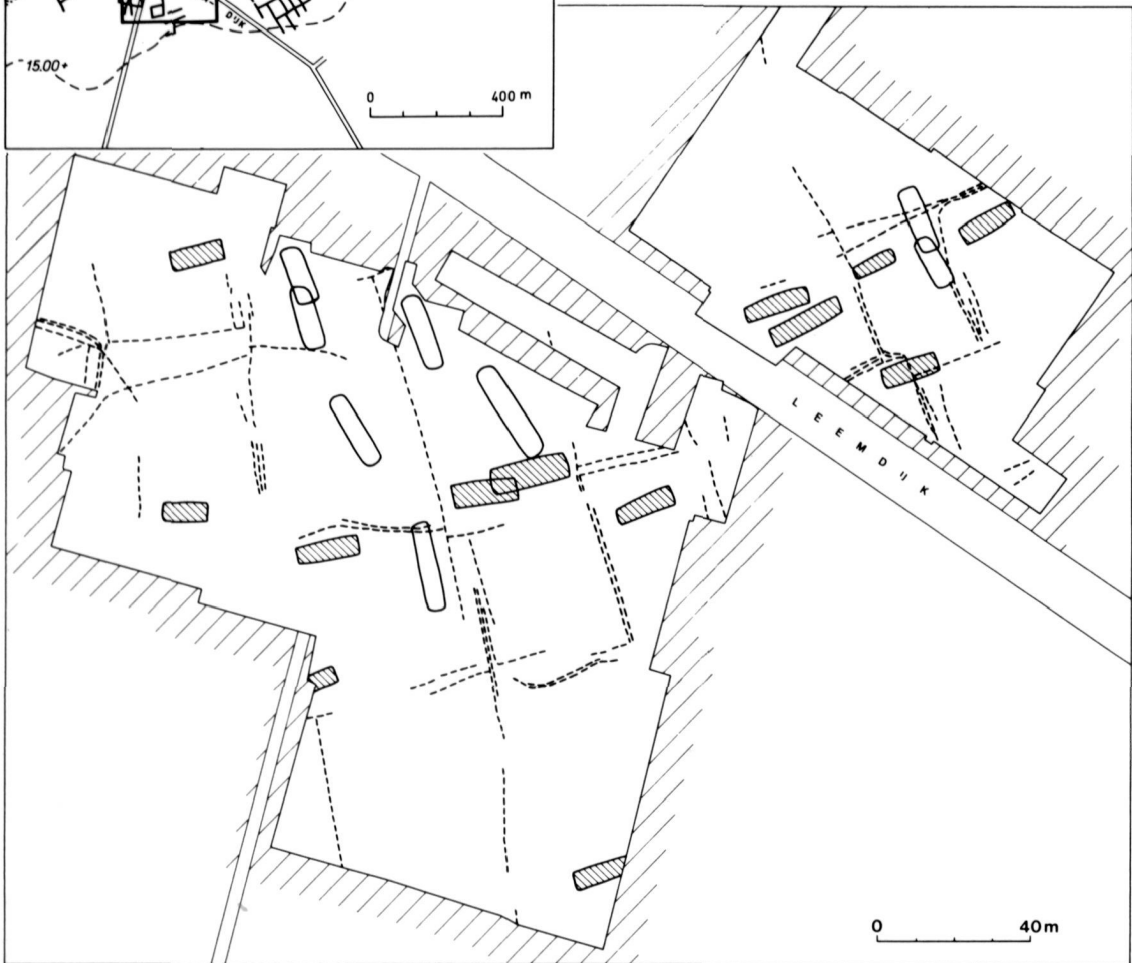


Fig. 8. Hijken, plan of the excavated area within the Celtic field (for location cf. fig. 7). Indicated are Middle Bronze Age houses (open), Iron Age houses (hatched) and fences (broken lines) surrounding the Iron Age fields resp. homesteads.

Celtic field system also had to be farmed by the family. In the way in which habitation and agricultural use was combined in the Celtic field system at Hijken a compromise has been found between minimization of agricultural effort on the one hand (demonstrated by the fact that some of the plots even border on the homestead) and a rather compressed settlement plan on the other (responding to social needs, such as the maintenance of social ties, and security). It seems that factors which are operative within the entire settlement pattern can also be applied in the explanation of the layout of the individual settlement site.

To discover which criteria played a role in the actual site choice we will look again at the soil map and the contour map. The Celtic field system at Hijken occupies an area where the boulder-clay comes relatively close to the surface. Dry sandy soils are found only in a small strip in the western part of the system. This strip borders to the southeast on slightly wetter soils (fig. 9). The division between the soil types is formed approximately by the 16 m contour-line. The entire system is on a southeast facing slope between the 17 and 15 m contour-lines (fig. 7, 9).

Waterlogged depressions are few and are not present within 500 m of the excavated part of the settlement. Neither major variations in soil type nor ecological variations resulting from considerable differences in elevation can have prompted the choice of this site. Could it just be that uniform conditions over a large area were especially valued in the Iron Age? Or are other factors to be taken into consideration?

In historical times an important road, connecting the southwestern part of Drenthe with the north ran along the western border of the field system (fig. 7). In the beginning of the nineteenth century the digging of two canals - running east-west, just south of the Hijken area - changed the traditional traffic system. There are indications that this old road had a very long history and probably even went back to the Later Neolithic. Almost certainly it was in use in the Middle Bronze Age. This road may very

well have influenced the preference for this place as a site for settlement. In the Iron Age it even seems to have influenced the layout of the fields in terms of the direction of the strips, in such a way that all the farmers had equal access to the road.

If we now look closer at the main Celtic field system in northern Drenthe, at Balloo and Zeijen, we see that also in these two cases one of the two directions of the dividing field-bank system is perpendicular to the direction of the road, while the other one runs parallel to it. Roads may be among the determining factors in the choice of habitation sites and of some importance at least from the Iron Age onwards. Nevertheless the reasons for the selection of precisely the chosen area along the road are not self-evident, neither is the selection always sufficiently explained by the soil conditions.

So we will finish with a last consideration. It is remarkable how often burial monuments from quite different periods are concentrated in certain areas. It is theoretically possible to explain this situation by continuity of habitation, but it is quite certain, in Hijken at least, that there was no habitation between the end of the 10th century (after the Middle Bronze Age) and the beginning of the sixth century B.C. Certainly every occupation would have had an effect on the landscape, but I wonder if change in the vegetational cover (a more open landscape as the result of earlier occupation) is the only determining factor here. Certainly in Hijken such changes would have been largely obliterated after 3 if not 4 centuries. Nevertheless after this long break in habitation the Iron Age group settled at exactly the same site as the former Bronze Age inhabitants. The only possible visible remains and reminders of this Bronze Age habitation would have been the barrows, one to two hundred metres to the north.

I think that, in prehistory, if there was a choice to be made between several more or less equally suitable sites, preference often would have been given to the site which had its suitability for human occupation demonstrated by the presence of older burial monuments.

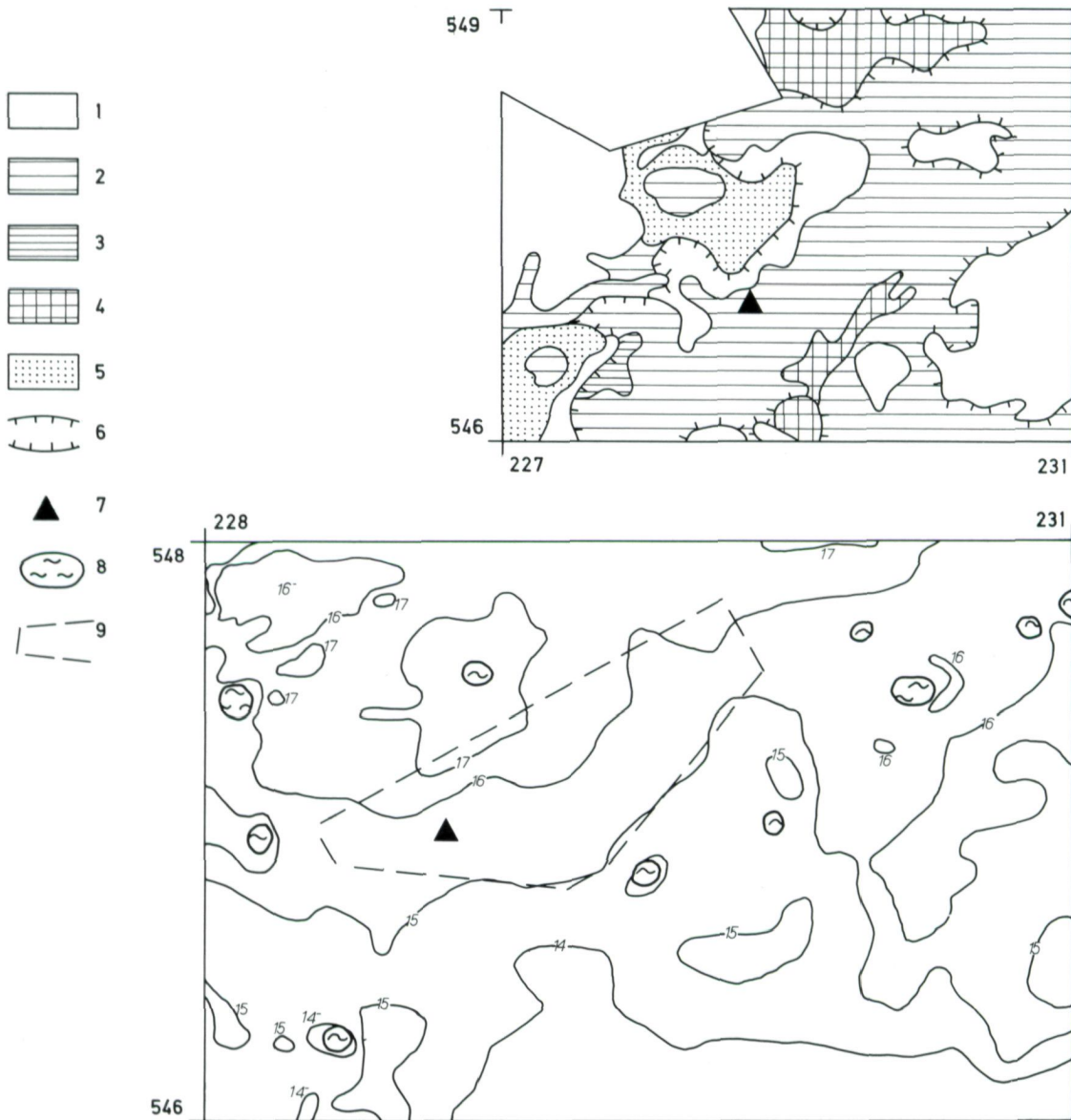


Fig. 9. Hijken, soil map (top) and contour map of the area around the Celtic field and the settlement; scale 1 : 50.000 and 1 : 25.000 resp.

1 = dry sandy soils; 2 = moderately dry sandy soils; 3 = wet sandy soils; 4 = peaty sediments; 5 = recently (?) blown sand; 6 = boulder-clay between  $-0.40$  m and  $-1.20$  m; 7 = site of Middle Bronze Age and Iron Age settlements; 8 = waterlogged depressions; 9 = approximate limit of Celtic field (cf. fig. 7).

## NOTES

1. Chang, K.C. (ed.) (1968)
2. Trigger, Bruce G. (1968)
3. Ucko, Peter J., Ruth Tringham and G.W. Dimbleby (eds.) (1972)
4. Cunliffe, Barry and Trevor Rowley (eds.) (1978)
5. Jankuhn, Herbert, Rudolf Schützeichel and Fred Schwind (Hrsg.) (1977)
6. Myhre, Björn (n.d.)
7. Hawke-Smith, C.F. (1979)
8. Beck, Heinrich, Dietrich Denecke, Herbert Jankuhn (Hrsg.) (1979)
9. SARG, The members of (1974)
10. Boserup, E. (1965)

## BIBLIOGRAPHY

- Beck, Heinrich, Dietrich Denecke, Herbert Jankuhn (Hrsg.) (1979), *Untersuchungen zur eisenzeitlichen und Frühmittelalterlichen Flur in Mitteleuropa und ihrer Nützung* (Abhandlungen der Akademie der Wissenschaften in Göttingen). Göttingen.
- Boserup, E. (1965), *The Conditions of Agricultural Growth. The Economics of Agrarian change under Population Pressure*. London.
- Brongers, J.A. (1976), *Air Photography and Celtic Field Research in the Netherlands* (Nederlandse Oudheden 6). Amersfoort.
- Chang, K.C. (ed.) (1968), *Settlement Archaeology*. Palo Alto.
- Conrad, Geoffrey W. (1978), Models of compromise in settlement pattern studies: an example from coastal Peru. *World Archaeology* 9:3, pp. 281-298.
- Cunliffe, Barry and Trevor Rowley (eds.) (1978), *Lowland Iron Age Communities in Europe* (BAR International Series (Supplementary) 48). Oxford.
- Gathercole, P. (1972), The study of settlement patterns in Polynesia. In: Ucko, Peter J., Ruth Tringham and G.W. Dimbleby (eds.) (1972), pp. 55-60.
- Harsema, O.H. (1980a), *Drents boerenleven van de bronstijd tot de middeleeuwen* (Museumpublicatie - nr. 6). Assen.
- Harsema, O.H. (1980b), *Het Drents plateau. De latere prehistorische bewoning*. In: M. Chamalaun & H.T. Waterbolk (red.) (1980), *Voltooid verleden tijd? Een hedendaagse kijk op de prehistorie*, pp. 83-102, Amsterdam.
- Hawke-Smith, C.F. (1979), *Man-Land Relations in Prehistoric Britain: the Dove-Derwent Interfluvie, Derbyshire. A Study in Human Ecology* (BAR British Series 64). Oxford.
- Jankuhn, Herbert, Rudolf Schützeichel und Fred Schwind (Hrsg.) (1977), *Das Dorf der Eisenzeit und des frühen Mittelalters* (Abhandlungen der Akademie der Wissenschaften in Göttingen). Göttingen.
- Myhre, Björn (n.d.), Agrarian Development, Settlement History and Social Organisation in Southwest Norway in the Iron Age. In: Kristiansen, Kristian & Carsten Paludan-Müller (eds.) (n.d.), *New Direction in Scandinavian Archaeology* (Studies in Scandinavia Prehistory and Early History, Vol. I), pp. 224-271. The National Museum of Denmark.
- Rouse, I. (1972), Settlement patterns in archaeology. In: Ucko, Peter J., Ruth Tringham and G.W. Dimbleby (eds.) (1972), pp. 95-108.
- SARG, the members of (1974), SARG: A cooperative approach towards understanding the locations of human settlement. *World Archaeology* 6:1, pp. 107-116.
- Smith, P.E.L. (1972), Land-use, settlement patterns and subsistence agriculture: a demographic perspective. In: Ucko, Peter J., Ruth Tringham and G.W. Dimbleby (eds.) (1972), pp. 409-425.
- Taylor, C.C. (1972), The study of settlement patterns in pre-Saxon Britain. In: Ucko, Peter J., Ruth Tringham and G.W. Dimbleby (eds.) (1972), pp. 109-113.

- Trigger, Bruce G. (1968), The Determinants of Settlement Patterns, In: Chang, K.C. (ed.) (1972), pp. 53-78.
- Ucko, Peter J., Ruth Tringham and G.W. Dimbleby (eds.) (1972), *Man, Settlement and Urbanism*. London.
- Waterbolk, H.T. (1960), Preliminary Report of the Excavations at Anlo in 1957 and 1958. *Palaeohistoria* VIII, pp. 59-90.
- Waterbolk, H.T. (1964), The Bronze Age Settlement of Elp. *Helinium* IV, pp. 91-131.

