Prehistory or paradise? Prehistory as a reference for modern nature development, the Dutch case

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Abstract
'True prehistory' is hidden behind our biasses and pre conceptions So we generally have a too romantic and idealized vision of the past It is demonstrated that environmental impact in the Netherlands was severe from the early Metal Ages onward The agricultural system on the uplands was not sustainable, not in 'harmony with nature', but destructive Less than 30 000 people did away with major parts of the 'virgin forests' in two millennia Certainly, prehistory was unpolluted, but it was less varied and shows a distinct human impact in its vegetation than realized when 'prehistory' is chosen as a reference for nature management and development
The 'desired habitats' of nature conservationists are closer to paradise than to prehistory

Introduction [1]

Waldo Zagwijn's merits for Dutch prehistory are beyond discussion. A major field of study throughout his scientific carreer has been the palaeogeography of the Netherlands, more specifically of the dynamic Dutch coastal lowlands. It are his maps on which we plot our sites and we let our prehistoric people live in his palaeolandscapes. But his reconstructions of the prehistoric environment also are a quite unexpected source of inspiration for nature conservationists. That made me ultimately select the topic of my article for this special occasion.

A few years ago I was surprised in a pleasant way when two leading ecologists, preparing a governemental report on nature development schemes, asked my opinion on their ideas: it was proposed that prehistory - or better: the reconstructions of prehistoric palaeo-environments - should be used as a major frame of reference for present day nature management and more specifically nature development (Ministery of Agriculture and Forestry, 1988). Special reference was made to a semi-popular book of mine, dealing with the natural evolution and prehistoric occupation of the Western Netherlands or the former Rhine delta deposits (Louwe Kooijmans, 1985). At that time nature development was a new idea and primarily a wetland affair, with schemes for a 'blue infrastructure', for free flowing rivers in the embanked forelands (called Ooievaar = Stork, De Bruin et al., 1987), for marsh development in lake bottom reclamations (Oostvaarders Plassen in the polders Flevoland) and the like. The idea has since then been extended to the upland as well, for instance in a scheme called Goudplevier or Golden Plover, to restore upland moorland conditions on present day farming land.

Nature developments and prehistoric reconstructions

The choice for natural prehistoric conditions as a reference seemed logical and self-evident in this wetland case. We should realize that the present day landscape of the Western Netherlands is mostly artificial, man made, and that only few nature reserves of restricted extent show uncultivated conditions. But the former, prereclamation conditions seem to be well-known. By detailed geological mapping of the Holocene deposits, by pollen analysis and archaeological research, the patterns and sequences of the subsequent landscapes of the coastal lowlands have been reconstructed in detail, especially in a series of palaeogeographic maps by Zagwijn (1986). Another example is the detailed vegetation reconstruction of several phases in a microregion in the peat district by Van der Woude (1984). These are purely natural landscapes, with all their marine, lacustrine and fluviatile processes, unpolluted water, natural vegetation and fauna, and seemingly hardly touched by men throughout prehistory. These pictures seem to demonstrate that we know these landscapes very well, but we need to be more cautious:

1 Palaeobotanists use present day nature reserves like the Naardermeer reserve, the last relic of the former intracoastal peat district, as a reference for *their* interpretation of the palaeo-ecological proxy data, like pollen, seeds and wood remains. So, with nature conservationists doing the opposite, there is a major danger of circular reasoning, the prehistory being based on present day references and nature development it its turn on prehistory.
2 Most reconstructions present a phase of wide ecological diversity, often a transgressive period, because these phases have the most distinct patterning. Quite frequently, however, large parts of the coastal plain consisted of rather dull and immense reed swamps or alder carr and might have been less diversified than nature conservationists might wish.
3 Some ecozones, like the tidal flats and the peat zone with its swamps and bogs, were indeed hardly touched by men throughout prehistory, but this is not true for other zones, the salt marshes and river deposits, that offered good conditions for arable farming and rich grazing. These zones were occupied and intensively exploited at least from the Middle Bronze Age onward. Although the physical landcape remained untouched the succession of the vegetation was disrupted and altered (Louwe Kooijmans, 1974, 1980, 1985, 1993).
4 For a series of ecozones no modern counterparts exist anymore, like the free flowing rivers, the wide inland parts of salt marshes and the delta *Sphagnum* peat bogs. Moreover, many of the restricted parts of 'nature' left in our delta are in origin man-made, like the now highly valued flooded former peat cuttings, with their specific lay out, reflecting the former Medieval parcelling of the land. Their vegetation and sedimentation patterns link up with the *petgaten* and *legakkers* (the canals left after dredging the peat and the separating dams resp.) of the peat cuttings.
5 Much development to regain the former situation is, moreover, frustrated by the extremely drained situation, the poor water quality and the modest extent of nature reserves.

[1] *This paper was also presented in the international conference 'wetland nature conservation and archaeology' held in Wills Conference Centre, University of Bristol, April 11-14, 1994*

However, if we are aware of such drawbacks, they can be taken into consideration and to some extent overcome. Prehistory seems to be a valid and usable reference for nature development at least in major parts of our wetlands.

The "back to prehistory" option generates, however, other questions, especially if we extend this choice to iclude the upland: do we want to regenerate prehistory as a goal in itself, independent of how it would look like and independant of the environmental impact of prehistoric man, or do we factually restrict the principle to a preconceived and idealized vision of how prehistory was?

Considering the motives and goals of nature development, there first might be a feeling of guilt for the present day destruction of landscape and nature qualities, an impulse to restore our landscape by returning arable land to nature. Second, especially in a fully reclaimed, arranged and exploited country as the Netherlands are, there might be a longing for a pure and unspoiled land, for a 'back to paradise'. I feel that these are the major drives behind the present day enthusiasm for nature development in recent years. For nature conservation and management one reads about 'desired habitats'. I have the impression that we aim at nature reserves with a large ecological diversity, with biotopes and space for endangered plants and animals, and/or pleasant landscapes for walking and recreation. I also have the impression that generally the prehistoric environment is seen as an 'unspoiled past' and as having most, if not all, of these qualities. In this perception the 'true nature' of prehistory was pleasant, rich, diverse and essentially without people or at least not in numbers to bother about their environmental impact. I will argue in this paper that prehistory was *not* such a paradise and in many cases not an acceptable reference at all. I wonder, moreover, whether adjusted models of the past, that are essentially different from the present day biological perception, for instance with a lack of ecotones or full of human interference, whether these also would have been attractive and selected as a reference.

Thus we are confronted with the way prehistorians present the past and the way non-prehistorians develop their version of the past on that information. This 'relativism' is not anything new. We are more and more aware that true prehistory is hidden behind deficient data and interpretational problems, and that factually every generation and social group creates its own prehistory. This can be perfectly illustrated by the often romantic reconstruction drawings of prehistoric life, presented to the general public. In most reconstructions the *Zeitgeist* is clearly reflected. One can write a culture history by the way the prehistoric past is presented and it mostly appears to be romanticized even in the pictures in my own book from ten years ago, mentioned above (Figure 1). But it is very doubtful whether prehistory and prehistoric life were romantic. Farm life must have been harsh and there is more and more evidence for endemic tribal warfare throughout later prehistory all over Europe.

Prehistorians, being themselves members of this society, select how the past is presented. They are, moreover, dependent of artists that add *their* biasses, and of the public that select from the presentations first what fits to their preconceived ideas. This implies that we, as archaeologists now aware of this, have to select ourselves the information relevant for specific ecological and nature conservation use and present it directly. A main focus should be on the man:nature relations and on the environmental changes caused by the subsequent prehistoric societies: prehistory as a history of environmental impact.

Prehistoric environmental impact in the Netherlands

Palaeolithic

In Europe man is an intrusive animal from c. 500.000 years ago (Roebroeks & Van Kolfschoten, 1994), originating from scavenging apes in the East African savannah and developed into a hunter of megafauna, competing and repressing the main large predators. So man established himsef at the top of the food chain of temperate Europe, keeping that position throughout the hostile and harsh glacial periods. It might be important for the antihunt lobby of nature conservationists to realize that man has been the main predator in Europe at least from 35.000 years ago, but perhaps even longer ago. This, however, should not be used to argue for a historical right to hunt for pleasure and for to shoot at anything and everything, but more as an argument in favour of game management.

Mesolithic

After the last ice age the exploitation of nature was extended to all possible food sources, especially to aquatic resources, marine and fresh. There are, moreover, clear indications of game management in the age patterns of the animals, more specifically of red deer, shot at some Danish sites (Bay Petersen, 1978). There is discussion whether fire would have been used on purpose to increase ecological diversity and so the biomass of game (Mellars, 1976; Edwards, 1990). I do not, however, know of any reliable non-British evidence for the use of fire in this way and British pollen data are still open to alternative, natural explanations. If we would like to use prehistory as a reference for nature development, it is this period of ecological diversity, especially the Boreal/Atlantic transition around 8.000 BP, that would

fulfil most of the qualities (or 'desired habitats) wanted But we should also realize that people played an essen tial role in it hunting fishing and gathering be it in modest numbers say 0 1 person every km² or not more than 2000 on the present day Dutch upland territory There was a radical change away from present day 'desired habitats in the Atlantic period, when the decidu ous forests closed and large parts of Europe became covered by extensive and dense woods

Neolithic

The introduction of farming is always considered as a major break in man land relationships and a revolution in environmental impact This appears however not so much to be the case at least not so in the Northwestern part of the European continent We have now a fairly accurate picture of the impact of the early agricultural societies the Bandkeramik culture Large scale excava tion, archaeological survey and pollen analysis form the basis of reliable models for settlement systems and environmental impact The modal Bandkeramik settle ment consisted of 10 15 houses with c 75 inhabitants The farmers created an open space of c 30 ha in the dense lime forests for their settlement and permanent fields (Figure 2) It seems as if the Bandkeramik people relied fully on their agriculture, predominantly arable farming and took advantage of natural resources only on a modest scale (Bakels 1982 Louwe Kooijmans in press) In the Dutch Graetheide settlement cluster 20 settlements existed simultaneously at its maximum, with c 1500 inhabitants (Modderman, 1985) The Alden hovener Platte had a similar population density, but it is calculated that less than 5% of the forest was opened up Even in pollen diagrams close to the settlements like those by Kalis (1988) from the Aldenhovener Platte and that by Bakels (1992) from the Belgian site of Wange, vegetational disturbance appears to have been very mod est This implies that cattle grazing was either of limited extent or took place far from the settlements on the sands to the north or on the Eifel/Ardennes upland The

Figure 1
Romantic reconstruction of the Late Beaker settlement of Molenaarsgraaf situated on a sandy river deposit in the peat district of the Western Netherlands demonstrating the subjective and idealistic approach to prehistory up till our times (drawing by Bob Brobbel from Louwe Kooijmans 1985)

situation was one of small cultural enclaves in a predominantly undisturbed, dense forest.
This would not change in the next Neolithic stage, that of the Rössen and Michelsberg cultures, even up till the end of the Neolithic (Kalis, 1988; Kalis & Meurers-Balke, 1988).

Metal Ages: upland

Forests were opened not earlier than the Later Beaker times on such a scale, that this became visible in a shift in the Arboreal:Non-arboreal pollen ratio. This shift holds for the loess zone, but for the Northern Plain as well. This is especially well-documented in the c. 50 diagrams from the central part of the Netherlands, presented by Teunissen (1990), in which this major phase of the opening of the forests, is well-dated to c. 2500 cal BC (Figure 3). The Bronze Age is also the period of serious soil degradation. Brown Forest Soils turned into Humus Iron Podzols (Waterbolk, 1964). Woodland changed into heathland, documented by the pollen content of the fossil soils below the Bronze Age barrows and the sods with which these were built (Casparie & Groenman-van Waateringe, 1980). It seems that a rather destructive type of arable farming was developed. We must assume a system of shifting cultivation, with long periods of fallow, at least initially. We know from archaeological sources that it was a plough agriculture and a system of integrated mixed farming (Fokkens, 1986; Louwe Kooijmans, 1993).

We can make calculations of the number of inhabitants involved in this proces during the Late Bronze and Iron Age, on the basis of urnfields (e.g. Kooi, 1979) and Celtic Field systems (e.g. Harsema, 1980) in the province of Drenthe.
There is now a general agreement that urnfields, dated to the Late Bronze and Early Iron Age, are the cemetries of generally 1-3 modal households of 6 persons.
Settlements from this period consisted of a similar number of farms, loosely distributed over a Celtic Field. The most complete overview of such a settlement and its evolution from the Middle Bronze Age up till Roman Times is given by the large scale excavations at Oss, province Noord-Brabant (Schinkel in prep.). Although this settlement is not associated with a Celtic Field (that are only incidently and very fragmentarily preserved in this part of the country) it has a similar open and dispersed layout as assumed for those of the Celtic Fields. In this micro-region of Oss a growth from 2-3 dispersed farms in the beginning of the Iron Age to a more concentrated settlement of 5-7 farms at its end could be established over a surface of c. 100 ha.
Thirdly, in the well-preserved and well-documented micro-region of Emmen/Odoorn (prov. Drenthe) a one-to-one correlation of Celtic Fields and urnfields could be established by means of territorial analysis (Figure 4). This calculation at site level can be extended to that of the macro-region of the c. 1300 km² Drenthe Plateau. The Celtic Field map of Drenthe is based mainly on pre-World

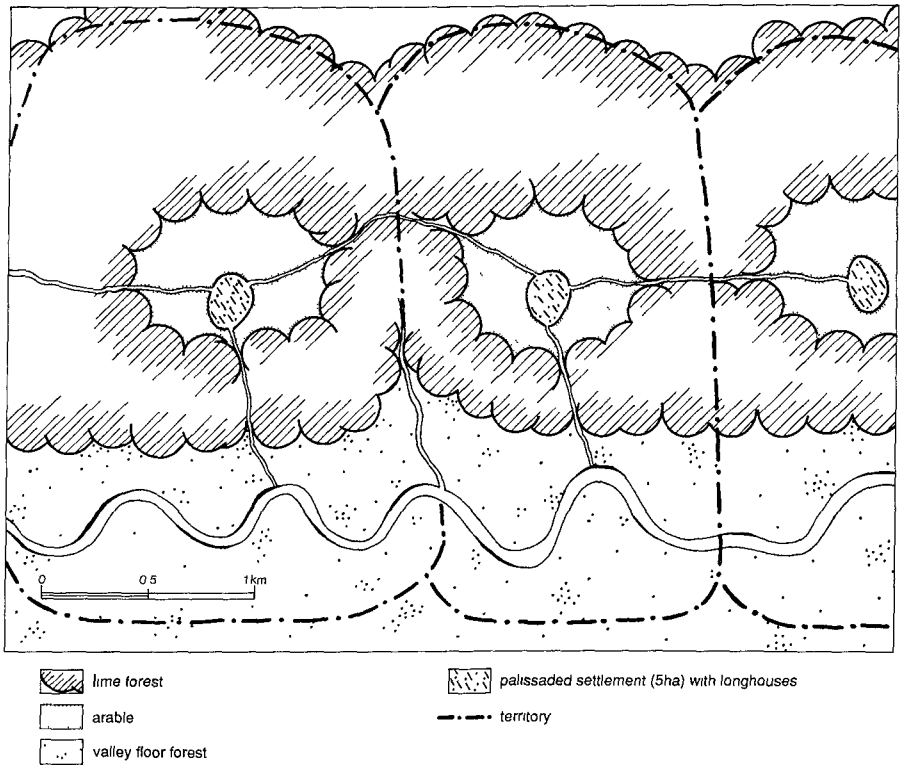

Figure 2
A model for the Bandkeramik landscape in the loess zone of the Lower Rhine Basin. It consists of separate clearings in the dense lime forests, each c 30 ha and comprising the settlement, palissaded and 5 ha in extent, and 25 ha of permanent arable fields. The settlements are c. 1.5 km apart and located along the upper slopes or terrace edges of the minor and major rivers resp.

War II aerial photographs and must be considered to give a reasonably full presentation of the field systems originally present (Brongers, 1976) It shows the locations of of circa 130 remains So this region must have been divided into c 130 units of 10 km², each consisting of a Celtic Field that would ultimately develop to 70 or even over 100 ha, with 2-3 farms in its early phase and 5 7 at the end of the Iron Age, and one or two (successive) urnfields (Figure 5) The total population can be calculated as to have grown from 2000 in the early stage to 4000 at the end of the Iron Age It is possible to make an edu cated country-wide extrapolation, taking site densities and natural conditions into account, which gives a population from 15 000 to 30 000 inhabitants during the Iron Age for the 50% of the Netherlands that were inhabitable at that time (Figure 6) This means that 1 2 persons/km² did away with a major part of the forests and exhausted most of the soils in the last two millennia BC

There are good agricultural models of these Iron Age societies, mainly since farms with integral stables allow a relatively reliable calculation of the livestock numbers of a modal household The mode of 16 cattle per household (of 6 persons) gives a number of 37 000 to 74 000 head of cattle on the total of Dutch upland, most probably free grazing in brook valleys and woodland Although their feeding habits were not identical to those of red deer we consider these cattle to have been in direct competition with the larger herbivores, more specifically red deer We should realize that the clearings started and expanded from their optimal habitat, that is the lower brook valleys, and that the number of cattle surpasses a rather speculative calculation for the natural red deer population (cf Louwe Kooijmans, 1983) This would explain the scarcity of red deer, as of all game in faunal remains from domes tic sites from the Middle Bronze Age onward (Louwe Kooijmans, 1993) Red deer must at least from these times have been reduced to low numbers

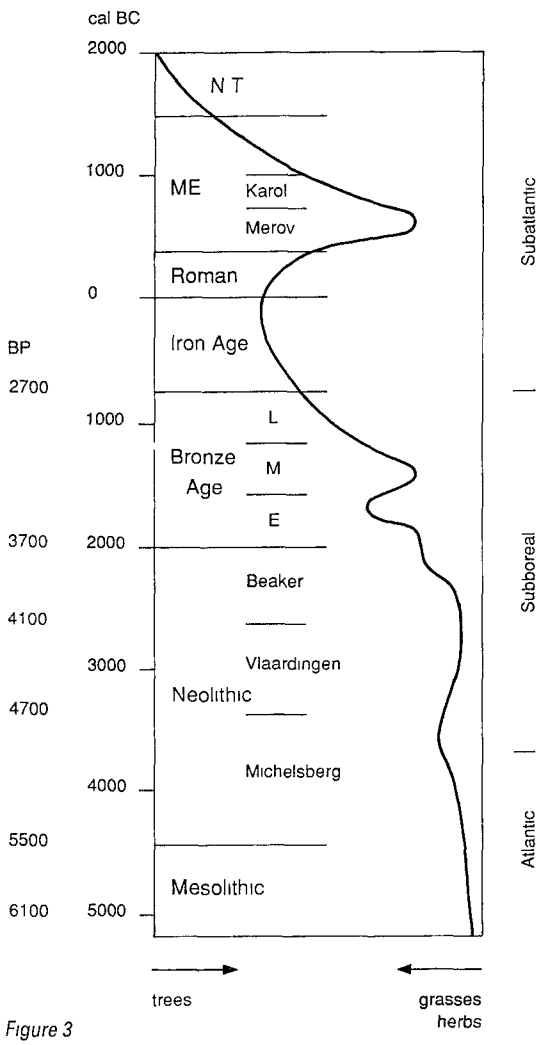

Figure 3
The changing human impact on the vegetation in the central part of the Netherlands as reflected in the Arboreal Non arboreal pollen ratio in a large number of pollen diagrams (redrawn after Teunissen 1988)

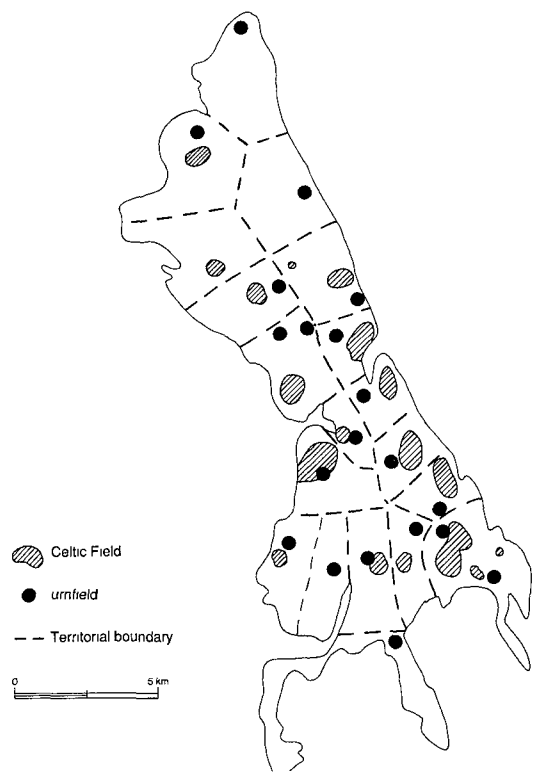

Figure 4
The Emmen/Odoorn microregion in SE Drenthe It is a cover sand/boulder clay upland, formerly surrounded completely by brook valleys and peat bogs Celtic Fields and urnfields are rela tively well documneted and allow a generalized reconstruction of the late Bronze/Iron Age territorial division Data from Brongers (1976) and Kooi (1979) combined

What we see here is *not* the stable equilibrium or *harmony with nature* in which one might think prehistoric people lived. Quite the contrary. It is a picture of use and misuse, of over-exploitation. The choice of this period as a reference for nature management would support the grazing of woodland by cattle and of heathland by sheep, but in general the human impact in this period seems to have been too dominant and rigourous for the aims of nature development.

Metal Ages: wetland

Let us return now to the wetlands of the lower half of the Netherlands: selected regions appear to have been intensively occupied and exploited from the end of the Neolithic onward, that is from the time the integrated mixed farming system had been developed and the large scale clearings on the upland sands had started. An early example from Late Beaker times is the Molenaarsgraaf micro-region in the peat district between the lower courses of the main rivers (Louwe Kooijmans, 1974). The sand deposits of an old river course had been fully deforested for fields and the herbs and grasses on the adjacent clay deposits were probably used for grazing cattle. This type of use is even more evident for the high salt marshes of Westfrisia in the Middle Bronze Age (IJzereef, 1981). The inversion ridges of sandy creek fills offered there perfect arable land and the backswamps a rich grazing. This landscape was densily populated, at least in parts, by agricultural communities up till the period when it gradually became too marshy as a result of rising groundwater. IJzereef calculated a maximum of 1000 inhabitants for a microregion of 10 km². At the floruit of the settlements the population might not have been very far below this level. A similar situation is documented for the river clay district, where tens of Middle Bronze Age settlements are mapped in micro-regions that escaped later erosion (Havinga & Op 't Hof, 1983).

In the Iron Age, at last, newly formed salt marshes, silted

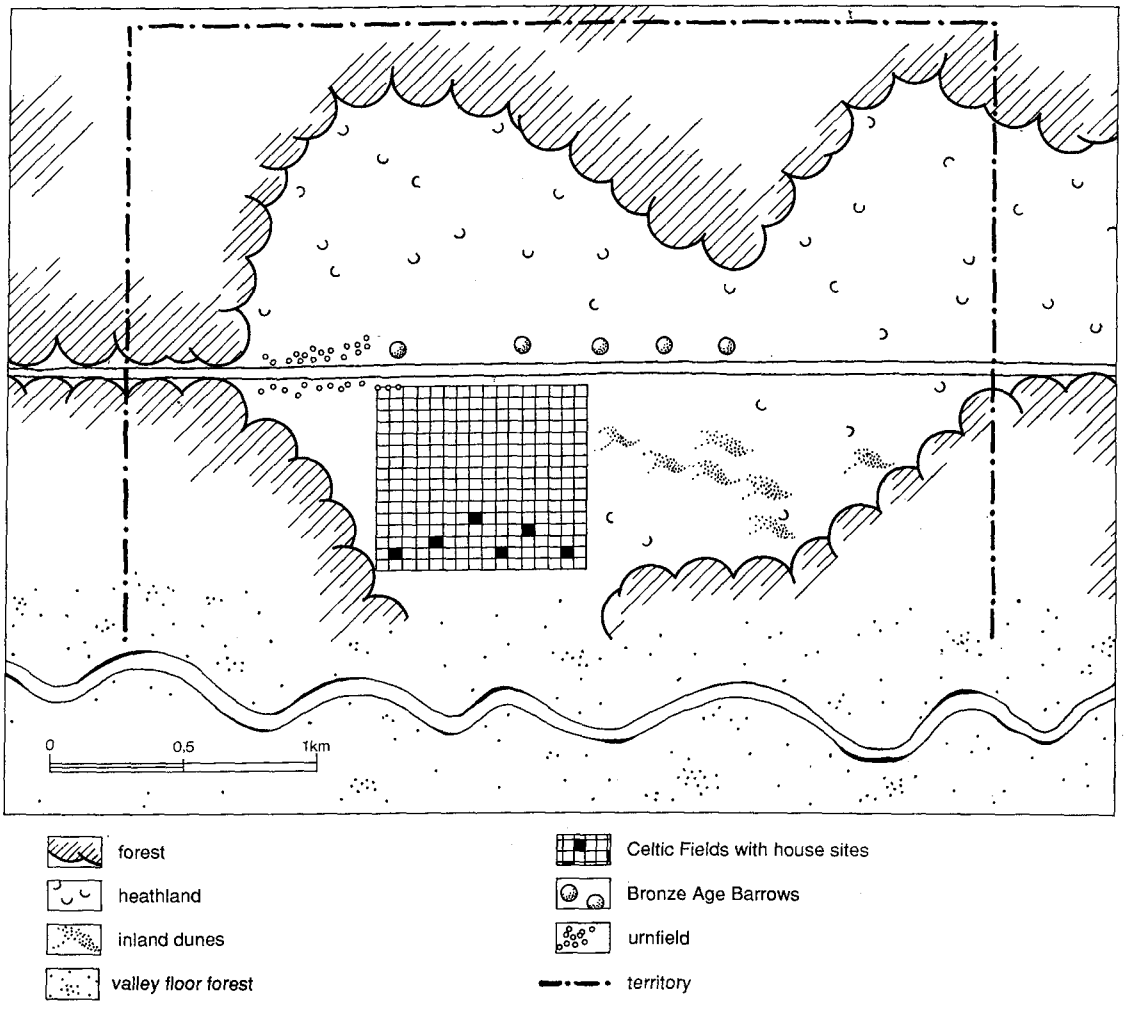

Figure 5
A model for the Celtic Field landscape on the Pleistocene coversands of the Lower Rhine Basin, at the same scale as Figure2. The Celtic Field, grown in the course of time to an extent of 70 ha, comprise a number of dispersed farms and their yards, that may wander through the system over time. Barrows of the ancestors and the urnfield cemetery line up along the roads that conect communities. The Celtic Field is the centre of a 10 km2 territory, mainly consisting of deforested and depleted land, covered by heath and with occasional sand drift, but major parts are still forested.

up to a higher level and desalinated by precipitation, became colonised from the upland in the Northern Netherlands, probably initially in the form of transhumant cattle grazing (Van Gijn & Waterbolk, 1984). The same applies for the more localized and less extensive salt marsh deposits around the estuaries behind the inlets through the coastal barriers of Holland proper: Northwest of Amsterdam, West of Leiden, and most prominent around the Meuse estuary to the West of Rotterdam (Van Heeringen, 1992). The grasslands will have been so intensively grazed that this vegetation should not be considered as natural, but as anthropogenic. The Iron Age people even settled on the margins of the intracoastal peat bogs that were drained in these times by the expanding estuarine creeks, especially in so-called transgressive phases. There is much discussion about the peatland farming system (e.g. Brinkkemper, 1993), especially about the possible arable farming at these sites, but there is no discussion about the animal husbandry in view of the stable parts of the farms and the preserved dung layers. One may wonder why people settled in these wetlands: were they primarily attracted by the fertility and rich vegetation or pushed as well by the deterioration of the uplands, as a result of their destructive farming system and a (perceived) population pressure?

We should, however, not overestimate the prehistoric human impact on the wetlands: the sedimentation systems were still fully natural and unaffected. Several important ecozones were not affected at all, like the peat swamps that were not reclaimed before the later Middle Ages, and the tidal flats that are still 'natural' from a sedimentary point of view, leaving embankments, fishing, shell fishing, water pollution etc. out of consideration.

Figure 6
Tentative map of the Iron Age occupation of the Netherlands. Regions with major site concentrations (either settlements, Celtic Fields and/or cemetries) indicated in dark. Other inhabitable land in grey. Unoccupied lowland marshes and upland peat bogs blank.

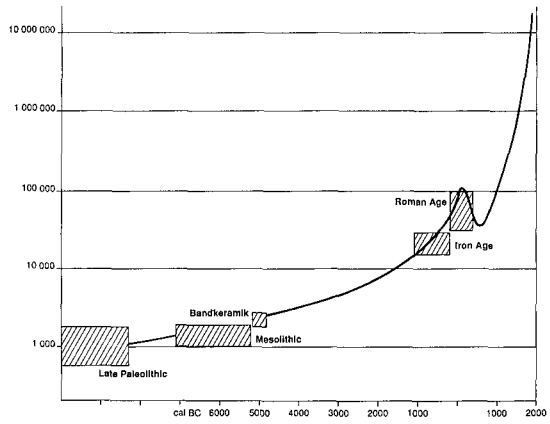

Figure 7
Tentative population curve on a logarithmic scale, based on archaeological calculations for several pre- and protohistorical stages (boxes) and historical data (dots).

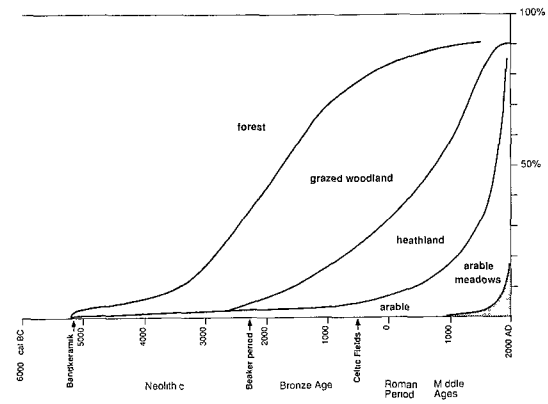

Figure 8
Schematic representation of the dramatic shifts in land use during later prehistoric and historic times. Shaded in the lower right corner: built up area.

Conclusions

In two diagrams the radical changes on the Dutch upland regions in later prehistory are demonstrated. Figure 7 is a tentative population curve for the Netherlands based on some archaeological calculations and historical data, showing the relatively modest and gradual population increase in prehistoric times. The second (Figure 8) demonstrates the discussed changes in human impact in the same period, and shows the radical deforestation and increase in grazed woodland and heathland while arable land remained of very modest extent.

So prehistory offers us not one but a long sequence of references over a long time trajectory. People played a role in nature from the very beginning, but it is only in the last two millennia BC that there was a serious environmental impact. It appears that the idea of prehistory as a reference for nature management and development is complicated. It might hold with some caution for those ecozones of the wetlands, where human impact hardly played a part. The reference appears to hold less or not at all for the upland, where none of the models of prehistoric environment, perhaps with the exception of the later Mesolithic, seem to fulfil the demands of nature development. Or is the lesson from prehistory that we should be more tolerant of the rôle of man in nature and not seek to recreate a paradise?

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