

Re: De/Transforestation at the NW. European Neolith/Mesolithic boundary

Source: <http://sci.tech-archive.net/Archive/sci.archaeology/2006-08/msg00650.html>

- *From:* prd <X_header@xxxxxxxxxxxx>
 - *Date:* Wed, 23 Aug 2006 14:06:00 GMT
-

In sci.archaeology message [news:ech23t\\$lnp\\$1@xxxxxxxxxx](mailto:news:ech23tlnp1@xxxxxxxxxx) by "Uwe Müller" <uwemueller@xxxxxxxxxx> . . . :

Obviously soil can be restored, but it takes much effort than the casual effort to destroy it that is part of crop raising,

In Neolithic harvesting only the ears were cut off, supposedly the cattle were then driven on the fields to graze off the rest of the plants. This would lead to considerable amounts of dung to be dumped on the fields. As the primary settlements in the early neolithic are stable for hundreds of years, and the area utilised for farming must have been inside walking distance from the settlement, the loss of nutrients from the ground could not have the devastating effects you describe.

But in the paper you presented this appears to be what happened the settlement became overpopulated, all the arable land was used and then the population collapsed. Probably the use of marginal lands was too intensive and quickly lost productivity.

Most pine trees are growing roots that will dig deep into the earth, securing water and nutrients. Oak on the other hand grows only shallow roots, but lots of them. Oaks are quite finicky if their roots are cut or damaged.

Yes, but the problem is if you slash and burn several times over a millenium you have drawn the nutrients up from the depths and depleted them from the depths. If you have depleted from the depths the soil can be restored from the surface, through composting and bioturbation and leaching.

Which is the one thing we do not have for the early neolithisation. In a matter of a few generations neolithic settlements were set up, so fast in fact, that no major change could be seen between settlements hundreds of miles apart.

Yeah but they have the immediate benefit of a pristine ecosystem with areas of underutilize organic soils from recent floods, etc.

The basis of the human neolithic equation is.

Given

1. Cattle culture
2. Wheat culture
3. Time

Humans can advance into increasingly colder climates.

The basis of the human ecololigical equation.

Given

1. climate changes
2. nutrients escape.
3. bad timing

Humans advancements can retract to fractional levels in a semipredictable manner (see curse above). This product of the second equation is known but not understood 6000 years ago or so. IOW not long after this neolitization took off in the middle east.

You should take care about the dates, 6000 years ago is roughly 4000 BCE. That is long after neolithisation took place.

6000 BCE.

The analogy is putting your hand on an electric stove, you get burned you associate the red hot coil with burning, but you don't know neccesarly what makes the coil hot. This is core to the proto and early civilizations everywhere. It did not escape the dust bowl either.

Combining the two one expects advancements and declines. We also expect resourceful humans will find other meadows and pasture land to attempt to repeat.

Re: De/Transforestation at the NW. European Neolith/Mesolithic boundary

Fundamental premise to the argument of neolithization of northcentral europe is that given a portable neolithic culture humans could port the culture into areas of unfavorable ecology marginally favorable ecology and temperatures, and make those ecologies favorable.

Or they could set up with the new technics in areas HGs would not use intensely, that had a favourable microclimate supporting imported seeds etc. Than the problems would only arise after a couple of centuries of occupation, on secondary and tertiary settlement sites. That's what the data from the Rhineland and the Netherlands suggest.

Premise 2 is the less favorable the slow the transportation works.

What do you mean by that?

It means that you need to take the process as rapid but small steps if any several given steps results in a complete failure chain or split end stops, or needs to reverse. This slows the migration north.

Premise 3 as a more climatically favorable local fails to produce, there is a marginal utility for moving to a less favorable but (old land v. new land) initially more productive locale. Or to put otherwise splitting such a people to a new plot makes the old plot more favorable as it is depleted at a slower rate, and shares the burden on the new plot.

These three premises will spell out how human settlements spell doom for the most biomassive trees in favor of faster growing less biomassive trees.

But this is only true for the areas utilised by humans, the major part was not utilised, saw no woodcutting, anthropogenic burning, cattle grazing, and still shows the same changes.

How do we know that there was not rolling occupation of some of these areas? Look at the level of accupation found in the german

Re: De/Transforestation at the NW. European Neolith/Mesolithic boundary

site when intense survey was undertaken, 80% of a 70km site was used at some point, only briefly. This altered the character of the soil for a period of time. Granted that is not going to tear down a forest 1000 years later, but it may cause the total biomass of a forest 500 years later to be 1/2 or 2/3rds.

"

The average agricultural and pastoral territory demand is 35 sq km in total, which is about half of the study area. In the middle Linear Pottery phase former single farms developed into hamlets (fig. 5). Therefore, despite an increase of only two sites, to a total 35, much more land is used in this period. For the first time we find settlements near to the highland, in areas up to 300 m asl, with a hinterland less favourable for agriculture. 86 % of the study area is exploited by the farmers and their animals. The population and settlement density increased clearly again in the later phase (fig. 6). Now, several hundred people and their livestock inhabited 47 sites. The whole study area is no longer sufficient to meet the required demands.

"

This means, that there were few if any potential colonists in early neolithic times, that would be able to spread neolithisation to mesolithic areas. Even in the late LBK there were not more than 'several hundred' people on 72 km² of prime agricultural lands.

That is actually a lot of people (and cattle). And BTW you don't know that they could not spread, that is an assumption, they may require or desire a critical size to then send out colonizers to new sites, such blips may not be visible within the study.

The only thing that the 100s of individuals per 72 km² tells us is that with 80% of the land in use at the maximum, they were very inefficiently using the land. Historically we know that some of the land in use was marginal. The 72 km² is a survey area, we do not know how far that area extended in any direction.

Ask yourself the basic question, why such a reliance on cattle, my opinion is by the time they get to Britain, they will be much more reliant on cattle than wheat. Initially they had higher gluten strains, the derived tetraploids and near-bread wheat in the Near East, by the time they get to central Europe most of the growth is in diploids and near-wild tetraploids. Gluten production is down (protein). Therefore they are more dependent on conversion processes. The use of soils that had an initial advantage soon would play down, and this is when the desperation strategies would kick in.

Re: De/Transforestation at the NW. European Neolith/Mesolithic boundary

You cannot cut down a pine forest and then expect good cropland, as I mentioned you need to bring in hardy grasses and graze and reburn the grasses or chop out new growth. In some areas it might require tending for 50 or 100 years. If I get the story correct here, in the 1930s they chopped down interdispersed pines and build an airstrip in a cattle ranch, the airport was removed and the land subdivided and the pine tannins are still inhibitory to many plants. That is over 70 years.

Looks like the LKB site became overpopulated and declined
Moved elsewhere. Starting at >50% forested and deforested to
<14% is a significant change for a 72 km parcel of land.

During a period of two thousand years, during the whole of the LBK, population grew and settled in the same areas. There is no indication of population pressure and, compared with later periods, the area is still sparsely populated.

Later periods were using land more efficiently more energy per humans per plot of land, less need for cattle.

There is little indication of people moving out of the sampling area, the settlements grow all the time.

The sampling area is a square, a survey of another reality. The 72 km² plot is not the neolithic reality, it is the reality of the 2000AD sampling reality.

The sampling area is uncommonly good for agriculture, inviting more and more people in the following periods. It was seen as so positive, that the Romans abandoned their clearly drawn boundaries along the Rhine and the Danube to conquer it, with great expenses.

The Romans crossed the English Channel to conquer Britain, but that didn't take. The Romans conquered in search of trading partners and to extend the protective zone around Rome. In that time those peoples were the Gauls and the Barbarians to the north. To Rome their ability to produce is a threat.

So in the final LBK period, the demand on the land was bigger than the resources. But this applies to an area after 2000 years of agriculture. It can not be applied to the problem of

Re: De/Transforestation at the NW. European Neolith/Mesolithic boundary

early neolithisation and the change from mesolithic to neolithic economies.

And we don't know from the paper how extensive that problem extended. My opinion is this, they went into the area expecting to have a modest settlement in accord with the area. Success, unseen in this report resulted in a population surge. They were forced to burn trees for grazing. The problem is that the cattle moved and new cropland placed into use was more marginal than the first cropland put into use, but the population still grew, at a slower rate. Then they were forced to cut and burn again, this time they are moving cows off previously cut land and onto new land, not a problem, but they are moving crop land into cutland, and those fields did not produce nearly what the first cultivated fields produced. The growth of wheat is more productive for humans than the feeding of cows, the extension of land for grazing, rapidly is required when crop production falls. There lies the problem. Had they very good planning they would have cut and burned all the trees in the region immediately leaving a few choice strands untouched. Then to immediately begin turning the soil into cropland while still grazing, to bring the deep soil up and to oxidize the tannins in it, reterrace the soil and work compost into it. The problem is there is no metal, they needed to draw out stumps and burn them, many impossible neolithic tasks. This is too much work, easier to move people to other places.

"

The settlement group "Niedermörlen" consists of one main village with at least 15 contemporary houses and other hamlets and single farms. During the middle phase of the Linear Pottery a total of 25 houses belonged to the group (Schade 2003a:228ff.). If we divide 50 head of cattle amongst them, each household will have kept 2 animals, every person 0.3 animals. The group "mittleres Merzbachtal" on the Aldenhoven Plateau consists of the main village "Langweiler 8" and some hamlets and single farms, altogether 16 contemporaneous houses in generation 12 (later phase; Lüning and Stehli 1994). If the 50 animals are then divided by the 16 houses, one arrives at a total of 3 animals per household, or 0.5 animals per head. Conclusion: if the unit managing the herds was indeed the settlement group, the number of animals per head or per household would only be half that, or even less, of the estimates made by Bakels and Gregg and other authors.

"

If the social unit managing the herd was not the settlement group as proposed, but the village or hamlet, your proposed minimal herd size of 40 head would result in a couple of hundred

Re: De/Transforestation at the NW. European Neolith/Mesolithic boundary

head of cattle.

Which still means that guesses on the maximum number of cattle could be off by more than the numbers used here.

At the same time there is no measure of fission within the culture or the budding of groups who left and set up elsewhere,

The archaeological case study says the settlements grew, not that they were abandoned for setting up outside the sampling area. The data points at a maximum number of settlement sites that could be used successfully with the given technologies, and that this number was pretty much reached at the end of the LBK.

This complies quite good with data pointing to the occupation of sites using non-agrarian resources starting with the middle neolithic, after the LBK.

present during the onset. The study was not designed to measure the rise and fall of the neolith, but to measure the fate of people and their ecosystem in one area. We got it, humans depleted the ecosystem.

Yes, after 2000 years of continued use, and restricted to elevations of less than 300 m. As an argument it would work against your supposed model of neolithisation, because there would have been no pressure on the mesolithics or on the early neolithics, if another 2000 years of intense farming was possible.

After they fail then there is a reconfiguration of the habit, for example trading with down stream fisherman brings resources into the system. you trade out starch for proteinaceous foods. The waste then is directed at the feilds. There is no need that the soil be depleted in 2000 years. You are missing the point, this is seen over and over again with human occupation.

Humans go in, they find a soil of great composition and deep nutrient base.

They cultivate the land carelessly of the depletion problem

The soil is depleted

Catastrophe.

Dealers (long term farmers) with such problems, move in or provide

Re: De/Transforestation at the NW. European Neolith/Mesolithic boundary

Re: De/Transforestation at the NW. European Neolith/Mesolithic boundary

a new cultural equation, the soil is restored, modes of population control are employed (warfare, rites of passage, etc) and a longer term equilibrium is established. There are some areas where soil will never be exhausted as long a reasonable practices are employed. The principle reason is rainfall, if there is adequate rainfall all the bad humans can do can be washed out of the soil and reparative materials can be brought in rather cheaply to restore it. Intensive and desparate agriculture on marginal lands eventually results in irreparable damage.

Those dealer of problem folks will tend not to use 80% of the land when the 50% is within the marginal utility of gain, since 30% can be used as a resource base for the 50% in use. For example wild types of fruits and nut trees can be cultivated, wild animals can be allowed to roam and graze, these are potential migratory routes which can be used for seasonal hunting, etc. This staves off a bigger problem until efficient practices and tools come into the picture. (Plus you need a spot for frankfurt international airport).

All of this make sense if they are buring forest every 100 of 200 years which is damaging to species like pines which overwhelm the canopy.

You noted, that they did not even mention pinus?

Yes. In fact I looked for their arboreal break down.

Charcoal (not anthropogenic charcoal) is mentioned as occurring in increasing numbers only on some sites. Not a majority, and by no means all sites. So the herders–burn–the wood–theory can be applied only to some sites, the majority of instances of forest change has to be explained differently.

Sites close to known occupied areas, at the onset.

practices. A natural consequence over a 50 year period is for tall strand pinus species to undergo reforestation.

The case study talked of 2000 years of occupation before there were consequences. How do you arrive at 50 years?

The species requires 50 or so undisturbed years to reach near

equilibrium height. If humans tampering in a negative manner it would inhibit long term prospect of old growth grow back on millenium time scales.

However humans tend to liberate soil nutrients to lower elevations away from the optimal places for pine competition, the 1st referenced study show what happens as the population reaches 80% resource saturation and implicit land overuse with no rehabilitative capacities (i.e. 'the curse') followed by depopulation. Of course for pinus tehre are still deep nutrients, but during the next cycle the nutrients brought from deep soil are deposited on the surface and subsequently lost to agrarian practices, and abandoned again. At some point there is inadequate deep soil resources and pines would be dependent on the anthropogenic importation of nutrients (composting or grazing) or very long term processes.

Erosion and sedimentation would provide for renewed topsoils in every other ecosystem, have a look at a map of the Wetterau region and compare it with the Aldenhoven highland.

Yes erosion does this, but it also puts soil humus and carbon into a potential for oxidation. Certainly in the richest ecosystems it is good but in systems that have been depleted is can be catastrophic. Take a look at the soil on most pristine flood plains. Deep, loose, and dark.

No, the study showed, that the old sites were not abandoned, but grew with time. From single farmsteads to hamlets to villages. There were only a few sites that were founded anew.

Where did you get this from? What is your confidence in this statement. paper 1 showed very little about flux in forested and deforestation. What they showed was that only 20% of the land was immediatly settleable, then 80% was used and then the level of occupation was eventually backed off, abandoning land.

We can devise a scenario that an average herd of 1/1 humans at peak with optimal human breeding depletes the nutrient rich grasses and clovers, first calving slows, then milk production, with nonproductive cows the herd is consumed and finally there are inadequate herds for breeding. Fields are left untended, crops overgrow, trees take over and finally pine trees restore themselves, and the understory dies out.

So the middle neolithic settlements in the Wetterau were all imagined, since they would contradict your theory? And what has the over-exploitation of resources in the late LBK has to do with the spreading of the early LBK?

Not at all, see above, the first generation of farmers need to focus on survival strategies on the best arable lands. This does not restrict the use of secondary immigrants or new cultural techniques restoring abandoned farm land. In the second round however longer term techniques are employed.

The conclusion is that while pollen redistributed these three oak genomic markers, maternal markers (cytoplasm) showed strong regional patterns and that the repopulation of the regions Oak population came from Italy or the balkans about 8000 to 11,000 years ago or about the time for the first neolithic peoples to arrive.

Watch your dates. That would be 9000 to 6000 BCE. Before the advancement of agrarian societies into NW Europe, and after the pinus sharp decline.

The advance was from Italy to Switzerland. within the range of the first neolithic migrations. The dates are a standard deviation wide or at 96% confidence 6500 to 13500.

The other point to be made is that humans get no immediate relative benefit from conifer biomass above and beyond that needed for domiciles and firewood. As a cooking wood, oak is better.

No, pine burns quicker and not so hot. I tried it.

Your smoking beef or pork, you are using Oak, I worked in a BBQ restaurant for 2 years, it was Oak in at night and you had a fire all night long. Mequite or hickory and you have a charred piece of rock that was a briskett.

The large amount of biomass stored in conifers is not something translatable into consumables. Oaks and deciduous trees produce edible products for human consumption.

Only, while grain stores have been found regularly from the early neolithic, clearly showing agriculture, stores of oak are seldom, and later. The best guess is, that they drove pigs in the woods for feeding on oaks.

And we see ultimately conservations strategies come to play in agrarian and pastoral humans after a calamity has taken place and there is a desire to repopulate those areas.

First you would have to show that areas were depopulated by agrarian usage. Or do you mean to imply they were depopulated by the mesolithics?

Your first paper shows depopulation due to depletion.

climate induced instabilities. This however long held realization has not brought the giant cedar back to lebanon.

A new study on water use implies, that the amount of water has been more or less constant, what changed was where the water is stored (not on the mountains anymore) and what it is being used for. So there is a lack of water inhibiting cedar growth.

Soil carbon, humus and old growth retain water in the upland water sheds.

Burns on the order of 1 per 100 or 200 years result in the depletion of these. Also felling and removing of trees for downstream use. Upstream nutrients (phosphorus, iron, manganese, magnesium, calcium) result in upstream carbon, and old growth = upstream water retention.