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Stability Through Movement: Theoretical and Practical Considerations of Social Space in Central European Neolithic Lakeside Settlements

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Abstract

Studies related to prehistoric, Circum-Alpine lakeside settlements have for the last decade or so begun to focus increasingly on the reconstruction of its inhabitant's social dimensions of life. More traditional models attempting to explain the often-fleeting settlement patterns set in a tightly managed cultural landscape focusing on climate and economic factors alone have proven insufficient and opened up to more nuanced and multi-scalar approaches. Especially built structures, due to their exceptional preservation, constitute a popular jumping-off point for a number of theories and interpretations but recent work has also moved beyond the confines of the settlement to include the wider cultural landscape as crucial in understanding the lakeside phenomenon. This article re-evaluates one of the more popular architecture-based models, namely the non-correspondence model, and subsequently suggests an alternative, more integrative approach based on Amos Rapoport's understanding of space. The aim is to create a more flexible approach to questions of space, time and meaning that does not stop at the built environment. Input from both the natural and the social sciences is combined in an attempt to sketch out an approximation of life on the lakeshores more than 5000 years ago.

Keywords Social space · Neolithic society · Lakeside settlements · Space syntax · Network

Introduction

The social dimensions of life in prehistoric lakeside settlements in the Circum-Alpine region have in the last decade or so moved steadily towards the centre of inquiry. Explanatory models based on climate change and economic factors alone

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were found to be insufficient in explaining the short-lived and structurally transitory appearance of the settlements girdling the lake shores (Baum, 2016; Bleicher, 2009, 243; Hofmann, 2013; Hofmann et al., 2016). Central to these inquiries are usually questions related to (1) possible processes of social stratification along the lines of hierarchical versus egalitarian, (2) the influence of social and economic aspects on the patterning of the built environment itself, such as the search for spatio-temporal cycles as well as local, economical specialisation which may have influenced settlement building and use patterns and lastly (3) questions aimed to validate hypotheses as to why people settled on the lake shores in the first place.

All of these fields of inquiry have a rather long tradition in Circum-Alpine wetland archaeology — the difference lies in a current change of perspective, focusing on spatially and temporally multi-scalar processes while also addressing the social dimensions of the inhabitant's lives as well as a wide array of sources to add to the complex picture that has been emerging for some time (Ebersbach et al., 2017; Hofmann et al., 2016). Earlier studies adopted a rather static and sometimes mechanistic view but nowadays settlements are no longer seen as independent, isolated units and instead as part of an extensive temporal and spatial system within which people, resources and places are linked to one another in multiple ways (Gross & Huber, 2018). Following this trajectory, some discourses have centred on the interpretation of the seemingly paradoxical settlement pattern, combining short-lived and highly dynamic settlements with a comparatively stable, wider cultural landscape. Due to the exceptional preservation of the built structures of lakeside settlements, the prevalent focus on the built environment to approach these questions seems obvious but rightly so is not uncontested (Bailey, 2005; Gross & Huber, 2018).

To Correspond or not to Correspond: a Critical Reappraisal

In recent years, one of the more popular approaches to untangling the social structures in prehistoric, Circum-Alpine lakeside settlements has seen the revival of the architects Hillier and Hanson's (1984; 2010) non-/correspondence model spearheaded in particular by some of Renate Ebersbach's work (2010a; 2010b; 2010c; 2016).[1] Using the model as an example, this chapter first aims to show some of the weaknesses recent architecture-based interpretative models inherited. The model focuses on patterned aspects of the built environment to draw conclusions about social structures and was used to explain the highly dynamic and

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[1] The following theoretical assertions are largely based on the unpublished master thesis: Bahss, A. Zwischen den Häuserzeilen: Soziale Interpretationen neolithischer Feuchtbodensiedlungen des zirkumalpinen Raums am Beispiel Zürich Parkhaus Opéra. Submitted February 2020 at the Institut für Ur- und Frühgeschichte und Vorderasiatische Archäologie, University of Heidelberg.
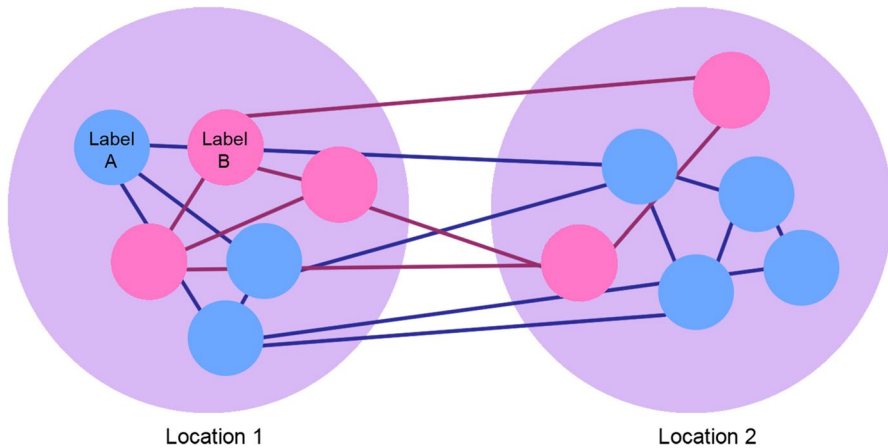
Fig. 1 The non-correspondence model (based on Hillier, 2010, Fig. 4b)

short-lived settlement patterns typical for the research area (Bleicher & Harb, 2018).[2] Simply put, it suggests that in the case of the Circum-Alpine lakeside settlements, we are dealing with a non-correspondence society, typically defined by "non-exclusivity, weaker rules, weak boundaries and lack of hierarchy" (Hillier & Hanson, 1984, 142). For this type of society, it is assumed that the majority of labels[3] binding people together are organised on a trans-spatial level not restricted by the residence group as a local phenomenon (Fig. 1). The opposite would be the correspondence society, characterised by the congruence of location and label as well as stronger internal hierarchies.

At the time, the model's application was novel and innovative in that it served to unite certain recurring aspects of the lakeside settlement's unusual dynamics (outwardly unstable, infra-settlement level units prone to shifting and relocating at regular intervals while displaying recurrently similar, structural patterns). It inspired and veered the discussion away from an isolated towards a connected and processual view of locations, people and landscapes. Furthermore, it was using the built environment as a baseline for inquiry — an established category of evidence, particularly important for the field of wetland archaeology.

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[2] Additional literature discussing the model's application in archaeology can be found in Bleicher and Harb (2018), Leach (1978) and, more generally relating to the application of space syntax and spatial analysis, in Cutting (2003; 2006), Hahn (2010), Dafinger (2010), Dawson (2002) and Thaler (2005) just to name a few. Furthermore, Hillier and Hanson's (1984) Social Logic of Space offers a detailed description of all methods, models and theories that are mentioned here only in passing.

[3] A label in the context of Hillier and Hanson's (1984, 40; 140–142) work means a trans-spatial category, which may, but does not have to, correspond to a specific spatial category. The spatial category organises entities based on a defined space while the label groups according to similarities between entities in space. For our purposes, a good example for a spatial category or grouping may be the residence group: the people living in settlement X. This category is defined by the settlement and its spatial confines alone. Labels as trans-spatial categories in our example however could be groupings based on common gender, age, language, ritual and/or religious background, notions of family, kin or even shared activities or professions.

Ebersbach recognised certain features in Hillier's and Hanson's spatial models and examples of non-correspondence societies, in particular the N'dembu described initially by Victor Turner (1996 [1957]), that seemed to correspond to the behavioural and structural patterns observed through the archaeological record of Circum-Alpine lakeside settlements. In her own words,[4] "If we consider the types of settlements found on the lakeshores during the Swiss Neolithic from the perspective of this theoretical approach, I come to the conclusion that the corresponding prehistoric societies were most likely organised in a kind of non-correspondence system" (Ebersbach, 2010c, 154). According to Ebersbach (ibid., 153–154), in summary, the relevant analogies were (1) high settlement mobility and multiple dynamics, (2) autonomous groups larger than a house but smaller than an entire settlement, (3) wealth and prestige not being expressed through a building's size and furnishings, suggesting the unimportance of a long-lasting connection to a specific place, (4) staple resources not being limited/distributed unevenly, (5) no discernible political or legal unit like the village or above to provide stability and a basis for hierarchical groups, and lastly (6) no evidence for place-bound ritual/religious groups.

However, while the model attempted to explain, or at least unite under a common term, many of the phenomena observed, it is in itself partly based on assumptions — methodical and theoretical — that do not hold up well when discussed in detail.

Roughly a handful of issues can be identified which make it difficult to advance it beyond a "model to think with".[5]

Firstly, the theory behind it relies almost exclusively on the method of space syntax and Chomsky's linguistic concepts suggesting in a structuralist fashion a universal spatial grammar resulting in self-stabilising systems of spatial patterning. It is assumed that labels will attempt to stabilise themselves of their own accord either locally (corresponding with a spatial category) or globally (non-corresponding) (Hillier & Hanson, 1984, 141). This means for one that processes of change and decision-making cannot be explained and temporal depth is excluded, as the system, taking precedence over its parts (the people), is thought to be self-sustaining. Secondly, Hillier's and Hanson's core concepts of residential group, label and system are rigid and do not account for the lived situatedness of identities, and shifting borders and scales of a group's and person's identities and places (Eriksen, 2001, 280–286; Kotsakis, 2005; 2010; Leach, 1978; Milner, 2005, 36–37). We can illustrate the weight of this issue in particular when looking at the discussion about certain buildings on the lakeshores being regarded as either a pioneer building of one, or the outskirts of a previous settlement stage (Bleicher, 2017, 211).

Thirdly, ethnographic and historic examples given by Hillier and Hanson themselves to root their models in the real world are unfortunately few and extremely

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[4] Translation by author. The original reads: "Betrachtet man die Siedlungsformen des schweizerischen Seeuferneolithikums aber […] aus dem Blickwinkel dieses theoretischen Ansatzes, so komme ich zu der Schlußfolgerung, dass die jeweiligen prähistorischen Gesellschaften am ehesten in der Art von '*noncorrespondence*' – Systemen organisiert waren".

[5] Cutting (2016) applies the term "tool to think with" in a similar fashion, originally referring to the use of spatial analysis in archaeology. Here, it is understood in the same fashion as a model which may help to illuminate new perspectives and inspire discussion but is hindered by its own limitations in being anything other than a thinking aid.

selective. Verification and contextualisation of sources is lacking.[6] What is more, contrary to the method of space syntax in general, there have been almost no attempts to integrate the non-/correspondence model into other research wherefore the number of examples even after nearly 40 years since publication still remains extremely limited.

Fourthly, a plethora of evidence such as movable objects, non-building related materials and vestiges as well as surrounding landscapes and spaces are omitted — some of the main evidential categories in archaeology. Lastly, the categories, even if seen as a spectrum (as proposed by Hanson and Hillier, 1987) themselves), are exceedingly broad. This permits to brush over distinct differences between and within groups and turns into an exercise of abstract dualism utilising arbitrary connections. This risks leading to a cul-de-sac focussing on questions of "either-or" instead of nuanced and expedient interpretations (*e.g.* Bleicher & Harb, 2018).[7] Ultimately, it is argued here that assuming an egalitarian society without long-lasting ties to a specific place based on the built environment and the application of the non-correspondence model alone is problematic. While this critique is not meant as an argument against the possibility of societal patterns along the egalitarian spectrum itself, it simply aims to highlight the pitfalls and restrictions inherent in Hillier's and Hanson's model. We have given this critique a little more space here because it has not been formulated in this context before.

Rapoport and the Exploration of Prehistoric Landscapes

Taking these criticisms on board, it becomes clear that future approaches to social dynamics in lakeside settlements using space and the built environment as a starting point need to be able to tackle these issues while integrating all the positive aspects developed to date. Thus, we are looking for integrative as opposed to restrictive approaches allowing us to open rather than close perspectives and modes of inquiry[8] and furthermore, accept gaps, absences and unknowns as integral and potentially significant nodes along our explorative paths.

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[6] As their two prime examples for a non-correspondence society, Hillier and Hanson showcase the N'dembu as described by Turner (1996 [1957]) as well as the Hopi based on Mindeleff and Mindeleff (1891). A contextualisation of sources is absent. In both cases, it can be easily shown that academic debates and processes of change related to the usage and form of the built environment as well as social structure in the respective societies were not addressed (Krutz 1973; McGuire and Saitta 1996, McIntire 1971; Turner, 1996 [1957], 10, 45). Debates about the role of equality and hierarchy in Hopi society as well as the influence of US reservation politics, or colonial politics with regards to the N'dembu, are ignored. Hillier and Hanson's use of (ethnographic) data is thus reminiscent of a phenomenon dubbed "grab-bag" approach (Rapoport 1999, 15; 2000, 189) or "Trickkiste der Analogie" (Ebersbach 2007, 41): an unfortunate tendency to use ethnographic sources and analogies selectively and non-transparently to prematurely validate a theoretical argument. More examples for this practice can be found in Trebsche (2009, 513) discussing among others early analogies in pile-dwelling archaeology. For a passionately scathing critique of analogy and ethno-archaeology in general, see Gosselain (2016) and Lyons and David (2019) as proponents.

[7] This directly feeds into discussions regarding the restrictiveness and artificialness of binarily opposed categories like "egalitarian/hierarchical" or "sedentary/mobile" (Bailey and Whittle, 2005).

[8] During the process avoiding and counteracting as much as possible so-called mechanisms of closure, meaning strategies that "offer closure to potentially ambiguous data sets, [and thus] build larger, stable, certain and unequivocal knowledge products [...]" (Gero 2007, 320 based on Jasanoff 1996).

In an ideal world such an approach would be able to 1) operate on multiple scales (temporal and spatial) as suggested for example by Hofmann et al. (2016) and Hodder and Hutson (2003), 2) is able to include a multitude of objects (physical *and* virtual in character), 3) manages to foreground actions, change and decision-making-processes but 4) does not lose the focus on local and supralocal networks, systems and settings[9] which have become pivotal to understanding lakeside settlement's dynamics.

Amos Rapoport's lifework which has dealt with questions as to how people and environments interact with a strong focus on culture as an influential factor, offers a complex and multi-scalar understanding of space that addresses most of the issues outlined in the previous chapter. Known especially for his role in shaping the field of environment-behaviour studies (EBS), Rapoport (e.g. 1999; 2000; 2006; 2008) has over decades shown a recurrent interest in archaeology that seems, with some exceptions such as Smith (2011) and Steadman (2000, 2016), to have remained largely one-sided.

Without adopting his rather traditional agenda to detect universal rules and patterns as criticised by Buchli (2013, 52), there are many concrete aspects of his concept of space that could be beneficial to the matter at hand. To summarise briefly, Rapoport sees space as (a) the organisation of four variables: space, time, meaning, and communication; (b) a whole cultural landscape which, (c) includes systems of settings[10] and activities (d) that in turn consist of so called fixed, semi-fixed and non-fixed feature elements that are utilised and express themselves in different ways. These categories organise different types of objects and subjects in space, both animate and inanimate. A fixed feature element could be something like a street or wall, a semi-fixed feature element might describe furnishings and other movable objects while the last category pertains to living beings and their actions which in archaeology are often the hardest to discern. The elements described fulfil different functions (*cues*) in guiding people through space and their rigidity/fluidity is the tool through which they communicate meaning.

What is important is that according to Rapoport *all* these different aspects of space are valid parameters needing to be discussed if one wants to understand the connection between social life and architecture and none of the elements are treated as more important than the others by default.

It follows that the system and its parts need to be discovered — not assumed (Rapoport, 1990a, 14). He also (*e.g.* 1990a; 1999, 15; 2000, 177) allocates enormous importance to the way activities are performed in space — noting that not the activity itself is what may create a unique spatial implementation but rather the way it is realised[11] (*e.g.* all humans prepare food but do so differently). This point feeds into several discussions and strands of theory highlighting the importance of repeated (everyday) activities in space and time to gain a better understanding of social

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[9] Closely linked to for example Barretts (1988) "Fields of discourse" or Hodder's and Hutson's (2003, 175) "activity areas".

[10] A spatial setting/a location.

[11] In part, these arguments are reminiscent of Tim Ingold's (1993) plea to *discover* meaning in landscapes/taskscapes from a dwelling perspective.

structures and power relations as advocated by authors like Hofmann and Whittle (2008), Barrett (1994), Hodder (2005) and of course Bourdieu (1977).[12] What makes this kaleidoscopic understanding of space useful to us is that it addresses many of the difficulties expressed above. It adds "an unavoidable temporal component" (Rapoport, 1990a, 15) (included in a), highlights the importance of networks and connections through the introduction of systems of settings and activities (included in c) while addressing people's actions in the shape of activities and non-fixed feature elements. Furthermore, the concept allows us to integrate a multitude of objects and settings even beyond the built environment (included in b) as well as through the idea of semi-fixed features) and does not assume the built environment to be the pinnacle of societal evidence[13] Furthermore, the concept provides a strong terminological and conceptual tool kit. It also remains compatible with and open to a multitude of theories, models and methods[14] and can for example easily be brought into the fold of Hodder's (Hodder & Hutson, 2003) delineation of contextual archaeology. It further highlights the need for imagination, exploration and investigation (Fleming, 2017) of evidence of different kinds.

Nevertheless, we propose some concrete modifications to Rapoport's notions of space to better align it with the questions at hand.

Firstly, it is useful to extend Rapoport's concept of setting, which refers despite the integration of a cultural landscape mostly to the built environment, and promote a more general idea of setting or place. This allows us to be clear in not presuming that built settings are somehow superior to others and to go beyond the settlement or building in our search for clues and cues.

Secondly, we suggest to free Rapoport's feature elements from their rigidity and instead pay more attention to the nature and function of the object in question in its specific context. For instance, instead of classifying a house and its structural parts from the beginning as a classic fixed-feature element, we may discern in the short-lived and constantly changing buildings around Lake Zurich (see below) traits more commonly linked to semi-fixed feature elements. In fact, this may be where the strength of these categories lies. Making them scalable and in themselves something that needs to be discovered, we can ask about spatial features and their role without pre-designating a fixedness. Instead, we ask how stability and mobility are constituted. By assuming that all settings potentially display fixed, semi-fixed and non-fixed elements in some way, we could then ask, how stability is constructed

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[12] By extension, also Giddens (1979). In particular, we are referring to the concepts of the "duality of structure" as well as "habitus" (as pioneered by Mauss (1975 [1935])).

[13] It is typical for more traditional approaches to the built environment to understand it as a direct mirror or condensed replica of society which, once "unlocked", allows to draw conclusions about a wide variety of social aspects (Trebsche 2010; Yaneva 2012). This perspective in the past has led to the accumulation of mostly classificatory and comparative data on the subject and allowed "the house" to tower above other evidential categories (Buchli 2013, 48). These days, more nuanced approaches are common, in which a (built) structure is understood as dynamic both influencing and being influenced by its environment and constituent parts (Hahn 2010, 112; Löw 2001; Maran 2012; Sanders 1990: Trebsche, ibid.).

[14] To give only a few examples: applications of network analysis (*e.g.* Brughmans 2010; Hodder and Mol 2016), discussions of mnemonics and social memory (*e.g.* Hodder and Cessford 2004, Hodder 2005, Rapoport 1990a, 1990b, 2006 etc.), considerations of experience, the constitution and meaning of landscapes, entanglement, movement, agency and dwelling (*e.g.* Barrett 2001; Ingold 2000, 2006, 2017).

if for example not through "the durable house" per se. This question strikes at the heart of the current discussion regarding the perceived paradox between short-lived individual settlements situated in cultural landscapes tended for centuries (Bleicher et al., 2017; Billamboz, 2014; Styring 2016).

Thirdly, we should allow referential and virtual settings to be included in our considerations. Referential settings describe settings which are imagined based on a referential object such as imported goods or ruins in the landscape — settings which cannot be seen in their original state due to their temporal or spatial distance but nevertheless influence and reference people's actions.[15] Virtual settings refer to imagined locations based on dreams, myths etc. The transition between virtual and referential settings is fluid and subjective. A distant land, the past and the realm of spirits for instance may be very much alike in the way they are perceived and imagined as a place tied to specific objects, locations or goods.

Fourthly, and this is more of a formality, non-humans should be included in considerations of non-fixed feature elements. The importance of the movement and diet of ruminants to understanding seasonality and ways of life in lake shore settlements has already shown this (Akeret & Jacomet, 1997; Ebersbach, 2002; Bleicher, 2015; Jacomet et al., 2016).

With these modifications in mind, we can endeavour to collect available information on elements that are relevant for the understanding of space and its social meaning in the Circum-Alpine Neolithic. In doing so, we use not only classical archaeological information such as excavated elements of buildings (or any built environment in general) but make use of a wealth of knowledge from disciplines like archaeobotany, dendrochronology (dendrotypology), zoology, palynology and of course the social sciences, trying to become aware of scales and processes as well as of networks, settings and the activities therein.

From House to Landscape: Exploring Space Across Scales

From what has been said, we should endeavour to explore the landscape and identify spatial scales and settings that were of importance to Neolithic settlers. In doing so we will focus on the example of Zurich because this city has a rich history and data sets of investigations into prehistoric lakeside settlements with several of them having been excavated and interdisciplinarily researched (Fig. 2). In addition, we point at further sites to illustrate repeating patterns. Certainly, one could also find a wealth of ethnographic examples trying to demonstrate that multi-scalar movement through and perception of landscapes and waterscapes (and in fact every -scape anyone might think of) has been documented elsewhere. However, we refrain from focusing on analogies too much as it is commonplace today that cross-cultural similarities provide little to no means for archaeological interpretation (Gosselain, 2016). One

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[15] Dušan Borić (2003) describes a similar process when writing about *trace*, defined as: "[…] 'stopped' agency; an imprint or mark left in the passage of agency as a materialization of its absence". Distance here describes the absence of agency. This does not mean the setting cannot be reintegrated into a new context.
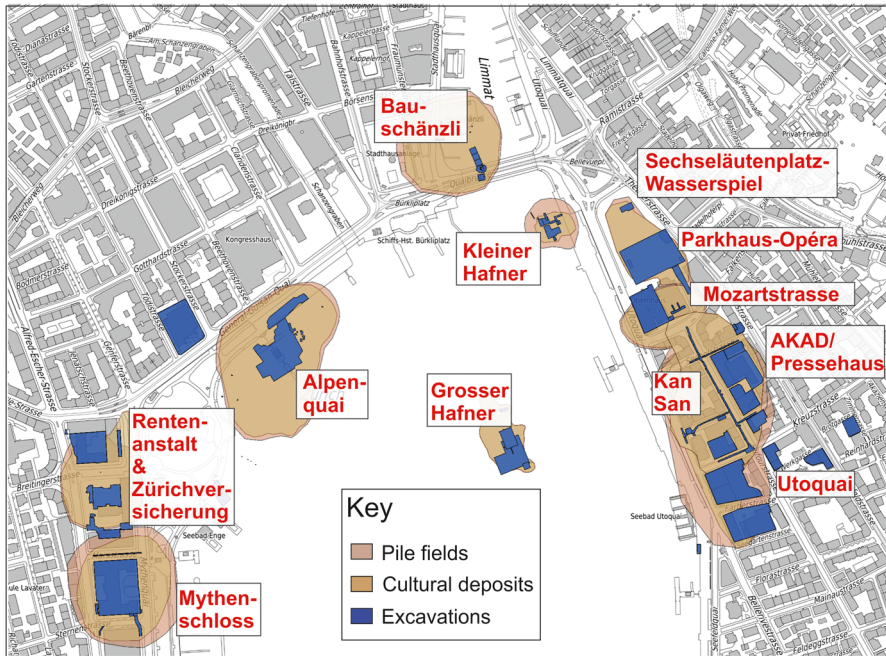
Fig. 2 Map of excavated and researched lakeside sites in the city of Zurich

could *e.g.* hint at an Amazonian tribe such as the Nukak, finding that they, too, were constantly relocating their settlements while producing food in gardens and having relatively fixed territories (Politis, 2007). However, the differences are many as *e.g.* the lifespan of their buildings which is mostly measured in weeks rather than years. Therefore, we largely refrain from building our argument too extensively on analogies and readily admit that we are endeavouring to build a purely archaeological and theoretical model drawing on archaeological data and ecological textbook knowledge. This approach certainly is in danger of confusing scales that are visible in our data for methodological reasons with scales that were actually perceived as such by the Neolithic settlers. Still, this is a straightforward approach to identify spatial and temporal scales that were arguably important from a functional point of view and are therefore likely to have been culturally relevant as well.

The smallest scale was obviously the house. We cannot say who lived there together, but what we can say is that in all buildings of the studied settlements comparable household activities took place. In fact, we know that houses came in different sizes with two size classes and only small differences in the finds (Bleicher & Harb, 2018). It is interesting to note, as Ebersbach (2010b) has pointed out that in several cases individual houses were re-erected at exactly the same spot (*Hausplatz*) during later phases of occupation. This reference indicates a temporal aspect that we will come back to later. The next unit on the scale would be the house group, because in several cases (all of which are Horgen culture) we find small houses in clear spatial relation to larger ones, such as in Parkhaus Opéra, phase 1 (33rd

century BC) and probably phase 3 (32nd century BC), Chalain 3 (32nd century BC, Pétrequin, 1997, 310), Torwiesen 2 (33rd century BC, Schlichtherle et al., 2010) and similarly, although without the size-difference, in Sutz-Lattrigen Riedstation in Switzerland (34th century BC, Eberschweiler et al., 2006). Several houses and sometimes house groups form a quarter. It consisted of lines of houses of identical orientation with a common avenue. Often, the smaller houses were built in a second row behind the first and without direct access to the main avenue.

However, there is also one case (Torwiesen 2 in southern Germany), where a small house (a hut) was built on a site large enough for full-size houses (Bleicher, 2009). One to several quarters formed a settlement (Bleicher & Harb, 2018). Houses were mostly in use for eight to fifteen years and this also holds true for most of the villages that rarely reached or exceeded 20 years of duration (Bleicher, 2009; Bleicher & Burger, 2015).

Several settlements could coexist in just a few hundred metres distance and formed a social unit for which we do not have a word yet. These settlements constantly reorganised and moved along the shore over small distances, regularly returning to formerly used places (Bleicher & Harb, 2018). Every time a settlement was given up, a new one was built in close proximity, but frequently not with the same number of houses or house groups. Therefore, we believe that the principal social unit was the house group and every eight to fifteen years there was a chance that the house groups formed new settlements in different compilations.

The totality of settlements stayed together in the area of today's city of Zurich for about 200 years (3234–3055 BC). After that, there are no traces of settlement in Zurich which is in accordance with pollen data. This refers to Zurich as a whole, but for taphonomic reasons any archaeological evidence of the time in question is most likely to be found on the lake shore, which has been extensively studied. Directly after 3054 BC, we find a surge in building activity in the bay of Meilen on Lake Zurich. Therefore, it seems that the totality of settlement activity was moved to another stretch of shore about 15 km further south, where a slightly more dispersed, but structurally similar system was adopted. After another 250–300 years (3054–2755 BC), people returned to Zurich, where they stayed again for some 240 years until about 2510 BC (Bleicher, 2019, 260). As a small exception to this pattern, it should be noted that there was a short, roughly 8-year presence around 2885 BC. Since, to our current knowledge, the predecessors of the 3234 BC-settlement came from exactly the same area, where people went afterwards, we can postulate a relatively clear bipolar settlement system with two territories in rotational use. Bioarchaeological studies of botanists, dendroarchaeologists and palynologists resulted in the hypothesis that the reason for this behaviour might be an economic/ecological cycle: Natural climax forest is of little economic value and its transformation into a productive cultural landscape needs several years of time. Moving a settlement therefore needs a lot of planning and preparation and implies a thorough environmental reengineering of the settlement's surroundings. Not only is clearing beech forests time-consuming and labour-intensive, fruit-bearing hedges and trees also need to be planted and fostered. The same holds true for hazel (Bleicher et al., 2017). Also, we regularly find evidence of intensely and cyclically used oak coppices (Bleicher et al., 2015). The supply of building timber relied heavily on

anthropogenically managed stands. Lastly, in times without noteworthy stretches of grassland, fodder for the cattle needed to be produced, which was done based on leaf hay. This again meant that anthropogenically managed fodder groves had to be installed with trees grown in a way so that they produced much leaf hay at an accessible height (Bleicher, 2015). Indications are that over the course of 200 years of settlement, (thorny) bushes gained importance in the landscape and we see a sudden decrease in the use of regularly produced oak wood directly before the area is left (Bleicher et al., 2017).

In toto, this data allows us to deduce a number of spatial elements and their respective temporal and spatial scales and networks. This in turn gives us ideas about the settings and a range of plausible meanings. At any rate it becomes clear that a cultural landscape is full of elements of different temporal and spatial scales and related activities. And since many of these are related to reconstructable and well-studied ecological processes and economic functions we have a chance to make educated guesses about some of their roles and meanings.

In the surroundings of the settlements, we know of an area where fields, fruit-orchards, coppices, leaf-hay groves with pollarded trees, hedges and fallows existed. We might call these surroundings the *proximal or inner territory*. All the named various elements therein (from the house to the orchards) have their individual time scale. Orchards, fields and coppices are installed, have a time of productivity, a phase of decline and lastly after abandonment a phase of succession back to the pre-installation state. However, as fallows and orchards etc. are a constant part of the agricultural system and since orchards and coppices can be maintained for generations, the totality of the managed proximal territory can be considered a fixed feature, lasting for around ten generations. Much in contrast to this, houses and in fact quarters and settlements were normally moved or reorganised several times in the course of a human life. The built environment may therefore be called a semi-fixed feature. Without a means of knowing for sure, we suppose that moving a settlement within the proximal territory most probably had no effect on the economically used spaces. Relocating the living space and building houses is already a considerable additional workload. Clearing beech forest for arable land, however, is an extreme workload because it is not enough to cut down the trees. The trunks of many tons weight and at least part of the roots must be removed as well (both of which will not burn), which is an enormous effort with wood and stone tools and it is questionable whether it was possible at all to manage both tasks at the same time in addition to agricultural tasks. Moreover, beech was not used as construction timber so there were even more trees to cut down. Lastly, it was not even necessary, if the new settlement site was close enough to the old fields, which is exactly what the data suggest.

Beyond the proximal territory existed a larger area of economic interest with much less anthropogenic installations. We might call this the *outer territory* and it is here that herding took place and where specialised sites for seasonal activities like fishing or hunting existed. A Late Neolithic seasonal herding place has been documented in Alleshausen-Grundwiesen in southern Germany, dating to the twenty-ninth century BC (Bleicher, 2009, 2015). A possible hunting site from the decades around 3200 BC was found in Bad Buchau Dullenried (Upper Swabia, Germany;

Schlichtherle, 2004, 51). Several centuries older and dating in several phases around 4000 BC, in Cham Eslen (Switzerland) indications are that the site was a specialised installation for fishing (Gross & Huber, 2018, 266). The outer territory was of major economic importance: Ebersbach (2002) and Lüning (2000) have collected historic and ethnographic sources on the feeding of cattle and found that the demand per capita is considerable — especially if no grasslands is available and fodder must be gained in woodland. As meadows in our region are an invention of the Bronze Age, during the Neolithic, cattle fodder was unlikely to be found the whole year around in close proximity of the main settlement. Seasonally used huts and ranges of trees affected by herding and pollarding clearly made this outer territory an anthropogenic landscape, but it was far from the heavily restructured proximal territory. Without a means of knowing, it seems plausible that areas formerly used as proximal territories with their relatively open fallows and early successional stages of high fodder value formed part of the following outer territory. Possibly, a community kept its claim on the area by staying present through its herders. The outer territory consisted mostly of non-fixed and semi-fixed features, the most permanent probably being the pathways between sites, as these were partly dictated by topography. However, the sites themselves were probably regarded as fixed features, as they were re-occupied repeatedly. Ebersbach (2010b) pointed to this phenomenon coining the term "Siedlungsplatz".

Concerning the network character of all the different elements, we have evidence that pathways and trackways were of major importance as well. A house group or village was characterised by its central avenue (Fig. 3).

This automatically formed an open social space where people met whenever they left a house. However, it was also the route into the proximal territory and it probably took the people both to their economic areas and to other villages. In Zurich, trackways were discovered in and outside several Neolithic settlements of the time around 3200 BC. These trackways ran along the shoreline and most probably connected the different synchronous settlements (Bleicher & Walder, 2019). As the wood (poplar) was not very durable and since the settlements kept relocating along the shore, these trackways had to be re-erected at least as frequently as the houses and can therefore just as well be considered semi-fixed features. These trackways can probably be seen in context with the early wheel, which was introduced in central Europe during the fourth millennium BC (Bakker, 2004). Another means of transport were the waterways and in our case the lake. A monoxyle made it possible to transport considerable payload in little time over distances that it would have taken several days to cover on foot. However, thinking of the herdsmen (or herdswomen) and their cattle, there must have been a network of paths in the landscape as well. Temporal scales can be reconstructed similarly. For agricultural reasons it seems logical to start with seasons and single years. The next level would probably be the field cycles (a few years) because one had to make sure that when one field had to be turned into a fallow, another plot would be open and ready.

Thus, the agricultural planning horizon was probably something around 3–5 years. The architectural scale then was structured by house durations which were mostly identical to settlement durations (8–15 years). Most humans lived long enough to inhabit several settlements during their lifetime. As

Fig. 3 Reconstruction of the situation around 3170 BC: the settlement of Parkhaus Opéra is linked to the synchronous settlement of Kanalisationssanierung Seefeld (KanSan) nearby by means of a wooden trackway. The houses in lines form central aisles. Some houses stood in a second row. The hinterland features fields, fallows, orchards and fodder groves in various stages of development (© Cantonal Archaeology of Zurich)

dendroecological evidence identified cycles of around 23 years duration (Bleicher et al., 2015, 144), we can hypothesise that the next economical scale (coppice generations) was of the same length as human generations (~ 20–25 years). We can be sure that oral history or societal memory stretched over several decades, because we find evidence of houses built exactly to the single pile-position on the same spot where during an earlier settlement a house had been erected (Ebersbach, 2010b, 46).

Above these, we can reconstruct the last known temporal scale which is the cycle-steps (~ 180–250 years) that ensue from the rotation between the proximal territories. Here, we can be sure that the settlers were aware of these comparably long-time spans because of several indications: For a number of decades, the former proximal territory must have been recognisable by the succession states on former fields and fallows. It also took many years for hedges and orchards to get overgrown. For the trained eye, former coppices are also recognisable for many years. In many cases, we find the new settlements in the same bays on the shore as earlier phases 200 years ago. This is certainly also due to topographical constraints. However, it is even probable that in the shallow water remains of earlier

buildings such as piles were visible so that older settlements remained discernible. Considering the value of fallows and former fields for herders in a region of otherwise closed woodland, we can hypothesise that when the proximal territory was relocated after 200 years (*e.g.* from Zurich to the bay of Meilen) the former proximal territory turned into part of the new outer territory and people knew about the area "where we were before and will return".

The spatial settings of a Neolithic landscape can therefore be described as a number of semi-fixed features such as houses, quarters and settlements that were situated in a permanent, highly managed proximal territory. This was surrounded by the less intensely managed outer territory with some semi-fixed installations and lastly the off-area. All of these were connected by pathways or water transport. Land transport was organised through trackways connecting settlements and economic areas. All land-transport was finally funnelled into the main avenue of every single quarter, which was often only to be accessed by one end such as in Torwiesen 2 (Schlichtherle, 2004). All activities in the proximal territory took place in anthropogenic and economically important features in their respective developmental states. Normally, the houses of average or larger size were oriented towards the central lane. The small houses in the second row had only indirect access to this public space but also to the main path into the proximal territory outside the village. We may take this reduced access to the public and the existence of fences as indications of a strict social control. In fact, we can find many elements that fit Rapoport's concept that the (semi-)fixed features guided people through space according to the activities that had to be performed in different settings.

Everybody could expect to see a lot of change in one's built environment within his or her lifetime and within the proximal territory. Furthermore, everybody could expect to live in different settlements, albeit probably within the same house group. The limits and guiding of people's actions through built features were collectively re-established by common building activities such as pathways or fences and through the place that individuals were allowed to build in. We also see room for individual agency, as the smaller houses were normally in the second row, but could in certain cases be built at the main aisle, such as in Torwiesen 2.

Outlining Communities? From Space to Identity

For the moment, we have no method to reconstruct who lived in the houses we excavated. Many different types of households have been documented in ethnography and we have no reason to favour the idea of a family in our modern sense as inhabitants of a house. However, we find differences in ceramic styles between houses in Torwiesen 2 (dendrodated to 3283–3279 BC), where old-fashioned ceramics were found in the largest buildings at the village entrance. In Zurich-Parkhaus Opéra phase 3 (dendrodated to 3176–3159 BC), it is again ceramics of an old-fashioned style that in this case were found in two out of three quarters but not in the third. The same distribution pattern was found with other objects that likely mirror social status: Bear tooth pendants were repeatedly found in the same two quarters but only once in the third. Dog tooth

pendants in contrast were common in all quarters. Similarly, perforated axes were unequally distributed with several of them found in the named two quarters where the bear pendants were found but none in the last quarter. The border between the quarter richest in these probable status symbols and the quarter that is devoid of them was delineated with a fence (Bleicher & Harb, 2018; Fig. 2). It is along the lines of the same quarters that the distributions of tools and raw materials are structured, indicating that social differences between the inhabitants were also related to their occupations and the procurement of imported raw materials. For example, we found axes made from Taveyannaz sandstone in the two sectors that also featured status symbols, while the traces and means of their production were found in the third sector (Harb et al., 2017, 257–262). For the moment, we do not interpret these differences as hierarchical but simply as signs of social differences of some kind.

However, indications are that social differences existed not only between but within quarters as well. Two objects were found in Parkhaus Opéra that are likely also status symbols but due to their low number, their distribution cannot be interpreted: these two objects, of which only one other example has been found, were bows made of yew that were not apt for shooting but decorated with bark strips of another species (Bleicher, 2016). As these symbolic bows are so rare, it seems that these were connected to outstanding individuals within the quarters as opposed to status symbols that are more frequent but restricted to and characteristic of certain quarters or house groups.

With recurring architectural patterns of social space and the described similarities of find distributions (*e.g.* old fashioned ceramics associated with status signals), it seems that identity was at least in parts constructed through being part of a house group, living in a given house within this group and wearing certain status symbols, using identifiable ceramics, doing given activities. One was also given a place to do so which was either close to the public life at the central lane or in the second-row houses. Given the physical strain of seasonal activities in the outer territory such as hunting and herding, these were presumably also carried out by only certain parts of the population and influenced their identities. So far, we can only speculate who lived in the second row and who had (or was allowed) to move into the outer territory. It seems likely however, that such tasks and identities changed over the lifetime of people. For the moment it is important to note that we find evidence for different dimensions of identities: First, there was identity (and maybe status) as expressed through one's belonging to a quarter and second, as expressed through one's residence (size and location) within a quarter. Lastly, it seems that individual status was expressed using artefacts such as symbolic bows. It is obvious, that these need not correlate with any kind of coercive power. Still, these status symbols testify to a concept of personal status as part of an individual's identity as opposed to identity being generated by being part of a group. Thus, without entering the wide field of what status is and how it might be detected and interpreted in archaeology, the term is used here to denote some kind of social categorisation related to esteem and prestige. It is seen as one of many facets that together result in personal identity.

Degrees of Power: on Communal Decision-Making

Through dendrochronology, we get data on the timing and scale of the movement of buildings. These tell us that movement on a communal scale happened regularly. It starts with the described relocation of whole settlements. These tell us that decisions were made on a higher scale than just a house or a single house group. Data from the Federsee region demonstrate that settlements in several kilometres distance moved synchronously on a decadal basis (Bleicher, 2009). Consequently, decision-making instances were at least sometimes situated above the level of a settlement. The reorganisation of settlements in Zurich and lastly the complete abandonment of at least the eastern shore in today's city of Zurich when the whole community moved to the bay of Meilen are further examples of such higher-ranking decision taking levels. Archaeobotanical evidence gives us an idea of the planning horizon: The high relevance of hedges and fruit trees that provided a considerable amount of the calories (as well as vitamins etc.) led to the hypothesis, that fruit trees had been tended in the surroundings of the settlements (Antolín et al., 2016, 66). In fact, several thousand apples have been consumed per house and per year. Since it takes the crab tree mostly some 15 years to bear fruit (and the same holds true for sloe), their nutritional importance indicates that such large-scale shifts of a whole population to a new settlement territory needed to be planned and organised for at least 10–15 years in advance. This implies the detachment of pioneers in order to prepare the cultural landscape for the main body of the people.

The organised shaping of the cultural landscape was enormously laborious. The workers who *e.g.* cleared the local climax beech woodland with its massive trunks from many hectares were not producing food for a long time but rather the preconditions for food production in the future. Accordingly, they had to be sustained by stocks or surplus produced by others. A productive cultural landscape was thus not only of highest importance for the community's survival, but can also be regarded as a large communal investment. Its elements structured the individual and common activities and carried meaning of fertility, welfare and health. Local presence, relation and possibly ownership were probably performed visibly. Indications of monumentality are rare in the realm of lakeside settlements, but not absent. Megalithic alignments in western Switzerland (Burri-Wyser et al., 2016) and few megalithic tombs such as Oberbipp (Ramstein et al., 2014) are present in western Switzerland and just reach the adjacent areas around Zurich so that the idea of monumentality as part of the landscape was known. Monumentality visually demonstrates the power of the community that built the monument. Since a single person could not erect such a monument, these monuments testify to the respective community's ability to take common decisions and perform great tasks. Being a visual part of the landscape, great communal buildings and especially monuments are a statement of the connection between a group of people and the landscape and create the aforementioned link to virtual or referential settings.

From all these spatial and temporal data, we may deduce that the social structure of the Neolithic Lakeside settlers knew powerful instances of

decision-making for collective action, although several lower levels of decision-making were present as well. It is important to stress that we do not claim to know anything about the structure of this decision taking. Although objects have been found that we interpret as status symbols, we explicitly do not claim to have found any indication of coercive power of individuals or groups as opposed to power as collective consensus (Lund et al., 2022). However, the opposite holds true as well.

Stability Through Movement: Positive Aspects of Spatial and Temporal Fluidity

As the previous pages have shown, to focus solely on architectural elements when attempting to decipher possible social dynamics underlying the construction and use of prehistoric lakeside settlements in the Circum-Alpine region is too narrow a perspective. Instead, it makes sense to take a broader temporal (keyword: cycles) as well as spatial (keyword: proximal and outer territory) stance thus arriving at a multi-scalar perspective appreciating the multitude of detailed data as well as evidence for broader patterns (a perspective also suggested in Hofmann et al., 2016). Rapoport's multifaceted understanding of space might seem overwhelming at first but it allows us, with some modifications, to flexibly inspect a broad range of visible as well as hypothetical settings and their elements without losing sight of our leitmotif.

By asking first what settings and activities can be discerned, what elements they contain, how they are connected and what their elements' stability or instability in relation to one another may tell us about their purpose and meaning also leads us to question our own presuppositions connected to in/stability as such. In this context this means to specifically question the necessity of a stable[16] built environment when thinking about the genesis of communities, identities and structure and to take into account the possibility that stability in a social and physical sense might emerge from other mechanisms like repetition and seasonality and settings in the wider cultural landscape, or even seemingly "unstable behaviour" itself.

To provide more context, we should briefly look at the seemingly paradoxical notion of flux being used as a tool to create stability and belonging in human societies, how outwardly unstable settings do not preclude stable ones per se and how instability neither excludes complexity nor hierarchy on a social and symbolic level. The examples given are not meant to restrain and solidify but rather diversify existing ways of reasoning and interpretation resonating with the findings around Lake Zurich.

Authors like Lowe (2003), Carsten (1995), Rodman (1985, 1992), Hofmann (2013) and Waterson (2013) point out that movement through and activities in/interactions with space in time are in fact major strategies of place- and identity-making

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[16] The terms stable and unstable in this context are not clear cut but rather need to be defined in relation to one another. Their application should also, where possible, take into account the lived experience of time of the people discussed here (*e.g.* seasons and generations).

and create social continuity. No durable, static dwelling is needed to ground oneself in space and time. Echoing Ingold (1993, 2000) and Lefebvre (1991), Wright (2016) put it concisely when he writes: "It is [household] actions that create [inhabited] spaces and dwelling places as much as an enduring construction might do". This quote is especially interesting, as it suggests that as a starting point of inquiry, activities and settings are interchangeable and may perpetuate one another.[17]

Lowe (ibid.) shows, writing about the Indonesian Sama[18] that accumulated experience with a location and resulting memories are what shape the relationship to a locality and a sense of belonging. Furthermore, she shows the pitfalls of assigning unstable tendencies to a group of people, namely, eclipsing everyday strategies that run counter to perceptions of instability such as agriculture and landscape management. This point partly mirrors current discussions in pile-dwelling archaeology. Rodman (1985), writing about communities in Vanuatu, showed how dismantling and moving (a) house (in terms of residency *and* the house or parts of it itself) may in fact illustrate a continuous process of reasserting one's place in space and society. In its extreme form, she understands the house not as short-lived but rather as open-ended. Evidence for the recycling of building parts[19] as well as the notion of *Hausplatz* (Billamboz, 2006; Ebersbach, 2010b, 2013) plays into this very idea.

Carsten (1995, 2018) advances another interesting point when writing about houses in Langkawi, Malaysia, stressing how buildings may carry immense meaning socially without their physical form necessarily reflecting this role — a point that is also taken up in Waterson's (2013) remarks on traditional Makasarese houses. In a different vein, Waterson (1995) remarks that a society does not need to be highly stratified to attach ideas of continuity and property to the house as an institution.

It is also interesting to once more consider the Hopi — one of Hillier's and Hanson's prime examples for a typical non-correspondence society. While structurally, the movement of people within and between Hopi settlements has been shown to be fluid for certain types of labels, a point in favour of the classification, the context and implications do not sit well with the typical societal traits associated with the model. It is less problematic to point out the long-lasting architecture typical for Hopi villages[20] than their interpretation as an open and egalitarian society. Authors like McGuire and Saitta (1996) have pointed out that the very tension between hierarchical and egalitarian elements are in fact at the heart of Hopi society. This crucial interplay is lost if we look at built structure alone and one may ask what we gain if

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[17] This is actually quite a roundabout way to arrive at the widespread notion of duality (Löw 2001), double contingency/*doppelte Bedingtheit* (Hahn 2010) or interactive model (Sanders 1990) describing a reciprocal relationship (Banning 2010) of buildings and activities.

[18] Based on Clifford Sather (1997) often referred to as "sea nomads".

[19] Examples for this practice can be found among others in Billamboz (2006), Bleicher (2009) and Bleicher und Burger (2015)

[20] This is an important point that is at times overlooked in the discussion of the non-correspondence model: Hilliers and Hanson's understanding of instability may but does not have to refer to buildings as such. They refer to the supra-local organisation of the majority of *labels* which may result in fluid building techniques but most importantly has to facilitate the movement of people in a certain way. There are multiple ways this can be achieved (*e.g.* shared access, facilitation of splits and disassociation). The model does not factor in the passing of time (*e.g.* some materials decaying faster than others) — it focuses on a specific structure at any given moment and therefore is decidedly ahistoric.

societies like that of the N'dembu and Hopi are thrown into the same comparative bucket, different as they are from one another in the first place.

Moving, changing places — be it a person or a building — always creates meaning. For our research area, this positive, creative aspect of movement should be considered more seriously. If we assume that all systems of settings include fixed, semi-fixed and non-fixed elements and that outwardly perceived instability may indeed create rootedness through repetition and reference, our possible understanding of the communities around Lake Zurich changes in substantial ways. As pointed out above, aside from asking about the role of a relatively fluid built environment as a part of a network of settings, we may assume that other settings such as ruins, paths, fields, and tree stands (see above) created longer lasting reference points that may have "anchored" fluid residential systems (Billamboz, 2006, 335; Ebersbach, 2010a, 146). To understand how stable and fluid elements are connected, it is not important to find or set a specific time limit to label strictly stable and unstable elements but more so to understand them in relation to one another.

In the case of Neolithic lakeside societies, it appears plausible that the overall connectedness of all house groups in a currently inhabited territory was intensified by the concept of regular rearrangement and regrouping into new settlements. The seemingly unstable nature of the short-lived buildings would induce a high degree of social stability through the existence of personal relations from the last settlement organisation across settlements. The ruins of former settlements still visible in the shallow water might well have functioned as a place of remembrance and reference as in the example of Vanuatu mentioned above. Since it is unclear in which aspects and to what degree personal relations across settlements were maintained, there is potential for notable complexity — especially under the circumstances of such a fluid built environment.

Conclusion

While the model of non-/correspondence led us to interpret the low stability of the built environment as indication of "non-exclusivity, weaker rules, weak boundaries and lack of hierarchy", the multi-scalar approach à la Rapoport leads us down a different path. The consideration of different facets of the cultural landscape and its ecological/economic aspects as well as the temporal and spatial structure of the built environment on different scales let us deduce a number of features of these Neolithic societies: They knew considerable amounts of social control, social differentiation and probably statuses. Some of the activities and status symbols appear to be related to quarters instead of houses or individuals. It seems therefore probable that social status was in fact inheritable (under the assumption that the quarter one was born in mattered). The society was structured along different lines between and within social units such as quarters and house groups. Togetherness was obviously performed through regular rearrangement of the house groups into settlements, thus intensifying bonds and personal relations within the community that consisted of several settlements. On the other hand, space was clearly regulated with some people living along a common central lane and others in the second row. In other cases, whole quarters were separated by fences. A stronger

indication of exclusivity is difficult to imagine. In the same way, it is striking how in several regions we find evidence that groups of settlements moved synchronously into or away from a defined area. This implies powerful instances of communal decision taking. Even though we have no means to decide whether it was powerful individuals, boards of household headmen/headwomen or a more collective means of decision taking, it appears that the rules were far from weak.

The adapted Rapoport approach also helps to explore and link elements in the (cultural) landscape using different bioarchaeological data in order to identify different settings and functionally attribute economic and possible cultural meaning to them.

This article aimed to show how an integrative approach, bringing together data and theories from the social and natural sciences, including but also reaching beyond the built environment, can shape a deeper understanding of possible dynamics governing the daily lives of people on the lakeshores in the Circum-Alpine Neolithic. We also wanted to draw attention to things lost when the built environment is understood as a stand-alone container from which social structure is deducted and how it can be problematic to see instability as evidence for something lacking. Focusing on networks and activity systems has undoubtedly a rather long tradition and may to some even smack of retrogressive pondering. Instead, it is meant here as a step forward, tailoring instead of reinventing existing theories and models to allow an integral picture to emerge in line with a renewed focus on the entanglement of matter, practices and processes in space and time. Certain aspects of this approach need further refining, such as a more in-depth, concrete and relational allocation and discussion of semi-/fixed properties, considerations of emic concepts of distance, nearness and a productive integration of the idea of virtual and referential settings.

Nevertheless, using a tweaked version of Rapoport's multifaceted understanding of space allows us to look for connections rather than confines, enables us to take different categories of evidence seriously without elevating one above the others and addresses shortcomings of models like that of non-/correspondence. Furthermore, it seems malleable enough to aid with the creation and containment of quite diverse lines of interrogation and discussion while maintaining a common theoretical and methodological scaffold.

Declarations

Conflict of Interest The authors declare no competing interests.

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