

## Abhandlung

Agathe Reingruber\*

# Geographical mobility and social motility in the Aegean before and after 6600 BC

<https://doi.org/10.1515/pz-2018-0005>

**Zusammenfassung:** Eine der folgenreichsten Veränderungen in der Menschheitsgeschichte betrifft die Überwindung der Abhängigkeit von ausschließlich lokalen Ressourcen durch die am Beginn des Holozäns im Vorderen Orient einsetzende Domestikation von zuerst Pflanzen und dann Tieren. Jede Generation von Archäologen hat diesen Wandel im Lichte neu gewonnen Wissens aufgrund neuer Ausgrabungen und neuer analytischer Methoden reflektiert. Die Ausbreitung der produzierenden Wirtschaftsweise aus dem Kerngebiet in Nachbarregionen wurde dabei vornehmlich als kultureller Wandel gedeutet, der durch Auswanderer oder Kolonisten vollzogen worden wäre. Dementsprechend beinhalten die vorgeschlagenen Neolithisierungsmodelle lineare Bewegungen von Ost nach West, die den scheinbar abrupten Kulturwandel erklärten.

Dabei wurde der Konzeptualisierung von Begriffen wie Kolonisation oder Migration, wie sie von Soziologen vorgeschlagen wurde, wenig Aufmerksamkeit geschenkt. Unter Berücksichtigung soziologischer Studien wird der Schwerpunkt dieser Untersuchung weniger auf dem schnellen kulturellen als vielmehr auf dem langsamen, generationenübergreifenden sozialen Wandel und auf der aktiven sozialen Beweglichkeit (Motilität) liegen. Die Perspektive ist folglich nicht die von Neuankömmlingen aus dem neolithischen Anatolien, sondern die der mesolithischen ägäischen Gemeinschaften. Es mag nämlich nicht die Entscheidung mobiler Bauern gewesen sein, nahe oder ferne Regionen zu „kolonisieren“, sondern die der Jäger und Sammler, Innovationen aus den Ursprungsgebieten (selektiv) zu übernehmen und ihren eigenen Bedürfnissen anzupassen. Als aktive Entscheidungsträger setzten sie einen Prozess in Gange, der nicht nur zu ökonomischen, sondern auch, über mehrere Generationen hinweg, zu sozialen und kulturellen Veränderungen führte.

**Schlagwörter:** Zirkumägäis; Anatolien; Mesolithikum; Frühneolithikum; Mobilität; Motilität; Radiokarbon daten; Innovationen; generationsübergreifender sozialer Wandel.

**Résumé:** Un des changements les plus lourds de conséquences dans l'histoire de l'humanité concerne l'autonomie graduelle par rapport aux ressources locales qui sont remplacées par la domestication des plantes d'abord, puis des animaux au début de l'Holocène au Proche-Orient. Chaque génération d'archéologues a relayé ce phénomène à la lumière de nouveaux acquis scientifiques dus à des fouilles récentes ou de nouvelles méthodes analytiques. La diffusion de l'économie de production du centre à la périphérie fut interprétée surtout comme un changement culturel dû à des émigrants ou des colons. Les modèles de néolithisation proposés comportent en conséquence des mouvements linéaires d'est en ouest qui expliqueraient le changement culturel apparemment abrupte.

Cependant, peu d'attention fut accordée à l'élaboration proposée par des sociologues de concepts tels que colonisation ou migration. En tenant compte des études sociologiques, ce travail mettra davantage l'accent sur l'évolution sociale graduelle à travers plusieurs générations et sur la mobilité sociale active (motility) que sur le changement culturel rapide. Ce ne sera donc pas la perspective de nouveaux venus de l'Anatolie néolithique, mais plutôt celle des communautés mésolithiques égéennes. On peut très bien imaginer que ce ne furent pas des paysans itinérants qui décidèrent de « coloniser » des régions proches ou lointaines, mais des chasseurs-cueilleurs qui ont adopté de manière sélective des innovations étrangères pour les adapter à leurs besoins. En tant que décideurs, ils déclenchèrent un processus qui engendra non seulement des changements économiques, mais également sociaux et culturels sur plusieurs générations.

**Mots-clés:** pourtour égéen; Anatolie; Mésolithique; Néolithique précoce; mobilité; datations au radiocarbone; innovations; évolution sociale sur plusieurs générations

\*Corresponding author: Agathe Reingruber: Institut für Prähistorische Archäologie, Fabeckstr. 23–25, 14195 Berlin, Deutschland. E-Mail: Agathe.Reingruber@fu-berlin.de

**Abstract:** One of the most far-reaching changes in human history relates to the overcoming of the dependency from exclusively local resources by domesticating first plants and then animals at the beginning of the Holocene in the Near East. Each generation of archaeologists has reflected on these transformations in the light of the augmented knowledge obtained by new excavations and new analytical methods. The spread of the producing economy from the core area in neighboring regions was interpreted primarily as cultural change, which would have been accomplished by emigrants or colonists. Accordingly, the proposed Neolithisation models include linear movements from east to west that explain the seemingly abrupt cultural change.

Generally, little attention has been paid to the conceptualisation of terms like colonisation or migration as proposed by sociologists. Taking them into account, the focus of this study will be less on the swift cultural change but rather on the slow, intergenerational social change, on the active social mobility (motility). The perspective is not that of newcomers from Neolithic Anatolia but rather that of the Mesolithic Aegean communities. It may not have been the decision of mobile farmers to „colonise” neighbouring areas, but rather that of hunters and gatherers to adopt (selectively) innovations from the areas of origin and to adapt them to their own needs. As active decision-makers, they set in motion a process that led not only to economic but also to social and cultural changes over several generations.

**Keywords:** the circum-Aegean; Anatolia; Mesolithic; Early Neolithic; mobility; motility; radiocarbon dating; innovations; intergenerational social change

**Περίληψη:** Μια από τις πιο μακρόπνοες αλλαγές στην ιστορία του ανθρώπου σχετίζεται με την απεξάρτηση από αποκλειστικά τοπικές πρώτες ύλες, η οποία επιτεύχθηκε με την εξημέρωση πρώτα των φυτών και κατόπιν των ζώων στις αρχές του Ολόκαινου στην Εγγύς Ανατολή. Η επιλεκτική καλλιέργεια φυτών πλούσιων σε θερμίδες και η διατήρηση ορισμένων ζώων οδήγησαν σε μια πιο μόνιμη εγκατάσταση, η οποία πυροδότησε κοινωνικές και πολιτισμικές προσαρμογές (και εν συνεχεία επηρεάστηκε και η ίδια από αυτές). Κάθε γενιά αρχαιολόγων προβληματίζεται γύρω από αυτούς τους μετασχηματισμούς βάσει της ολοένα μεγαλύτερης γνώσης που προκύπτει από νέες ανασκαφές και νέες αναλυτικές μεθόδους. Η εξάπλωση της παραγωγικής οικονομίας από έναν γεωγραφικό πυρήνα προς τις γειτονικές περιοχές ερμηνευόταν ως πολιτισμική αλλαγή που προκλήθηκε από μετανάστες ή αποίκους. Ακολούθως, τα προτεινόμενα μοντέλα περί Νεολιθικοποίησης

σης περιλαμβάνουν γραμμικές πορείες από την Ανατολή προς τη Δύση προκειμένου να εξηγήσουν την φαινομενικά απότομη πολιτισμική αλλαγή.

Ως επί το πλείστον, ελάχιστη προσοχή έχει δοθεί στη νοηματοδότηση όρων όπως αποίκηση ή μετανάστευση όπως αυτοί προτείνονται στην κοινωνιολογία. Λαμβάνοντας υπόψη αυτούς τους όρους, η παρούσα μελέτη εστιάζει όχι τόσο στη ραγδαία πολιτισμική αλλαγή, όσο στην αργή, από γενεά σε γενεά κοινωνική αλλαγή, στην ενεργή κοινωνική κινητικότητα (‘κινητότητα’) και υπό το πρίσμα όχι νεοαφιχθέντων γεωργών από τη Νεολιθική Ανατολία, αλλά των ντόπιων Μεσολιθικών Αιγαιακών κοινοτήτων. Πιθανόν να μην πρόκειται περί απόφασης (μετα)κινούμενων γεωργών να «αποικήσουν» γειτονικές περιοχές, αλλά περί απόφασης ντόπιων κυνηγών και τροφοσυλλεκτών να υιοθετήσουν (επιλεκτικά) επινοήσεις από τις περιοχές όπου αυτές προέκυψαν και να τις προσαρμόσουν στις δικές τους ανάγκες. Ως ενεργοί λήπτες αποφάσεων, έθεσαν σε κίνηση μια διαδικασία η οποία δεν οδήγησε μόνο σε οικονομικές αλλά και σε κοινωνικές και πολιτισμικές αλλαγές με το πέρασμα αρκετών γενεών.

**Λέξεις κλειδιά:** η περιφέρεια του Αιγαίου; Ανατολία; Μεσολιθική; Αρχαιότερη Νεολιθική; κινητικότητα; κινητότητα; ραδιοχρονολόγηση; καινοτομίες; κοινωνική αλλαγή μεταξύ των γενεών

## Introduction: Legacies, viewpoints, and biases

Few other transformations in human mankind were as fateful as the overcoming of the direct dependency upon edible resources as provided by nature. The controlled replication, re-creation and mastering of basic foods is seen nowadays, contrary to what appeared as a “revolution” to V. G. Childe<sup>1</sup>, as a long-lasting process starting thousands of years before the storage of supplies was possible in durable containers<sup>2</sup>. Humans were thereby no longer compelled to move with groups of migrating wild animals suitable for hunting, or to collect and consume (more or less instantly) the plants and fruits of a specific area. The free choice of favourable living places, better living conditions as well as raising conditions for offspring, the availability of nourishment, and the (possibly) less restricted

1 Childe 1951.

2 Zeder 2009.

conditions for reproduction led to a constant increase in population during the Neolithic.

One of the major topics debated until few decades ago centred on the question whether the “Neolithic Way of Life” appeared independently in Asia and in Europe. Today most archaeologists agree to the antecedence of the Near Eastern Neolithic, yet they still strongly debate the way in which farming spread from the “Core area” or “Primary Neolithisation Zone” to “Secondary Neolithisation Zones” (e. g. the Aegean and the Balkans). Two main scenarios, mutually exclusive of each other, have been proposed: that of population movements (by colonists or migrants) and that of the diffusion of ideas and knowledge (without people leaving an area and settling down at a close or far distance). Well into the second half of the 20<sup>th</sup> century, owing to Childe’s influential writings, the main explanation was that of cultural change induced by the diffusion of people. Later autochthonous models became more prominent, although, and especially in the Aegean, colonisation models predominated. Nowadays, owing to interdisciplinary investigations, migration models receive much emphasis, and expectations are high that especially the study of aDNA and strontium isotopes will shed more light onto the still open discussion – but human bone samples from exactly the contact zone between Asia and Europe are still very sparse. No conclusive results have as yet been obtained that would disclose the genomes and phenotypes of the late Mesolithic and the early Neolithic populations of the circum-Aegean region.

Simplified views mask the contribution of the Mesolithic communities and overshadow a more thorough and detailed analysis of the enduring transformations traceable in the secondary Neolithisation areas like those of Southeast Europe. Additionally, a black-and-white thinking in contrasting pairs: mobile – sedentary, consuming – producing; old-fashioned – progressive; simple – complex, etc., constitutes the scientists’ reference classes. As K. Kotsakis repeatedly argued<sup>3</sup>, bipolar arguments as well as the disregard of the social dimension of space and time have favoured simplified colonisation and diffusion models. Such stereotypes were transferred also to the communication among scientists by either assenting colleagues as “autochthonist” and “indigenist” or not, as “diffusionist” and “colonist” or not. But when carefully reading the original publications, such clear-cut positions can only seldom be ascertained. Even D. R. Theocharis, who can be considered as the most prominent representative of an autochthonous development based on a local domestication of plants and animals in Greece, acknowledged the temporal

supremacy of the Near East and an “indirect diffusion” from there<sup>4</sup>. Albeit this small but important insertion has often been ignored when quoting him, his concept certainly cannot be conceived as a static one.

During the past 100 years we were accustomed to looking at the Aegean as separated into two different worlds: here the West and there the East; here Greece – there Turkey, here Christianity – there Islam, here Europe – there Asia, here Indo-European – there Turkic languages. This dichotomy has greatly influenced our perception of the Aegean: of the way in which the land- and seascapes there were used, of how populations moved within them, and how cultural exchange happened. Basically, the Aegean has been seen as a transitional space: A plenitude of maps shows east–west oriented arrows of different size and thickness, indicating a direct and swift movement of people through this space.

Apart from such geographical shortcomings, also the ecological assessment of the areas under discussion has seldom been sufficiently treated. It appears as if the pre-supposed migrants were moving through an imaginary space without obstacles and adversities. Environmental impediments resulting between the source-area of a highland (the Anatolian Plateau), the target area of a sea with its many bays and coastal plains (the Aegean), and the arid and steppe-like climate of a vast plain (Thessaly) have not been quantified. The different ways of moving (by foot, by boat on the open sea or along river courses) and the different speed resulting from the natural environmental conditions were not envisaged. Besides, explanatory approaches are dedicated too much to large scale processes in only one (east–west) direction and too little to small scale migrations of individuals in perhaps even different directions.

Owing to the research traditions and possibly also to the fact that comparatively little research funds have entered the systematic study of the Mesolithic in the circum-Aegean, because significantly fewer prehistorians focus on pre-Neolithic periods, the dominant narratives received little counterbalance. At the heart of the proposed models discussing the spread of farming is still the cultural change. The emphasis on culture draws from Childe<sup>5</sup>, who compared the material culture from the different parts of Anatolia and Europe and explained the changes on behalf of population movements. More attention was paid in the 1970s to economic aspects<sup>6</sup>. The new subsistence strategies were further directly connected to a variety of other

<sup>4</sup> Theocharis 1973, 34–36.

<sup>5</sup> Childe 1950.

<sup>6</sup> Ammerman/Cavalli-Sforza 1973.

<sup>3</sup> Kotsakis 2014, 44.

changes, like technological change<sup>7</sup>, new languages<sup>8</sup>, or new religions<sup>9</sup>. Since the 1990s new social behaviour<sup>10</sup> and new symbolic meanings<sup>11</sup> have been discussed and more recently new genes discovered<sup>12</sup>. Such radical transformations going on in Southeast Europe seemed hardly conceivable within what retroactively seemed to be merely a short time period, if not by the swift colonisation or migration of larger groups originating from Anatolia.

Studies focusing on the Aegean and adjacent regions further lacked a broader theoretical foundation: poorly conceptualized notions like the “Neolithic Package” and a selective discussion of certain elements of the material culture resulted more often than not in linear models of colonisation and/or migration. These models have at their very centre the expected and well-known result of the process: that of the prevalence of the Neolithic way of life. Few models put the Aegean foragers of the Mesolithic at their centre and try to conceive the transformations from their perspective. During the 20<sup>th</sup> century AD foragers were thought to have been inferior to the higher developed superior groups of farmers: a rather discriminative attitude. This way of thinking may be the legacy from the colonial era, when the hunting, fishing and collecting aboriginal peoples of the Americas, of Africa or of Australia were regarded as backward and were humiliated, enslaved and decimated by the “civilized”, “superior” colonists<sup>13</sup>. Many terms and concepts used (often uncritically) in prehistoric archaeology derive from this century-long colonial period that only gradually came to an end after the Second World War. Even until the late 20<sup>th</sup> century the vocabulary of archaeologists contained formulations like “agricultural colonization”, “penetration”, “expansion”, “expanding farming” and “wave front” for pointing out the overwhelming dynamism of the Neolithisation process<sup>14</sup>. Yet, such terms easily obscure the fact that the transition to agriculture was carried out by persons and not by an amorphous mass of people, as pointed out a decade later by R. Tringham<sup>15</sup>. At the turn of the millennia, more importance had been given to Mesolithic indigenous populations<sup>16</sup>, albeit less so in the Aegean<sup>17</sup>.

Thus, it is the completed process of cultural change that has been mainly investigated, with transformations mostly explained through the lenses of those who prevailed: the farmers.

Bearing this in mind, why not contemplate this process as a slow social change? Little attention has been paid by archaeologists to sociology, even though since the 1970s sociologists have studied systematically the movement of peoples. Humans always were and still are mobile; this is a truism. As K. Bade pointed out, *Homo sapiens* spread all over the world as *Homo migrans*, the history of movement being an integral part of the general history<sup>18</sup>. More recently the migrating woman, *Femina migrans*, has become an important *topos* in sociological studies<sup>19</sup>. Whereas women were hitherto described as migrants dependent upon husband and family, as passive and unable of independent decision-making, this image is now under revision. And it should stimulate discussions also in prehistory since in those cases where systematic stable isotope analysis has been effected, it was mainly women who changed their living places<sup>20</sup>. In this context, the finding of G. Clark is very interesting: namely that social mobility would proceed at a similar rate in all of the societies and in all of the periods of history that he had studied. An exception though are social groups with higher endogamy – they experience higher social persistence and thus lower social mobility<sup>21</sup>. Exogamy can thus be considered as a key to social change.

Therefore, the main focus in this study will be on the slow intergenerational social change and not on the seemingly abrupt cultural change. The first – social mobility (motility) – has not been included in the theories of Neolithisation processes in the Aegean so far. Of interest here is the viewpoint of Mesolithic hunter-gatherer-fishers as active and competent decision makers. As St. J. Mithen argues, this age is of none too little significance, but instead of great social and economic change<sup>22</sup>. Questions targeted at the role that Mesolithic foragers and fishers played in the transformation processes are more than justified: Were the native populations actively involved in a decision-making process? Did they – and if so, why and how did they – accept and integrate innovations into their daily lives? In this respect it is necessary to incorporate also theories of innovation into the discussion: e. g. how

7 Elster 1978.

8 Renfrew 1987.

9 Gimbutas 1974.

10 Hodder 1990.

11 Cauvin 1994.

12 E. g. Mathieson *et al.* 2015.

13 Osterhammel/Jansen 2012.

14 E. g. Anthony 1990.

15 Tringham 2000, 31.

16 Zvelebil/Lillie 2000.

17 Kyparissi-Apostolika 2000; Sampson 2015.

18 Bade 2004, 27.

19 Liebig 2011, 19–35.

20 Borić/Price 2013; Knipper 2016; Thissen 2017, 80.

21 Clark 2014.

22 Mithen 1990, 91.

did innovations spread? And when exactly did the different Neolithic innovations reach the Aegean?

Especially important for achieving a more detailed view is a reliable chronological framework: The narrative of a massive movement from east to west was reinforced by radiocarbon dates from the 1960s and 1970s that seemed to suggest a beginning of the Neolithic in the Aegean around 7000 BC, during the Pre Pottery Neolithic B (PPN B). Newer sets of <sup>14</sup>C dates modelled according to Bayesian statistics reveal that the economic transformations reached Europe via the Aegean only around 6600 calBC, several centuries after the broad introduction of pottery around 7000/6900 calBC<sup>23</sup>. A re-evaluation not only of old radiocarbon dates but also of the documentation and of publications related to such “Preceramic” sites (e. g. Argissa Magoula, Sesklo A, Sesklo C, Achilleion, Gediki, Souphli Magoula) has shown that pottery did indeed appear in the earliest levels; however, it was interpreted as intrusive from above<sup>24</sup>. At some sites, though, the lowest levels apparently are devoid of sherds. This is the case not only at sites excavated and interpreted in the 1950s–1970s (Knossos X<sup>25</sup> or Franchthi Cave with the so-called “gray clay stratum”<sup>26</sup>), but also in recent excavations as in Ulucak VI<sup>27</sup> and at Uğurlu<sup>28</sup>. Such Aceramic levels are nonetheless exceptional as the overwhelming number of Neolithic sites in the Aegean belongs to the pottery Neolithic<sup>29</sup>.

Nowadays, the beginning of the Neolithic around or even after 6600 calBC as described by different authors<sup>30</sup> is largely accepted. The re-dating of the beginning of the Neolithic from 7000 to 6600 calBC, the de-construction of the Preceramic Period in the Aegean and the confirmation of the presence of Mesolithic groups in almost all parts of the Aegean<sup>31</sup> form the basis for a renewed interpretation of the Neolithisation process in this region.

Generations of archaeologists have invested hard work and thorough thinking to prehistoric processes that are difficult to be satisfyingly documented. Thus, the perception of movements of people and/or of information about them are partly directed by convictions that may have derived from both the “*Zeitgeist*” and from personal

experiences (e. g. pre-war, war or post-war generations, potentially experiencing escape and eviction – or, to the contrary, living in democratic and co-operative societies). It is impossible to quote all of the sources absorbed that led to the model exposed here, but I certainly do build upon the wisdom of the previous generations with results that were valid for their times. The claim of this contribution is no more than to reflect upon the information that we possess at the moment from the Aegean area, including also past theories and current discussions in sociology.

Consequently, a circum-Aegean view will be proposed here that highlights, apart from uni-directional population movements also the behaviour of geographically mobile and socially motile “innovators” of the Aegean.

## Anatolia and the circum-Aegean sphere: geographical and ecological spaces

The umbrella under which different “grand narratives” of colonisation and migration can be subsumed throws a lot of shadow exactly on the coastal areas of the Mediterranean and the Aegean. Especially the Aegean can be conceived as an interconnected and interrelated space with different subregions that can be described according to geography and fault lines crossing the Aegean Basin. The three main regions under discussion here are the eastern Aegean (i. e. western coastal Anatolia), the western Aegean (mainly Thessaly and Boeotia) and the southern Aegean (the Peloponnesus and Crete). Therefore, the term circum-Aegean incorporates not merely the Aegean Sea and its islands, but also includes the coastal areas up to the hilly slopes. The outer boundaries are thus given by the frame of the different surrounding mountains: roughly the Pindus, the Rhodopes and the Anatolian Plateau<sup>32</sup>. Northwestern Anatolia with the Sea of Marmara is regarded here as a separate catchment: How exactly the relationship between the southern Marmara region with the northern and eastern Aegean can be described will be a matter of future research.

The Neolithisation process in the Aegean has not been viewed in great detail before as being dependent upon the ecological space that can also delineate a social space. It has not been questioned why groups of people

<sup>23</sup> Thissen 2007. All dates mentioned in this contribution are freely accessible at [www.14SEA.org](http://www.14SEA.org).

<sup>24</sup> Milošević 1962, 8; *contra*: Reingruber, 2008, 144.

<sup>25</sup> Evans 1971.

<sup>26</sup> Payne 1975.

<sup>27</sup> Çilingiroğlu/Çakırlar 2013.

<sup>28</sup> Erdoğan 2017.

<sup>29</sup> Reingruber 2015.

<sup>30</sup> E. g. Reingruber/Thissen 2009; Weninger *et al.* 2014; Reingruber *et al.* 2017b; Douka *et al.* 2017.

<sup>31</sup> Galanidou 2014; Kaczanowska/Kozłowski 2015; Sampson 2015.

<sup>32</sup> For more details compare Reingruber/Thissen 2016: [www.14sea.org/3\\_II\\_aegean.html](http://www.14sea.org/3_II_aegean.html).



Fig. 1: Southwest Anatolia with Epipalaeolithic/Mesolithic and Neolithic sites

from the highland of Central Anatolia who had no access to the Sea should have colonised a completely different ecological and geographical area, that of coastal regions, and whether they were able to navigate the Sea. The idea of the concordance of ecological with social spaces and the definition of “agricultural frontiers” (zones of interaction between foragers and farmers) is not new; it has been explained by M. Zvelebil and M. Lillie<sup>33</sup> and need not be repeated here. Although the two authors have discussed their model for other parts of Europe, it certainly has validity for the Aegean sphere as well.

Yet, little attention has been paid to the fact that Central Anatolia (with sites like Çatalhöyük) and the Lake District of southwestern Anatolia (e. g. Hacılar) are separated by the steep mountain range of the Western Taurus (Fig. 1). Whereas Çatalhöyük is situated at the very western limit of a socially sedentary sphere, culturally PPN-coined and chronologically belonging to the late 8<sup>th</sup> millennium BC, Hacılar and Kuruçay are at the northeasternmost limit of an ecological space characterized by mountains and lakes at higher altitudes. The perception of the sites in the Lake District has been biased by the (in my view) wrong interpretation of an early Aceramic occupation in Hacılar<sup>34</sup>,

constructed around the reported absence of sherds and a single <sup>14</sup>C date from the very beginning of the radiocarbon method (BM-127: 8700±180 BP; 8170–7570 BC). No Aceramic levels have appeared in subsequent excavations directed by R. Duru at the periphery of the mound: Sherds were found not only on but even inside the red-plastered floors<sup>35</sup> that are considered by some authors to be related to the PPN. Although Duru argues against the existence of an Aceramic period in the Lake District, he does not question the relevance of the high date BM-127, even though this date has not been backed by any other dates, neither from the site itself nor from the broader region, and should be dismissed as an outlier.

Southwestern and Western Anatolia are characterized by at least three different geographical spaces (Fig. 1):

- the Mediterranean coast near the Gulf of Antalya with rock shelters and caves used both in Epipalaeolithic/Mesolithic as well as Neolithic times, unfortunately only poorly researched;
- the Lake District characterized by mountains and valleys with important Neolithic tell-sites;
- the Aegean coast with many bays and rivers flowing into them, neighboured by both larger and smaller islands.

<sup>33</sup> Zvelebil/Lillie 2000, 60–64.

<sup>34</sup> Mellaart 1970; Reingruber 2008, 420–432.

<sup>35</sup> Duru 1989, 101 Fig. 1 Pl. 19,4–9.

Known until recently through Neolithic sites only, the presence of Mesolithic hunter-gatherer-fisher is now attested by the further inland site of Girmeler<sup>36</sup> and three coastal sites: one site located on the peninsula of Karaburun<sup>37</sup> and two other sites on the islands of Ikaria and Chalki<sup>38</sup>.

Due to this special geographic conditions with islands in eyesight separated by navigable waters, greater emphasis should be placed on these coastal zones connected in a trans-Aegean perspective<sup>39</sup>. Whereas until now a rather bidirectional exchange has been considered, one decade later it is possible to take the discussion a step farther and speak of a multidirectional circum-Aegean approach<sup>40</sup>. As has recently been pointed out again<sup>41</sup>, coastal affiliations played a major part in the Neolithisation process of the Aegean.

## Spaces and places and their absolute chronological appraisal

Indeed, as we move from east to west the radiocarbon dates decrease in age: the oldest dates in the Near East from sites of the PPN A belong to the 10<sup>th</sup> millennium BC; the dates from the Central Anatolian PPN B fall between the late 9<sup>th</sup> millennium BC (Aşıklı Höyük) and around 7000 calBC (Çatalhöyük XII). More insightful for our purpose are the Neolithic sites and dates from the coastal plains: Mersin-Yumuktepe and the area around Antalya with dates from the mid-7<sup>th</sup> millennium BC. In the latter region Beldibi and Belbaşı, two abris near the coast, as well as the caves of Karain and Öküzini were visited by hunters and gatherers and after ca. 6700 BC also by farmers (unfortunately there are no dates available from Beldibi and Belbaşı). Opposite Öküzini and Karain, on the other side of the same mountain, lies the oldest hitherto known Neolithic site of the Lake District: Bademağacı<sup>42</sup>. In this area appear also other important tells of the Neolithic like Höyücek, Hacılar and Kuruçay<sup>43</sup>. In general it can be stated that the farther north a site is situated from the coast (Fig. 1), the later it was founded<sup>44</sup>. This is indicated specifically by the <sup>14</sup>C dates (apart from the problem-

atic dates from Hacılar from the beginning of the radiocarbon method).

A possible interpretation of this corollary is that the Neolithic way of life did not spread from Çatalhöyük directly to Hacılar and from there to Sesklo in Thessaly. It is not only or mainly the Central Anatolian highland that must be considered as the direct source for transformations occurring in the Lake District, but also (or perhaps rather) the Mediterranean coastal plain around Antalya (and the more eastern plain around Mersin). Only a few decades later Neolithic sites appeared farther west, in the eastern Aegean: not in 7000 calBC as previously thought, but indeed only after 6700 calBC<sup>45</sup>. Hence, the impulse for the Neolithisation of the Aegean did not derive directly from the Anatolian Plateau, but from the coastal area where the Mediterranean and the Aegean Seas merge and where seafaring hunter-gatherer communities from the two catchments lived in close proximity.

A more detailed observation reveals that not all circum-Aegean Neolithic sites appeared at the same time. New sets of <sup>14</sup>C dates enable us to describe more regional changes, not in terms of centuries anymore, but in terms of decades. The oldest dates known until now are situated in the eastern Aegean: the dates on grains from Çukuriçi Höyük and Ulucak concentrate around 6750/6500 calBC. Modelling them, Weninger was able to pinpoint the decades around 6630 calBC for the start of the sites<sup>46</sup>. These earliest dates are followed by those from the southern Aegean, from Knossos on Crete around 6600/6500 BC<sup>47</sup> and from Franchthi around 6600/6450 calBC<sup>48</sup>. The first dates from the western Aegean, from Sesklo and Argissa, are even younger, around and after 6500 calBC<sup>49</sup>. Lately the northern Aegean stands out as well with very early dates from the sites of Uğurlu (on the island of Gökçeada/Imbros) and Paliambela-Kolindros (in central Macedonia); however, like the dates from Mavropigi (in western Macedonia), they do not form a continuous sequence that can be modelled. Therefore, it is methodologically problematic to compare single high dates deriving from different materials (even human bone as in Mavropigi) with modelled sequences of dates on grains<sup>50</sup>. The modelled sequence of dates from Barcın Höyük in the neighbouring southern Marmara region also starts very early, around 6640 calBC<sup>51</sup>. Interestingly, Neolithic sites north of the Sea

<sup>36</sup> Takaoğlu *et al.* 2014.

<sup>37</sup> Çilingiroğlu *et al.* 2016.

<sup>38</sup> Sampson *et al.* 2012.

<sup>39</sup> Thissen 2005, 29–30; Reingruber 2008.

<sup>40</sup> Reingruber 2018.

<sup>41</sup> Horejs *et al.* 2015; Rosenstock forthcoming.

<sup>42</sup> Thissen 2000.

<sup>43</sup> Umurtak 2007.

<sup>44</sup> Reingruber 2008, 454–456 Tab. 5,7.

<sup>45</sup> Reingruber/Thissen 2016, [www.14sea.org/3\\_Ila-d.html](http://www.14sea.org/3_Ila-d.html).

<sup>46</sup> Weninger *et al.* 2014, 17–18.

<sup>47</sup> Douka *et al.* 2017, 308.

<sup>48</sup> Perlès *et al.* 2013.

<sup>49</sup> Reingruber *et al.* 2017b.

<sup>50</sup> Compare Reingruber 2015.

<sup>51</sup> Gerritsen *et al.* 2013.





**Fig. 2:** The circum-Aegean with the first appearance of obsidian from Melos; indicated are possible routes of exchange that outline a network between islands and especially southern coastal areas

of Marmara appear only centuries later, this Sea acting as a barrier rather than as a bridge<sup>52</sup>.

Nonetheless, the dates do indeed speak for a fast spread of the Neolithic, yet only for the basic elements of subsistence: animals and plants. They are indicative of the adoption of certain innovations first, followed during the centuries 6600/6500–6000 calBC by the incorporation into daily life of other items and practices. The intergenerational continuous exchange between groups of circum-Aegean mobile communities is therefore worth studying in more detail: it is about time to look at the Aegean not as a dividing but rather as a connecting and interrelated space in prehistoric times.

## The transitional communities of the circum-Aegean sphere

Some 15–20 years ago prehistoric societies in the Aegean were viewed exclusively as Greek, the Anatolian coastal areas not providing enough data to be included in volumes with titles like “Neolithic Society in Greece”<sup>53</sup> or “The Greek Mesolithic”<sup>54</sup>. Neolithic communities, more thoroughly investigated than the Mesolithic communities, were accepted as forming a society, whereas Mesolithic groups were not. In the last years our knowledge has impressively broadened: sites with early Neolithic levels have been investigated in the eastern Aegean according to modern standards<sup>55</sup>, and more data are available for the

<sup>53</sup> Halstead 1999.

<sup>54</sup> Galanidou/Perlès 2003.

<sup>55</sup> E. g. Çilingiroğlu *et al.* 2012; Horejs *et al.* 2015.

<sup>52</sup> Reingruber *et al.* 2017a.





**Fig. 3:** The circum-Aegean with an enhanced network during the Early and Middle Neolithic visualized on behalf of Melian obsidian exchanged especially between coastal and inland sites

Mesolithic as well<sup>56</sup>. Certainly, more evidence is needed in order to better define “Neolithic Aegean Society”, especially that of the Early Neolithic. And, certainly, more sites of the Mesolithic must be unearthed before we may view their groups as a discernible society<sup>57</sup>.

Nevertheless, on the basis of the existing evidence certain elements can be traced that lead to the comprehension of the hunter-gatherer-fishers as “a unified body of individuals such as an interacting population of various kinds of individuals (...) in a common location”<sup>58</sup>.

<sup>56</sup> Sampson *et al.* 2009; Galanidou 2014; Kaczanowska/Kozłowski 2015.

<sup>57</sup> The term ‘society’ is used here in its most basic meaning as defined by Merriam-Webster’s Dictionary: “a cooperating social group whose members have developed organized patterns of relationships through interaction with one another” or even “having common traditions, institutions, and collective activities and interests”: <https://www.merriam-webster.com/dictionary/society>.

<sup>58</sup> <https://www.merriam-webster.com/dictionary/community>.

According to this definition the interacting individuals form groups and develop relationships among each other; such groups are the basis of a community. A community is therefore a system of relationships that exists among the individuals of the groups.

The Mesolithic hunter-gatherer-fishers were not static communities, unchanged since Palaeolithic times, but very dynamic communities, adapting to changing environments and new challenges. Not only terrestrial but also aquatic (both freshwater and marine) resources were exploited more systematically. Especially the coastal, riverine and lake side areas with their rich resources, high biomasses and diverse range of available foods fostered social dynamics that were different from those farther inland. It may not be a coincidence that burial grounds have been reported mainly in coastal areas in northern Europe<sup>59</sup> and also in the Aegean, for example, at Marou-

<sup>59</sup> Mithen 1990, 101 fig. 4,5; 181.

las on the island of Kythnos<sup>60</sup> and in the Franchthi Cave on the peninsula Ermionida, Argolis<sup>61</sup>. Seafaring and at least some basic nautical knowledge were shared by these coastal communities ever since the Final Palaeolithic, when obsidian from Melos was utilised on the mainland, for example, in the caves of Franchthi and Sarakenos<sup>62</sup>. By the end of the Mesolithic this raw material was widespread throughout the Aegean. Obsidian is a good proxy for visualising the networks and the relationships among the groups that formed the Mesolithic community (Fig. 2<sup>63</sup>): not only is the knowledge of the source shared by the whole community, but also the access is granted and the exchange with more distant groups of the community is ensured. Groups of the Aegean Mesolithic are further outstanding as funeral or burial communities, practicing both interments and cremations<sup>64</sup>. They must be envisaged also as a seafaring community, their navigational skills being traceable back to the transition from the Final Palaeolithic to the Mesolithic.

Looking at the stone tools, one can also speak of a “technological community”<sup>65</sup> or „communities of practice”<sup>66</sup>. Not only in the Aegean but throughout Europe new materials and new tools spread rapidly, in specific the geometric microliths. As parts of composite tools, inserted in wooden shafts, triangles were obtained from standardized narrow blades. But after ca. 7500 BC trapezes, obtained from broader blades, came into use<sup>67</sup>. Because they were more effective than other microliths, they remained in use for millennia only to be replaced in the Aegean at the end of the Middle Neolithic by tanged points.

The Mesolithic community is therefore envisaged here as a community in constant change, adapting and adopting, making its own decisions. But it is the individual him/herself who should be placed in the foreground, not the amorphous mass of people acting according to the rules that we archaeologists posit for them. It may be argued that this view is a very modern one, in which the individual and his/her fulfilment are in the very centre of today’s attention; nevertheless, it is the individual who is the basic component of any community. According to Mithen it is his/her own decision-making process that bears con-

sequences for survival and reproduction<sup>68</sup>. He sees the “creative thought” as the driving dynamic of change and as the essential element in the active process of adaptation<sup>69</sup>. The underlying social principle is not that of competition leading to conflict, but rather that of competition leading to mutual advantages, co-operation and interaction. It is the individual arriving at a decision (at times a long and possibly difficult process), whereby other individuals either actively co-operate or just follow. According to Mithen<sup>70</sup> the decision-making process requires both past background knowledge and newly acquired information gained through the own experiences and perceptions (seeing, hearing and feeling), or obtained from other individuals: this is very much in the line of thought regarding the spread of innovations (see below).

The capacity for learning and the importance of teaching are universal and time-independent: above all, passing on knowledge and skills that were essential for survival were child-rearing practices in the world of hunter-gatherer-fishers as well as of farmers. The strong intergenerational correlation not only between parent and child, but among several generations in different political systems and different historical times in any given area has been emphasized by Clark<sup>71</sup>: The underlying social competence of a family and the aspiration of parents for the social success of their children determine the rate of social mobility. We may conjecture that a prehistoric community consisting of individuals in constant exchange in a given geographical region, practicing exogamy, integrating innovations and enhancing not only their subsistence strategies, but also the technological possibilities was open to cultural and social change. The distinction between a predominantly acquiring and a predominantly producing economy may seem only in retrospect as a decisive feature. Further, the transitional generations themselves may not have foreseen the outcome of their individual decisions.

The intention of the clarifications expounded above is to loosen up the all too clear-cut differences between “Mesolithic” and “Neolithic” communities. The last generations of hunter-gatherer-fishers and the first generations of farmers may not have been so distinctly different as often thought today. As pointed out by Zvelebil and Lillie, mostly single mobile individuals or small groups ensured contacts between different communities<sup>72</sup>. Taken a step

<sup>60</sup> Sampson *et al.* 2010.

<sup>61</sup> Cullen 1995.

<sup>62</sup> Perlès 1987; Sampson *et al.* 2009.

<sup>63</sup> Compare also Kopaka/Matzanas 2009; Laskaris *et al.* 2011; Galanidou 2014; Kaczanowska/Kozłowski 2015; Carter 2016.

<sup>64</sup> Lichter 2017.

<sup>65</sup> Kaczanowska/Kozłowski 2015.

<sup>66</sup> Wenger 1999.

<sup>67</sup> Mithen 1990, 190.

<sup>68</sup> *Ibid.* 7.

<sup>69</sup> *Ibid.* 12; 191.

<sup>70</sup> *Ibid.* 26; 32.

<sup>71</sup> Clark 2014, 212; 286.

<sup>72</sup> Zvelebil/Lillie 2000, 63.

further, the scenario developed here is not envisaging two different blocks of groups, one of Mesolithic foragers and the other of Neolithic farmers who lived separated, but rather groups cooperating with each other, connected by kinship, alliances and other social ties. The network visualized by the spread of Melian obsidian operated not only during the Mesolithic, but developed well into the Neolithic (Fig. 3). It served as a means for the exchange of knowledge, information, optimal products, innovations and genes (spouses).

## Mobility/ies: Conceptualized terms in sociology *versus* descriptive terms in archaeology

Hardly any model pertaining to the Neolithisation process in the Aegean denies the exchange of ideas and commodities between the Aegean and Anatolia. People always were and still are mobile – this is indeed commonplace (the other extreme, that of non-mobility in a purely autochthonous development, lacks any theoretical background; it will not be followed up in this contribution). Hence, movement should be understood as an essential part of prehistoric communities. It is therefore not really explicable why the systematic approaches to describe mobility in sociological studies went unnoticed in archaeological literature of the 1970s and later. Terms and concepts used for explaining cultural change were only vaguely defined or not at all; comprehensive studies conceptualizing and treating systematically notions such as colonisation or migration appeared only late in archaeology<sup>73</sup>. Certainly already earlier, in the 1990s, archaeologists attempted to describe the phenomenon of migration in prehistory<sup>74</sup>. These authors also complained about the general paucity in theories during the 1980–1990s and held the generation of post-processual archaeologists as responsible<sup>75</sup>: war, invasion or colonisation were no longer important topics of debate. Their assessment takes into account only Anglo-Saxon writings and does not explain the failure in archaeological literature of the 1980s to incorporate knowledge from social sciences.

<sup>73</sup> Burmeister 2000; Prien 2005.

<sup>74</sup> For a brief history of research compare Anthony 1990; Chapman/Hamerow 1997.

<sup>75</sup> Chapman/Hamerow 1997, 4.

## 1 Colonisation

Already in the late 19<sup>th</sup> and early 20<sup>th</sup> century AD sociologists were concerned with the problem of mobility and defined several types thereof: For example, H. Fairchild distinguished between a) Invasion, b) Conquest, c) Colonisation, and d) Immigration<sup>76</sup>. Within the first three cases an inherent cultural gradient or declivity was assumed and only in case d) was a similar stage in civilization supposed. The term “colonisation” according to Fairchild thus designates the populating of a newly discovered or sparsely populated area by a progressive community, the penetration of culturally higher developed groups of people into the territories of less developed indigenous peoples.

This kind of definition was criticized already in the late 1950s by W. Petersen, since: “an attempt to distinguish between ‘high’ and ‘low’ cultures is an invitation to ethnocentrism”<sup>77</sup>. Instead, Petersen distinguished between an “innovative” and a “conservative” movement: People would migrate either to achieve a new goal or to preserve the status they have<sup>78</sup>. And later also P. Franz questioned such typologies which rely on empirically non-verifiable assumptions (e. g. that of a “cultural gap”, German “*Kulturgefälle*“)<sup>79</sup>. Such interpretations obtained are then not the result of documented studies, but of suppositions and convictions.

However, in archaeological Aegean literature the process of colonisation is considered to be a plausible explanation for cultural change: Accordingly, colonists had introduced the achievements of the Neolithic way of life directly into the Aegean, i. e. people moved with their belongings. One of the most influential articles using the notion of colonisation in Aegean prehistory is the publication by J. Cherry in 1981. He defined the colonisation of especially the eastern Mediterranean islands on behalf of premises like:

- Premise 1: The islands of the eastern Mediterranean were not inhabited in pre-Neolithic times – apart from the Middle Palaeolithic finds on the island of Alonissos<sup>80</sup>; the “initial island colonization”<sup>81</sup> took place at a “late phase” of the spread of the Neolithic in Europe<sup>82</sup>. This is an important point as Cherry used the term “colonisation” for describing only the first

<sup>76</sup> Fairchild 1925, 13 ff.

<sup>77</sup> Petersen 1972, 96.

<sup>78</sup> Ibid. 97.

<sup>79</sup> Franz 1984, 52.

<sup>80</sup> Cherry 1981, 58.

<sup>81</sup> Ibid. 42.

<sup>82</sup> Ibid. 59.

human occupation of an island, meaning that there was no Mesolithic population existent with which the first farmers could have come into contact.

- Premise 2: Although Cherry envisaged a “*purposive* behaviour over a relatively short time-span” for the colonisation of the Mediterranean islands in general, as opposed to a “*passive* colonization process” in the case of animals and plants<sup>83</sup>, turning to the case of the Aegean islands he found that “the principles of faunal colonization and extinction” would serve well to explain the archaeological record in the Aegean<sup>84</sup>.

Premise 1 was invalid even before Cherry published his influential article, for already in 1972 K. Honea discovered evidence for Mesolithic occupation on the island of Kythnos, in Maroulas<sup>85</sup>. Although Cherry dismissed this proof as untenable, Honea was nevertheless proven correct: Subsequent excavations led by A. Sampson between 1996 und 2001 confirmed the existence of Mesolithic groups of people on Aegean islands<sup>86</sup>. Indeed, it was found that not only Kythnos but also other islands like Ikaria, Crete, Gavdos, Youra, Melos, Naxos and Chalki had been populated by Mesolithic foragers and fishers<sup>87</sup>.

Regarding Cherry’s second premise, sociologists have clarified during the 1970s that a colonisation process is never purely “biological” in the way that birds or plants colonise an area<sup>88</sup>. It always has economic and political causes; parts of a community are sent by a political system with an advanced administrative organisation for settling in a distant area<sup>89</sup>. Unidirectional and swift movements of small groups were preceded by “scouts” exploring the territory and (possibly) followed by other groups with different purposes. And it is expected that the aboriginal population will adapt to the newcomers<sup>90</sup>.

Cherry himself doubted that the term “colonisation” was appropriate and cautioned that it was perhaps misleading, since it had the connotation of a well-planned expedition by a group of people. Alternatively, he spoke of “short-distance reciprocal movements” by few individuals only<sup>91</sup>. Yet later, both his doubts and his clarifications were ignored and the colonisation narrative was used for

the mainland as well<sup>92</sup>, although it was known that Mesolithic communities had indeed lived there<sup>93</sup>. The term “colonisation” is used by archaeologists following in the footsteps of Cherry in a basic definition as “the ‘setting up’ of people’s presence in a geographical area”, be it in Neolithic or even in Mesolithic times<sup>94</sup>. Lately, the notion of colonisation has also been used for the eastern Aegean<sup>95</sup> – although by now there is already evidence (admittedly scant) for an early Holocene presence in Girmeler, on the peninsula of Karaburnu, and on the islands of Ikaria and Chalki close to the mainland and to Rhodes. Thus, it seems to be only a question of time until more such sites are discovered.

It appears that archaeologists tend to use the notion “colonisation,” when a Mesolithic occupation of the area into which “colonists” move has either not been noted or when the Mesolithic hunter-gatherer-fishers there played a negligible role. Therefore, “colonisation” as a concept does not explain the complex transformations at the Mesolithic–Neolithic interface in the Aegean, because this model includes only half of the story: that of the newcomers as colonists. It completely ignores the local, Mesolithic population and the role it might have played in the whole story.

Yet, it is beyond the scope of this paper to dwell on the topic of colonisation if not in direct connection to the Aegean. In the last years a variety of publications have appeared that attempted to overcome simplistic models, in which maps are not criss-crossed by big arrows pointing to direct movements from east to west (e. g. Guilaine conceiving the spread of the Neolithic as an arrhythmic process<sup>96</sup>). Since in many publications mass migration and colonisation are used more or less synonymously, more weight will be placed in the following on the discussion of migration.

## 2 Migration

In the early 1970s a turning point in sociological methodology regarding the study of mobility must be acknowledged. Both simplifying typologies and generalizing approaches were not at the centre of investigations anymore. This may have to do with É. Durkheim’s quest according to which:

<sup>83</sup> Ibid. 41–42.

<sup>84</sup> Ibid. 59–60.

<sup>85</sup> Honea 1975.

<sup>86</sup> Sampson *et al.* 2010.

<sup>87</sup> Sampson *et al.* 2012; Kaczanowska/Kozłowski 2015.

<sup>88</sup> Albrecht 1972, 16.

<sup>89</sup> Ibid. 27.

<sup>90</sup> Ibid. 28.

<sup>91</sup> Cherry 1981, 60.

<sup>92</sup> Perlès 2003.

<sup>93</sup> Runnels 1995.

<sup>94</sup> Dawson 2013, 42.

<sup>95</sup> Horejs *et al.* 2015.

<sup>96</sup> Guilaine 2007, 166–176.

“The first step of the sociologist must therefore be to define the things he examines, so that one knows and knows exactly what the problem is. This is the first and unavoidable prerequisite for any proof and verification [...].”<sup>97</sup>.

It was indeed Durkheim’s demand that motivated H.-J. Hoffmann-Nowotny<sup>98</sup> to a first comprehensive definition of the term migration. Only two years later G. Albrecht also treated the phenomenon of geographical mobility and mass migration systematically<sup>99</sup>. Both sociologists complained about the variety of explanations of low-level abstraction that dominated the discussion in studies related to migration<sup>100</sup>, or the general lack of theory (German “*allgemeine Theorielosigkeit*”<sup>101</sup>). In their writings they aimed towards a more systematic theory of migration. Typology is largely dispensed with, since different cases can be combined and many differentiating features used<sup>102</sup>. Each migration is understood as a process with numerous variables and must be analysed accordingly in various aspects.

Migration denotes the movement of people through space from a source area into a target area resulting in a permanent relocation of the place of residence<sup>103</sup>. Mass movement starts with small (pioneer) groups that are followed by larger groups. Other than in E. G. Ravenstein’s concept of 1885, in later discussions distance is considered less decisive than duration<sup>104</sup>. For other authors migration is considered regardless of both distance and duration<sup>105</sup>.

Nonetheless, migration is not the ordinary case of mobility: “Migration is a crisis phenomenon”<sup>106</sup>. Risk-takers, entrepreneurs and adventurers may have been among the pioneers of such a process, but the migration itself was induced by serious social instability. Therefore, migration never is a purely random result. To the contrary: the social context of a migration flow must be in the centre of attention, since even individual migrations are part of a corporate process. According to Albrecht migration is an interactive process and can be the source for fundamental changes in social organisation<sup>107</sup>.

In 1972, E. S. Lee introduced another important aspect into the conceptualization of migration: that of the individual decision-making process as a starting point for geographical mobility. These include the weighing of factors in the initial area and in the target area, overcoming obstacles, and personal factors, because the geographical migration does not happen “in itself” nor in the airless space.

Such systematic conceptualizations have led to the discussion of different kinds of models<sup>108</sup>, for example:

- model of social gravity (based on physical gravity), where distance plays a major role<sup>109</sup>: migrations become less frequent with increasing distance but migration costs increase with greater distances, while information becomes less. Among these the internal migration (from one settlement to the next) and chain migration are the well prepared and less risky kinds of migration<sup>110</sup>. Especially in the latter case also social and emotional commitments should also be considered during the decision-making process<sup>111</sup>;
- regression models, for which push and pull factors are discussed and where geographical barriers are considered to be potential cultural boundaries;
- simulation models, which include mathematical and probabilistic models.

Those models that envisage equilibrium in all systems developed into a system theory of migration, in which geographical mobility ensures the balance between power and prestige of individuals as well as whole societies<sup>112</sup>. In this view the unequal distribution of power and prestige is the main source of tension in and between social systems. Migration helps to reduce such tensions by achieving social equilibrium.

Migrations take place under certain conditions and they lead to certain consequences (whereby most scientists and sciences are more concerned with the consequences than with the causes). According to Franz mobility is not out of self-interest (this kind of movement would be sociologically uninteresting), but a means to achieve a specific goal<sup>113</sup>. If all mobile people pursue the same goal, then social and cultural changes can arise, including chain reactions and chain migrations. Therefore, questions must be answered concerning the social context of the migra-

<sup>97</sup> Durkheim 1961, 131; translation by the author.

<sup>98</sup> Hoffmann-Nowotny 1970, 50.

<sup>99</sup> Albrecht 1972.

<sup>100</sup> Hoffmann-Nowotny 1970, 47.

<sup>101</sup> Albrecht 1972, 11.

<sup>102</sup> Franz 1984, 52.

<sup>103</sup> Hoffmann-Nowotny 1970, 53; Albrecht 1972, 22–32; Han 2000, 10–12.

<sup>104</sup> Hoffmann-Nowotny 1970, 56.

<sup>105</sup> Franz 1984, 30.

<sup>106</sup> Diner 1998, 3.

<sup>107</sup> Albrecht 1972, 17; 279.

<sup>108</sup> Franz 1984, 52–60.

<sup>109</sup> Han 2000, 13.

<sup>110</sup> Ibid. 9; 12.

<sup>111</sup> Ibid. 14; Steele/Rockman 2003.

<sup>112</sup> Hoffman-Nowotny 1970, 146; Saunders 1956.

<sup>113</sup> Franz 1984, 10.

tion processes. Franz argues on two distinct levels, that of the personal behaviour of an individual (“individual category”) and that of the state of a society (“system category”) <sup>114</sup>. The “basic unit” is that of the mobile households (1+ persons) or of the families (2+ persons) with their movable property <sup>115</sup>.

In archaeological discourses the issue of “geographical mobility”, the movement of individuals or of small groups through a given space, has not been seriously conceptualized, at least not in the discussions concerning the Neolithisation process in the Aegean. Here we are dealing rather with a matter of belief and of convictions; the two types of mobility, colonisation and migration, are even used synonymously. Thus, no distinction is made as to whether people were moving into an unpopulated area or not. In the case of migration, interactions between newcomers and autochthonous populations should also be studied, in our case between the native Mesolithic populations and the migrating farmers. Yet, why should these farmers have become migrants in the first place?

Not only in the Aegean but for archaeologists in general it is rather a challenge to define criteria that are valid for the verification of a migration. During the earlier part of the 20<sup>th</sup> century AD it was generally accepted that prehistoric cultures represent a certain *ethnos* and that the similarity of archaeological materials found in two different areas would be proof for migrations. The main supposition was the existence of an organic connection between a social group (*ethnos*) and the cultural property (material culture) that they dispersed in the course of migration. This ethnocentric view has been heavily criticized by St. Burmeister, since there is no archaeological proof for “ethnicity”, the existence of distinct ethnic groups. Apart from this, a relationship between migration and material culture must first be established before using archaeological finds as arguments in favour of migration <sup>116</sup>.

The comparison of material culture in the source area (Anatolia) and in the target area of the presumed migrants (the Aegean) has been the aim of many studies on Aegean prehistory: using the “Neolithic Package” as a proxy, mainly direct movements of peoples have been proposed. The initial elements of the “Neolithic Package”, domesticated animals and plants <sup>117</sup>, did indeed appear first in Anatolia and much later in the Aegean. Domestication spread not only as an economic practice from

east to west, but also the animals and plants themselves moved, since they genetically derived from their eastern predecessors <sup>118</sup>. Since the 1990s the “Package” has been expanded by many other items that fit into the different argumentations (especially clay objects such as figurines, stamps, weaving implements, loom weights, mudbricks). Those elements that do not fit into the “Package” have been left aside, thus unadmittedly reducing the analysis of important factors. Therefore, the discussion surrounding the “Neolithic Package” is lopsided, because it is devoted to only a small part of the whole and not even the most important part: rituals such as burial customs belong on another level of human behaviour than the reproduction of certain clay objects. And even if new rituals arise (e.g. a presumed fertility cult) without the old ones being abandoned (burial rites), this is still not an indication for a population replacement.

Apart from this, a more detailed chronological discussion is needed, since the exact temporal relationship between the different elements of the “Neolithic Package” must be established first. As has been shown elsewhere, the elements of the “Package” are not at all coeval <sup>119</sup>. The “Package” is a palimpsest that covers 600 years of ongoing adaptation and adoption. Moreover, the “Package” marks the end of a condition and not the beginning of a process <sup>120</sup>. Besides, studies examining the spread of the “Package” seldom discuss the geographical frame: even the question as to how migrants from inner Anatolia could have crossed the Aegean Sea is not addressed (for instance, being non-coastal inhabitants did they know how to construct and use boats?). Thus, the “Package” is hovering over Anatolia and the Aegean without touching the ground or the water: as if no muscle power or no boats are needed for its transfer.

In fact, the material culture can be used instead as an argument against mass migration. It underscores a process of adoption and infiltration that took place over centuries’ time. As discussed above and as also observed by other scholars, domestic resources and not items of the material culture were initially of most significance <sup>121</sup>. After the introduction of economical innovations other elements of the “Package” were adopted step by step in different parts of the Aegean. Pottery and other artefacts made of baked clay certainly did not appear at once as a “Package”, but were gradually integrated and adjusted to the own needs over several hundreds of years. They are indicative of the

<sup>114</sup> Ibid. 23.

<sup>115</sup> Ibid. 30; Manderscheid 2013, 55.

<sup>116</sup> Burmeister 2000.

<sup>117</sup> Ammerman/Cavalli-Sforza 1973.

<sup>118</sup> Scheu 2017.

<sup>119</sup> Reingruber 2017b.

<sup>120</sup> Robb 2013.

<sup>121</sup> Ammerman/Cavalli-Sforza 1973; Mithen 1990, 192.



constant exchange and integration of innovations (e. g. the “textile revolution”<sup>122</sup>) based on perpetual mobility that was certainly not solely unidirectional.

A repeatedly discussed issue concerns the causes leading to such mass movements, subsumed under the convenient expression of “push and pull factors”. For example, poor living conditions or deteriorated habitats, on the one hand, and, on the other, knowledge of areas that would provide opportunities for an amelioration form the framework for migration processes. Expectations and “fulfilment of needs”<sup>123</sup> not only for oneself, but also for the next generation are considered to be the motor for setting such processes into motion.

Not accepted in sociology as a true reason for social disequilibrium is that of population surplus, since a reduction in overcrowding shows only short-term relief effects<sup>124</sup>. Rather, especially in the case of “primitive cultures”, an ecological push is considered<sup>125</sup>. And indeed in present-day archaeological studies this is the generally accepted cause. However, in order to prove that a mass-migration from (in our case) Anatolia to the Aegean took place, one would have to also analyse the following aspects:

- **Who** was moving (age, sex, social status)?
- **How** were people moving and **how far**? How large were the groups?
- **Why** were some people moving and others not? Were **whole** communities moving or only **parts** of them?
- **Why** were people moving **at all**?

For the time being it is not possible to find conclusive answers to the first three sets of questions because of the extreme paucity of human remains at the Mesolithic-Neolithic interface in the whole of the circum-Aegean area. These most basic anthropological questions regarding the age and sex of specific individuals on the move must remain unanswered at the moment. And also more general questions relating to a given population, its DNA-signature or the intake of stable isotopes characteristic for a certain region cannot be answered yet (see below).

From an archaeological perspective at least the question of why people (presumably) left the Anatolian highland to settle in an unfamiliar sea-oriented coastal landscape of the Mediterranean or Aegean Sea where navigational skills were required should be answerable. The main reason mentioned by archaeologists for why people

were leaving an area (the push factors) is the deterioration of living conditions in the homeland.

A. J. Ammerman and L. L. Cavalli-Sforza based their wave of advance-model on the supposition of population pressure<sup>126</sup>. As sociologists argue, overpopulation is not an exclusive cause for migration – and we may add especially not in the 7<sup>th</sup> millennium with rather sparsely occupied territories.

B. Weninger invoked climate deteriorations<sup>127</sup>. Yet, the “8.2ka event” (ca. 6200 calBC) occurred centuries after the Neolithic way of life had started in the Aegean, around 6600 calBC.

M. Özdoğan explained that population movements were due to the decline of the PPN B-society<sup>128</sup>. But this “decline” can be dated to around 7000 calBC, centuries before the Neolithic way of life had started in the Aegean.

L. Clare and co-authors argued that warfare has compelled people to give up their homes<sup>129</sup>. This argument should be supported by a high mortality among young men (however, as stated above, human remains are insufficient for such studies). Even if there were massive hostilities among single villages, or even if raiding bands terrorised whole populations, more effective and pragmatic solutions could have been found, instead of settling anew hundreds or even thousands of kilometres away.

On the other hand, the pull factors attracting immigrants are seldom discussed and mainly result in one single argument: that of better living conditions. General considerations like the search for favourable agricultural conditions<sup>130</sup>, the attractiveness of a place<sup>131</sup>, or the search for an environment like that in the homeland<sup>132</sup> are insufficient reasons for people to take on the huge risks of migration. Not only are the costs needed before, during and immediately after migrating enormous, but also the difficulties to overcome when migrating with small children, old or perhaps impaired persons are a great challenge. Besides, as is the case with push factors, here as well sociologists warn against a monocausal explanation: the causes for migration are manifold<sup>133</sup>.

If the idea of the pull factor is taken a bit further, then it turns out to be the other way around: According to sociological expectations of social equilibrium<sup>134</sup>, the eco-

<sup>122</sup> Becker *et al.* 2016.

<sup>123</sup> Albrecht 1972, 8.

<sup>124</sup> Franz 1984, 63.

<sup>125</sup> Han 2000, 24; Petersen 1972, 100.

<sup>126</sup> Ammerman/Cavalli-Sforza 1973.

<sup>127</sup> Weninger *et al.* 2007.

<sup>128</sup> Özdoğan 2007.

<sup>129</sup> Clare *et al.* 2008; Clare/Weninger 2016.

<sup>130</sup> Broodbank/Strasser 1991.

<sup>131</sup> Anthony 1997.

<sup>132</sup> Fiedel/Anthony 2006.

<sup>133</sup> Han 2000, 21.

<sup>134</sup> Hoffmann-Nowotny 1970, 86.

nomically ‘precarious’ Mesolithic hunter-gatherer-fishers would have had to migrate to Anatolia. Present there were the pull factors of prosperity: to foragers it might have appeared quite attractive to have secure living conditions, with food sources (domesticated animals and plants) directly in front of well-built and nicely painted houses, warm in the winter, with ovens for cooking and boiling a plenitude of tasty dishes, surrounded by many lovely things such as sophisticated bone and stone tools, personal adornments, textiles of different colours, etc. Why shouldn’t the hunter-gatherer-fishers have migrated to the “promised lands” of stability and security in Neolithic Anatolia? Theoretically at least some individuals or small groups could have reached inland Anatolia and returned to the Aegean with the knowledge of the Neolithic way of life. Yet, push factors that may have caused hunter-gatherer-fishers to leave the Aegean must be regarded as either non-existent or insufficient or, at least at the moment, not conceivable. Little convincing and rather doubtful are the push-factors put forward also in the case of Anatolia’s early farmers.

### The genetic evidence as proof for long-term migration

At this point, the discussion about the spread of the Neolithic way of life seems to have come to a dead end: On the one hand, there is general consensus that in the Aegean a local domestication process must be excluded. On the other hand, the data speak against a colonisation process and mass immigration. This may be also a reason that our generation of archaeologists expects conclusive answers from geneticists: by defining phenotypes in the different regions of Anatolia and Europe and by comparing and dating them, both the pace and the routes of migration should be disclosed. In the last few years several working groups of geneticists and archaeologists have been dedicated to investigating the important issues of migration<sup>135</sup>. One of the most recent publications was introduced by the axiomatic assumption: “Farming was first introduced to southeastern Europe in the mid-7<sup>th</sup> millennium BCE – brought by migrants from Anatolia who settled in the region before spreading throughout Europe”<sup>136</sup>. What should have been the result of the study also served as its precondition. The study includes 204 individuals sampled for 11,500 years and at least a million square kilometres, depending on how southeast Europe is defined. Unfor-

tunately, not a single sample derives from the Mesolithic of the Aegean or of the eastern Balkans – both zones of contact with northwest Anatolia south of the Sea of Marmara – so that the genetic fingerprint of the pre-Neolithic population has not been established yet: what if the Mesolithic populations in these areas would be of the same genotype like the Early Neolithic population? This scenario has been proposed by Z. Hofmanová and co-authors on the basis of two samples obtained from human bones of Mesolithic context (yet the authors themselves challenge their own result by cautioning against over-interpretation)<sup>137</sup>.

Indeed, geneticists have to build their models upon scant ancient DNA samples<sup>138</sup>. Results obtained from only few and perhaps not even representative human bones from distant (both geographically and temporally) sites are imposed on the whole of the European and on rather large parts of the Asian continent. The risk is that the “absence of localized sampling reduces any discussion of the historical complexity behind the phenomenon to simple model fitting”<sup>139</sup>. Apart from this, again a superficial geographical delimitation must be deployed: e. g. the site of Barcin or any other site in the region of Marmara<sup>140</sup> cannot be taken as representative for the whole of Anatolia. The separation into an “Early Neolithic Greek genome” as opposed to “Anatolian samples (Bar8)”<sup>141</sup> is the result of the above described East–West dichotomy. A certain genetic closeness in directly neighbouring areas must not be the result of colonisation or migration, but perhaps of sharing the same ancestors. Before we are able to exclude this possibility, the axiomatic verdict quoted above cannot be accepted as a verified explanation for the spread of farming by migrants.

A confusing misunderstanding is the temporal depth of colonisation and migration scenarios: whereas archaeologists involve only few generations into their narratives, most genetical studies include over 100 human generations spanning some 3500–4000 years, if not more<sup>142</sup>. The results obtained by geneticists therefore point rather to long-term, intergenerational mobility and not to sudden colonisation or migration processes in Late Mesolithic/Early Neolithic times. An indeed justified question is whether by aDNA-analysis we will be able to filter out

<sup>135</sup> Lazaridis *et al.* 2014; Mathieson *et al.* 2015; Hofmanová *et al.* 2016; Lipson *et al.* 2017.

<sup>136</sup> Mathieson *et al.* 2017.

<sup>137</sup> Hofmanová *et al.* 2016, 2.

<sup>138</sup> Interpretations resulting from the modelling of modern DNA or the transfer of results obtained in one region to a completely different area are not considered here as supportive.

<sup>139</sup> Kotsakis 2014, 49.

<sup>140</sup> E. g. Hofmanová *et al.* 2016, fig. 1; Lipson *et al.* 2017, fig. 1a.

<sup>141</sup> Hofmanová *et al.* 2016, 4.

<sup>142</sup> E. g. Hofmanová *et al.* 2016, tab. 1; Lipson *et al.* 2017, fig. 1c.

the first movers bringing with them a new way of life, or whether with this method selections based on mating habits and mating choices and their genetic impact on future generations are established. In order to locate mobile people far better results can be obtained by isotopic evaluations<sup>143</sup>.

Human bones are important archives for the bio-history of a certain region and should be submitted not only to genetic but also to stable isotopic analyses: for questions regarding nutrition by establishing the ratio between C/N; for mobility by measuring the content of strontium-isotopes; for direct dating using the <sup>14</sup>C content. All the mentioned methods should be effected on the same bones before basing upon them models of colonisation, migration, or rather intergenerational and long-term mobility.

### 3 Geographical mobility, social motility and the transfer of innovations

As described above, movements of people can be the result of a crisis. Apart from such processes explicable (or not) on behalf of push and pull factors, another kind of mobility has been described in sociology that goes beyond crises. Already since 1927 the macrosociological and macroeconomic system theory has been supplemented by a social and cultural mobility on the level of the individual: Mobility is conceived by P. Sorokin as both a vertical and horizontal social movement and can, yet must not be connected to the geographical mobility<sup>144</sup>. Within a horizontal movement the change from one group into another comparable group within the same social layer occurs; the vertical movement implies a change in status. Generally, since the 1970s migration is understood as the movement of people, not only in the physical but also in the social space as well<sup>145</sup>. As a critique to this theoretical approach it has been put forward that social mobility is often not separable from geographical mobility<sup>146</sup> and that, on the other hand, a connection between social and geographical mobility can be produced only indirectly and interpretatively<sup>147</sup>.

Yet, Sorokin's approach was later supported also by psychological analyses of the causes for migration, in which the "capacity for free movement, the quality of

being movable" are considered<sup>148</sup>. And it is exactly such formulations that have been subsumed under the concept of 'motility'<sup>149</sup>. The term had been coined by J. Abbott, who borrowed it from biology and medicine where it designates the capacity of an organism to be in motion<sup>150</sup>. Accordingly, Abbott described motility as the capacity of individuals of being mobile in a geographical and social space and to transmit culture. This concept has been re-introduced into the discussion by V. Kaufmann, who described it as the link between spatial and social mobility<sup>151</sup>.

It is generally acknowledged that immigrants contribute greatly to thrusts of innovations in their receiving countries, especially when they arrive from different regions<sup>152</sup>. Therefore, the geographical and social mobility (i. e. motility) greatly facilitates the spread of innovations. No large number of people is needed in this process, as only few individuals or small groups would suffice.

Hunter-gatherer-fishers, on the one hand, and farmers, on the other, belong to two different social groups, not classifying them in this contribution vertically, but rather horizontally. In order to pass from the one group to the other a decision-making process may be assumed. According to Mithen adaptation is not a self-evident process, but an active process of becoming<sup>153</sup>. A constant weighing of cost-benefit along with creative thought<sup>154</sup> and — we may add — also the innate human curiosity for anything new and innovative can be considered as the driving force for not only cultural but also social change. In order to be able to make the right decisions the appropriate information is basic. As sources of information Mithen has identified other individuals as well as the own past experiences as background knowledge<sup>155</sup>.

Both co-operation and competition with other individuals can lead to conscious and unconscious choices with intended or unintended consequences<sup>156</sup>. During the Mesolithic an array of specializations appeared: new hunting techniques, new tools and weapons, the use of cylindrical clay masses<sup>157</sup> and millstones made of andesite, a raw material that must have been imported already in the early

143 Borić/Price 2013, 3298–3303.

144 Sorokin 1964 [1927], 133.

145 Albrecht 1972, 23.

146 Franz 1984, 26.

147 Han 2000, 15.

148 Saunders 1956, 221; Hoffmann-Nowotny 1970, 86.

149 I would like to thank Reinhard Bernbeck for drawing my attention to this concept during the workshop "Scales of movement in early village societies", held in Berlin: Bernbeck 2016.

150 Abbott 1966, 153–161.

151 Kaufmann *et al.* 2004, 745–756.

152 Diner 1998, 4.

153 Mithen 1990, 8.

154 *Ibid.* 12–13.

155 *Ibid.* 32.

156 *Ibid.* 262–263.

157 Kyparissi-Apostolika 2000, 136–137.

Mesolithic from the Saronic to the Argolic Gulf<sup>158</sup>. Also, a new attitude towards animals, like the domestication of the dog and the keeping of wild animals in captivity, may have prepared the grounds for accepting and adopting transformations that led to sedentism and farming<sup>159</sup>. The decision to transport wild animals to an island (e.g. to Cyprus or Youra) and to keep them there under control may have been followed by the decision to take over the already domesticated variant instead, and to keep it near the own living space. Is the very person making this decision still a hunter or already a herder? Or a “hunter in transition”<sup>160</sup>? The same question can be posed in the case of a person using wild forms of barley, oat and lentils in the Mesolithic<sup>161</sup> and subsequently deciding for the domesticated variants: is he/she still a gatherer or already a farmer? Whatever we may call that person, by making this (and other) individual decisions he/she produced transformations that not only related to the immediate social environment, but had an impact not comprehensible and not foreseeable at that very moment.

As pointed out from the very beginning of the use of the concept of motility, active social mobility ensures the transmission of culture<sup>162</sup>. Also the transfer of knowledge and of innovations is thereby facilitated: the transfer of innovations is a social process<sup>163</sup> borne by the existing networks of communication and exchange. As can be visualized in obsidian tools of Melian origin, such networks were existent during the Mesolithic (Fig. 2) and were widened thereafter (Fig. 3). Unlike the colonisation model, in this view the Mesolithic population did not play a marginal, passive role, but indeed an active role. At the moment population estimates are hardly reliable, since only the peak of the Mesolithic iceberg is visible. If the pace of detecting new Mesolithic sites continues, and they keep emerging almost every year, then we may well assume that the Mesolithic population was much greater than can be estimated nowadays. The local community accepting, incorporating and adapting innovations to its own needs was after all not as small as hitherto thought.

This model is inspired by the considerations of Zvelebil and Lillie regarding an “individual frontier mobility” as imposed by ecological conditions<sup>164</sup>. Their concept envisages the “socially embedded mobility” as the main factor for the spread of farming in most of Europe. Therefore, the

Neolithisation process should no longer be seen as mainly a cultural change, but also as a social transformation. The social frame for the spread of innovations is still best described by E. Rogers<sup>165</sup>. Central to his theory of innovation is the decision-making process of the “Innovators”, whom Rogers describes as bringing the innovation in from outside of the system. However, it is the “Early Adopters” from inside the boundaries of the social system who were most likely leaders and deployed resources. Their attitudes towards an innovation and their networks are the foundation of its spread. It is their decision to either adopt the particular innovation (whether it suits the own needs and those of the group) or to reject it. The group of the “Early Majority” formed by about one-third of the community needs more time to decide for or against an innovation, and this holds true even more so for the group of the “Late Majority”. The most sceptical members of the community, the “Laggards”, are those reluctant to change or against changes.

Awareness (or knowledge) is the most basic human condition in the struggle not only for physical but also for social survival. The exchange of information, of genes, of items and of innovations among individuals, within a group and/or with other groups of people, and a predominant cooperative rather than hostile attitude is accepted in this study as the motor for long-lasting transformations, to which several generations of motile individuals have added their input. Parts of the material culture, especially burial rituals<sup>166</sup> and the use of raw materials sources (Fig. 2–3), but also specific tools made of stone and bone<sup>167</sup> indicate a strong continuity between the Mesolithic and the Neolithic Age. Also the fact that certain animals were kept under control already in the Mesolithic and that wheat and legumes were in the focus of the, again, Mesolithic communities adds to a much more complex picture. Furthermore, the networks from the Mesolithic were still in use and were the basis for the spread of innovation, developing their own dynamics (Figs. 2–3).

Geographical mobility can therefore be understood as the mobility within a given ecological framework: the coastal fishers of the Mediterranean and the Aegean were presumably interrelated already during the Mesolithic; at least the tools from Franchthi Cave and from the caves north of Antalya are comparable<sup>168</sup>. In the same time period, during the PPN B, a close relatedness between

158 Runnels 1981, 100–101.

159 Trantalidou 2011; Reingruber 2017a.

160 Zvelebil 1986.

161 Hansen 1991, fig. 53–54.

162 Abbott 1966.

163 Rosenstock *et al.* 2016, 100.

164 Zvelebil/Lillie 2000, 62–63.

165 Rogers 2003 [1962].

166 Reingruber 2011; Lichter 2017.

167 Moundrea-Agrafioti 2011.

168 Kaczanowska/Kozłowski 2015.

sites of Central Anatolia has been demonstrated<sup>169</sup>. Yet the interplay between the two different geographical and ecological areas, between the interior of the Anatolian Plateau and the coastal areas of Anatolia (that of the Mediterranean Sea, the Aegean Sea, and the Sea of Marmara), is still not well understood. It is certain that around 6700 calBC a shift from previously interregional to intraregional exchange can be recognised, however, since the coastal areas opened up towards new ways of life.

## Discussion and conclusion: geographical mobility and social motility

What we can learn from the studies mentioned above is that mass-migration and colonisation are not the ordinary kinds of mobility, but instead extraordinary, extreme and exceptional cases thereof. Such movements are thought to have brought important transformations to the Aegean. They resulted in changes that were induced by enforcement (violently or not) upon a given area and upon the population living there. Yet, it is just as likely that transformations can happen by deliberate and well-considered decisions made by individuals. In this respect not only geographical mobility may be acknowledged, but also social mobility (motility).

Mobility in this model is not connected solely to groups of hunter-gatherer-fishers, but also to the first generations of farmers in the Early Neolithic I (6600/6500–6400/6300 calBC). Only with the Early Neolithic II (ca. 6300 calBC) do tell-settlements appear in Thessaly in greater number, and even in the later phases of the Middle Neolithic many breaks occur in their stratigraphies: people were always mobile.

Therefore, the *trilemma* related to the Neolithisation process in the Aegean is in this view (1) the trade-off between the swift colonisation movement enforcing a new way of life upon a whole region, (2) the long-lasting mass-migration absorbing the local population and profiting from its knowledge regarding resources, and (3) small scale mobility and motility favouring the exchange of innovations and genes.

In the first case an insufficient conceptualization of the term colonisation must be acknowledged. Sociological studies prove that colonisation never happens randomly, for instance, in the way birds colonise an area; it is a well-organized process, starting with “scouts” that are sent out by a high-level organization and followed by col-

onists. Apart from this, neither the Aegean islands nor the mainland on both the western and eastern shores of the Aegean Sea were empty, uninhabited spaces – this misconception derives from the history of research, when no Mesolithic sites were known as yet in specific areas of the Aegean (or were inadmissibly ignored).

The insufficient conceptualization of terms blurs the difference between colonisation and (mass)-migration. Both of these processes must be seen as extreme versions of the movement of peoples. At the head of a migratory stream are the “pioneers”, who explore and prepare the conditions for families and fellows to follow after a certain time. The causes for a migratory stream that arose shortly before the mid-7<sup>th</sup> millennium BC are poorly defined (e.g. the push and pull factors). The evidence viewed as supportive for such a process, the “Neolithic Package”, is again ill-defined and not at all suited to serve as a basis in the discussion (elements that do not fit into the “Package”, such as certain tools and customs, are either ignored or minimized).

If we look at the process not primarily as a cultural change, but also as a social change, then another concept can be added to the discussion, that of motility. Transformation need not have been enforced upon the mid-7<sup>th</sup> millennium BC hunters and gatherers of the Aegean; however, to these highly mobile navigators must be conceded the knowledge and awareness of transformations happening farther east, as well as an own decision-making process.

If the “innovators” were indeed well-informed, how can the delay of several centuries in between the PPN B in Central Anatolia and the Early Neolithic in the Aegean be explained? Here, the model of the “agricultural frontier zone” proposed by Zvelebil and Lillie fits well: if we understand the ecological spaces as social spaces, geographical boundaries between them may have served as frontiers. In our case the Taurus mountain range has been such a boundary between the Central Anatolian Plateau and the coastal areas of the Mediterranean Sea. Once farming appeared in the ecological sphere of the coastal area around Antalya, coastal groups of the Aegean also started the long process of economical reorientation. The innovations did not appear as a package, but rather as single items during several centuries: Using their maritime networks, the navigators and innovators of the Aegean (“fishers in transition”) first adopted domesticated animals and plants, substituting local resources (boar and ibex, barley and lentils) with non-local variants of these species in domesticated form. Piece by piece certain objects of daily or of special use followed, of which especially those made of clay (pottery, figurines, stamp seals, mudbricks, and weaving implements) have survived during the millennia,

169 Özbaşaran/Cutting 2007.

as well as sets of tools made of bone and stone that were augmented by new and better production techniques.

In this study the transformations of the mid-seventh millennium BC are supported by geographically mobile and socially motile individuals or small groups from both the East (Anatolia) and the West (Aegean), who exchanged knowledge, intermarried, and over many decades or even centuries enlarged the basis of their economic, cultural and social lives. Not one generation of colonists or immigrants, but several generations of motile people added to the long-lasting transformations that the individual him/herself could not foresee in only one short life-span. Furthermore, recent results presented by geneticists support this view rather than the view of swift mass-migrations.

To our present knowledge the maritime areas of both Mediterranean and Aegean Anatolia served as zones of contact and exchange. It is mainly the coastal areas with large gulfs into which important rivers flowed that were suitable both for late fishers and for early farmers. The direct continuation of a specific location may not have been useful for early farmers; the best examples are the interruptions in sequences in Knossos and in Franchthi Cave after a short (Aceramic?) phase<sup>170</sup> and the lack of Early Neolithic sites on the islands. Yet, the networks have not been given up but rather widened, expanding from the southern into the northern Aegean, from coastal to inland areas (Figs. 2–3). That the living spaces close to the Aegean Sea were not fully abandoned may also be taken as an indication of continuity between the two periods that we so casually separate into the Mesolithic and the Neolithic.

## Acknowledgements

The author would like to thank Emily Schalk for all her useful comments, in addition to those regarding grammar and style. The anonymous reviewers of an earlier version of the manuscript contributed greatly to a clearer exposure of the line of argument and provided additional bibliographical suggestions – I am especially grateful to the reviewer adding helpful comments related to the Mesolithic communities of the Aegean. Thankfully, Stella Souvatzis translated the Abstract into Greek language.

<sup>170</sup> Reingruber 2015.

## Bibliography

- Abbott 1966: J. Abbott, The concept of motility. *Sociol. Rev.* 14/2, 1966, 153–161. DOI: 10.1111/j.1467-954X.1966.tb01157.x
- Albrecht 1972: G. Albrecht, *Soziologie der geographischen Mobilität: zugleich ein Beitrag zur Soziologie des sozialen Wandels* (Stuttgart 1971).
- Ammerman/Cavalli-Sforza 1973: A. J. Ammerman/L. L. Cavalli-Sforza, A population model for the diffusion of early farming in Europe. In: C. Renfrew (ed.), *The explanation of culture change* (London 1973) 343–357.
- Anthony 1990: D. W. Anthony, Migration in Archeology: The Baby and the Bathwater. *American Anthropologist* 92/4, 1990, 895–914.
- 1997: –, Prehistoric Migration as Social Process. In: J. Chapman/H. Hamerow (eds), *Migrations and invasions in archaeological explanation*. BAR Internat. Stud. 664 (Oxford 1997) 21–32.
- Bade 2004: K. J. Bade, *Sozialhistorische Migrationsforschung. Studien zu Historischen Migrationsforschung* (Göttingen 2004).
- Becker *et al.* 2016: C. Becker/N. Benecke/A. Grabundžija/H.-C. Küchelmann/S. Pollock/W. Schier/C. Schoch/I. Schrakamp/B. Schütt/M. Schumacher, The Textile Revolution. Research into the Origin and Spread of Wool Production between the Near East and Central Europe. In: G. Graßhoff/M. Meyer (eds), *Excellence Cluster Topoi*, Berlin, eTopoi Special Vol. 6, 2016, 102–151. <http://journal.topoi.org/index.php/etopoi/article/view/253>
- Bernbeck 2016: R. Bernbeck, Temporal scales of mobility. In *Scales of movement in early village societies*. Workshop organised by R. Bernbeck/J. Eger/I. Heit, Excellence Cluster Topoi (A-2) Political Ecology, Nov. 2016 [www.topoi.org/event/36605/](http://www.topoi.org/event/36605/)
- Borić/Price 2013: D. Borić/T. D. Price, Strontium isotopes document greater human mobility at the start of the Balkan Neolithic. *PNAS* 110/9, 2013, 3298–3303. [www.pnas.org/cgi/doi/10.1073/pnas.1211474110](http://www.pnas.org/cgi/doi/10.1073/pnas.1211474110)
- Broodbank/Strasser 1991: C. Broodbank/T. F. Strasser, Migrant Farmers and the Neolithic Colonization of Crete. *Antiquity* 65, 1991, 233–245.
- Burmeister 2000: St. Burmeister, Archaeology and migration: approaches to an archaeological proof of migration. *Current Anthropol.* 41/4, 2000, 539–567.
- Carter 2016: T. Carter, Obsidian consumption in the Late Pleistocene–Early Holocene Aegean: contextualising new data from Mesolithic Crete. *Ann. Brit. School Athens* 111, 2016, 13–34. DOI: <https://doi.org/10.1017/S006824541600006X>
- Cauvin 1994: J. Cauvin, *Naissance des divinités, naissance de l'agriculture: la révolution des symboles au néolithique* (Paris 1994).
- Chapman/Hamerow 1997: J. Chapman/H. Hamerow (eds), *Migrations and invasions in archaeological explanation*. BAR Internat. Stud. 664 (Oxford 1997).
- Cherry 1981: J. Cherry, Pattern and process in the earliest colonization of the Mediterranean islands. *Proc. Prehist. Soc.* 47, 1981, 41–68.
- Childe 1950: V. G. Childe, *Prehistoric migrations in Europe* (Oslo 1950).
- 1951: –, *Man makes Himself* (New York 1951).



- Çilingiroğlu *et al.* 2012: A. Çilingiroğlu/Ö. Çevik/Ç. Çilingiroğlu, Towards understanding the early farming communities of central-western Anatolia: contribution of Ulucak. In: M. Özdoğan/N. Başgelen/P. Kuniholm (eds), *Neolithic in Turkey 4. New excavations and new research. Western Turkey (Istanbul 2012)* 139–175.
- Çilingiroğlu/Çakırlar 2013: Ç. Çilingiroğlu/C. Çakırlar, Towards configuring the neolithisation of Aegean Turkey. *Doc. Praehist.* 40, 2013, 21–29.
- *et al.* 2016: –/B. Dinçer/A. Uhri/C. Gürbıyık/I. Baykara/C. Çakırlar, New Palaeolithic and Mesolithic sites in the eastern Aegean: the Karaburun Archaeological Survey Project. *Antiquity* 90, 2016, 1–6. Project Gallery, doi:10.15184/aqy.2016.168 [February 2017]
- Clare *et al.* 2008: L. Clare/E. J. Rohling/B. Weninger/J. Hilpert, Warfare in Late Neolithic/Early Chalcolithic Pisdia, southwestern Turkey. Climate induced social unrest in the late 7<sup>th</sup> millennium calBC. *Doc. Praehist.* 35, 2008, 65–92.
- /Weninger 2016: –/B. Weninger, Early Warfare and its Contribution to Neolithisation and Dispersal of First Farming Communities in Anatolia. In: M. Reindel/K. Bartl/F. Lüth/N. Benecke (eds), *Palaeoenvironment and the Development of Early Settlements. Menschen – Kulturen – Traditionen. Forschungs-Cluster 1; 14 (Rahden/Westf. 2016)* 29–49.
- Clark 2014: G. Clark, *The son also rises: surnames and the history of social mobility* (Princeton 2014).
- Cullen 1995: T. Cullen, Mesolithic Mortuary Ritual at Franchthi Cave, Greece. *Antiquity* 69, 1995, 270–289.
- Dawson 2013: H. Dawson, *Mediterranean voyages: the archaeology of island colonisation and abandonment*. Publ. Inst. Arch., Univ. College London (Walnut Creek 2013).
- Diner 1998: D. Diner, *Historische Migrationsforschung. Einleitung*. Tel Aviver Jahrb. Deutsche Gesch. 27, 1998, 1–4.
- Douka *et al.* 2017: K. Douka/N. Efstratiou/M. M. Hald/P. S. Henriksen/A. Karetsou, Dating Knossos and the arrival of the earliest Neolithic in the southern Aegean. *Antiquity* 91/356, 2017, 304–321. doi:10.15184/aqy.2017.29
- Durkheim 1961: É. Durkheim, *Regeln der soziologischen Methode* (Neuwied 1961).
- Duru 1989: R. Duru, Were the Earliest Cultures at Hacilar really Aceramic? In: K. Emre/T. Özgüç (eds), *Anatolia and the Ancient Near East: Tahsin Özgüç'e armağan; Studies in Honor of Tahsin Özgüç* (Ankara 1989) 99–104.
- Elster 1978: E. Elster, *Neolithic technology*. (Ann Arbor, Michigan, Dissertation, Los Angeles, University of California [1977] 1978).
- Erdoğu 2017: B. Erdoğu, A preliminary report on the earliest Neolithic levels at Uğurlu on the island of Gökçeada. *Anatolica* 43, 2017, 1–11.
- Evans 1971: J. D. Evans, Neolithic Knossos: The Growth of a Settlement. *Proc. Prehist. Soc.* 37/2, 1971, 95–117.
- Fairchild 1925: H. P. Fairchild, *Immigration: a world movement and its American significance* (New York 1925).
- Fiedel/Anthony 2006: St. J. Fiedel/D. Anthony, Deerslayers, pathfinders and icemen: the origins of the European Neolithic as seen from the frontier. In: M. Rockman/J. Steele (eds), *The Colonization of Unfamiliar Landscapes: The Archaeology of Adaptation* (London 2006) 144–168.
- Franz 1984: P. Franz, *Soziologie der räumlichen Mobilität. Eine Einführung* (Frankfurt, New York 1984).
- Galanidou 2014: N. Galanidou, Advances in the Palaeolithic and Mesolithic Archaeology of Greece for the New Millennium. *Pharos* 20/1, 2014, 1–40. DOI: 10.2143/PHA.20.1.3064535
- /Perlès 2003: –/C. Perlès (eds), *The Greek Mesolithic: problems and perspectives* (London 2003).
- Gerritsen *et al.* 2013: F. Gerritsen/R. Özbal/L. Thissen, The earliest Neolithic levels at Barcın Höyük, Northwestern Turkey. *Anatolica* 39, 2013, 53–92.
- Gimbutas 1974: M. Gimbutas, *The Gods and Goddesses of Old Europe, 7000–3500 BC: Myths, Legends and Cult Images* (London 1974).
- Guilaine 2007: J. Guilaine, Die Ausbreitung der neolithischen Lebensweise im Mittelmeerraum. In: C. Lichter (Hrsg.), *Vor 12.000 Jahren in Anatolien. Die ältesten Monumente der Menschheit*. Badisches Landesmus. Karlsruhe (Stuttgart 2007) 166–176.
- Halstead 1999: P. Halstead (ed.), *Neolithic Society in Greece* (Sheffield 1999).
- Han 2000: P. Han, *Soziologie der Migration: Erklärungsmodelle, Fakten, politische Konsequenzen, Perspektiven* (Stuttgart 2000).
- Hansen 1991: J. M. Hansen, The Palaeoethnobotany of Franchthi Cave. In: T. W. Jacobsen (ed.), *Excavations at Franchthi Cave, Greece, Fascicle 7* (Bloomington, Indianapolis 1991).
- Hodder 1990: I. Hodder, *The domestication of Europe* (Oxford 1990).
- Hoffmann-Nowotny 1970: H.-J. Hoffmann-Nowotny, *Migration: ein Beitrag zu einer soziologischen Erklärung* (Stuttgart 1970).
- Hofmanová *et al.* 2016: Z. Hofmanová/S. Kreuzer/G. Hellenthal/C. Sell/Y. Diekmann/D. Díez-del-Molino/L. van Dorp., Early farmers from across Europe directly descended from Neolithic Aegeans. *PNAS Early Edition* 2016: www.pnas.org/cgi/doi/10.1073/pnas.1523951113
- Honea 1975: K. Honea, Prehistoric Remains on the Island of Kythnos. *American Journal Arch.* 79/3, 1975, 277–279.
- Horejs *et al.* 2015: B. Horejs/B. Milić/F. Ostmann/U. Thanheiser/B. Weninger/A. Galik, The Aegean in the early 7<sup>th</sup> millennium BC: maritime networks and colonization. *Journal World Prehist.* 28, 2015, 289–330.
- Kaczanowska/Kozłowski 2015: M. Kaczanowska/J. K. Kozłowski, The Aegean Mesolithic: material culture, chronology, networks of contact. *Eurasian Prehist.* 11/1–2, 2015, 31–62.
- Kaufmann *et al.* 2004: V. Kaufmann/M. M. Bergmann/D. Joye, Motility: mobility as capital. *Internat. Journal Urban and Regional Res.* 28/4, 2004, 745–756.
- Knipper 2016: C. Knipper, Female exogamy and patrilocality at the transition from Final Neolithic to the Early Bronze Age in Southern Germany. In: Scales of movement in early village societies. Workshop organised by R. Bernbeck/J. Eger/I. Heit, Excellence Cluster Topoi (A-2) Political Ecology, Nov. 2016. www.topoi.org/event/36605/
- Kopaka/Matzanas 2009: K. Kopaka/C. Matzanas, Palaeolithic industries from the island of Gavdos, near neighbour to Crete in Greece. *Antiquity Project Gallery* 83, 2009, 321. http://antiquity.ac.uk/projgall/kopaka321/index.htm
- Kotsakis 2014: K. Kotsakis, Domesticating the periphery: new research into the Neolithic of Greece. *Pharos* 20/1, 2014, 41–73. doi: 10.2143/PHA.20.1.3064536
- Kyparissi-Apostolika 2000: N. Kyparissi-Apostolika, The Mesolithic/Neolithic transition in Greece as evidenced by the data at Theopetra Cave in Thessaly. *Doc. Praehist.* 27, 2000, 133–140.

- Laskaris *et al.* 2011: N. Laskaris/A. Sampson/F. Mavridis/I. Liritzis, Late Pleistocene/early Holocene seafaring in the Aegean: new obsidian hydration dates with the SIMS-SS method. *Journal Arch. Sci.* 38/9, 2011, 2475–2479. DOI: 10.1016/j.jas.2011.05.019
- Lazaridis *et al.* 2014: I. Lazaridis/N. Patterson/A. Mittnik/G. Renaud/S. Mallick/K. Kiranow/P. H. Sudmant *et al.*, Ancient human genomes suggest three ancestral populations for present-day Europeans. *Nature* 513/7518, 2014, 409–413. Doi:10.1038/nature13673
- Lee 1972: E. S. Lee, Eine Theorie der Wanderung. In: G. Széll (Hrsg.), *Regionale Mobilität* (München 1972) 115–129.
- Lichter 2017: C. Lichter, The transition from the Mesolithic to the Neolithic between western Anatolia and the lower Danube: evidence from burial customs. In: A. Reingruber/Z. Tsirtsoni/P. Nedelcheva (eds), *Going West? The dissemination of Neolithic innovations between the Bosphorus and the Carpathians*. Proceedings of the EAA Conference, Istanbul 2014. *Themes in Contemporary Arch.* 3 (London, New York 2017) 113–122.
- Liebig 2011: S. Liebig, Migration und Geschlecht – Eine Einführung in das Thema. In: E. Aubele/G. Pieri (eds), *Femina migrans: Frauen in Migrationsprozessen* (18.–20. Jahrhundert) (Sulzbach 2011) 19–35.
- Lipson *et al.* 2017: M. Lipson/A. Szécsényi-Nagy/S. Mallick/A. Pósa/B. Stégmár/V. Keerl/N. Rohland *et al.*, Parallel palaeogenomic transects reveal complex genetic history of early European farmers. *Nature* 551/7680, 2017, 368–372.
- Manderscheid 2013: K. Manderscheid, *Mobilität als relationale Aushandlung. Ein Vergleich zwischen England und der Schweiz*. In: M. Hömke (Hrsg.), *Mobilität und Identität: Widerspruch in der modernen Gesellschaft* (Wiesbaden 2013) 51–77.
- Mathieson *et al.* 2015: I. Mathieson/I. Lazaridis/N. Rohland/S. Mallick/N. Patterson/S. Alpaslan Roodenberg/E. Harne/ *et al.*, Genome-wide patterns of selection in 230 ancient Eurasians. *Nature* 528, 2015, 499–503. Doi:10.1038/nature16152
- *et al.* 2017: –/S. Alpaslan Roodenberg/C. Posth/A. Szécsényi-Nagy/N. Rohland/S. Mallick/I. Olade/ *et al.*, The Genomic 1 History of Southeastern Europe. *bioRxiv preprint*, first posted online May 9, 2017. <http://dx.doi.org/10.1101/135616>
- Mellaart 1970: J. Mellaart, *Excavations at Hacilar* (Edinburgh 1970).
- Milojčić 1962: V. Milojčić, Die präkeramische neolithische Siedlung von Argissa in Thessalien. In: V. Milojčić (ed.), *Die deutschen Ausgrabungen auf der Argissa-Magula in Thessalien I. Beiträge zur ur- und frühgeschichtlichen Archäologie des Mittelmeer-Kulturräumens 2* (Bonn 1962) 1–25.
- Mithen 1990: S. J. Mithen, *Thoughtful foragers: a study of prehistoric decision making* (Cambridge 1990).
- Moundrea-Agrafioti 2011: A. Moundrea-Agrafioti, The Mesolithic and Neolithic Bone Implements. In: A. Sampson (ed.), *The Cave of the Cyclops. Mesolithic and Neolithic Networks in the Northern Aegean, Greece. II: Bone Tool Industries, Dietary Resources and the Paleoenvironment, and Archaeometrical Studies*. *Prehist. Monogr.* 31 (Philadelphia, Pennsylvania 2011) 3–49.
- Osterhammel/Jansen 2012: J. Osterhammel/J. Jansen, *Kolonialismus: Geschichte, Formen, Folgen* (München 2012).
- Özbaşaran/Cutting 2007: M. Özbaşaran/M. Cutting, Das Neolithikum in Zentralanatolien. In: C. Lichter (Hrsg.), *Vor 12.000 Jahren in Anatolien. Die ältesten Monumente der Menschheit*. Badisches Landesmus. Karlsruhe (Stuttgart 2007) 112–134.
- Özdoğan 2007: M. Özdoğan, Von Zentralanatolien nach Europa. In: C. Lichter (Hrsg.), *Vor 12.000 Jahren in Anatolien. Die ältesten Monumente der Menschheit*. Badisches Landesmuseum Karlsruhe (Stuttgart 2007) 150–160.
- Payne 1975: S. Payne, Faunal Change at Franchthi Cave from 20000–3000 BC. In: A.T. Clason (ed.), *Archaeozoological Studies: Papers of the Archaeozoological Conference 1974*, Groningen (Amsterdam 1975) 120–131.
- Perlès 1987: C. Perlès, Les industries lithiques taillées de Franchthi (Argolide, Grèce). Tome I, Présentation générale et industries paléolithiques. In: T. W. Jacobsen (ed.), *Excavations at Franchthi Cave, Greece 3* (Bloomington, Indianapolis 1987).
- 2003: –, An alternate (and old-fashioned) view of Neolithisation in Greece. *Doc. Praehist.* 30, 2003, 99–113.
- *et al.* 2013: –/A. Quiles/H. Valladas, Early seventh-millennium AMS dates from domestic seeds in the Initial Neolithic at Franchthi Cave (Argolid, Greece). *Antiquity* 87, 2013, 1001–1005. <https://doi.org/10.1017/S0003598X00049826>
- Petersen 1972: W. Petersen, Eine allgemeine Typologie der Wanderung. In: G. Széll (Hrsg.), *Regionale Mobilität* (München 1972) 95–114 [The original English text was published in 1958: A general typology of migration. *American Soc. Rev.* 23/3, 1958, 256–266].
- Prien 2005: R. Prien, *Archäologie und Migration: Vergleichende Studien zur archäologischen Nachweisbarkeit von Wanderungsbewegungen* (Bonn 2005).
- Ravenstein 1885: E. G. Ravenstein, The Laws of Migration. *Journal Statist. Soc.* 48/2, 1885, 167–327.
- Reingruber 2008: A. Reingruber, Die Argissa Magula. Das frühe und das beginnende Neolithikum im Lichte transägäischer Beziehungen. *Die deutschen Ausgrabungen auf der Argissa Magula II. Beiträge zur ur- und frühgeschichtlichen Archäologie des Mittelmeerraums 35* (Bonn 2008).
- 2011: –, Early Neolithic settlement patterns and exchange networks in the Aegean. *Doc. Praehist.* 38, 2011, 291–305.
- 2015: –, Pre-ceramic, Aceramic or Early Ceramic? The radiocarbon dated beginning of the Neolithic in the Aegean. *Doc. Praehist.* 42, 2015, 147–158.
- 2017a: –, Foragers, Fishers and Farmers in the Aegean (12,000–6000 calBC). In: M. Märgärit/A. Boroneanț (eds), *From hunter-gatherers to farmers: human adaptations at the end of Pleistocene and the first part of the Holocene*. *Papers in Honour of Clive Bonsall* (Târgoviște 2017) 203–215.
- 2017b: –, The transition from the Mesolithic to the Neolithic in a circum-Aegean perspective: Concepts and narratives. In: A. Sarris/E. Kalogiropoulou/T. Kalayci/L. Karimali (eds), *Communities, Landscapes and Interaction in Neolithic Greece*. *International Conference, Rethymno 29–30 May 2014*. *Internat. Monogr. Prehist., Arch. Ser.* 20 (Michigan 2017) 8–26.
- 2018: –, Zirkumägäische Netzwerke am Übergang vom Mesolithikum zum Neolithikum. *Jahresschr. Tübinger Ver. z. Förderung Ur- u. Frühgesch. Arch.*, TÜVA-Mitt. 16, 2018, 27–39.
- /Thissen 2009: –/L. Thissen, Depending on <sup>14</sup>C Data: Chronological Frameworks in the Neolithic and Chalcolithic of Southeastern Europe. *Radiocarbon* 51, 2009, 751–770.
- /– 2016: –/–, The 14SEA Project: a <sup>14</sup>C database for Southeast Europe and Anatolia (10,000–3000 calBC). <http://www.14sea.org/index.html> [last accessed July 2017].

- *et al.* 2017a: – /Z. Tsirtsoni/P. Nedelcheva (eds), Going West? The dissemination of Neolithic innovations between the Bosphorus and the Carpathians. Proceedings of the EAA Conference, Istanbul 2014. Themes in Contemporary Archaeology 3 (London/New York 2017).
- *et al.* 2017b: – /G. Toufexis/N. Kyparissi-Apostolika/M. Anetakis/Y. Maniatis/Y. Facorellis, Neolithic Thessaly: Radiocarbon dated periods and phases. *Doc. Praehist.* 44, 2017, 34–53.
- Renfrew 1987: C. Renfrew, *Archaeology and language: the puzzle of Indo-European origins* (London 1987).
- Robb 2013: J. Robb, Material culture and structural causation: a new model for the origins of the European Neolithic. *Current Anthropol.* 54/6, 2013, 657–683.
- Rogers 2003: E. Rogers, *Diffusion of Innovations* (New York 2003).
- Rosenstock forthcoming: E. Rosenstock, Dot by dot: Phase-mapping Neolithic sites in Anatolia. In: M. Brami/B. Horejs (eds), *The Central/Western Anatolian Farming Frontier*. Proceedings of a workshop held at the ICAANE in Vienna 2016.
- *et al.* 2016: – /S. Scharl/W. Schier, Ex oriente lux? Ein Diskussionsbeitrag zur Stellung der frühen Kupfermetallurgie Südosteuropas. In: M. Bartelheim/B. Horejs/R. Krauß (eds), *Von Baden bis Troia – Ressourcennutzung, Metallurgie und Wissenstransfer. Eine Jubiläumsschrift für Ernst Pernicka*. *Oriental and European Archaeology 3* (Rahden/Westfalen 2016) 59–122.
- Runnels 1981: C. Runnels, *A Diachronic Study and Economic Analysis of Millstones from the Argolid, Greece*. Ann Arbor: Indiana University, University Microfilms International (Bloomington, Ind. 1981).
- 1995: –, Review of Aegean Prehistory IV: The Stone Age of Greece from the Palaeolithic to the Advent of the Neolithic. *American Journal Arch.* 99, 1995, 699–728.
- Sampson 2015: A. Sampson, The Aegean Mesolithic: environment, economy, and voyaging. In: A. J. Ammerman/T. Davis (eds), *Island Archaeology and the Origins of Seafaring in the Eastern Mediterranean*. *Eurasian Prehist.* 11/1–2, 2015, 63–74.
- *et al.* 2009: – /J. K. Kozłowski/M. Kaczanowska, Sarakenos Cave in Boeotia. From Palaeolithic to the Early Bronze Age. *Eurasian Prehist.* 6/1, 2009, 1–33.
- *et al.* 2010: – /M. Kaczanowska/J. K. Kozłowski, *The Prehistory of the Island of Kythnos (Cyclades, Greece) and the Mesolithic Settlement at Maroulas*. *Polish Acad. Arts Scien., Univ. Aegean* (Krakow 2010).
- *et al.* 2012: – /M. Kaczanowska/J. K. Kozłowski, *Mesolithic occupations and environments on the island of Ikaria, Aegean, Greece*. *Krakow: Polish Acad. Arts Scien. Fol. Quaternaria* 80, 2012, 5–40.
- Saunders 1956: H. W. Saunders, Human migration and social equilibrium. In: J. J. Spengler/O. D. Duncan (eds), *Population Theory and Policy* (Glencoe, Illinois 1956) 219–229.
- Scheu 2017: A. Scheu, Neolithic animal domestication as seen from ancient DNA. *Quaternary International*, February 2017. DOI: 10.1016/j.quaint.2017.02.009
- Sorokin 1964 (1927): P. A. Sorokin, *Social and cultural mobility* (New York 1964).
- Steele/Rockman 2003: J. Steele/M. Rockman, “Where do we go from here?” Modelling the decision making process during exploratory dispersal. In: M. Rockman/J. Steele (eds), *The colonization of unfamiliar landscapes: the archaeology of adaptation* (London, New York 2003) 130–143.
- Takaoğlu *et al.* 2014: T. Takaoğlu/T. Korkut/B. Erdoğu/G. Isin, Archaeological evidence for 9<sup>th</sup> and 8<sup>th</sup> millennia BC at Girmeler Cave near Tlos in SW Turkey. *Doc. Praehist.* 41, 2014, 111–118.
- Theocharis 1973: D. R. Theocharis, *The Neolithic Civilisation. A Brief Survey*. In: D. R. Theocharis (ed.), *Neolithic Greece* (Athen 1973) 17–128.
- Thissen 2000: L. Thissen, Thessaly, Franchthi and Western Turkey: Clues for the Neolithisation of Greece? *Doc. Praehist.* 27, 2000, 141–154.
- 2005: –, Coming to grips with the Aegean in prehistory: an outline of the temporal framework, 10,000–5500 cal BC. In: C. Lichter (ed.), *How did farming reach Europe? Anatolian-European relations from the second half of the 7<sup>th</sup> through the first half of the 6<sup>th</sup> millennium cal BC*. *BYZAS 2* (Istanbul 2005) 29–40.
- 2007: –, Die Anfänge der Keramikproduktion in der Türkei – ein Überblick. In: C. Lichter (ed.), *Vor 12.000 Jahren in Anatolien. Die ältesten Monumente der Menschheit*. *Badisches Landesmuseum Karlsruhe* (Stuttgart 2007) 218–229.
- 2017: –, The First Balkan Neolithic in the Lower Danube Plain and the Making of a Pottery Tradition. In: A. Reingruber/Z. Tsirtsoni/P. Nedelcheva (eds), *Going West? The dissemination of Neolithic innovations between the Bosphorus and the Carpathians*. Proceedings of the EAA Conference, Istanbul 2014. Themes in Contemporary Archaeology 3 (London/New York 2017) 79–90.
- Trantalidou 2011: K. Trantalidou, From Mesolithic Fishermen and Bird Hunters to Neolithic Goat Herders: The Transformation of an Island Economy in the Aegean. In: A. Sampson (ed.), *The Cave of the Cyclops. Mesolithic and Neolithic networks in the northern Aegean, Greece. II: bone tool industries, dietary resources and the paleoenvironment, and archaeometrical studies*. *Prehist. Monogr.* 31 (Philadelphia 2011) 53–150.
- Tringham 2000: R. Tringham, Southeastern Europe in the transition to agriculture in Europe: bridge, buffer or mosaic. In: D. Price (ed.), *Europe’s First Farmers* (Cambridge 2000) 19–56.
- Umurtak 2007: G. Umurtak, Die jungsteinzeitlichen Siedlungen im südwestanatolischen Seengebiet. In: C. Lichter (ed.), *Vor 12.000 Jahren in Anatolien. Die ältesten Monumente der Menschheit*. *Badisches Landesmuseum Karlsruhe* (Stuttgart 2007) 139–149.
- Wenger 1999: E. Wenger, *Communities of Practice: Learning, Meaning, and Identity* (Cambridge a. O. 1999).
- Weninger *et al.* 2007: B. Weninger/E. Alram-Stern/E. Bauer/L. Clare/U. Danzeglocke/O. Jöris/C. Kubatzki/G. O. Rollefson/H. Todorova/T. van Andel, Abrupt Climate Forcing observed at Early Neolithic sites in South-East Europe and the Near East. In: H. Todorova/M. Stefanovich/G. Ivanov (eds), *In the Steps of James Harvey Gaul. Volume 2. The Struma/Strymon River Valley in Prehistory*. Proceedings of the International Symposium ‘Strymon Praehistoricus’, Kjustendil-Blagoevgrad (Bulgaria) and Seres-Amphipolis (Greece) 2004 (Sofia 2007) 7–28.
- *et al.* 2014: – /L. Clare/F. Gerritsen/B. Horejs/R. Krauß/J. Linstädter/R. Özbal/E.J. Rohling, *Neolithisation of the Aegean and*

- Southeast Europe during the 6600–6000 calBC period of Rapid Climate Change. *Doc. Praehist.* 41, 2014, 1–31.
- Zeder 2009: M. Zeder, The Neolithic macro-(r)evolution: macroevolutionary theory and the study of culture change. *Journal Arch. Res.* 17, 2009, 1–63.
- Zvelebil 1986: M. Zvelebil, *Hunters in transition: Mesolithic societies of temperate Eurasia and their transition to farming* (Cambridge 1986).
- /Lillie 2000: –/M. Lillie, *Transition to agriculture in eastern Europe*. In: D. Price (ed.), *Europe’s First Farmers* (Cambridge 2000) 57–92.