

the find complex number and then proceed to folder 3 'Finds and features' in search of the file in a table including feature numbers and find complex numbers. It is in fact neither possible to reconstruct the inventory of separate features nor to gain precise information on which find complexes or features were included in the analysed samples and which were not. One will not find a plan of the whole site – in the whole book only undecipherable sketches of 10 × 15 cm are presented.

In general, the book is not coherently structured; while not all chapters must necessarily be of comparable length, the assignment of some issues (e. g. foreign elements in the SBK – chapter 6.2) to some chapters can raise eyebrows. There are some inconsistencies in the narrative, for example, why the chapter on Baalberge is preceded by an introduction about the history of research, while chapters on other cultures are not. Essentially, one can gain the impression that Baalberge is Bergemann's favourite subject which she treated with much more care and interest than other stages. This part was in fact worth the effort as it is the best section of the whole book. It is not only the way the data was analysed but also an open-mindedness in its interpretation by going further with vital social questions. It is a huge disappointment how different it is from the subchapter on the LBK. The lack of a coherent spatial and chronological analysis is caused, to a large extent, by limited data, and it would be unfair to blame Bergemann. But there are other research questions that remain unanswered, concerning, for example, the special finds: are they more numerous than on other sites in Saxony? How are they distributed within the settlement: are they concentrated in a special part and period, or do they occur totally randomly? These questions not only remain unanswered – they were not even asked; rather, already-published opinions are repeated. Similar criticism applies to the treatment of numerous finds from upper layers, excavated manually, which Bergemann introduced in chapter 1 as a unique challenge to analyse post-depositional processes. In the following sections she did not take this chance (apart from a rather weak flint chapter), limiting her research instead to homogeneous assemblages only.

This criticism should not dismiss the whole of the reviewed book. It is very uneven, with some quite good parts (Baalberge, chapter 8 on diet), which were, however, not brought together into a coherent overview. Thus, Bergemann's work must be regarded as an important first but definitely not the last step in analysing and evaluating the data on the Neolithic from Zauschwitz.

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PHILIPP W. STOCKHAMMER / JOSEPH MARAN (eds), *Appropriating Innovations. Entangled Knowledge in Eurasia 5000–1500 BCE*. Oxbow Books, Oxford, Philadelphia 2017. £ 48.00. ISBN 978-1-78570-724-7. £ 24.99. ISBN 978-1-78570-725-4 (E-book). iv + 268 pages with numerous tables and figures.

While innovation and entanglement studies are not new, this book contributes in various ways to a richer understanding of this field. In chapter 1 (pp. 1–3), Joseph Maran and Philipp W. Stockhammer state: the aim of the book is not “to develop a non-linear perspective for the large number of technological innovations that have shaped human existence since Childe's ‘Neolithic Revolution’” (p. 1). According to the editors, Vere Gordon Childe's later criticised diffusionist ideas still have great value. The papers here focus on this value: coupling societal change with interaction and technological change. Two groups of innovations are central: the “Secondary Product Revolution” (SPR, crucial work by A. SHERRATT, Plough and pastoralism. Aspects of the secondary product

revolution. In: I. Hodder et al. [eds], *Pattern of the Past. Studies in Honour of David Clarke* [Cambridge 1981] 261–306) and bronze casting. Both have often been explained through the diffusionist concept. As archaeology tried to move away from this explanatory framework in the 1970s, the editors argue, an important side effect loomed over archaeological explanation, leaving out a wide field of intercultural contact studies in favour of explaining phenomena as local independent developments (autochthonism).

The introduction situates the book's overall goal and discusses briefly the key questions that run throughout the chapters. The editors argue that objects can be transferred but cannot be translated since that entails reaching out to acquire knowledge from far away and, simultaneously, also local knowledge during this process of negotiation. Equally important is the sense that new, foreign objects and innovations also need to be recognised and accepted before they can be considered for appropriation. This anchoring power, or in Avinoam Meir's terms: "adoption environment" (p. 2) of an innovation, or a society's understanding of new arrivals is crucial in the process of adopting and adapting these new objects, innovations, technologies, worldviews, processes, and practices. The question arises, though, whether it is not the *acceptance* of both the object and the innovation that is the key to the transfer or translation? Translation may not be possible, not even at the level of the same language, if the object or innovation cannot be accepted.

Other questions are outlined (p. 2) and these, in my mind, can be linked to the concept of acceptance, i. e. "which actors are interested in new technologies?" If the interest is not there, acceptance will not be either. This notion associates this important question both with the individual *and* with society as a whole. Another question is: who *benefits* from being interested? Apparently, Science and Technology Studies (more references would have been useful) indicate that male actors of high status seem less interested in innovations as it may contain dangerous consequences. Yet, when we consider introductions and adopters of innovative technologies to society (e. g. iPhones, self-driving cars), especially the elite seems to have the time (in itself a luxury) and the economic power to uptake it. When they reject innovations because they are not in their political and economic interest, mere "mortals" will seldom even know about them (until later). People on the fringe of society or with flexible status may be more open to innovation because their lack of power implies less danger of their forfeiting influence and they have less to lose. This book thus starts with the tall promise of posing exciting questions and looking at them across human social status boundaries.

Chapter 2 (Cornelius Schubert, pp. 4–11) outlines a perspective from the sociology of technology and innovation, and its usefulness for archaeology. Some of the evolutionary models of socio-technical change stand directly opposite of technological determinism and the idea of linear progression, as if such forces are inevitable processes prompted by uncontrollable technological developments. For Schubert, evolutionary understanding of innovation sits in its contingent nature, rather than in linear progression. So, the more radical the novelty, the more it will be found in the margins, and from there it needs more effort / time to reach the centre where social conformity rules. Things may thrive in the margins simply because there is not that much to lose: the early Christians took centuries from being prosecuted outcasts to forming the largest religion in Europe. Moreover, the more flexible a technology is, the easier it opens up to the needed changes for adaptation and thus successful diffusion which should be seen as an active process of appropriation across social boundaries. Marginal user groups and settings may play a role, reflected in the phenomenon of so-called transition towns and green cities, and the much-needed skills, time, and know-how that such contexts display when actively involved (A. BRYSBAERT, Artisans versus nobility? Crafting in context: introduction. In: A. Brysbært / A. Gorgues [eds], *Artisans versus Nobility? Multiple Identities of Elites and 'Commoners' Viewed Through the Lens of Crafting*

from the Chalcolithic to the Iron Ages in Europe and the Mediterranean [Leiden 2017] 13–36). Technical changes move along social changes, both co-exist and are also contextualised, thus being useful for archaeological thinking.

Chapter 3 (Kristina Sauer, pp. 12–28) on book-keeping in the Uruk period in Mesopotamia is less related to the volume's themes but shows through writing, (ac)counting, and recording that the innovative potential of the Uruk bureaucracy did not start *ab ovo*, and that innovations can both work or be rejected. Through transformative processes, older systems were not always replaced by the new ones, so old technologies are not always superseded by new ones. This resembles the introduction of metal artefacts and tools, which do not replace stone tools immediately. The uptake of something new is always a social decision (N. JOHANNSEN, Technological conceptualization: cognition on the shoulders of history. In: L. Malafouris / C. Renfrew [eds], *The Cognitive Life of Things: Recasting the Boundaries of the Mind*. McDonald Inst. Monogr. [Cambridge 2010] 59–69) but so is the decision to hold on to older practices.

In investigating changes in socio-cultural traditions and innovations, chapter 4 (Maria Bianca D'Anna and Giulio Palumbi, pp. 29–39) studies the interaction between humans and animals in the Anatolian Highlands. In a chronological overview of the material from Arslantepe (TR; 4th/3rd millennia BCE), no linear process of innovations related to animal husbandry can be detected; instead, processes of selection and adoption of technologies are related to changing socio-economic and cultural contexts. Not all secondary products seem to have arrived and been taken up at the same time. This confirms Greenfield's earlier observations in the same direction and thus critiques the SPR by SHERRATT (1981). However, the development postulated by Andrew Sherratt of different subsistence specialisations resulting in polyethnic social systems seems to resound with the situation in Arslantepe, showing that caution is required before theoretical discussions (SPR and its inherent rigidity) are entirely rejected.

In chapters 5 (Maria Ivanova, pp. 40–49), 9 (Maleen Leppek, pp. 98–108), and 11 (Niels N. Johannsen, pp. 122–135), animal traction (ANTRAC – Ivanova) in the Late Neolithic is understood as one of many elements integrated in a “technology cluster” (Leppek) of both plant and animal production; being part of this cluster made ANTRAC a successful innovation. ANTRAC is thus not an innovation by itself but in relation to plough cultivation which, *together*, increased production, saved on labour input, allowed larger areas to be worked, gave the capacity for surplus collection, and changed crop rearing strategies. Chapter 5 studies this phenomenon for Central and North Europe through comparing manual and ANTRAC systems. Chapter 9 discusses the importance of studying all possible transport means from a micro-regional perspective since all these may have been adapted to local needs and uses. In the Caucasus, animal labour was used in the making of large funerary monuments. For chapter 5, ANTRAC seems only to become productive when the animals work beyond agricultural tillage: in engaging them in large-scale building activities and the transport of manure and large resources over longer distance. Intensification of ANTRAC, furthermore, went together with increased human impact in the landscape and resulted in a shift in cropping practices. Also, Chapter 11 indicates, for South Scandinavia, that there are specific regional differences in draught cattle technologies, one of the most important secondary animal products. Some change over time and some general patterns are recognised through the study of ard marks, wooden disk wheels and tracks, funerary monuments and their alignments, and from osteomorphological data. As with the above two papers, the entanglement between technological changes and socio-economic and ideological changes seem to be important matters.

Chapter 6 (Haskel J. Greenfield, pp. 50–68) brings together 35 years of research in Europe and the Near East on both animal secondary products or animal exploitation strategies and the use of

metal tools in processing animal foods or butchering technologies. Intensification and specialisation are two essential phenomena in the development of complex and urban societies, not just for elites but for all social classes. Of interest is how people changed the way they exploited livestock from primary to secondary produce and why. Greenfield's research on SPR showed that the process of milking came much later than originally thought and coincided with the use of the plough, wheeled vehicles, and woolly sheep. For the Near East and the Central Balkans, it seems important to study goat and sheep as separate categories in order to examine exploitation strategies between the Neolithic and the Bronze Age. Utilitarian metallurgy, based on bronze and not copper, became a building block for economic production and led to new employment types, intensification of production, and hierarchical stratification.

Chapter 7 (Stefan Burmeister, pp. 69–77) discusses the innovation of the wagon in Eurasia since the 4th millennium BCE as the product of social interplay between technical potential (affordances) and the ideological needs of people on the one hand, with their true economic and social needs and capabilities on the other. Burmeister argues that in order to understand this innovation one needs to study both human agency and technical rationality, something that returns often in the volume. The most perplexing of the spread of the wagon is that this takes place in several regions independently and simultaneously. Equally, over time, the innovation became better anchored in existing lifestyles where wagons fulfilled a necessary function, and thus became more acceptable. This resonates with the idea of an integrated package of technological changes when the wagon is understood, technologically, together with the needed knowledge for animal traction. Moreover, the spread of these vehicles hinges on the understanding of their production *and* their function since local differences are clear. Burmeister emphasises the understanding of function *over* production. I feel it is *both* because while it may seem simple to use a wagon with draught animals a good oxen guide has trained the animals over a period of time before they can do it well (e.g. P. HALSTEAD, Two Oxen Ahead. Pre-Mechanized Farming in the Mediterranean [Chichester 2014]).

Based in the Caucasus region in the 4th millennium BCE, chapter 8 by Sabine Reinhold et al. (pp. 78–97) discusses how the same technology can be appropriated in different ways by different communities. The authors see innovation as a social act of appropriating new practices or techniques into an existing life, and the case study revolves around wagons and animal traction (s. a. chapters 5; 7; 9). Growing populations in given regions would need to cope with each other and with more competition, so adopting new technological solutions would help distributing the stress of heavy labour and also receiving some form of symbolic remuneration (e.g. in acts of building funerary mounds, a competitive and very frequent act in the Caucasian region) for training the animals. Animal labour appropriation and its integration into human lives likely brought about major changes for the animals and their owners alike. The draught animals would have been involved in symbolic processes, thus connecting their presence and work with the need for swift knowledge transfer on how to train the animals to work. Neither in groups of the Maikop nor in those of the Yamnaya culture areas changed the appropriation of animal labour life dramatically, but there is a difference between the communities that emphasise social differentiation and power relations as part of their socio-political make-up between both areas. These resulted in different representations of the animals in both contexts, reflecting the symbolic differences these represent to each group.

Chapter 10 (Joseph Maran, pp. 109–121) takes the wheeled vehicle discussion to the level of how these were perceived by people and the connotations with which these were associated in the different regions of their appearance. Two main lines of interpretation, ritual deposition versus profane dumping, are summarised for large parts of Europe during the 3rd millennium

BCE. This seems to resound the metal hoard debates in the same regions where a practice-based approach allows for much more nuanced reading of contextual information pertaining to hoards (D. R. FONTIJN, *Sacrificial Landscapes. Cultural Biographies of Persons, Objects and ‘Natural Places’ in the Bronze Age of the Southern Netherlands, 2300–600 BC*. *Analecta Praehist. Leidensia* 33/34 [Leiden 2002]). Over time, as fewer representations of wheeled vehicles occurred, their significance did not diminish but showed in different ways, for example, in ritual depositions. Several find contexts show a common link: their use in extraordinary practices; however, their specific deposition contexts and associated materials suggest rituals founded on varied ideas and intentions. It is useful to accept that our understanding of wood as a “cheap” resource can no longer play a role in differentiating profane from sacral (if these can be entirely separated from each other at all). The paper contradicts this and suggests the polysemous meaning of the vehicles and entangled life biographies of both vehicles and their users.

By investigating the alloying of copper and the lost-wax casting technique, chapter 12 (Svend Hansen, pp. 136–148) looks at the origin and the technological processes of diffusion of these early innovative techniques. In the 6th/5th millennia BCE, the emergence of metallurgy was crucial in the relation between technological innovation and the processes generating social hierarchies in Eurasia’s prehistory. The author contrasts Childe’s diffusionist models to Colin Renfrew’s ideas of independent local developments of technologies. The richness of metal finds from Varna’s cemeteries I and II are highlighted for their value in terms of labour input when compared to correspondent versions in stone and antler. Ceramics are seen as the oldest form of transformation of material by fire and adding in temper; they formed the inspiration to alloying copper. Useful to point out is that the limestone transformation into plaster by fire is an even older pyro-technology and slaked lime was also mixed with fillers (a-ceramic and epi-palaeolithic / Geometric Kabiran, i. e. 12000 BCE: W. H. GOURDIN / W. D. KINGERY, *The beginnings of pyrotechnology: Neolithic and Egyptian lime plaster*. *Journal Field Arch.* 2, 1975, 133–150. doi: <https://doi.org/10.2307/529624>; W. D. KINGERY et al., *The beginnings of pyrotechnology, part II: Production and use of lime and gypsum plaster in the Pre-Pottery Neolithic Near East*. *Journal Field Arch.* 15, 1988, 219–244. doi: <https://doi.org/10.2307/530304>). I have argued (A. BRYSAERT, *The Power of Technology in the Bronze Age Eastern Mediterranean. The Case of the Painted Plaster*. *Monogr. Mediterranean Arch.* 12 [London, Oakville 2008] esp. 179) that common transformative powers of fire helped in understanding how one technology and its changes could inspire others in the processes that led to better materials, a point also stressed in Hansen’s paper. A common temperature of c. 750–900 °C that works for thorough ceramic firing, frit production, and limestone dissolution cannot be a coincidence. The metallurgical experimentation in mixing metals seems to have taken place already at least from the mid-5th millennium BCE, indicating that the origin of metallurgy precedes this mixing and seems to reach large parts of Eurasia. By the 4th millennium, both the objects’ qualities and their aesthetics improved. Casting via the lost-wax method seemed to have logically appeared *in tandem* with alloying as evident among the 5th millennium BCE finds from Nahal Mishmar (IL).

In a Eurasia-wide study for the 5th / 4th millennia BCE also chapter 13 (Florian Klimscha, pp. 149–160) argues that in order to comprehend innovations, one needs to understand the existing local know-how, the technical prerequisites of a given technology, and to take into account the social context. The chapter aims to provide long-term perspectives on the diffusion of techniques, and the resulting social consequences, so that a full understanding of the complexity of social change will be possible. Klimscha develops a different view of both the diffusionist and evolutionist model whereby actors are not passive consumers of foreign know-how; moreover, it shows that adoption, recombination, and transformation can lead to further innovation processes. The data on early wagons throughout large regions and long stretches of time form the case study database for

this research. Prehistoric innovation processes seemed to have taken place within spheres of interaction where certain minimal levels of mobility were present. This notion is not entirely different from the concepts of multiple *chaînes opératoires*, cross-craft interaction, and embedded technical practices (A. BRYSBÆRT, Introduction. Tracing social networks through studying technologies. In: A. Brysbært [ed.], *Tracing Prehistoric Social Networks through Technology. A Diachronic Perspective on the Aegean*. Routledge Stud. Arch. 3 [London, New York 2011] 1–11 with references. doi: <https://doi.org/10.4324/9780203156179>), which advocate the unlimited continuous exchange of people, goods, materials, and knowledge and within an environment that helps shaping the needed levels of communication and mobility.

Chapter 14 (Barbara Helwing, pp. 161–170) discusses the emergence of metallurgy as part of a package of innovative technologies that spread through the 5th–4th millennia BCE in South-West Asia. Metallurgy is an embedded innovation rather than a new technology, thus part of a package of innovations. Different models of skill and technology transfer are outlined leading to the new concept of “engrafted innovation”. This is very similar to the Anchoring Innovation concept now forming the main theme of a decade-long research cluster in the Humanities held at several Dutch Universities (Principal Investigators: Ineke Sluiter and André Lardinois). The chapter focusses on how such developments continued to unfold parallel to each other in places far apart and what conditions enabled this. By studying both the early wind-powered smelting furnaces in Iran, the Arabian Peninsula, Egypt, the Levant, the Aegean, and western Anatolia (end of 4th / early 3rd millennium BCE) and the appearance of metal weapons in graves (early 3rd millennium BCE), an upsurge of metallurgical production in the late 4th millennium seems to be the result of the developing socio-technical processes rather than being the pre-condition to it. This shows that the socio-political embeddedness of these innovations, albeit in different ways, forms the crucial factor in their take-up. Helwing suggests that innovations are social phenomena, not technological ones, while I would argue that they are both. Both Helwing and Hansen look at social or hierarchical phenomena to explain innovations, with Helwing starting more from a bottom-up perspective (craftsmen) and Hansen rather from a top-down perspective (“sponsors”).

Chapter 15 (Marcella Frangipane, pp. 171–183) offers an overview and discussion of the role of metallurgy in various early hierarchical societies in Mesopotamia and East Anatolia. Arslantepe as a type site shows how 4th millennium BCE metalworking started there from ore smelting to the processes of melting and moulding, while in the 3rd millennium BCE ore was processed in the mining region into ingots which, in turn, were taken to the site for further working. Frangipane argues that the early metal workers were not necessarily under direct control of the early state bureaucracy. Here, metal production increased due to its efficiency for warfare and, coinciding, its hardness when alloyed with tin. The paper focusses specifically on the prestige items from the 4th–3rd millennia BCE through the study of the finds from Arslantepe which produced material from the two important successive periods under discussion, each with a different socio-political system: the centralised Late Uruk societies and the fragmented tribal and ranked societies that succeeded the previous groups. In the first case, metal items were presented publically to *display* power while in the latter context they were taken out of circulation and hidden, to show that metal only belonged to chiefs in charge who had to *create* prestige and power.

In a large survey covering the region between the Aegean and west Iran, chapter 16 (Lorenz Rahmstorf, pp. 184–210) discusses the spread of tin bronze technology from the 3rd millennium BCE onwards. It looks at the provenance of tin and where tin bronze objects were found in order to test the past diffusion models that explained the spread of this technology and materials. Rahmstorf argues that tin ore likely did not come from the Kestel mines and Göltepe in the Taurus (both TR). This is supported by careful readings of where the small amount of tin was detected, by how

insignificant amounts of tin were extracted over long periods of time, by how cassiterite's associated minerals would not have allowed ancient metal workers to recognise the tin ore, and by textual evidence. Lead isotope, too, shows that the copper of Aegean and Near Eastern Early Bronze Age finds likely came from central Asia and Afghanistan. Tin bronzes from the Aegean must have resulted from imported copper or bronze from beyond Europe, possibly in the form of ring ingots. Based on elimination, though with lack of fieldwork possibilities in the Irani-Afghani-Pakistani border region, the Afghan area seems the only possible source for tin demand in the Near East and Aegean for the 3rd millennium BCE. Tin bronze was only one of several copper alloys made during this period and the linear progression from arsenic to tin copper needs to be reconsidered in terms of far more complex metal consumption patterns per region.

In aiming to better understand the entanglement of society and technology in southern Mesopotamia in the 3rd millennium BCE (a region without metal resources), chapter 17 (Ulrike Wischnewski, pp. 211–219) studies both archaeological and textual evidence concerning tin-bronze casting. The questions posed pertain to how and why such a metal-poor region could adopt, adapt, and appropriate this metal alloys into its socio-technical environment. It appears that the tin-bronze technology did not appear on virgin terrain and that potential cross-craft interaction patterns may have helped it move along. The knowledge that a material changes properties by alloying was understood from the earlier production of arsenic bronzes, so applying this to tin was a logical step. Moreover, it fitted an already existing package of technologies concerning casting and hammering. As noted in chapter 16, new technologies did not always replace existing ones, so vessels, previously made in ceramic or stone, were still made in these materials while also metal ones were produced.

Chapter 18 (Federica Lume Pereira, pp. 220–230) presents a wide range of items (etched agate beads, glass paste on stone beads, ivories, cylinder seals) that spread over large regions in south-eastern Iran, the Helmand Valley, and the Indus Valley as the result of interregional communication networks from the mid-3rd millennium BCE onwards in Turkmenistan. These data are of great archaeological interest in a series of imported and non-local finds. However, these data by themselves do not signify any innovation *per se*. Innovation would be more obvious if these exotica were also actively used and given meaning or function in people's lives. Gonur Depe (TM) forms the case study for this wealth of finds in the context of innovation aspects, but why these constitute an innovation there is not fully addressed.

Chapter 19 (Jianjun Mei et al., pp. 231–240) discusses the appropriation of early bronze technology in the Central Plains of China. Copper and bronze metallurgy may have been brought to North China from the Eurasian steppes via the Hexi Corridor during the 3rd millennium BCE, and the appropriation of these technologies was shaped by existing favourable social and ideological conditions peripheral to the Central Plains. This technology seemed to have come as a package together with other western phenomena which indicates cultural interaction between the West and North China. Since the Central Plains of China display different ways of metal production than those from the North, perhaps a local indigenous tradition of metal working in the Central Plains was present? This is investigated through the study of ritual vessels and the piece-mould casting technique. The authors argue that it was the social and ritual need for such vessels that prompted the invention of piece-mould casting which had a major impact on labour division and on the coordination and organisation of bronze manufacture overall. The local metal traditions surrounding the Central Plains indicate how their ritual systems seemed to be the decisive factor in directing the development of bronze technology and that the technical side of it became an integral part of these ritual systems.

Chapter 20 (Ken Massy et al., pp. 241–261) shows how a society combined individual long-distance mobility with continuous settlement in the Bavarian Lech valley in the form of constant

movement of their small farmsteads. The authors look into the transformation patterns from the Final Neolithic (FN) to the Early Bronze Age (EBA) through the study of both archaeological and scientific evidence into biological relationships, individual mobility, and the relation of mobility to archaeological evidence. The palaeogenetic data points to the migration of people in the 3rd millennium BCE and genetic components from the eastern Pontic steppe region into Central Europe. In contrast to the highly dynamic transformation characteristics for this period, the Lech valley seems to indicate evidence for long-term continuity, while such results are influenced by the scale of a microstudy. The relationships between the hamlets and their burial grounds and the relation between social and technological change in the micro-region are analysed through ¹⁴C, stable isotope ratios, and aDNA as well as XRF-scanning of copper or bronze artefacts. The latter showed a change from tin-bronze in the FN to pure copper in EBA to tin-bronze again after this. The aDNA indicated kinship-based relations between burials, and burial gifts and body positions confirmed close relationships and tight-knit traditions kept over time. The isotope studies revealed complex mobility patterns in all periods and of people of all age and sexes from FN onwards. The power of micro-regional and interdisciplinary studies is clear in this paper.

Chapter 21 (Christian Horn, pp. 262–268) places the innovative appearances of halberds and other weaponry in their FN context to illustrate the contribution of the past artisans to this technology in South Scandinavia. Horn highlights the interwoven nature of the development of specialised weaponry. Of interest is that the combat techniques themselves do not seem to change much and that all action which may leave traces detectable through use-wear of the tips and edges of weapons can be linked to an all-out form of fencing. Weapon designers, though, develop new forms and shapes with the sole aim of surprising the enemy in combat. The carrier of the new item thus gathers time for the ultimate attack. Being better in combat links to new techniques used in fighting or in using improved weapons. This surprise effect, though, is only temporary and symmetry is achieved sooner or later, but also this is only temporary. The crux in the development from FN to EBA in weaponry and combat sat in a smooth succession of small changes. Unfortunately, there are no chronological charts or maps in this paper, and the use of halberds is not explained nor its connection with the central European Únětice culture.

What struck me in reviewing this book is that several themes, additional to those indicated, emerged repeatedly:

Firstly, that the development and the thriving of new technologies may be more a social than a technical phenomenon (chapters 14; 16). As mentioned, I strongly believe it is both together.

Secondly, that several innovative technologies seem to emerge together with several other ones as a technical package without which the individual innovations may not have succeeded (chapters 5; 6; 9; 11; 14; 17; 19). A strong believer in cross-craft interaction in any sphere of activity (not only crafting), these packages may now be recognised more frequently. The clustering of technologies in packages, though, should not be confused with researching in enough detail as pointed out by chapter 6 in separating goat and sheep evidence.

Thirdly, that older technologies may happily continue to exist next to newcomers rather than being replaced (chapters 3; 5; 16; 17). This makes a lot of sense since habits of consumption, when things work well, do not change easily. We only need to think of ourselves having to learn yet again another version of Word processing.

Fourthly, that there is a good tension between micro-regional (chapters 11; 20) and large overview studies (chapters 6; 13; 16). The more micro-regional studies provide detailed data sets, the stronger the narrative for larger overview studies will become. This book has shown that there is room for both.

The book is of good quality including its figures and tables. While it forms a formidable source of information and discussion on SPR, human-animal interaction, and bronze casting, the structure of the book itself is not explained. The emphasis was on two clusters of innovation, but these do not form a line in the chapter sequence. Perhaps this was done on purpose, but the question remains. While bronze casting and the SPR were the key themes, several papers do not discuss these directly if at all, or they mention the themes of innovation or revolution but do not link them to either bronze casting or the SPR (chapters 2; 3; 18; 21). This does not, however, diminish the content of the chapters. An introductory overview chapter by chapter explaining their internal relation would have solved this issue. The book does not contain a biography or contact details per author, nor an index or abstracts of the papers. These are often useful in the uploading of papers on platforms like Academia.edu, ResearchGate, and university's own Open Access repositories. Beyond typos, missed or redundant words, and some incomplete reference lists, I recommend this book for students and professionals alike. There is perhaps a gap formed concerning Italy and the West Mediterranean, but another volume may make up for that in the future once this one has received the attention it deserves.

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MURIEL GANDELIN / VINCENT ARD / JEAN VAQUER / LUC JALLOT (Hrsg.), Les sites ceinturés de la préhistoire récente. Nouvelles données, nouvelles approches, nouvelles hypothèses. Archives d'Écologie Préhistorique, Toulouse 2018. € 25,-. ISBN 978-2-35842-023-5. 240 Seiten mit 153 Abbildungen in Farbe und Schwarz-Weiß.

Neolithische Erdwerke in Europa sind seit langem Gegenstand intensiver Erforschung – und gerade in den letzten Jahren sind dazu einige wichtige Sammelbände erschienen (z. B. A. M. GIBSON [Hrsg.], *Enclosing the Neolithic. Recent Studies in Britain and Europe*. BAR Internat. Ser. 2440 [Oxford 2012]; A. C. DE VALERA [Hrsg.], *Recent Prehistoric Enclosures and Funerary Practices in Europe. Proceedings of the International Meeting held at the Gulbenkian Foundation (Lisbon, Portugal, November 2012)*. BAR Internat. Ser. 2676 [Oxford 2014]). Fragen der Bedeutung der Anlagen für die sie erbauenden Gemeinschaften, ihre Nutzung und vor allem ihre Funktion (militärisch-defensiv oder sozial? profan oder religiös?) stehen in der Forschung im Vordergrund.

In Frankreich wurden aufgrund der extensiven Präventionsgrabungen des *Institut national de recherches archéologiques préventives* (INRAP) gerade in jüngerer Zeit zahlreiche neue Anlagen dieser Art entdeckt und untersucht. Eine *table ronde*, die 2012 in Carcassonne stattfand, hatte das Ziel, einen Austausch über die neuesten Fortschritte auf diesem Forschungsfeld zu initiieren, und nahm die Entdeckung neuer neolithischer Erdwerke gerade im Midi (d. h. Frankreich südlich des 45. Breitengrades) zum Anlass, diese in den größeren Rahmen der jungsteinzeitlichen Grabenanlagen Europas zu stellen. Die Beiträge decken einen Großteil des mitteleuropäischen Neolithikums ab (ca. 4500 bis 2200 v. Chr.).

Das Werk ist in zwei Teile gegliedert. Im ersten Abschnitt werden neue Grabungsergebnisse bzw. neue Daten zu Erdwerken vorgestellt. Von den sechs Beiträgen behandeln vier das Midi, die in chronologischer Abfolge vorgestellt werden; zwei Anlagen aus anderen Gegenden Frankreichs ergänzen das Bild. Teil 2 des Buches widmet sich neuen Ansätzen und Hypothesen. Hier erfolgt die Einbindung der Erkenntnisse zu französischen Erdwerken in den größeren europäischen