

# FROM THE AEGEAN SEA TO THE PARISIAN BASIN. HOW SPONDYLUS CAN REARRANGE OUR VIEW ON TRADE AND EXCHANGE.

Arne Windler

## Introduction

Communication can be seen as an inherent part of every economic system: It is not only necessary for the allocation of scarce resources, but also for the achievement of the economic objectives (Rössler, 2005, p.16). Furthermore communication is a mandatory precondition for every exchange; even the daily shopping is a transfer of information about price and quantity of a commodity via price labels. However, it is possible to transfer the own purposes and intentions in an exchange situation by either negotiating a successful contract or allowing the exchange to fail (Schmid, 2004), or as Claude Lévi-Strauss (1969, p.67) points out: "Exchanges are peacefully resolved wars, and wars are the result of unsuccessful transactions."

If there is the possibility to determine the provenance of an artefact or its material, acts of exchange and communication become visible in the archaeological sources. Provenance studies all by themselves are not able to give any evidence of different modes of exchange, though. For a further discussion of the transfer of artefacts, it is essential to have a closer look at different theories deduced from economics, anthropology and sociology. Afterwards some of these theories are applied to the *Spondylus gaedero-**pus* exchange during the Neolithic and Chalcolithic.

## Modes of exchange

Different scholars distinguished between modes of exchange due to theoretical and practical considerations. While Bronislaw Malinowski (2007) and Colin Renfrew (1975) classify exchange with regards to observations from Anthropology or Archaeology, Karl Polanyi (1978; Polanyi et al., 1957), Marshall Sahlins (1972), Douglass North (1984) and Frank Hillebrandt (2009) developed theoretical models.

Not only is the ceremonial gift exchange (known as the Kula ring) described in the eminent study *Argonauts of the western pacific* by Malinowski (1922 [2007]), but also six other modes of exchange. He distinguished between:

- pure gifts
- traditional payments without an equivalent and irregular return
- a payment for different services
- gifts with an economic equivalent
- exchange of material goods against privileges or immaterial goods
- a commercial trade

There is an ongoing discussion about structure, reasons and meaning of the Kula ring and there is a variety of literature from various disciplines about this topic (for a review of recent publications see Adloff and Mau, 2005).

Colin Renfrew (1975) correlated the quantity of artefacts which spread in a certain distance from the source with ten different modes of exchange. On the one hand he connected different "fall-off curves" with a prestige good exchange, a commercial trade or a trade from hand to hand (criticism was expressed by Hodder, 1992, pp.123-124).

In his theory of reciprocity Marshall Sahlins (1972) divided exchange into generalised, balanced and negative reciprocity. The pure gift (in terms of Malinowski) or an exchange based on kinship is connected with generalised reciprocity. Balanced reciprocity can be seen as a commercial trade between different villages or lineages, which serves the social relationship as well as the economic wants. Utility maximisation is the characteristic feature of negative reciprocity; obtaining a commodity is the leading principle, even though violence can be used to enforce the own economic aims. According to Sahlins, negative reciprocity is the main mode of exchange between different tribes.

The economic and social objectives are related to the social distance of the exchange partners. If they are relatives, they benefit from the exchange by reproducing their social relationship. If both of them belong to different tribes or social units, selfish actions and intentions prevail.

The models of Renfrew and Sahlins were combined to explain the supply of lithic tools in the Linear Pottery culture (Zimmermann, 1995; Scharl, 2010).

By contrast Karl Polanyi (1978; Polanyi et al., 1957) differentiated between gift exchange, redistribution and market trade. Whereas gift exchange occurs between symmetrical groups to reproduce their social relationships, redistribution is characterised by a centre, which reallocates the produced commodities. Distinct features of a market exchange are the forces of supply and demand and the development of equivalents. A special feature of Polanyi's definition of a market is the presence of money, whereas money is irrelevant for microeconomics<sup>1</sup> (Pindyck and Rubinfeld, 2003). Furthermore his conclusion is still essential for Archaeology: In premodern societies, gift exchange and redistribution are believed to predominate, whereas the free market is supposed to be of minor importance. But, indeed, he ignored the fact that even in the peak of capitalism market exchange was not self-regulating, but rather organised by different contracts and institutions (North, 1988, p.43).

The trichotomy of reciprocity, redistribution and market exchange developed by Karl Polanyi is of central importance to the field of Archaeology, even though this distinction is not explicitly mentioned and defined by different researchers (e.g. Eggert et al., 2011). A clear demarcation between these modes of exchange is problematic, in so far as in economics the market is the base of every voluntary exchange (Homann and Suchanek, 2005; North, 1988, p.43).

Likewise Douglass C. North (1984, pp.255-258), an economic historian, described three different modes: "personal exchange, impersonal exchange without third-party enforcement, and impersonal exchange with third-party enforcement." (North, 1984, p.258) These three general types are characterised by four variables: the cost of measuring quantity and quality of the goods and services, the nature of the exchange process, the enforcement of property rights, and ideological attitudes. These variables are associated with the transaction costs of an exchange. With the invention of scales and weights the costs of evaluating the quantity of a commodity declined (North, 1988) and it was easier to specify and enforce the property rights of goods and services (North, 1984, p.258). The nature of exchange is connected to the rela-

tionship of the participants. In a personal exchange the partners know about behaviour and reaction of the counterpart, whereas in an impersonal exchange nothing restrains the parties to get an advantage of the transaction and the exchange gets more costly. Enforcement is an important variable for the transactions costs, too, because the costliness for measurement makes it difficult to determine if and by whom a contract was violated. In a world with specialisation and impersonal exchange a neutral third-party is essential to enforce and judge on property rights (e.g. courts). North (1984, p.258) emphasises, that the costs of exchange arise as a consequence of an individual maximisation behaviour at every margin; that is why ideology matters. While in neoclassical economics the preferences and tastes are important, but kept stable, ideology changes over time. It could be measured by the willingness to endure rather than "free ride"<sup>2</sup> and cheat (North, 1984, p.258).

In accordance to Frank Hillebrandt (2009, pp.92-96), the theoretical construction of a perfect market and a pure gift exchange, and their contraposition, is not very helpful for a study of exchange and for that reason he classified every exchange into a social, a material and a time dimension. A gift, e.g., has a high social dimension, whereas the material dimension is of minor importance and there is a delayed return of the equivalent. The relationship between demander and supplier is insignificant in a market, but the material dimension is high. The equivalent returns without any delay.

The models developed by Polanyi, Sahlins and Renfrew are the most relevant for defining prehistoric exchange. Economic models are still used rather rarely, and as a result the discussion about prehistoric market exchange is insufficient (see Garraty and Stark, 2010 as a counter example).

## Spondylus in Prehistory

The distribution of *Spondylus gaederopus*, a shell from the Mediterranean Sea, is one of the earliest examples of long distance exchange in Europe (Fig. 1). Although the shell has been in the focus of prehistoric archaeology for nearly 130 years (Virchow, 1884, pp.399-400), there still is an ongoing debate about origin, meaning and modes of transfer from the Mediterranean coast to Central Europe (for a discussion see Bajnóczi et al., 2013 and a recent volume by Ifantidis and Nikolaidou, 2011).

*Spondylus* was being used in European prehistory for several Millennia, between the Palaeolithic (Lezetxiki Cave, Spain: Arrizabalaga et al., 2011) until

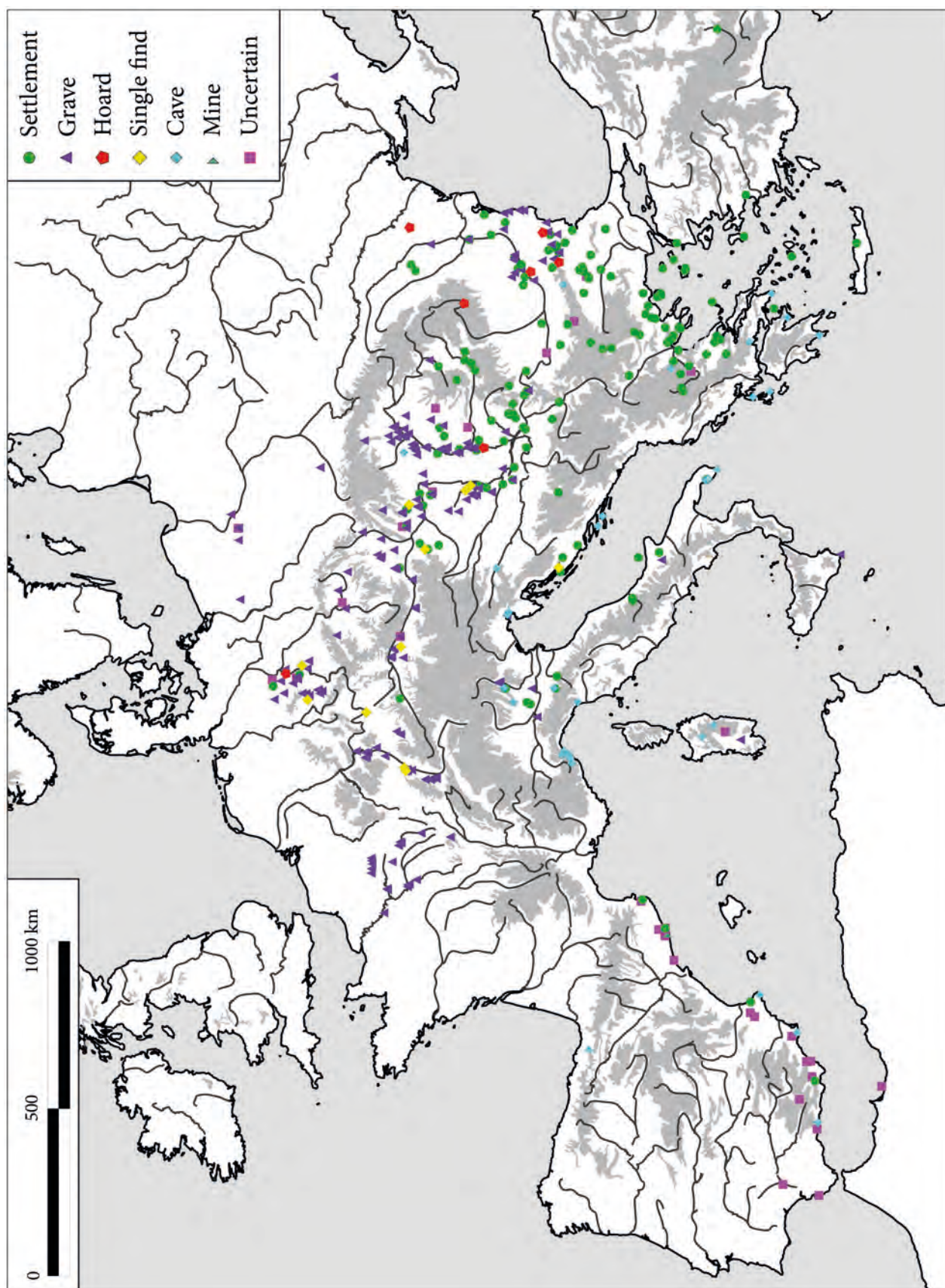


Fig. 1: The distribution of *Spondylus gaederopus* artefacts in Europe between the Paleolithic (Spain) and the Iron Age (Greece).



the first Millennium BC (Veropoulidou, 2011), as a personal adornment as well as an addition to the diet. But most of the artefacts are dating into the Neolithic or Chalcolithic, nevertheless a chronological analysis is still necessary.

To analyse the chronological distribution of Spondylus in Europe, a method developed by Oliver Nakoinz (2012) was used. The particular problems are the different chronological categorisations for Europe and a time span of more than 2 Millennia and to synchronise them in one system. According to Nakoinz' method every site dates into a century with a certain probability. e.g. the Starčevo culture has a chronological span between 6200 to 5500/5400 BC (Schubert, 1999) and as a consequence the 7<sup>th</sup> Millennium has a probability of 28.6% ( $100/(6200-5500)*200$ ), but it is more likely that it dates into the first half of the 6<sup>th</sup> Millennium BC (71.4%;  $100/(6200-5500)*500$ ). Due to this fact it is possible to prepare different distribution maps for one time period, but therefore it is necessary to consider two facts: One site can date into two different time periods (e.g. a Late Neolithic I Spondylus figurine from Knossos (Fig. 2) and the distribution of Spondylus is influenced by the threshold value. There is a remarkable difference between 20% and 50% value during the 7<sup>th</sup> Millennium BC. Six sites of the Starčevo culture disappear, if a certainty over 50% is used – only Anza (for a discussion see: Gimbutas, 1974; Milošević, 1978; Schubert, 1999, pp.51-54) and Burial No. 63 in Vlasac (Borić et al., 2008) date with a high degree of probability into this first phase. In this case and for the different maps a threshold value of 20% was used.

In the first period Spondylus was used for different purposes: As addition to the diet (Agios Petros), as well as adornment, e.g. as bracelets (Sérvia (Ridley et al., 2000) and Anza) and beads (e.g. Vlasac).

During the next phase, the first half of the 6<sup>th</sup> Millennium BC, Spondylus was present in the late Early Neolithic and Middle Neolithic societies of Greece, around the Adriatic Sea, Northern Italy, Romania and one bracelet is known from Çatalhöyük West Mound (Erdoğu, 2009, pp.50-51) (Fig. 3). In the Balkans Spondylus artefacts occur in settlements, the only exception is one grave in Vinkovci – it contains a Spondylus pendant together with ceramics from the late Starčevo and early Vinča cultures (Burić and Težak-Gregl, 2010, pp.62-63, Fig. 5).

There is a significant change in the distribution of Spondylus in the second half of the 6<sup>th</sup> Millennium BC: The shell was distributed over the whole of Europe into the Parisian Basin, Central Germany, along the Danube and Tisza rivers and even one artefact is

known from the Ukraine (from the cemetery of Lasaya Gora, Azovo-Dnieprovskaya culture, personal communication N. Kotova, Kiev, 2013) (Fig. 3). In Central and Western Europe the spread of Spondylus accompanies the old and middle Linear Pottery culture. The dichotomy of Spondylus between Western/Central Europe and Southeastern Europe, which was observed by Johannes Müller (1997), still persists: During the Middle and early Late Neolithic of Greece Spondylus only occurs in settlements, whereas in Linear Pottery contexts the shell is usually known from funerals. But there is no distinct demarcation between these different contexts – both, in the Vinča and the Linear Pottery culture, Spondylus is known from settlements as well as graves (E.g. different sites at the western part of the Pannonian Basin or along the Tisza). A special feature of the Central European artefacts are the so called V-Klappen, which were probably used as belt buckles. They are uncommon in South Eastern Europe and there are only a few parallels from the Eastern Sector of Dispilio, Greece. They were found in Phases B2 and B3, which belong to the early Late Neolithic and the late Middle Neolithic and are coincident with the Linear Pottery culture (Veropoulidou and Ifantidis, 2004, pp.74-77, Tab. 1). During this period Spondylus was also present in northern Turkey: A necklace from Aşağı Pınar (Karanovo IV) (Özdoğan and Parzinger, 2000, p.87) and a bracelet from Uğurlu (Gökçeada, Aşağı Pınar 5 or Karanovo III) (Erdoğu, 2011, p.50, Fig. 16) are known.

In Middle Europe between 5000 and 4500 BC Spondylus was not as common as in the former period. A few funerals belonging to the Hinkelstein (e.g. Trebur), Großgartach or Villeneuve-Saint-Germain cultures still contain Spondylus adornment, but the main area of the distribution is Northern Greece and along the Danube and Tisza (Fig. 4). As Michel Louis Sfériadès (2010) noticed the shell is uncommon in the Cucuteni-Tripolye area and only known from the Tripolye A Hoard of Cărbuna with 270 Spondylus artefacts – in most cases beads. There is still a discussion about some shell artefacts from the Cucuteni A settlement of Scânteia in East Romania: While Schuster (2002) believes in Spondylus artefacts, Haimovici (2007) rejects this idea. There is evidence for the use of Spondylus from funeral contexts (Varna and Durankulak) as well as from settlements (e.g. Ceamurlia-de-Jos) in Northern Bulgaria and Southern Romania during the Early and Middle Chalcolithic.

In settlements during the Late Neolithic/Chalcolithic of Southeastern Europe Spondylus was not only found on the Aegean shore, but it was also common in Bulgaria (Kodjadermen-Gumelnița-

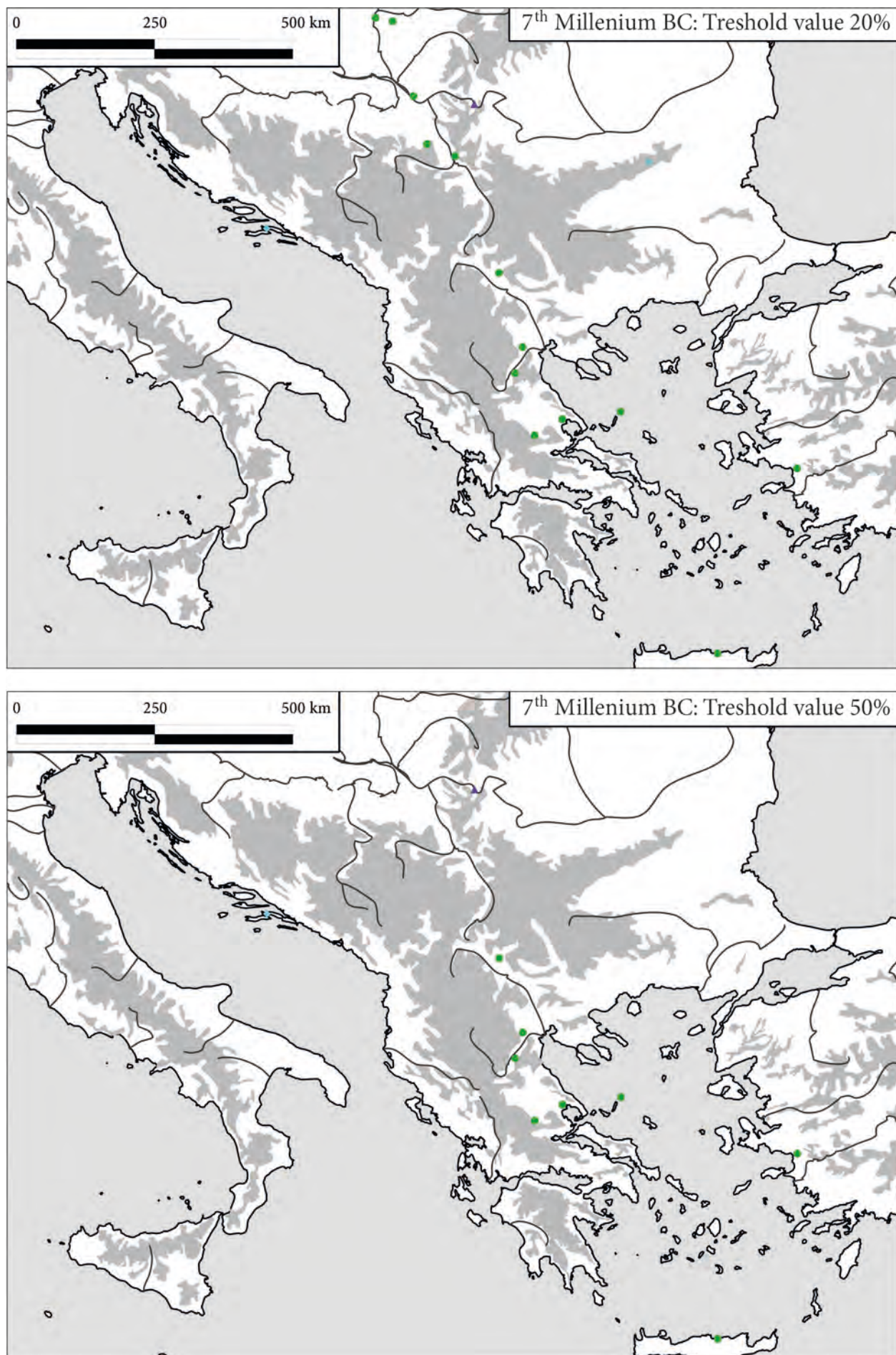


Fig. 2: The influence of different threshold values for the distribution of the 7th Millennium BC (legend see Fig. 1).



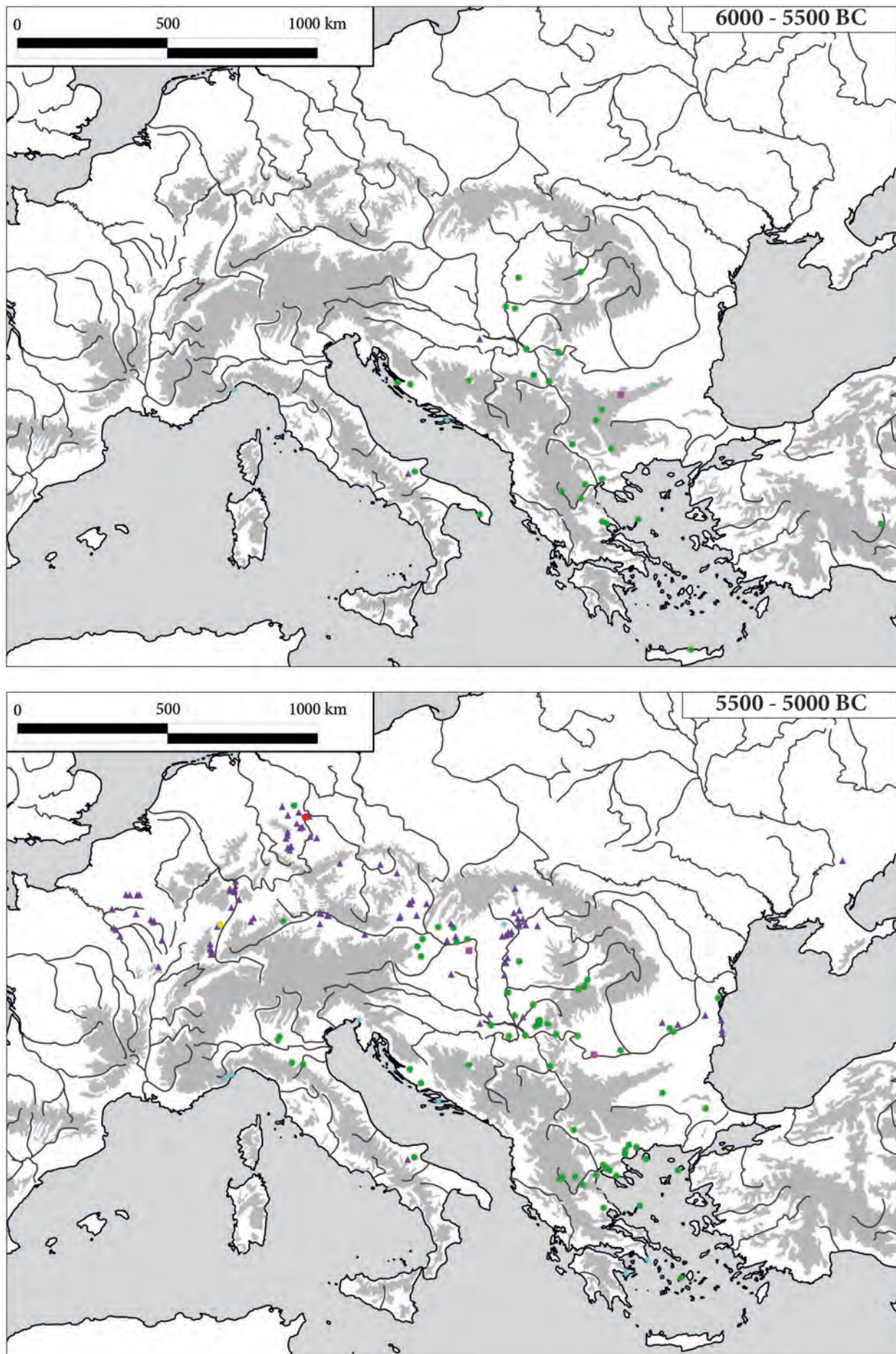


Fig. 3: The distribution of Spondylus artefacts between 6000 – 5500 BC and 5500 – 5000 BC (legend see Fig. 1).



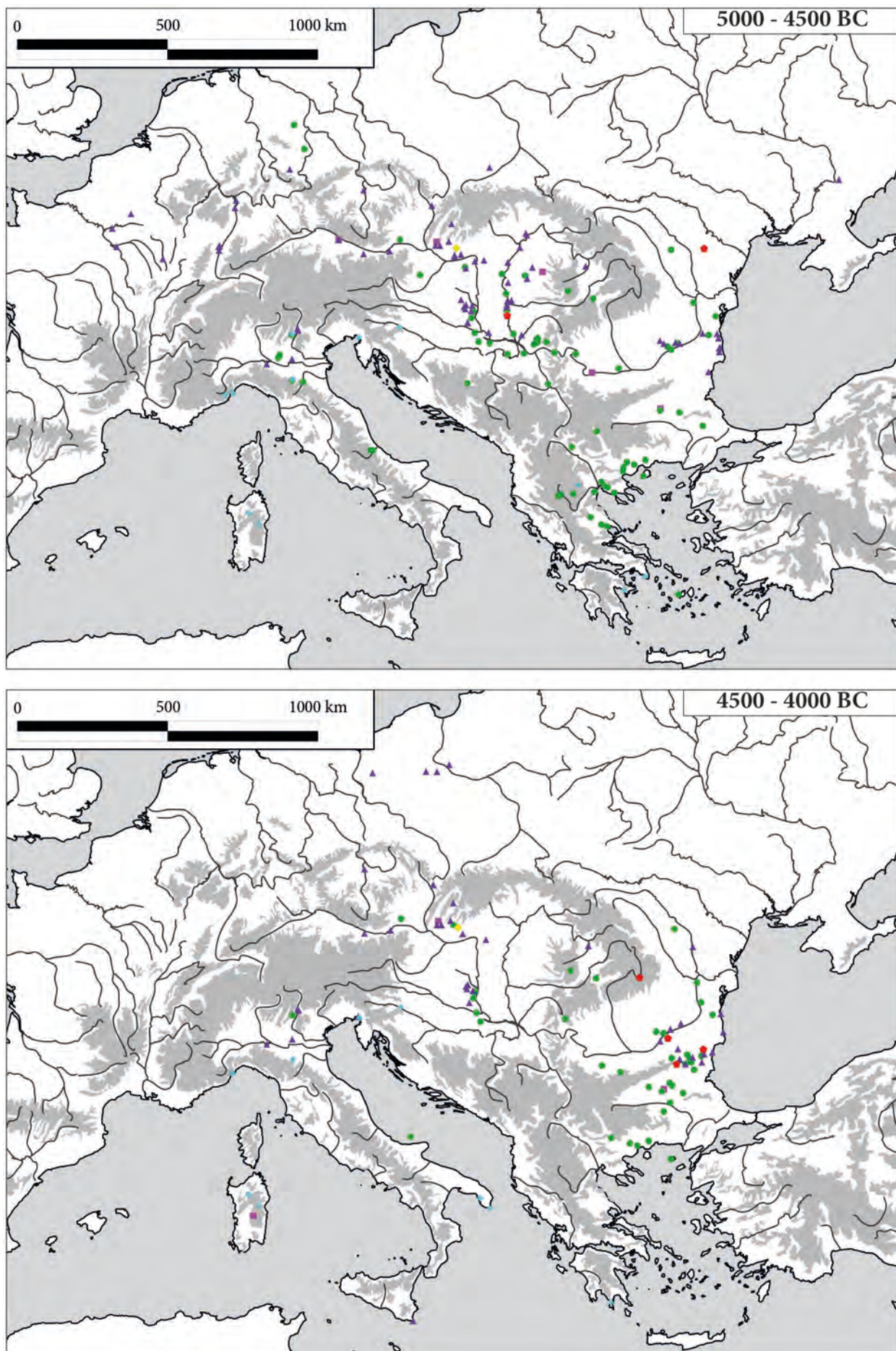


Fig. 4: The distribution of Spondylus artefacts between 5000 – 4500 BC and 4500 – 4000 BC (legend see Fig. 1).



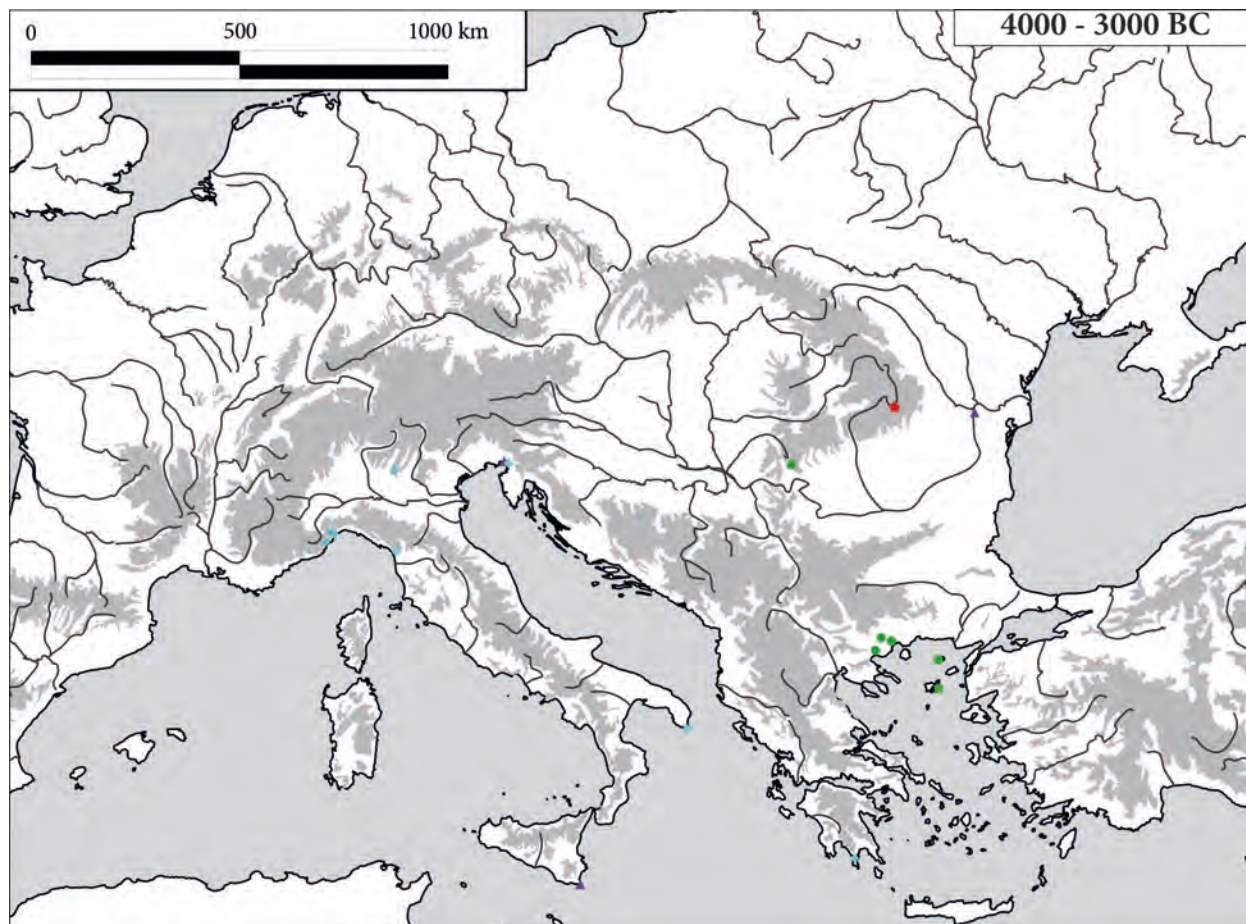
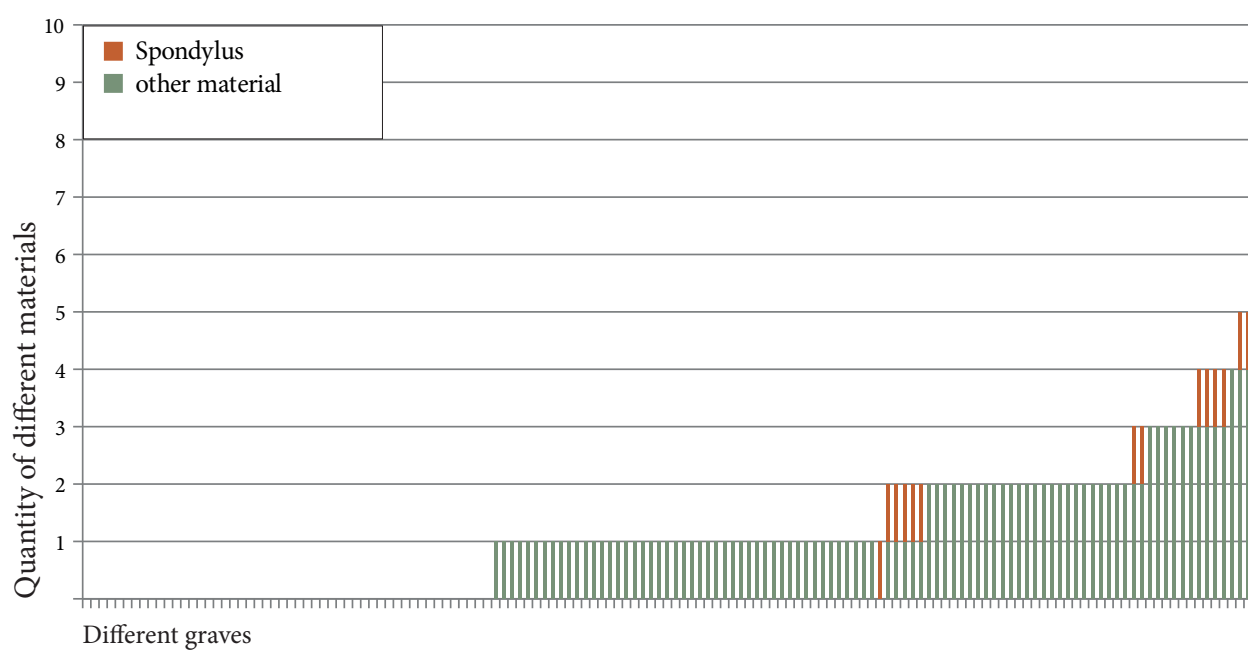


Fig. 5: The distribution of *Spondylus* artefacts between 4000 – 3000 BC (legend see Fig. 1).

### Different materials in the graves of Durankulak, Hamangia I-II





Karanovo (KGK-) VI cultures). There is less evidence of *Spondylus* utilisation in Central-Eastern Europe between 4500 to 4000 BC: Some artefacts are known from Brześć Kujawski culture in Poland and little more belong to the Lengyl culture in Hungary (Fig. 4). Using the data of Johannes Müller (1997), Raiko Krauß (2010) prefers the KGK-VI and the Cucuteni-Tripolye area as a transmitter of *Spondylus* from Southern Europe into Poland – an idea which has to be re-examined, due to several artefacts from the Danube during the Late Neolithic (according to Chapman, 2010, p.3 Fig. 1 from 4800-4200 BC) (Kovács, 2013, p.286 Fig. 1).

During the 4th Millennium BC *Spondylus* was common at the Mediterranean Sea (Greece and Northern Italy), but it was only found at three sites in the hinterland: The Cucuteni AB hoard of Ariuşd, the Cernavoda – Folteşti/Usatovo cemetery of Brăiliţa and at the settlement of Cuptoare-Dealul Sfogea (Fig. 5). But the chronological situation of these three sites has to be considered: Only Brăiliţa has a high probability to date into this period (Schuster, 2002, pp.53-54). At the Chalcolithic and Early Bronze Age Sitagroi (Greece) *Spondylus* was still used to produce bracelets and beads (Nikolaïdou, 2003).

As illustrated by the different maps, the distribution of *Spondylus* varies considerably during the periods of interest. The shell was being used only in South Eastern Europe until 5500 BC, but with the Neolithic transition in Middle Europe, *Spondylus* spread up to the Parisian Basin. After the end of the Linear Pottery culture around 4900 BC the main distribution of *Spondylus* yields back to South Eastern Europe. In the

4<sup>th</sup> Millennium BC it was only common in settlements at the Mediterranean shore.

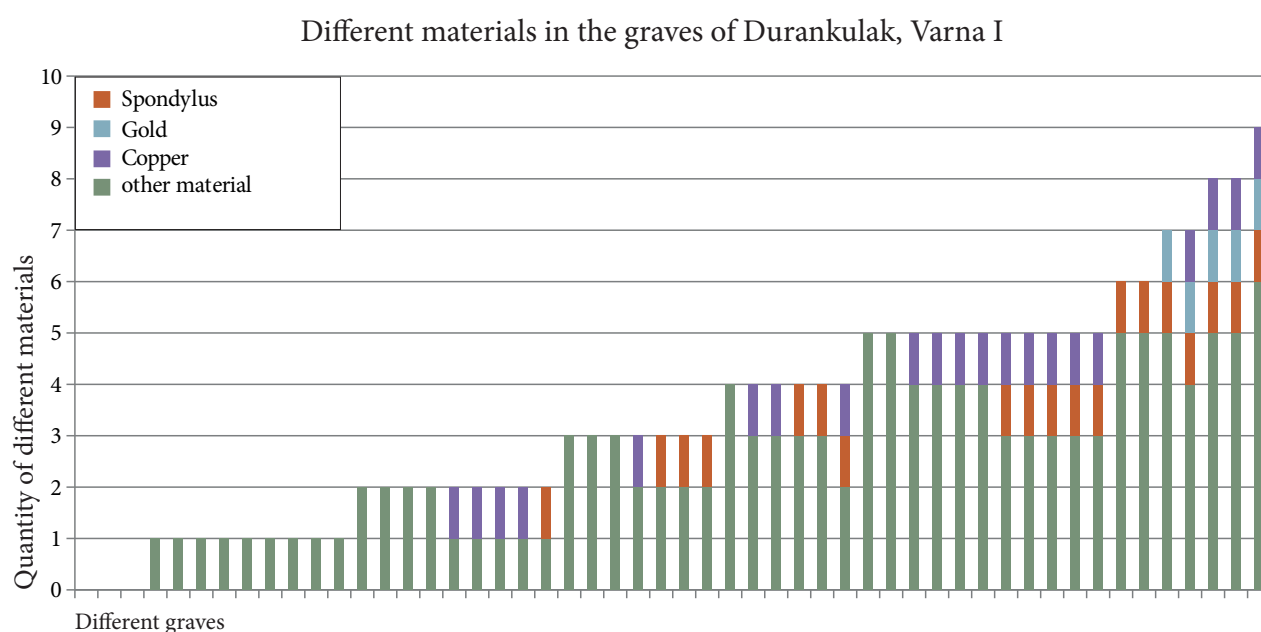
## Synthesis

As it was shown above, there are many possibilities to distinguish exchange and all of them have their strengths and weaknesses. In one case study the distribution of *Spondylus* can help to classify and apply these theories to prehistoric societies. The case study deals with the cemetery of Durankulak situated in Northern Bulgaria. Via its grave goods 1190 burials dated to a period lasting from Hamangia I to Varna III, in absolute dates referring clearly to a period from before 5000 BC to 4250/4150 BC (Bojadžiev, 2002).

Malinowski's pure gift as well as Sahlins' generalised reciprocity or North's personal exchange are demonstrable in Durankulak, as *Spondylus* is known from children's graves (e.g. Nr. 621 or 694A). An assignment to these modes of exchange is unequivocal, because there is no chance of receiving an equivalent from a neonate/child.

A detailed analysis of the graves in Durankulak provides information on the other modes of exchange and their development during different periods.

During the first period only a few different and local materials were given to the buried individuals. As Figure 6 shows, most of the graves contain only zero to two different materials and the artefacts were made of local resources, like clay or stone, whereas foreign materials like shell artefacts are uncommon



Box-Whisker-Plot for different materials in the graves of Durankulak

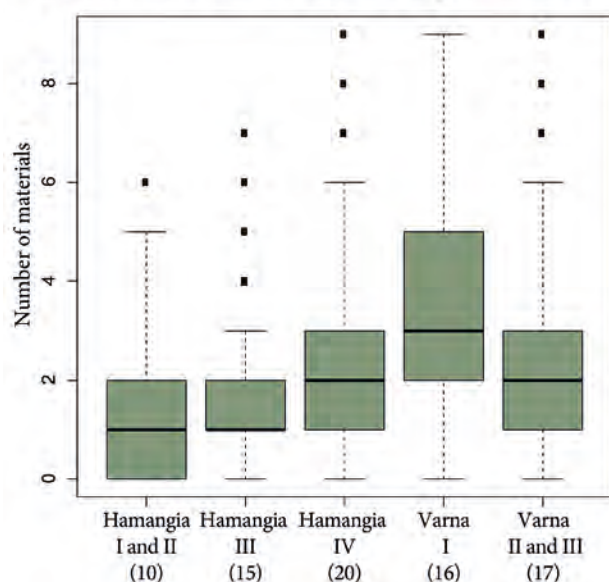


Fig. 8: Box-Whisker-Plot for different materials in the graves of Durankulak.

in the graves. There are small changes in the quantity of resources until the period Varna I – only outliers contain seven different materials. Furthermore during the period Hamangia IV just 24% of all graves contain copper (4% contain gold artefacts), whereas during the period Varna I the quantity of copper increases to 40% of all individuals (10% for gold). Another aspect seems remarkable: Graves of the period Varna I usually contain two to five different materials (Fig. 7).

The diversification of artefacts made of different resources in the graves of Durankulak shows the development of a complex exchange system (Fig. 8). Furthermore there might be a specialisation of craftsmanship, as it is indicated by the appearance of copper and gold objects. It is possible to associate these two developments with North's (1984) differentiation of personal/impersonal exchange. During the first periods, interaction occurs only sporadically and Spondylus is one resource, which was seldom given to the buried – this system can be connected with North's personal or impersonal exchange without third-party enforcement. The development of specialised craftsmanship, several different resources in the graves and the rise of a hierarchical system, like the graves of Varna (Lichardus, 1991), indicate an impersonal exchange with third-party enforcement.

## Conclusion

It is possible to distinguish exchange in many different ways and a study of exchange can not only focus

on one material, but rather has to include a whole exchange system and different resources.

Nevertheless it is necessary to define the used terms: for instance Polanyi uses a very narrow definition of a market, where money is a precondition for an exchange. By contrast, in economics every voluntary exchange occurs on a market (Homann and Suchanek, 2005) and to make use of the economic model can even help to explain reciprocity (Henrich et al., 2001).

As the case study indicates, it is possible to apply alternative models for prehistoric exchange without using the trichotomies of Polanyi or Sahlins. Instead of these two models the differentiation of North in personal and impersonal exchange with and without third-party enforcement was applied for Durankulak – there a development to a system with third-party enforcement is discernible.

## Notes

- <sup>1</sup> In microeconomics the behaviour of firms and households and their way of making decisions (price and quantity of a good) is analysed.
- <sup>2</sup> The free rider problem refers to a person who benefits from goods without paying for them.

## References

- Adloff, F. and Mau, S., 2005. Zur Theorie der Gabe und Reziprozität. In: F. Adloff, and S. Mau, eds. 2005. *Vom Geben und Nehmen. Zur Soziologie der Reziprozität*. Frankfurt / New York, pp.9–57.
- Arrizabalaga, Á., Álvarez-Fernández, E. and Iriarte, M.-J., 2011. Spondylus sp. at Lezetxiki cave (Basque Country, Spain): First evidence of its use in symbolic behavior during the Aurignacian in Europe. In: F. Ifantidis, and M. Nikolaidou, eds. 2011. *Spondylus in Prehistory. New data and approaches. Contributions to the archaeology of shell technologies*. Oxford, pp.19–24.
- Bajnóczi, B., Schöll-Barna, G., Kalicz, N., Siklósi, Z., Hourmouziadis, G. H., Ifantidis, F., Kyprissi-Apostolika, A., Pappa, M., Veropoulidou, R. and Ziota, C., 2013. Tracing the source of Late Neolithic Spondylus shell ornaments by stable isotope geochemistry and cathodoluminescence microscopy. *Journal of Archaeological Science*, 40(2), pp.874–882.
- Bojadžiev, J., 2002. Die absolute Chronologie der neo- und äneolithischen Gräberfelder von Durankulak. In: H. Todorova, ed. 2002. *Durankulak, Bd. 2. Die prähistorischen Gräberfelder, Vol. 1*. Sofia, pp.67–69.
- Borić, D., French, C. and Dimitrijević, V., 2008. Vlasac revisited: formation processes, stratigraphy and dating. *Documenta Praehistorica*, XXXV, pp.261–287.



- Burić, M. and Težak-Gregl, T., 2010. Das Grab 3 in Vinkovci – Ein Beitrag zur relativen Chronologie der Starčevo- und Vinča-Kultur. In: J. Šuteková, P. Pavúk, P. Kalábková, and B. Kovár, eds. 2010. *PANTA RHEI. Studies on the Chronology and Cultural Development of South-Eastern and Central Europe in Earlier Prehistory Presented to Juraj Pavúk on the Occasion of his 75th Birthday*. Bratislava, pp.59–65.
- Chapman, J., 2010. *From surface collection to prehistoric lifeways. Making sense of the multi-period site of Orlovo, South West Bulgaria*. Oxford.
- Eggert, M. K. H., Schweizer, B., Krausse, D., Dix, A., Nakoinz, O., Sievers, S., Kurz, S. and Pare, C., 2011. Zu kulturwissenschaftlichen Theorien und Konzepten im DFG-Schwerpunktprogramm 1171 des DFG-Schwerpunktprogramms 1171 in Stuttgart, 12.-15. Oktober 2009. In: D. Krausse, ed. 2011. *Fürstensitze und Zentralorte der frühen Kelten. Abschlusskolloquium des DFG-Schwerpunktprogramms 1171 in Stuttgart, 12.-15. Oktober 2009*. Stuttgart, pp.19–75.
- Erdoğu, B., 2009. West Mound Trench 8. In: S. Farid, ed. 2009. *Çatalhöyük 2009 Archive Report. Çatalhöyük Research Project*, pp.51–52.
- Erdoğu, B., 2011. A preliminary Report from the 2009 and 2010 field seasons at Ugurlu on the Island of Gökceada. *Anatolica*, 37, pp.45–65.
- Garraty, C. P. and Stark, B. L., 2010. *Archaeological approaches to market exchange in ancient societies*. Boulder, Colorado.
- Gimbutas, M., 1974. Anza cca. 6500-5000 BC: A cultural yardstick for the study of Neolithic Southeast Europe. *Journal of Field Archaeology*, 1, pp.25–66.
- Haimovici, S., 2007. Mediterranean species discovered among the animal remains from Dobrogea Province, Neolithic-Eneolithic Period. *Analele Stiintifice ale Universitatii « Al. I. Cuza » Iasi, s. Biologie animala*, 53, pp.291–302.
- Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H. and McElreath, R., 2008. In Search of Homo Economicus. Behavioral Experiments in 15 Small-Scale Societies. *The American Economic Review*, 91(2), pp.73–78.
- Hillebrandt, F., 2009. *Praktiken des Tauschens. Zur Soziologie symbolischer Formen der Reziprozität*. Wiesbaden.
- Hodder, I., 1992. *Theory and Practice in Archaeology*. London, New York.
- Homann, K. and Suchanek, A., 2005. *Ökonomik - Eine Einführung*. 2nd ed. Tübingen.
- Ifantidis, F. and Nikolaidou, M., 2011. *Spondylus in Prehistory. New data and approaches. Contributions to the archaeology of shell technologies*. Oxford.
- Kovács, K., 2013. Late Neolithic Exchange Networks in the Carpathian Basin. In: A. Anders, and G. Kulcsár, eds. 2013. *Moments in Time. Papers Presented to Pál Raczky on His 60th Birthday*. Budapest, pp.385–400.
- Krauß, R., 2010. Zur Akkumulation von Prestigegütern im Westschwarzmeerraum während des 5. Jahrtausends v. Chr. In: C. Theune, F. Biermann, R. Struwe, and G. H. Jeute, eds. 2010. *Zwischen Fjorden und Steppe. Festschrift für Johan Callmer zum 65. Geburtstag*. Rhaden/Westf, pp.289–300.
- Lévi-Strauss, C., 1969. *The Elementary Structures of Kinship (Les Structures élémentaires de la Parenté)*. 2nd ed. Boston.
- Lichardus, J., 1991. Das Gräberfeld von Varna im Rahmen des Totenrituals des Kodžadermen-Gumelnița-Karanovo VI-Komplexes. In: J. Lichardus, and R. Eght, eds. 1991. *Die Kupferzeit als historische Epoche. Symposium Saarbrücken und Otzenhausen 6.-13.11.1988*. Bonn, pp.167–194.
- Malinowski, B., 1992 [2007]. *Argonauten des westlichen Pazifiks. Ein Bericht über Unternehmungen und Abenteuer der Eingeborenen in den Inselwelten von Melanesisch-Neuguinea*. Eschborn bei Frankfurt am Main.
- Milojčić, V., 1978. Besprechung: Marija Gimbutas (Hrsg.), *Neolithic Macedonia*. *Germania*, 56(2), pp.548–559.
- Müller, J., 1997. Neolithische und chalkolithische Spondylusartefakte. Anmerkungen zu Verbreitung, Tauschgebiet und sozialer Funktion. In: C. Becker, M. L. Dunkelman, C. Metzner-Nebelsick, H. Peter-Röcher, Roeder, Manfred, and B. Teržan, eds. 1997. *Beiträge zur prähistorischen Archäologie zwischen Nord- und Südosteuropa. Festschrift für Bernhard Hänsel*. Espelkamp, pp.91–106.
- Nakoinz, O., 2012. Datierungskodierung und chronologische Inferenz – Techniken zum Umgang mit unscharfen chronologischen Informationen. *Prähistorische Zeitschrift*, 87(1), pp.189–207.
- Nikolaidou, M., 2003. Catalog of Items of Adornment. In: E. Elster, and C. Renfrew, eds. 2003. *Prehistoric Sitagroi: Excavations in Northeast Greece, 1968-1970. Volume 2: The final report*. Los Angeles, pp.383–401.
- North, D. C., 1984. Government and the Cost of Exchange in History. *Journal of Economic History*, XLIV(2), pp.255–264.
- North, D. C., 1988. *Theorie des institutionellen Wandels: eine neue Sicht der Wirtschaftsgeschichte*. Tübingen.
- Özdoğan, M. and Parzinger, H., 2000. The Status of Metallurgy between the Balkans and Anatolia: The evidence of Aşağı Pınar and Kanlıgeçit Excavations in Eastern Thrace. In: Ü. Yalçın, ed. 2000. *Anatolian Metal I, Beiheft 13*. Bochum, pp.83–91.
- Pindyck, R. S. and Rubinfeld, D. L., 2003. *Mikroökonomie*. 3rd ed. München.
- Polanyi, K., 1957. The Economy as Instituted Process. In: K. Polanyi, C. M. Arensberg, and H. W. Pearson, eds. 1957. *Trade and market in the early empires. Economies in history and theory*. New York / London, pp.243–270.
- Polanyi, K., 1978. *The Great Transformation. Politische und ökonomische Ursprünge von Gesellschaften und Wirtschaftssystemen*. Sinzheim.
- Renfrew, C., 1975. Trade as action at a distance, questions of integration and coommunication. In: J. A. Sabloff, and C. C. Lamberg-Karlovsky, eds. 1975. *Ancient civilization and trade*. 1st ed. Albuquerque, pp.3–59.
- Ridley, C., Wardle, K. A. and Mould, C. A., 2000. *Servia I. Anglo-Hellenic Rescue Excavations 1971-73 directed by Katerina Rhomiopoulou and Cressida Ridley*. Oxford / Northampton.
- Rössler, M., 2005. *Wirtschaftsethnologie. Eine Einführung*. Berlin.
- Sahlins, M., 1972. *Stone Age Economics*. Chicago / New York.

- Scharl, S., 2010. *Versorgungsstrategien und Tauschnetzwerke im Alt- und Mittelneolithikum. Die Silexversorgung im westlichen Franken*. Rahden/Westf.
- Schmid, M., 2004. *Rationales Handeln und soziale Prozesse. Beiträge zur soziologischen Theoriebildung*. Wiesbaden.
- Schubert, H., 1999. *Die bemalte Keramik des Frühneolithikums in Südosteuropa, Italien und Westanatolien*. Rahden/Westf.
- Schuster, C., 2002. Zu den Spondylus-Funden in Rumänien. *Thraco - Dacica*, 22, pp.27–83.
- Séfériadès, M. L., 2010. Spondylus and Long-Distance Trade in Prehistoric Europe. In: D. W. Anthony, and J. Chi, eds. 2010. *The lost world of old Europe. The Danube valley, 5000-3500 BC*. New York, Princeton, N.J, Oxford: Institute for the Study of the Ancient World at New York University; Princeton University Press, pp.179–186.
- Veropoulidou, R., 2011. Spondylus Gaederopus and meals in Central Greece from the 3rd to the early 1st Millennium BCE. In: F. Ifantidis, and M. Nikolaidou, eds. 2011. *Spondylus in Prehistory. New data and approaches. Contributions to the archaeology of shell technologies*. Oxford, pp.191–208.
- Veropoulidou, R. and Ifantidis, F., 2004. *Shell Assemblage Analysis of the Neolithic Lakeside Settlement of Dispilio, Kastoria. The Eastern Sector*. Thessaloniki.
- Virchow, R., 1884. Excursion nach Bernburg (Anhalt). *Zeitschrift für Ethnologie*, 16, pp.398–420.
- Zimmermann, A., 1995. *Austauschsysteme von Silexartefakten in der Bandkeramik Mitteleuropas*. Bonn.

## Authors' address

Arne Windler  
 Ruhr-Universität Bochum  
 Institute for Archaeological Sciences  
 Am Bergbaumuseum 31, 44791 Bochum  
 Arne.Windler@rub.de