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SUCCINITE AND SELECTED FOSSIL RESINS OF EUROPE:
LOCALITIES, PROPERTIES, ARCHAEOLOGY

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The Amber Seminar accompanying the Amberif Fair has a long tradition. This is a unique opportunity to meet in Gdańsk—the World Capital of Amber—and look in an interdisciplinary way not only at Baltic amber, but also at other fossil resins. Especially because the latter are more and more audaciously trying to compete with succinite. The Seminars owe their reputation to the involvement in their organisation of Professor Barbara Kosmowska-Ceranowicz from the Museum of the Earth in Warsaw. It is to Professor Kosmowska-Ceranowicz—a Person of wide knowledge, an unmatched openness to people and love for Baltic amber—that we are indebted for the magic moments of our meetings so far.

That is why it is such a great honor and distinction for me that from next year, I will replace Professor Kosmowska-Ceranowicz in organising the Amber Seminars accompanying Amberif. In 2015, the Amber Seminar is entitled “Succinite and selected fossil resins of Europe: localities, properties, archеology.”

Ewa Wagner-Wysiecka

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We have decided to devote this year’s Amber Seminar not only to succinite, but also to other fossil resins of Europe for two reasons. The first one is the very sad fact of Dr Günter Krumbiegel’s passing at the end of 2014. Dr. Krumbiegel was remarkably involved in the research of succinite and also other fossil resins. The person of Dr Krumbiegel, not only as a scientist but also simply as a man, will be presented in the lecture: “Amber researcher Günter Krumbiegel and his contacts with Poland” (by B. Kosmowska-Ceranowicz).

The region of Bitterfeld (Germany), with which Dr. Krumbiegel was connected, is a place with an accumulation of fossil resins of different types and varieties that is unparalleled anywhere else in Europe (and maybe even the world). This is a second reason why the current seminar is dedicated to the fossil resins of Europe. Two lectures discuss resins of the Middle Germany region: “New fossil resin discoveries in the Central German lignite mining area” (by R. Wimmer, G. Krumbiegel, B. Kosmowska-Ceranowicz, E. Wagner-Wysiecka) and “Baltic succinite vs. Saxon succinite in XRF and FAR-IR studies” (by E. Wagner-Wysiecka, L. Wicikowski).

But the fossil resins of Europe also include those from the British Isles. This still insufficiently known subject will be presented in the lecture on “Fossil resins from England” (by Edmund A. Jarzembowski).

The Old Continent has admired Amber for thousands of years and the European civilization is inseparably connected with Amber, which is evident in numerous archaeological findings. A block of lectures will be dedicated to this topic:

- “From the Alps to Frattesina. New evidence of amber routes and amber working in the Late Bronze Age in NE-Italy” (by U. Thun Hohenstein, I. Angelini, M. Bertolini, M. Chiara Turrini, P. Bellintani)

- “The influx of amber to the Circum-Adriatic area in the Bronze Age. Proposal for an interpretative model” (by M. Cwaliński)

- “Amber occurrences in Silesia” (by R. Niedźwiedzki)

- “Amber as one of the determiners of “elite” prestige in the eastern part of Central Europe in the Late Stone/Early Bronze Age. A contribution to the research on the extraction, working and use of amber” (by D. Manasterski, K. Kwiatkowska)

Ewa Wagner-Wysiecka, Barbara Kosmowska-Ceranowicz
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Amber researcher Günter Krumbiegel and his contacts with Poland

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The author’s acquaintance with the geologist Dr Günter Krumbiegel (1926-2014) was first made in writing, 30 years ago. In his letter, he suggested co-authoring a book about amber. Although his suggestion has never been realised, there are still many articles which resulted from our joint research on fossil resins.

We met in 1986, during a concurrently planned trip to the Goitsche mine. By the way, in that year entry to the mine was next to impossible, which is why Dr Erika Pietrzeniuk, custodian of the amber collection of the former Natural History Museum at the Humboldt University in Berlin (Museum für Naturkunde der Humboldt-Universität in Berlin), also took advantage of the unique foreign visitor entry permit. At the Goitsche mine, we collected samples for research on amber-bearing layers, along with a fine amber fraction from the production level. Going through the refuse heap, where all samples which are not identified as transparent amber variety were thrown away (as so-called “Brack” in German) [sic!], we managed to collect almost the entire range of accessory resins and different varieties of succinite.

In the years to come, we had two more very successful expeditions with Dr Krumbiegel, the first one to the then-closed Königsau lignite mine where we collected crumbs and small drip forms of krantzite from the sand interlaying the brown coal strata. The aim of the second joint trip, to Lusatia, was also to collect research material. Because entering operational mines was not easy, we visited the mine staff who had small private collections of not just crumbs but also sizable pieces of glessite found in the coal deposits.

Owing to the IR (infrared) fossil resin studies and identification which the Museum of the Earth began in 1985, the collected material was used in publications and was added to both the collection of Dr Krumbiegel’s and the Warsaw Amber Collection. Moreover, the contact that Dr Krumbiegel had established with the management of the MIBRAG coal

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1 You can find Günter Krumbiegel’s extensive oeuvre in: Ivo Rappsilber & Günter Krumbiegel, 2010: Bitterfeld Amber—a bibliography, 14 pages. Amberif 2010 Amber in Geology and Archaeology, Gdańsk
company resulted in their visit to Warsaw with donations of Saxon amber and other fossil resins, not only to the Museum of the Earth but also to several other Polish museums.

In the first half of the 1990s, in collaboration with the Kaliningrad Museum of the World Ocean, the Museum of the Earth’s Amber Department came up with the idea to organise a Russian-German-Polish team to research amber and organise a conference in Sambia. It did not take long to persuade Dr Krumbiegel to join the team. We travelled to Russia by car from the Göttingen University².

Dr Krumbiegel was a long-standing custodian and a former head of the Geiseltalmuseum at the Martin-Luther University, Halle. The Museum had a small but scientifically very valuable old collection of fossil resins which required identification. During my visits to Halle, I was invited to collaborate on describing the collection.

As a museum expert, Dr Krumbiegel was interested in presenting our amber exhibitions in Germany. We also collaborated on organising the Bernstein splitter exhibition at the Naturkunde Museum Leipzig in 1995 and Trennen der Götter at the Deutsches Bergbau-Museum (German Mining Museum) Bochum in 1996. The Bochum event was the first large amber exhibition after the fall of the Berlin Wall. Its launch was accompanied by a 2-day International Symposium.

From the early 1990s, Dr Krumbiegel, together with his wife Brigitte (a PhD in botany) visited Poland almost once a year or even more frequently. The goal was not only to perform joint research in Warsaw but also to participate in the annual Amber Researchers Meetings at which Günter delivered his papers (in 1988, 1992, 1994, 1995, 2000, 2002, 2006). The meetings were also held in Gdańsk: co-organised with the Archaeology Museum in Gdańsk (in 1997) and with the Section of Fossil Insects at the Polish Entomological Society (in 1998). In 1997, at the Archaeology Museum in Gdańsk, Dr Krumbiegel delivered his paper and donated

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part of the Gdańsk collection of Otto Helm from the Wienhaus legacy, which had been loaned out to Germany in the 1930s and shown at the exhibition in Leipzig [sic!]. The annual seminars at Amberif Gdańsk were also a regular place where the Krumbiegels took an active part (with papers delivered in 1994, 1998, 1999).

In 2001, to celebrate 50 years of the PAS Museum of the Earth’s Amber Department, Günter and Brigitte Krumbiegel received words of thanks presented by Director Krzysztof Jakubowski:

(...) for your long-standing collaboration with the Amber Department, which brought numerous specimens of amber and other fossil resins from Germany, for your numerous collaborations on academic and popular science papers, as well as for a special publication: Faszination Bernstein, edited by Günter and Brigitte Krumbiegel, showing your emotional bonds with Poland, which is why five Polish authors were exclusively invited to collaborate. We are proud to have the long-standing active participation from Mr and Mrs Krumbiegel—whose research output is indisputable—at the Museum of the Earth’s annual amber researcher meetings. Your name is displayed on the list of the donors and friends of the Museum of the Earth.

Fig. 2. The Krumbiegels receiving the words of thanks at the Amber Researchers Meeting, Museum of the Earth, Warsaw. (photo L. Dwornik)

Dr Günter was taken from us three months ago—he was a man larger than life, of great refinement and knowledge, and yet still extremely modest. He manifested his sincere friendship with Poland also by being a member of the International Amber Association and by extending many invitations to Bitterfeld conferences to Polish researchers. In recent years, he came to Gdańsk bringing young amber researchers with him, whom he taught about the finer points of resin science.

Dr Krumbiegel last visited Amberif in 2014.
New fossil resin discoveries in the Central German lignite mining area

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Zusammenfassung

Summary
Some new discoveries of the fossil resins from the tertiary (Eocene-Oligocene) brown coal deposits in Middle Germany in Saxony-Anhalt are presented. The findings were compared macro petrographically with the reference material of the resin collections of the Geisel Valley Museum in Halle/Saale and the private resin collections of G. Krumbiegel and R. Wimmer. The description and the results of infrared absorption spectroscopy are presented for the first time.

Introduction
The Central German brown coal area, situated east of the river Elbe contains the Early till Late Paleogene (Eocene till lower Miocene) brown coal deposits of Central Germany. The deposits and mining areas of the Weisselfelster Basin south of Leipzig (Saxony), the Bitterfeld coal field north of Leipzig, the isolated occurrences of the Geisel Valley and Oberröblingen/Amsdorf near Halle and the coal field of Nachterstedt/Königsau situated in the Subhercyn belong to the Central German brown coal mining area.

The lower tertiary brown coal deposits of Central Germany are famous for the occurrence of fossil resins and their differentiation into numerous species and varieties. The resins found in the brown coal open cast mines of the lower tertiary (Eocene) deposits mostly belong to the Krantzite-group (Krantzite and OxiKrantzite as well as to Retinite. Famous old resin discoveries are Großkayna (Krantzite), Körbisdorf (OxiKrantzite), Mücheln (Krantzite), Königsau (Krantzite), Nietleben (Krantzite), Bornstedt (Oxykrantzite), Altenweddingen (OxiKrantzite), Groß-Mühlingen (OxiKrantzite), Förderstedt (OxiKrantzite) and Nienburg (Krantzite) (Krummbiegel & Kosmowska-Ceranowicz 1992), as well as the firstly by Bergemann (1859) described Krantzite from Latdorf near Nienburg. Recent findings of fossil resins come from the brown coal open cast mine Profen, described by Standke (2008).

The material originating from the upper middle Eocene (Bartonium) was firstly considered as Retinite. Further resin material from the open cast mine Profen was collected by members of the working group of Bitterfeld Amber between 2008 and 2009. Four samples of the ample resin material were chosen for IR spectroscopy at the Museum of the Earth in Warsaw and at the Technical University in Gdansk in 2009 (Krummbiegel, Wimmer &
Kosmowska-Ceranowicz 2010). All the mentioned locations of old resin findings belong to the eastern and northeastern foreland of the Harz Mountains and the new discoveries in the Zeitz-Weißensefels brown coal mining area (Weißenfels valley) are situated in Saxony-Anhalt.

Succinite as younger fossil resins are known from the Schmiedeberg area as an old discovery. The most famous findings come from the Bitterfeld deposit within the Goitsche, where amber production took place between 1975 and 1993. Both deposits are located in the eastern part of the brown coal mining field west of the river Elbe in Saxony-Anhalt.

![Map about the historical discoveries of amber and other fossil resins in Central Germany](image)

**Fig. 1.** Map about the historical discoveries of amber and other fossil resins in Central Germany (according to Krumbiegel & Kosmowska-Ceranowicz 1992; added by Wimmer 2015).

**Description of new findings from Nachterstedt, Amsdorf and Köplitz**

*Resin findings from boreholes in the Nachterstedt area*

Repeatedly there were found fossil resin treasures in the form of yellow to yellowish brown resin inclusions of pinhead size (1-2 mm) and resin grains of pea size (5-7 mm) within the tertiary layers of the upper Middle Eocene (Bartonium) in the frame of exploratory drillings in the mining redevelopment area Nachterstedt and Königsau in 2010. The fossil resin treasures mostly occur within light to dark brownish grey, clayey to coaly, sometimes also slightly fine sandy silt of the so called “Hauptmittel 1”. Further up to 5 mm large resin grains together with black glossy Dopplerite (peat gel) were found in another borehole within very clayey silt, which is scattered with coalified root channels.

Lithostratigraphically these findings are determined as belonging to the barren ground as a part of the lower seam group (seam I). This barren ground divides the seam I wide-ranging into a upper, middle and lower division of seam. These fossil resin treasures, which are barely visible with the naked eye, are a resin called Retinite, which mostly occurs in earthy soft brown coal and their barren grounds.

Two exploration wells, the control point well for groundwater GWM 8/T2/2010 and the deep borehole Brk Nac Prä 3/2013 (brown coal Nachterstedt Praetertiary) were drilled east of the village Nachterstedt. There was found a honey yellow resin sample from the exploration well GW 8/T2 at the basal area of the Lower Bank of the middle eocene intermediate seam (seam II – Bartonium). The very brittle and up to two centimetres large, bladed resin sample is
probably a piece of a larger resin chunk, that was broken off during drilling. It has a slightly sulphurous smell, which becomes stronger when it is rubbed with a polishing cloth. A smell of Benzol-condensed aromatic compounds is discernible as well. These compounds are confirmed with the IR-spectrum (fig. 2, IRS 868), showing the aromatic cyclic systems through a strong absorption at 700 and 750 cm⁻¹.

![Infrared spectrum of the Krantzite sample from Nachterstedt (IRS Nr. 868 Warszawa).](image)

The deep borehole Brk Nac Prä 3/2013 reached a dark to blackish brown, finely stratified coaly silt substrate at a depth of 112.4 m. This layer is embedded within an alternating sequence of fine sandy and coaly medium sand. It contains numerous fossil remains of leaves and very brittle, light brownish grey to whitish yellow sinter like resin grains (diameter up to 10 mm). The first macropetrographic comparison with resin material of the collections of Krumbiegel and Wimmer bears a big resemblance to the historical findings from Königsau, from the Geisel Valley and Profen. The sediment material reached by drilling is also very similar to that of the finding level in the former brown coal open cast mine Königsau described by Krumbiegel 1995.

Lithostratigraphically the finding layer is assigned to the middle eocene floor sand layers of the floor sequence (upper Lutetium). The scientific investigation of these resin material by means of infrared absorption spectroscopy is still necessary.

Resin findings from an outcrop profile from the open cast mine Amsdorf

During a geological collecting excursion in 2011 members of the Bitterfeld Amber group found gypsum rosettes and numerous macrofossils, such as bivalves, snails, corals and shark teeth but also single pieces of fossil resin within the lower oligocene Rupel silt and clay. The fossil resin findings come from the layer of the middle eocene lower seam (Bartonium), seam II. This lower brown coal seam is separated by a sandy coaly silt from the above laying seam I, the so called main seam. Standke (2013) described and documented this finding layer more intensively for the first time. The author preliminarily named the fossil resins Retinite However she asked the question: “Is the Retinite from Amsdorf probably a “disguised” Krantzite?”

The collected resin pieces are irregular spherically formed aggregates with a diameter up to 2 cm. The surface of the dark to yellowish brown and very brittle resin pieces is strongly cracked, botryoidal to kidney like. Many resin pieces already crumble away during collecting
and cleaning from the bedrock, respectively. When making an attempt to corrode the dark brownish weathered crust of the single resin pieces they decay into single sharp-edged clasts. The stripped nucleus contains a whitish yellow, milky to vitreous matrix. The few until now found resin pieces were compared with the new and old findings from the open cast mines Profen and Königsau. They show a large similarity, what leads to the assumption that these resin samples may be Krantzite as well. This could become confirmed by the results of the infrared absorption spectroscopy (fig. 3, IRS 933).

Fig. 3. Infrared spectrum of the Krantzite sample from Amsdorf (IRS Nr. 933 Warszawa).

Resin finding from the gravel sand pit „Köplitz“ in the Schmiedeberg shoved terminal moraine area

The gravel sand pit Köplitz is situated in the easternmost position of the Bitterfeld lignite mining area. Geomorphologically it is situated on the northeastern brink of the shoved glacial lobe of the Schmiedeberg shoved terminal moraine area. The geological structural deposition conditions are strongly characterized by the glacially dynamic compressions from the inland ice. Steeply erected tertiary (lower Miocene to upper Oligocene) rock slice packets became exposed during the extraction of the glacial gravel sand. They consist of sandy to coaly silts, very fine silty glimmer sands and dirty brown coal. The lignite seams which are cropping out at the earth’s surface repeatedly have been used since 1864. Fossil resins were found consistently, too. These resins were mentioned for the first time by the Electoral Saxonian
Mining Councillor Dr. Johann Friedrich Henkel, who described them as “Saxonian Amber” (Henkel 1756, Krumbiegel & Kosmowska-Ceranowicz 1989).

A fossil resin was found for the first time during one of the annually several excursions to the gravel sand pit at the base of a gully, situated within a tertiary shoved rock slice on 16th March 2014. The resin piece of 4.5 x 5.0 cm in size and 29.0 g in weight comes from light to dark brownish grey, fine sandy, coaly and finely stratified silt. It is covered with a 0.5-1.0 mm thick dark brown weathered crust, scattered with a fine polyhedral pattern of cracks. The internal nucleus has a honey yellow colour. As confirmed by infrared absorption spectroscopy it concerns of a resin of the variant Succinite.

First micropalaeobotanical investigations of material of the discovery layer show, that the analysed samples belong to the “Postrupel” (Chatt to lower Miocene), probably to the Cottbus-Formation (Blumenstengel & Endtmann 2014). Thus the discovery layer would conform to the Bitterfeld amber containing layer.

Fig. 4. Infrared spectrum of the Succinite sample from Köplitz (IRS Nr. 5 PK Gdańsk).

Infrared absorption spectroscopy

The following samples from the new discoveries from Nachterstedt, Amsdorf and Köplitz were investigated for the first time (inventory numbers of the Museum of the Earth in Warsaw – MZ/PAN and the Technical University Gdańsk).

Nr. 868 Warszawa – Krantzite, honey yellow, non-transparent
Nr. 933 Warszawa – Krantzite, yellow to whitish yellow, non-transparent
Nr. 5 PK Wagner-Wysiecka, Gdańsk – Succinite, honey yellow, with dark brown weathered crust

The IR-spectra of the Krantzite samples from Nachterstedt and Amsdorf show the following characters:

– strong absorption within the bands of aromatic cyclic systems at 700 and 750 cm\(^{-1}\), whereupon the band at 700 cm\(^{-1}\) is clearly larger than the band at 750 cm\(^{-1}\)
– the typical band of the carbonyl group between 1700 and 1730 cm\(^{-1}\) or only one band at about 1710 cm\(^{-1}\) which are typical for Retinite
– one band at 1157 cm\(^{-1}\) and a wide horizontal curve between 1220-1270 cm\(^{-1}\) with an exception of an absorption at 1203 cm\(^{-1}\) show a picture similar to the “Baltic shoulder”
– the typical bands of fossil resins at 888 and 1640 cm\(^{-1}\) are in evidence.

The IR-spectrum of the fossil resin samples show the following characters:
– the typical curve between 1100 and 1250 cm\(^{-1}\) (Baltic shoulder) and a wide band formation of the carbonyl group (C=O – valence oscillation) between 1690 and 1730 cm\(^{-1}\) are typical for Succinite
– contrary to the Baltic Succinite, the Bitterfeld Succinite shows an O-H-deformation band at this C=O-band at 1660 cm\(^{-1}\), this band indicates trans of water (C. Lühr 2004)

There are a lot of IR spectra of Krantzite and Succinite samples in the literature which show the same curves like the here presented IR-spectra of the new discoveries from Nachterstedt, Amsdorf and Köplitz. Thus the newly determined resin samples from Nachterstedt and Amsdorf can be named as Krantzite without doubt. The new finding from Köplitz can be assigned to Succinite as well. According to the first macroscopic investigation by Krumbiegel and Wimmer the fossil resins have been determined as Krantzit and Succinite already in 2014.

Acknowledgments

We thank Dr. Anselm Krumbiegel for translating into English.

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Baltic succinite vs. Saxon succinite in XRF and FAR-IR studies

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Fossil and subfossil resins occur all over the world. Fossil resins – called commonly “ambers” – were formed million years ago in complex physical and chemical transformations of tree resins. The most famous fossil resin is Baltic amber – succinite or just “amber” formed at least 40 million years ago. Paleogene deposits of succinite are located in Gdansk Delta (Poland and Russia – Sambia Peninsula), Parchew Delta (Poland) and Klesov Delta (Ukraine) (Kosmowska-Ceranowicz 2012; Matuszewska 2010). In 1974/75 in Middle Germany deposits of resins with occurrence of succinite called as Saxon or Bitterfeld succinite were discovered (Kosmowska-Ceranowicz 1989; 1990; Krumbiegiel 1992).

Here, we describe a comparison between Baltic (Gdansk Delta) and Saxon succinate properties. Two representative samples of investigated succinites are shown in Figure 1.

Fig.1. Succinite sample from Gdansk Delta (left) and Bitterfeld region (right)

It was proved that succinites from different localities have similar organic composition (vide references not cited above). It is reflected among the others in comparable mid-infrared spectra. The mid-infrared spectra of representative samples of Baltic and Saxon (Fig.1) species are shown in Figure 2.

Fig.2. Partial mid-infrared spectra (1800-750 cm⁻¹) of Gdansk Delta (left) and Saxon (right) succinite.
Till now relatively less attention have been paid to inorganic components of succinite. However, for example interesting results were obtained for Baltic amber inclusion droplets (Buchberger 1997). Capillary electrophoresis analysis showed that water droplets contain a variety of inorganic cations (Na\(^+\), K\(^+\), Ca\(^{2+}\), Mg\(^{2+}\)) and anions (Cl\(^-\), Br\(^-\), NO\(_3\)\(^-\), SO\(_4\)\(^{2-}\)). Moreover, NH\(_4\)\(^+\), acetate, and succinate ions (in high concentration) were detected.

In this work results of qualitative and quantitative studies of Gdansk Delta and Bitterfeld succinite using fast and nondestructive technique: X-ray Fluorescence Spectroscopy (XRF) are shown. New results obtained from far-infrared spectroscopy studies of succinite are presented and compared to literature data (Pratti 2011).

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Authors thank Mr. Roland Wimmer for Saxon amber samples.

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Fossil resins from England

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In memoriam Martin Brasier, Lower Wealden amberologist

Abstract

Amber has been valued in Britain since prehistoric times, despite the absence of big deposits, and amber as well as various resins and copals have been found. Four nineteenth-century mineral species have been described and named from England. Highgate copalite Dana (also called copaline Hausmann, alias Highgate resin Thomson) in the Southeast and retinellite Dana (or retinite Hatchett) from the Southwest are both Palaeogene ambers, but apparently without inclusions. Middletonite Johnston and Settlingite Johnston in the North are both Carboniferous, the former with inclusions (micro-organisms) in neighbouring Scotland. Quaternary-reworked Eocene succinite (Baltic amber), with some insect and plant inclusions, is found in eastern England. More recently, Upper Wealden amber (perhaps distinguished from Lower Wealden amber as ‘chiltonite’ and ‘brasierite’ respectively) from southern England, and similar to rumaenite (or even cedarite), has yielded new species of Barremian (early Cretaceous) insects and spiders. The above occurrences are in marine or non-marine geological settings.
Some Wealden amber inclusions…

Chironomidae (midge - non-biting fly)

Tryoniidae (stilt fly)

Dryinidae (parasitoid wasp)
Summary

Eocene Baltic amber (succinite) was not all transported to England by people: some arrived naturally transported from the continent by Pleistocene European rivers (vide Bachofen-Echt, 1949).

Various resins and foreign copals can, however, be found in England due to human activity.

There is native Eocene (Ypresian) amber (at least sensu lato) in England—Highgate copalite and/or glessite—plus Oligocene retinellite.

There is also native Cretaceous ‘old’ amber (e.g. ‘chiltonite, brasierite’) – but to find insect inclusions, you need the right kind of Wealden amber (currently in the Barremian).

There is evidently fossiliferous Carboniferous amber (middletonite, with microscopic inclusions in neighbouring Scotland) but it needs fresh investigation (like unfossiliferous settlingite).

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From the Alps to Frattesina. New evidences on amber routes and amber manufacturing in the Late Bronze Age of NE-Italy

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The site of Campestrin di Grignano Polesine, currently dated XIII-XII century b.C. is located in the southern Veneto region, called Polesine, the lowlands between the major rivers of northern Italy, the Adige (north) and Po (south) just over 50 km from their mouths. Originally it was located at the left bank of an ancient branch of the Po, the so-called "Po di Adria". Discovered in 2007, has aroused great interest in the discovery of a considerable number of processing markers of Baltic amber.

However, the strategic importance of the area for trade on a regional scale and "long distance" during the Late Bronze Age is well known since the mid-60s, that is, after the discovery of the settlement of Frattesina about 9 km West from Campestrin.

The settlement is dated between Recent Bronze Age and the first phase of Final Bronze Age (around XII c. BC) on the basis of the typology of the pottery, bronze and glass materials.

Faunal remains have been analyzed, domestic animals (such as pig, cattle and sheep/goat) are more abundant than wild ones, among which red deer is the most represented. Infact, its antlers were used to produce handlers. Some bone tools have been recognized too.

The settlement has been explored for about 150 square meters, in which rectangular clay platforms with hearths, separated by little channels have been discovered. On the base of the excavation data available up to now, it is not clear whether they are huts or workplaces, covered by roofing, connected with the amber working. Amber working waste (part of original amber lumps, thousands of sub-centimeter chips, semi-worked blocks and a few number of finished products) are present mostly in the layers outside the platforms. The amber working evidences appear already in the earlier layers of the settlement and in the whole stratigraphic sequence.

Among the artefacts, the presence of Tiryns beads, well-known markers of amber trade that linked northern Adriatic and the eastern Mediterranean, deserve to be highlighted. Until now 12 beads of the "Tiryns treasure" type have been identified. Only one is finished (Fig.1C), the others are polished but without perforation (Fig. 1A). The main form is truncated cone with sub-triangular transversal section, but sub-cylindrical varieties with elliptical or irregular transversal section are also present. On the base of a so limited number of items is not possible to attribute this variety to an intentional choice or to a working-adaptation to the amber lump dimensions or to a combination of these factors.

Among the amber artefacts other two main forms have been recognized: conical button and small beads. In northern Italy amber conical buttons are rare. Two items with “V” perforation, as the Campestrin one, have been found in sites dated to EBA – MBA1 (Lucone and Cattaragna). Items with rectilinear perforation appear in the ritual site in Val Finale (Alpine region; RBA2-FBA1and in the burial n. 75 (FBA3), of “Narde2” one of the necropolis of Frattesina. The small beads are usually attested in settlements and burial context particularly
of the Recent Bronze Age of northern Italy but not in the Final BA. A selection of amber samples has been carried out for IR analyses in order to characterize the amber provenance. For this purpose, finished objects, very large pieces of partially worked amber and waste fragments were chosen. Infrared analyses have been carried out by Micro-FTIR: All the 20 finds analysed are composed by succinite (Baltic amber).

![Fig.1 A: CGP45 Tiryns bead without perforation; B: CGP2 Tiryns bead; C: CGP16 button; D: CGP50 small bead.]

We report the preliminary results, carried out by means of scanning electron microscopy (ESEM), aimed at recognizing the processing traces and use-wear, in lumps with cortex, semi-finished products at various processing stages, finished products.

These analyses allowed us to recognize the chaîne opératoire of Tiryns beads and other typologies of beads, allowing us to discover that perforation was done by drilling at the last stage of the manufacturing process.

The influx of amber to the Circum-Adriatic area in the Bronze Age. Proposal for an interpretative model

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There is a conviction in archaeological literature that the Circum-Adriatic communities played a key role in the movement of amber from Northern Europe to its southern regions. However, most researchers believe that this role was only one-dimensional and limited to the function of a middleman (for example Harding/Hughes-Brock 1974; Harding 1984; Bouzek 1985). In the present approach, a more complex hypothesis is adopted in which the status of the Circum-Adriatic area and its inhabitants is enhanced with their role as important customers for and users of this material. The progress in research which took place in recent years gives probability to an interpretation in which the middleman with time also gains the status of a customer, while at the same time gaining an increasing influence on the amber’s
flows and redistribution (Palavestra 1993; Negroni Catacchio 2006; Cazella/Recchia 2009; Czebreszuk 2011). Moreover, the present paper undertakes to present the dynamics with which this attribute could have changed and what influenced the process. At the same time, it is not the author’s intention to reject the concept of the flows of amber, mainly in its Baltic variety, in transit through the Circum-Adriatic area. Presented in the light of new data, this issue is to demonstrate an active participation from the Circum-Adriatic community in far reaching cultural contacts spreading from the Baltic Coast in the North to the Peloponnese in the South.

The chronological range of the subject matter presented here covers the entire 2nd millennium BCE and the first centuries of the 1st millennium BCE, with special attention to the turn of the millennia. Its territorial range covers the areas around the Adriatic (Caput Adria, Apennine Peninsula, Western Balkans) to the Ionian Sea with its islands. Sicily and the Aeolian Islands have also been included in the research due to the sources which document their cultural links with Greece and Italy (Bietti Sestieri 1988; Jones et al. 2005) and their role in the Circum-Adriatic branch of the Amber Route (Bellintani 2010; Cazella/Rechia 2009). Also the area of present-day Serbia, owing to its cultural kinship with the eastern coast of the Adriatic and its involvement in the amber exchange in this part of Europe (Palavestra 1993), has been included in the territorial range of the presentation.

The preliminary research provides knowledge about the size, distribution and internal structure of the majority of the amber artefacts originating from the Circum-Adriatic area and dated at the Bronze Age (Fig. 1). A preliminary catalogue of sites with amber artefacts has been developed as a result. Today, the catalogue contains a total of 107 sites in which at least 1010 amber artefacts were discovered (Fig. 2).

![Fig. 1. Breakdown of sites with amber artefacts referred to in this paper, by frequency of their characteristic features.](image-url)
The author will first consider the spatial and chronological structure of amber distribution within the Circum-Adriatic area. The preliminary results of an analysis on the degree of correspondence between each type of imported artefacts in the spatial and temporal dimension will also be presented. With the use of quantitative methods, it will be possible to determine the relationships between the selected types of artefacts with specific regions of the Adriatic basin and to see what changes these relationships underwent over time. Furthermore, attention will be focused on the role of amber in the formative process of local hierarchic communities and their mutual relationships. As an object of exchange, amber will be characterised alongside other categories of archaeological sources which evidence the existence of an interregional network of contacts. To conclude, an outline of a new
interpretative model will be proposed to connect events and phenomena related with the Circum-Adriatic branch of the Amber Route.

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Amber occurrences in Silesia

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Three types of fossil resin occurrences can be distinguished in Silesia: 1. related to Upper Cretaceous, Miocene and possibly Carboniferous coal inserts; 2. Baltic amber transported here in the Pleistocene by continental glaciers and frequently redeposited later by rivers; 3. Baltic amber brought here by humans in Antiquity or the Middle Ages. Until now, ca. 220 natural occurrences have been recorded in the region, not including archaeological finds.

Alexandrowicz and Kwiecinska (1977, Fig. 2 ibid.) presented IR absorption spectra of resinite (deemed by them to be a fossil resin) from a layer of Upper Carboniferous bituminous hard coal in Upper Silesia, unfortunately without designating the exact age or location of the sample. In the same paper, they described Cretaceous amber from three boreholes near Bolesławiec in the North Sudetic Synclinorium. In a series of claystones and sandstones from the Lower Santonian, which represented the environment of a coastal plain, they encountered lignite intercalations (up to 30 cm) and several-millimetre-large pieces of transparent yellow amber in one of them. During IR spectroscopy tests, they obtained spectra based on which they deemed this amber to be similar to neudorfite and valchovite from Moravia which, according to Jehliček et al. (2004), is also found in freshwater terrestrial sediments, including
coal lignite intercalations, although from the Cenomanian. Amber in Upper Cretaceous coal was recorded by Hintze (1933) near Lwówek Śląski, but without specifying its stage or analysis. As North Sudetic Synclinorium coals occur only in the Santonian, it can be assumed that both occurrences come from the same age and environment. Therefore, it seems that Santonian amber is quite frequent in the area of Bolesławiec–Lwówek Śląski.

Small quantities of the fossil resin were found in brown coal and the accompanying formations of the Silesian part of Upper Lusatia, on both sides of the Polish-German border. German researchers described its age as the Tertiary or did not provide it (Traube 1888), but the geological structure of the region suggests these to be Miocene rocks. Based on physical features of little diagnostic significance, such as hardness, Traube (1888) classified amber from Ząbka and Siekierczyn n. Lubań Śląski in present-day Poland, and from Rauschwalde (a district of Görlitz) and Petershain n. Niski in Germany, as succinite; whereas he classified the resins from Bad Muskau (pieces up to several cm), Olszyńska n. Lubań Śląski and Osiek Łużycki as retinite. In Silesia proper, retinite was found in the coal in Skorogoszcz n. Niemodlin (Traube 1888), while Grodzicki (1977) recorded grains and pieces of amber in the so-called Poznań Clays (Miocene) in the Stanisław Mine of Jaroszów, without specifying its composition.

Amber is found in Quaternary sediments in large quantities, for southern Poland. Göppert (1851, 1871) stated that in 1851, 100 amber localities were known of, while in 1870, there were already 180, including only a few from the Miocene deposits. He based his statement on his own query and Glocker’s data (1857). Other lists of Silesian ambers (Fiedler 1863, Traube 1888, Hintze 1933, Chętnik 1961, Lis and Sylwestrzak 1986, Niedźwiedzki 2011) were based mainly on the data from the two above-mentioned researchers. Several new, especially post-World War II, finds were described by Kusiak (1980) and Kosmowska-Ceranowicz and Pietrzak (1982, see Sachanbiński 1997). Updating is difficult due to the lack of pinpointed locations in Göppert and Glocker, which is why usually it cannot be determined whether a present-day amber outcrop is the same one as in the Göppert List. Nevertheless, a review of the literature and surveys among collectors suggest that in the 20th and 21st century amber has been found in at least 40 new locations. Within the last 10 years, several amber sites turned up on the Trzebnica Ridge. A sample of 300 unsorted pieces from one of them, which I have preliminarily tested, notably includes a large share of milky and marble-like varieties (1/3 of the set each). The remainder are yellow varieties with diverse degrees of transparency, while reddish and brown varieties are rare. Many specimens have preserved bark imprints or traces of carbonified wood, with sporadic insect inclusions. The analysis of the above mentioned sources shows that amber is found in definitely greater quantities in Lower Silesia and the Opole Region, while it is rare in Upper Silesia. In the Lower Silesia and Opole region, most finds are concentrated in four areas: the foreland of the northern edge of the Sudetes, northern forelands of tall mountain ranges (Izerskie Mountains, Karkonosze Mountains and Kamienne Mountains), the Trzebnica Ridge and the Odra Valley. These regularities result from the range of glaciation which brought the amber from the Baltic region. Apart from the higher mountain parts, the entire Lower Silesia and Opole Region were covered by three glacial periods: the San Glaciation 1, San Glaciation 2 and Odra Glaciation, with at least one of them reaching up to 400 to 580 m a.s.l. in various areas of the Sudetes (Lindner 1992, Migoń 2005). The next, Warta Glaciation, reached up to the Trzebnica Ridge (Migoń 2005), so it only covered northern Silesia. Each of these phases brought in huge masses of the material transported by the glacier from the north, including from Pomerania and Sambia. Upper Silesia, in turn, apart from its northern rim, was affected during one glacial period—the San Glaciation 2—which reached up to 400-500 m a.s.l. (Lindner 1992). As a result, the volume of the deposited sediment was several times lower here than in the rest of Silesia.
Additionally, this volume was decreased by the fact that, as an elevated area, the Silesian Upland was subject to intensive erosion processes, while the eroded formations were brought down by rivers to the surrounding lowlands where they formed a secondary deposits. In Lower Silesia, in turn, amber localities concentrate in the foreland of the morphological barriers which hindered the glaciation permanently or for some time. For the three older glacial periods, the first such threshold was the edge of the Sudetes and then possibly the taller mountain ranges; for the Warta Glaciation, it was the Trzebnica Ridge. Due to the stagnating glacier front and ice melting, sediment would accumulate on a large scale in these areas; furthermore, obstacles would stop some of the material carried by the ice. A similar barrier role was performed by the funnel-shaped Moravian Gate, which is why the Racibórz Basin has large accumulations of glacial deposits. The Wrocław Urstromtal (Migoń, 2005), in turn, was the route for the water outflow during the Warta Glaciation, with the Sudetes rivers also flowing down this way. This is why post-glacial sediments were eroded over a significant area and, having been transported, accumulated in the Urstromtal with the amber they contained. The process continued after the Urstromtal transformed into the present-day Odra Valley. The quoted heights which the glacier reached in the mountains are the maximum range in which postglacial amber can be found in Silesia.

Not all the authors agree that all of Silesia’s amber occurred in Pleistocene deposits comes from the Baltic area. Grodzicki (1977) found amber pieces in the Miocene brown coal layers in the Quaternary beds in Jaroszów quarry and suggested that amber from the Quaternary deposits in Jaroszów was washed out by rivers in the glacial period from Miocene coals. There are channels filled in with Pleistocene sediments, which cut through the Neogene substratum, including coal beds in Jaroszów. The view about the autochthonous Miocene origin of the site’s amber was supported by Pawlik and Paclawska (2009). However, as opposed to Bitterfeld, the Miocene coal of Silesia and Belchatów has very rare occurrences of amber in negligible quantities. According to my examination, amber has never been found in the thick coal-bearing series at Turoszów, while single pieces were found at Belchatów (P. Raczyński, personal comm.), but only sporadically. Besides, coal beds are usually focused in narrow and deep tectonic grabens which, by definition, could not undergo intensive erosion later on, perhaps with the exclusion of their roof part. Meanwhile, amber is found in Silesia’s Quaternary formations not only in many localities but also in large concentrations. In the 1970s, several kilograms of amber were mined per year from a small section of the Jaroszów excavation, with individual pieces reaching up to 230 g (Grodzicki 1977). In 2007-2008, several kilograms were mined at Strzelce n. Dobroszyce (the largest specimen of mass 221 g, M. Białecki, personal comm.). In the currently productive opencast mine near Oleśnica, 2-3 kg of amber are obtained per year, with specimens up to 300 g. Prior to World War II, there were considerable amber accumulations at Ząbkowice Śląskie, as a 90 cm² sample of the site’s clay displays 63 pieces of amber up to 2 cm in length. Ząbkowice’s largest specimen at the University of Wrocław Mineralogy Museum weighs 182 g. A number of significant amber accumulations were mentioned by the Germans (in the 19th century, a purchasing centre even operated in Silesia) and by Polish collectors (for example in the late 20th/early 21st century at Świebodzice, several points on the Trzebnica Ridge). They were not preserved within a redeposited slab of “blue earth” and the accumulation needs to be linked with the segregation of material during transport by fluvioglacial waters or Holocene rivers. The co-occurrence in the Quaternary sediment of amber and almost equally lightweight carbonified Miocene wood, mentioned by Grodzicki (1977), can also be attributed to the same process.

The pieces of Miocene fossil resins are small, rarely reaching a few centimetres in diameter (Traube 1888), while much larger ones can be found in the Quaternary material. Next
to the ones mentioned above, the specimens documented by Göppert (1871) and Glocker (1871) include: 1 kg at Leśna n. Lubań, 800 g at Grabiszyny Średnie, 620 g (525 g acc. to Traube 1888) at Namysłów, 350 g at Świdnica, 330 g at Uciechów. In 1969, a lump of mass 300 g was found in the sediments of the River Kamienna in Jelenia Góra (Kusiak 1980), and in 2010, a large piece of amber was found at Mokrzeszów (K. Pluta, personal comm.). Silesia’s record-breaking specimen was fished out of the Odra in Wroclaw in 1850. It weighed 3.25 kg and was nearly 21 cm long (Göppert 1851). There has been no wide-scale physical and chemical research on Silesia’s fossil resins, although NMR, IRS and molecular composition tests performed on the amber found in the Pleistocene sediments at Jaroszów have shown it to be succinite (Sachanbiński et al. 1997). For the reasons stated above, it needs to be concluded that the amber found in Silesia’s Quaternary formations came from the Baltic area, having been redeposited by glaciers. Only a very few specimens could have in fact been washed out of Miocene rocks.

It follows from a search query of published and unpublished archaeological reports that amber artefacts from Antiquity and the Middle Ages are found in Silesia in large quantities, along with unworked amber in hoards. They are common in the Lower Silesia lowlands and in the Opole Region, less frequent in Upper Silesia, and found only occasionally in the Sudetes, with the exception of the northern parts of their foreland (briefly described in Niedźwiedzki 2011). Such a distribution was caused by the fact that the mountainous and upland areas were much less populated than the more fertile plains. Furthermore, the distribution of amber artefacts was influenced by the course of amber routes, which ran mainly down the Odra Valley and sometimes through the northern part of the Kłodzko Region (Wielowiejski 1980). Several globally unique amber-related discoveries have been made in Silesia. At Nowa Wieś north of Bolesławiec, traces of an amber workshop were discovered: 37 small (up to 1.3 cm) pieces of raw amber and six partially worked pieces; spectroscopic analysis showed them to be Baltic amber (Burdukiewicz 2007). As the site has been dated at the probable decline of the Palaeolithic, this would make it the world’s oldest known amber workshop (Burdukiewicz 2007). In Wrocław’s district of Partynice, in turn, the world’s largest storehouse of raw amber from the 1st century BCE was unearthed in 1906 and 1936, with ca. 1.5 tonnes of the material (for description, see Niedźwiedzki 2014). In 1865, at Woskowice Górne, a grave gift of unworked pieces of amber weighing about 60 kg was found between the urns in a grave, probably belonging to the Lusatian Culture (National Archive (Arch. Państw.) Wrocław, files of Wydz. Samorz. Prow. Śl. No. 656).

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Amber as one of the determiners of “elite” prestige in the eastern part of Central Europe in the Late Stone/Early Bronze Age. A contribution to the research on the extraction, working and use of amber

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All societies have items of prestige which manifest the status of their owners. Various prehistoric groups very often had a different scale of values than we do today. The general principle discovered when assessing value is mainly the rarity of occurrence in a given area and unusual visual quality. The most common materials of prestige may include: metals (gold, silver, copper), precious and semi-precious stones, ivory and also amber. The only evidence of their huge importance comes from the objects of symbolic significance which are discovered and analysed by archaeologists. These are usually so-called hoards, ceremonial deposits and last but not least burial furnishings. Such ancient conventional materials of prestige which carried a certain symbolism also include: jadeite, glass, terracotta/porcelain, certain bird feathers, large sea shells, certain animal species and certain fabrics. Unfortunately, in many
cases artefacts made of perishable materials (other than stone or metal) have not survived until the present. The situation is somewhat different with amber which, admittedly, does oxidise in unfavourable circumstances but can still be identified even in an altered condition. Unfortunately, fire and high temperature, which destroy this material completely, are an absolute exception here. In light of the above, all kinds of burnt votive offerings or funeral pyres make it completely impossible to tell if amber was used either as manufactured artefacts or raw pieces. This state of affairs forces the researchers who study the use of amber in prehistoric societies to draw conclusions, on the one hand, based on a small number of discoveries, and on the other—on indirect premises, including co-occurrence with other objects of prestige.

The eastern part of the Polish Lowland, which in the late Neolithic/early Bronze Age was dominated by mixed late agricultural and late hunter-gatherer groups, experienced an internal stratification process, with “elites” emerging as a result. People who held a high position in the social structure of their tribe wanted to stand out in some way. This was achieved with artefacts considered to be prestige markers. One may only speculate that the shortage of gold, copper or bronze products (see Dąbrowski 1997) may have been compensated with artefacts made of amber, which was extracted and worked in the Baltic coastal zone centre (see Kosmowska-Ceranowicz 2012, Czebreszuk 2011, Mazurowski 2014). Finished and semi-finished products were used both by the local communities and groups living in relatively distant areas (Gimbutas 1965, Mazurowski 1983, Czebreszuk 2011). At the end of the Neolithic, amber artefacts are known mainly from the amber workshops and burial sites of the Globular Amphora and Złota Cultures, where they expressed a collective manifestation of the entire group’s prestige (see Gawronśka 2010 and items contained therein). The tradition of Late Neolithic use of amber artefacts cannot be seen at the turn of the Early Bronze Age any more. These artefacts differ in both their shape and the layout of their components, but most of all they are related to specific individuals rather than to a community (see Renfrew 2001). Moreover, they are usually broken in pieces (through ritual destruction) and fragmented while being placed in ritual sites—including those of a funerary nature (Renfrew, Bahn 2002). Therefore, such behaviour may be considered an expression of new cultural trends which would reach the areas under consideration from broadly understood Western Europe and which were related to individual, rather than communal, prestige (Renfrew 2001). By identifying the cultural components visible in both amber artefacts and other accompanying items, one can infer the cultural environment related to the Bell Beaker Culture (see Manasterski 2009; Januszek, Manasterski 2012; Wawrusiewicz 2013). Some of these items, culturally alien to this area yet symbolising the “social standing” of their owners, may be interpreted as evidence of certain cultural patterns and behaviours being “imported.”

In Central Europe’s burials which can be researched with the archaeological method, two phenomena can be distinguished: furnishing of collective graves, as in the Złota and Globular Amphora Culture, and furnishing of individual graves, known from the Corded Ware and Bell Beaker Cultures. The latter category is especially important as it features individual furnishings, fitting into the specific conventions which reflected social stratification (Czebreszuk 2001; Renfrew 2001 and items contained therein). The grave goods include insignia-type items, often made of a precious material (copper, gold and amber) to indicate the social standing of the buried member of a community. Typically, these are warrior accessories, including: battle-axes, axes, daggers, spears, bows and arrows, wrist guards and arrow straighteners. Apart from them, there were also artefacts classified as ornaments, including various kinds of beads, pendants and other garment accessories. From the Early Bronze Age, halbard had also been added, including dagger-like varieties. The listed items of symbolic significance were made with a diversity of materials. One may only speculate that items made
of copper, gold or amber enjoyed the greatest prestige due to the relatively low availability of these materials. Their counterparts made of traditional materials, such as stone, flint, bone and horn, did manifest the deceased’s social standing but to us, they speak of the certainly different “affluence” of the buried individuals. Among the said materials, amber belongs to the elite group and, combined with the prestigious form of the items, is strongly indicative of the highest social status.

East of the lower and middle River Vistula, in the Late Neolithic/Early Bronze Age, the dominant communities were characterised by, among other things, a burial rite which is almost 100% impossible to research with archaeological methods. This situation makes drawing conclusions on the communities’ internal stratification difficult. In spite of this, some, although few, discoveries of burial sites and other ritual locations are known of, in which artefacts of prestige were found to evidence the process of social stratification. Apart from the differences in the treatment of the deceased, and the quantity and quality of the “elite” furnishing of the sites, they were characterised by the presence of amber ornaments.

Starting at the north of the area under consideration, one needs to mention the vestigial burial of a child in the settlement of Suchacz on the Vistula Lagoon, equipped with an amber necklace (or tiara) made up of 67 amber components (Mazurowski 1987). Because of the size of this ornament, one may speculate that it was made for an adult, which is important in our reasoning as it may be evidence of the hereditary nature of prestige. Another, although unfinished, artefact comes from the amber workshops of Niedźwiedziówka near Nowy Dwór Gdański. It is interpreted as a semi-finished anthropomorphic amber figure (Mazurowski 2014), although it is more reminiscent of a replica of copper dagger or halbard.

Another remarkably important find to indicate the prestigious significance of amber was made in Żąbie near Olsztyn. The Żąbie discoveries included a man buried with a set of 50 amber ornaments composed of a necklace (“pectoral”?), a belt and two bracelets (Manasterski, Piasecki, Waluś 2001). The anthropological analysis showed that, in spite of his advanced age (ca. 40-45 years) and until his tragic death in combat, the buried man enjoyed good health and did not suffer from the then common ailments caused by malnutrition or inadequate food quality. All these are reasons for supposing that he held a high rank in his community.

The region of Masuria has yielded two more unique finds, albeit without providing a broader cultural context (Manasterski 2009 and items contained therein). They are commonly interpreted as anthropomorphic pendants and dated at the Early Bronze Age. Due to their shapes, however, a somewhat different interpretation should be considered, related to the mimicking of prestigious “armaments.” In the case of the Nidzica specimen, we would be dealing with a damaged replica of a copper dagger, while the artefact from Kruklanki resembles a copper axe. Amber artefacts whose prototypes can be connected with a “warrior” function are known, albeit in small quantities, from the Late Neolithic/Early Bronze Age in both Central Europe and the British Isles. They include amber wrist-guards from Złota Culture burials (see Mazurowski 1983) or a pendant in the shape of a dagger halbard from the Christchurch Barrow Cemetery, England (see Beck, Schennan 1991).

Also in the case of votive offerings, all things being equal, we are looking at items of extraordinary value that are worthy (prestige-wise) of the worshipped deity. These types of finds come from the Masovia-Podlasie Lowland, where two objects of ritual significance related to the Bell Beaker cultural package were discovered in the vicinity of Supraśl. The first case was a place of funerary and ritual nature, with two circular amber beads found among the discovered biofacts and artefacts (Manasterski 2014). In the neighbouring settlement site, a votive offering was found which, as such, was of huge symbolic and prestigious value (Wawrusiewicz 2013). Inside of the deposited “purse,” an amber pendant was found among
other things. In this case, it needs to be mentioned that items related to the Bell Beaker Culture are absolutely unique in the region of Podlasie, where they have not been found before. Therefore, one may only speculate that we are dealing here with material traces to indicate that, at the time, a process was in place whereby local elites emerged. These elites, while entering into cultural contacts with the foreign Bell Beaker community, would adopt certain elements of the cultural package related to the manifestation of a high social standing with items of prestige.

An equivalent ritual object is known from Skrzeszewo near Warsaw (Januszek, Manasterski 2012). It was an organic receptacle which contained, among other things, an ornament composed of an amber pendant and bead joined with a bronze wire. Much like in the case of the Supraśl find, we are dealing here with extraordinary artefacts that were valuable to the local community, who laid them down as part of an unidentified cultural ritual.

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