COMMUNICATIONS

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AMBER CRAFT IN KUJAVIA IN THE ERA OF PRZEWORSK CULTURE

The statement that amber belonged to the raw materials which played an important role in the economy of societies in many regions of Polish lands from the late Stone Age till the early middle ages, is now already a truism. To these regions belonged Central Kujavia the inhabitants of which were able to take advantage of the possibility to get, relatively easily, large quantities of this raw material from nearby amber-giving areas. The above is proved not only by the quite common use of amber products by the local population, but first of all by a strong involvement in the trade in this raw material, first on an interregional scale, and later in long-distance trade, as well as the development of the local production of amber ornaments.

The period of most active participation of the population of Kujavia in the distribution of amber to Southern and Central Europe and at the same time the period of its treating on a large scale falls in the first century B.C., i.e., in the time of the most intensive trade along the amber route. Local treating of amber in the era of Przeworsk Culture is confirmed by the excavation of amber workshops in various settlements (Fig. 1). The frequency of their occurrence coupled with large quantities of production-remains testifies that amber craft was by no means an unimportant domain of craftsmanship of Kujavia’s society, being one of the specific characteristic of its economic structure. Up till now, it has been possible, on the base of archeological research, to localize six such centres of production: at Jacewo (site 4b), Łojewo (site 4), Konary (site 28), Krusza Zamkowa (site 3), and most probably also in the region of Opoki and Gąski. They existed almost in every already explored settlement of the period of Roman influence. Hence the existence of a large number of places of amber treatment could be expected. The centres of production known hitherto were situated in the neighbourhood of the main routes of communication or in the vicinity.
of larger settlement centres. They are concentrated particularly on the territory of the large settlement agglomeration Krusza Zamkowa, which we consider to be the most important Kuiavian trade emporium. Within this agglomeration, for the time being, the existence of three amber workshops is ascertained. They were located in the central settlement, i.e., in Krusza Zamkowa and in nearby functionally connected "satellite" settlements (Jacewo, Łojewo). The workshop in Konary was situated in the neighbourhood of one of

Fig. 1. Distribution of amber finds in Kuiavia. 1: raw material finds, 2: amber treatment workshop, 3: finds of amber artifacts.
the main local roads of Kuiavia connecting diagonally two branches of the amber route which forms an arch in the vicinity of Inowroclaw (Fig. 2). Two more workshops are situated in the neighbourhood of one of the main halting places on this route (Gaśki, Opoki) (Fig. 1).
Among the amber treating centres, the workshops in Jacewo, Łojewo, and Konary, were relatively best examined. From them come the materials on the base of which the present article was written. Most valuable are finds at Jacewo, as only there systematic research was conducted, yielding a reasonably complete set of sources, whereas in the two remaining cases the salvaging character of exploration of the partially destroyed objects leaves some margin for the unknown. Although, at present, we are still in the preparatory stage of research into amber craft in Kuiavia, the complex of facts is sufficiently instructive to allow for an attempt to characterize this branch of production. We have not only plenty of amber findings for various stages of the production process, but also fragments of tools and remains of buildings in which workshops were situated. In analyzing the latter ones it should be stated that irrespective of their differences,
they have some characteristics in common, e.g., all amber workshops were localized in the central areas of the settlements, and there was only one such workshop in each settlement (Fig. 3). Amber workshops were situated in post buildings having a quadrangle plan, built on the face of earth (Jacewo) or slightly deeper (Lojewo, Konary) (Fig. 4). These were either
Fig. 3. Location-plan of amber treatment workshops in the Jacewo, Łojewo, and Konary settlements. Scale 1:500. 1: area of settlement, 2: amber workshop. a: Jacewo, site 4b, Inowrocław commune, Bydgoszcz voivodship, b: Łojewo, site 4, Inowrocław commune, Bydgoszcz voivodship, c: Konary, site 28, Dąbrowa Biskupia commune, Bydgoszcz voivodship.

multifunctional buildings, as e.g., at Jacewo and Konary, where they served residential as well as productive functions, or were used exclusively as amber workshops as is observed at Jacewo. The dispersion of most of the amber finds in form of productive remains, occupying a small space of only about 2.5 sq.m inside the building is strong evidence of the fact that the producer did not change his place of work arbitrarily, but had his workshop localized at a permanent site (Fig. 4). As a rule, this was situated in the central part of the building and somewhat shifted near the wall;
most probably for better visibility, which is most essential in performing this rather accurate work.

Kuiavian amber craftsmen produced mainly beads of various kind and of various standard of workmanship. The range of products of various centres was also different, hence their short characteristic will be made separately for each centre.

The workshop at Jacewo is prominent among the known Kuiavian amber workshops i.a., because it provided the most diversified and most numerous complex of material and factual sources containing i.a., about 5,000 amber finds. These were made up by small lumps of raw material, remains from production (in form of pieces cut off in forming beads, as also shavings of various size), fragments of products damaged during the treatment, unfinished objects, finished products (Fig. 5, Table 1), and fragments of iron tools. This material is a sufficient basis for a characteristic of the objects produced, for a reconstitution of the set of tools used, and for the reconstruction of the production process.

According to what has already been said, at Jacewo mainly beads of barious sizes were produced, from medium-sized of 1 cm to small ones of 3 mm. If we omit the latter ones, then plane-spherical, cylindrical, double-conic, and eight-shaped beads (Fig. 5) are most frequently encountered. The production cycle of beads in the Jacewo workshop was not different from the stereotype of the procedure used in this branch irrespective of time and region. It is only noteworthy that the producer at Jacewo used a turning lathe, which is quite exceptional.
The first function, after the preliminary procedure, i.e., after the cleaning of lumps of raw material from a layer of coating and cutting it in pieces, consisted in cutting out small blocks and perhaps giving them the form of the desired shape of beads. The latter cycle of activities depended, however, on the kind of beads. In treating larger pieces the procedure
Table 1. Specification of amber fragments from particular workshops in Kuiavia

<table>
<thead>
<tr>
<th>Locality</th>
<th>Small lumps of amber</th>
<th>Shavings over 8 mm</th>
<th>Shavings over 6 mm</th>
<th>Shavings over 4 mm</th>
<th>Shavings over 2 mm</th>
<th>Shavings less than 2 mm</th>
<th>Fragments of beads</th>
<th>Semi-products</th>
<th>Finished products</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jacewo stand 4b</td>
<td>13 15 g</td>
<td>333 92.4 g</td>
<td>792 88.4 g</td>
<td>2,412 97.9</td>
<td>1,133 18.7</td>
<td>5.8</td>
<td>238 57.2</td>
<td>13 6.2 g</td>
<td>6 8 g</td>
<td>4,940 389.6 g</td>
</tr>
<tr>
<td>Łojewo stand 4</td>
<td>x x 34 16 g</td>
<td>43 5.4 g</td>
<td>120 5</td>
<td>157 3.7</td>
<td>2.6</td>
<td>43 19.2</td>
<td>1 1.6 g</td>
<td>x x 398</td>
<td>53.5 g</td>
<td></td>
</tr>
<tr>
<td>Konary stand 28</td>
<td>x x 61 31.1</td>
<td>187 27.9</td>
<td>498 30.8</td>
<td>661 12.4</td>
<td>3.2</td>
<td>77 10.4</td>
<td>9 2.9 g</td>
<td>2 0.5 g</td>
<td>1,495 119.2 g</td>
<td></td>
</tr>
</tbody>
</table>
was different than in the case of producing small and delicate ones. In the former case the still clumsy blocks were perforated by means of special device equipped with drills of various diameter.\textsuperscript{10} From the relatively large proportion of still roughly planed pieces of amber, split through the unfinished openings, it may be surmised that this was the most risky function and for this reason it was one of the first to be performed in the whole production cycle. After successful perforation beads were given their final shape, and then some of them were turned on the lathe in order to get regular forms, and finally their surface was polished. In the case of delicate or very small beads, for which the drilling of a very little opening not only increased the risk, but was impracticable because of lack of a sufficiently thin drill, openings were burnt by means of a heated needle-formed small iron rod.\textsuperscript{11} In such a case (as has been said before) the order of activities was sometimes different, i.e., the drilling of the opening was one of the final manipulations. It was preceded by the final formation of beads and often even by the polishing of their surface. The thermic method of making openings, although safer, was much more time-consuming, hence it was not commonly used in the Jacewo workshop which produced mainly larger beads on a fairly large scale.

Quite similar in character, although much poorer quantitatively (cf. Table 1), is the complex of amber finds from Łojewo (Fig. 6). However it also presents all the successive stages of the treatment, hence it can

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{amber_finds.png}
\caption{Łojewo, Bydgoszcz voivodship, site 4. Amber finds.}
\end{figure}
be stated that as to assortment of the product, technique of production, and set of tools used, this workshop did not differ from the rules of procedure followed in the neighbouring Jacewo. At Łojewo, too, mainly larger beads were produced with the use, in certain cases, of a turning lathe.

The matter is, however, different for the workshop at Konary. Already a first glance at the complex of archeological material of the place shows its clearly different characteristics. First of all, the raw material seems to be different, being of poorer quality. The paucity of forms of beads is also striking; small, flat, and thin ones being decidedly predominant (Fig. 7), which suggests a tendency to economize raw material as much as possible, and to using even the smallest piece. This is also shown by the different proportion of particular kinds of remains (Table 1), among which small shavings form a large part. The much greater primitivism of the exclusively manual treatment is also evident as well as the predominance of the second production cycle, which at Jacewo and Łojewo takes only a narrow margin, and which is characterized by the burning of openings in already beads. The system of drilling openings, entailing a high risk of breaking beads, did not find general application here.

Our conclusions concerning the production technique employed in amber workshops of the Przeworsk Culture follow from the observation of traces appearing on the surface of the explored items and from ethnographic data.
Finds of well preserved tools are lacking. This is the effect of intentional leaving of each workshop after having taken away their whole equipment, and a result of the fact that delicate metal drills or parts of turning lathes had little chance to be preserved. Though in each building containing an amber workshop, very numerous fragments of iron objects of characteristic shapes (which did not appear in other residential sites) have been found, considerable deformation of their original form because of using and high degree of corrosion does not allow for unequivocal identification and reconstruction.

It has been already stated that in Kuiavian workshops mainly beads of medium size, 1 cm in height and in diameter, were produced, of traditional and age-long known shapes. This is confirmed by finds of finished products among the tomb equipment of the local population. On the other hand large turned beads common in the later subperiod of Roman influence, known e.g., from Bassonia and Kielpin were not produced.

As already mentioned, in comparing complexes of finds of particular workshops, there appear differences among them, as to saturation with relic material and also in respect to the assortment of produced beads and techniques used. There is a fundamental difference between the workshops at Jacewo and Łojewo, on one hand, and that at Konary, on the other. These dissimilarities have to be explained by chronological differences and especially by the mode of production depending on the localization of the workshop in functionally different settlement complexes. The workshops at Jacewo and Łojewo represented settlement complexes being parts of the large settlement agglomeration of the region of Krusza Zamkowa, which played the role of a central place of Kuiavia; these complexes dated back to the period of highest development of the amber route which ran across the region. Links with the main region characterized by an advanced socio-economic development, imposed a definite status upon the local workshops. In this environment the existence of a workshop of the Konary type would be unthinkable. The primitivism of the production at Konary was the result of the more peripheric situation of this centre and of the fact that it existed in a period of weaker long-distance trade with the Roman Empire. Although certain differences exist also between the workshops at Jacewo and at Łojewo, these are of minor importance and concern only the scope of production. The larger scope of activity of the centre at Jacewo has to be explained by the greater importance of this settlement, being the centre of a vast settlement complex in contrast to the small subordinate settlement at Łojewo.

A comparison of the scale of production of the workshops mentioned is given in Table 1, with some corrections for Konary and Łojewo, which are necessary in view of the partial devastation of objects at these places during earthenwork, which diminished the number of finds.

The Table shows that in the workshop at Jacewo about 5 thousand
pieces of amber were explored having a total weight of about 400 g. A large majority of them, namely more than two-thirds, is formed by shavings, mostly small ones up to 8 mm (210.8 g) as also larger cuttings which might still serve to make small beads (92.4 g). Next comes a set of production remains in form of beads demaged during the production (57.12 = 15 per cent), whereas small lumps of raw material (15 g), unfinished products (6.2 g) and finished product (8 g) jointly form a small margin ca. 7.5 per cent = ca 30 g).

If we want to estimate the volume of the production of the workshop we must not confine ourselves to numercial data concerning existing material and factual sources, as these are not fully adequate values. There is no doubt that these materials form only part of production remains of the workshop. In order to get the best possible picture in this respect, several corrections should be applied. First of all, our figures should be increased by a certain percentage for fragments omitted during the exploration and destroyed or displaced through farming work. Moreover, we should realize that even this supplemented complex does not represent the totality of remains but still only those left, overlooked, and treaded in the floor, whereas a large majority, mainly larger shavings and broken beads, still suitable to be treated, was carefully collected and repeatedly used. This was the only proper way, consistent with a rational control over this raw material being in high demand and, therefore, probably expensive. It seems, however, that waste even of smaller shavings inutilizable for the producer was not allowed; because of the belief in magic properties of amber it was used as medicine and in religious ceremonies. In order to solve the problem of the volume of production the determination of the duration of functioning of the workshop is important. In the case at hand it is confined within the short duration of the first settlement stage which corresponds to the duration of one generation. After applying the suggested corrections it would be possible to find the approximate true weight of the remains. This, in turn, with the known average rate of the weight of remains to the weight of finished products, will give the weight of the processed quantity of amber. On this base, and knowing the average weight of one bead, it would be possible to calculate the approximate number of beads produced. Dividing this figure by the number of years of existence of the workshop will give its annual output. For lack of comparative data attempts to solve this question would, however, be futile. It can only be stated that production for the own needs of the producer has to be ruled out. Amber craft was not a common activity, but an elitarian one of rather high rank. This is testified by the existence of one workshop in the particular settlements as also by its central location. Thus amber ornaments were made by specialists having the necessary set of tools at their disposal. (For Jacewo this is substantiated by the character of the settlement and by its
situation close to the long-distance amber route and to the centre of Kuyavia). The phenomenon of specialization of production appears within the framework of the new socio-economic structure formed under the inspiration of the mediterranean civilization, but does not go beyond the limits of family of territorial common ownership. The professionalism of amber crafts is, however, not to be taken as complete withdrawal of the craftsmen concerned from occupations connected with farming and animal husbandry, but as an occupation performed on a larger scale by only a small group of persons. In the material at our disposal we do not find any indication of combining amber craft with the treatment of horn which is so particular e.g., for the early middle ages; this might be due to the barely initial form of professionalization of crafts.

The professional character of the branch of production discussed is also testified by the finding in some graves of small lumps of raw material (Gąski) or semi-products (Szymborze) which has nothing in common with the desire to equip the deceased with objects having magical properties, but determines his position within his own social group.

The existence of specialists in amber craft does not exclude production of single ornaments by other persons—but only for their own use. This can be traced by remains of isolated lumps of amber in different residential buildings.

The products of specialists, amber craftsmen, met the demand for these luxury objects mostly by family and tribal elders, and formed probably also the object of exchange within intertribal trade.

It has been said that amber craft, based on expensive raw material, requiring special equipment and accuracy in working, the products of which because of their luxury character were destined for a definite group in society, was elitarian branch of production. No wonder, then, that it gave its representatives wide opportunity to acquire wealth, and thus to purchase expensive products of foreign origin. There is no other way of explaining the concentration of Roman imports observed in all buildings of amber craftsmen, in contrast with the overall state of equipment of other contemporaty residential buildings.

Amber craftsmanship of the era of Roman influence was not a short episode in the history of Kuyavian societies but, as testified by the excavation of workshops of different chronology (Jacewo, Łojewo—early period of Roman influence, Konary—late period of Roman influence), developed for three centuries. This development explains the participation of Kuyavia in the all-European long-distance trade, i.a., in amber, by using the transit communication route crossing the region, the location in this region of one of the most important trade emporia of Polish lands, and the advanced socio-economic development of the local population. This craft has, however, seemingly no older local tradition, although the custom of using amber
products in the region goes very far back—to the later stone age. But never did it become a prevailing fashion. A marked increase in interest in raw material and its products appears only in the late latenian sub-period. This happened under the impact of outside impulses being the reflection of predilection for amber ornaments among the Mediterranean societies at that time. In this period, under the inspiration of Celts who were then the main organizers of European trade in amber and who initiated in products made of this attractive “northern gold” in connection with the raw material. The period of particular intensity of this trade falls in the first century B.C., i.e., in the time of frequent contacts of Polish lands with the Imperium Romanum. At that time the societies of Kuiavia acted not only as carriers of Sambian amber over the Polish part of the amber route, but developed also their own treatment of this raw material. This was probably connected with the spread in this region of the custom to wear amber necklaces, which arose i.a., under the influence of Italian societies delighting in products made of this attractive “northern gold” in connection with the transmission of several new patterns of behaviour.21

In discussing the development of amber treatment, the problem of sources of this raw material cannot be omitted. Unfortunately problem is not easy to solve. It is known that the richest ambergiving areas were situated on the shore of the Baltic Sea between the mouths of the Vistula and the Zambia. Moreover, rich inland deposits stretched across the Pomeranian, Mazurian, and Lithuanian lake districts including the Kurpie forest.22 Amber probably appeared also i.a., in the tertiary loams in Kuiavia near lake Goplo,23 in the Pałuki district,24 and in the Tuchola forest.25 We would be interested in the Kuiavian deposits. Unhappily because of lack of respective specialist research it is barely possible to attempt at any precise localization, and the more so to assess their potential resources. It seems, however, that these were not very important and because of their exploitation in older prehistoric periods they could not form the base of existence of Kuiavian centres of amber crafts in the era of Przeworsk Culture. In our opinion, their demand was met by imports from Sambian lands within the longdistance trade between the Baltic shore and the Roman Empire. This conception provides also a justification for the observed chronological framework of the existence of local amber craft, links its origin with the intensification of long-distance trade with the Baltic shore, and its decline and final disappearance, particularly in the western zone of Central Kuiavia, with the shifting of the route of this trade.26

The above presentation of the amber craft in Kuiavia at the time of the Przeworsk Culture is the first attempt to present this problem on the base of the still scarce set of facts. A more comprehensive and deeper discussion will be possible after finding of new archeological sources and after additional studies confirmed by results of analyses.
NOTES

* The following text was prepared for the 6th work session of the Polish-Italian Working Group of the Sciences Applied in Archaeology and in Protection of the Cultural Patrimony (Warsaw 16—22 May, 1977).

1 We call "Central Kuyavia" the area extending from lake Pakość to the proglacial stream valley of the Vistula and the Noteć, and to the line Strzegom-Radziejów.


6 Badania powierzchniowe Ekspedycji Kujawskiej Katedry Archeologii UAM (Surface Research of the Kuyavian Expedition of the Chair of Archeology of the Adam Mickiewicz University).

7 The settlement at Krusza Zamkowa situated near the southern border of Inowrocław was the largest and most important settled centre of the societies of Przeworsk Culture in Central Kuyavia. It extended over an area of 15 hectares and played the role of central place of this region.

8 A. Cofta-Broniewska, Osada za okresu wpływów rzymskich na st. 4b w Jacewie pow. Inowrocław [Settlement of the period of Roman Influence on stand 4b at Jacewo, district Inowrocław], "Komunikaty Archeologiczne," vol. 2 1978, p. 149.

9 ibidem.


14 Research on the Przeworsk Culture in Kuyavia has shown that it was formed under a strong influence of the culture of the Celts, of the Roman Empire, and of the circle of Carpathic culture.

15 The combining of two branches of production using similar sets of tools was observed in several settlements of the early middle ages.

16 Collections of the J. Kasprowicz Museum in Inowrocław.

17 Archives of the Archeological Museum in Poznań.

18 Research of the Kuyavian Expedition at Łojewo.

19 In each workshop several objects of foreign origin were found, mostly glass beads, fragments of glass utensils, hedgehog and turned ceramics from Roman provinces, ans cowrie shells.

20 A. Cofta-Broniewska, Grupa kruszańska kultury przeworskiej [The Kruszka Group of Przeworsk Culture] (in print).

21 Local societies adopted at that time the custom of wearing signet rings, using caskets, drinking wine, and playing dice.

22 J. Okulicz, Pociąganie pobreza wschodniego Bałtyku z centrum sambiańskiego z południem
w podokresie wczesnorzymskim, [Relations of East Baltic Sambian Centre with the South in the Early Roman Period], in: Kultury archeologiczne i strefy kulturowe w Europie środkowej w okresie wpływów rzymskich [Archeological Cultures and Cultural Zones in Central Europe in the Period of Roman Influence], Warszawa, Kraków 1976, p. 183.


24 Słownik geograficzny Królestwa Polskiego i innych krajów słowiańskich [Geographical Dictionary of the Polish Kingdom and other Slavonic Countries], Warszawa 1895, p. 809.


26 Research in Kuiavia shows that by the turn of the 2nd century B.C. the main trade in amber shifts to the line of the Vistula.