CROSSING THE ALPS

EARLY URBANISM BETWEEN NORTHERN ITALY AND CENTRAL EUROPE (900-400 BC)

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Contents

Chapter 24

The Dürrnberg Salt Metropolis: Catalyst of Communication and Complexity in La Tène Central Europe

Holger Wendling

The Eastern Alps have always been less of a separating barrier than a connecting communication space, which since the Neolithic has enabled a multitude of cultural contacts and impulses. Since the Bronze Age, when the mining, distribution and use of metals contributed considerably to social differentiation, the traces of supra-regional contacts in the area around the Salzach River and valley network have noticeably increased. In this context, the exploitation of local mineral resources -copper and salt- is of fundamental importance. It led to the formation of Bronze and Iron Age "special economic zones" in the Mitterberg area and on Dürrnberg near Hallein. There, in a supra-regionally important economic hub, an industrial site developed from 600 BC, which differed considerably from previous and simultaneous patterns in the region in terms of social and economic organisation, and settlement structure. Whether settlement complexity of this important "salt metropolis" reveals urban patterns, however, is the subject of recent analysis and discourse.

Keywords: Late Hallstatt; La Tène; Settlement structure; Burial; Salt mining; Social differentiation; Crafts; Trade; Communication; Complexity; Urbanisation.

24.1 The Salzach region – Corridor of Communication

Ancient traffic routes characterise the Greater Salzburg Area, the course of which has made the region an important communications corridor from prehistory until today (Wendling 2018a, 103-119). The distinctive element is the Salzach River, which flows from the *Inneralpen* eastwards along the High Tauern Mountains and finally winds northwards in a significant bend. Here it dominates a wide valley, which sometimes narrows into a small passage which can be easily controlled. A supra-regional perspective illustrates the ideal traffic-geographical situation at the intersection of important communication routes: the later Roman road network, which perpetuates older Iron Age routes, shows the connections to the west along the foot of the mountain and the north-south routes linked to the rivers (Sommer 2016) (fig. 24.1). To the north, the Salzach Valley opens into the relatively flat Alpine foothills. The Salzach finally drains, after the Saalach flows from the west, into the Inn and thereby ultimately connects to the Danube. In the south, the valleys of the tributaries depart from the Salzach Valley in almost exact north-south direction and lead to the Tauern passes. These finally allow a relatively unproblematic access to Carinthia and Tyrol and beyond to northern Italy and to the *Caput Adriae*.

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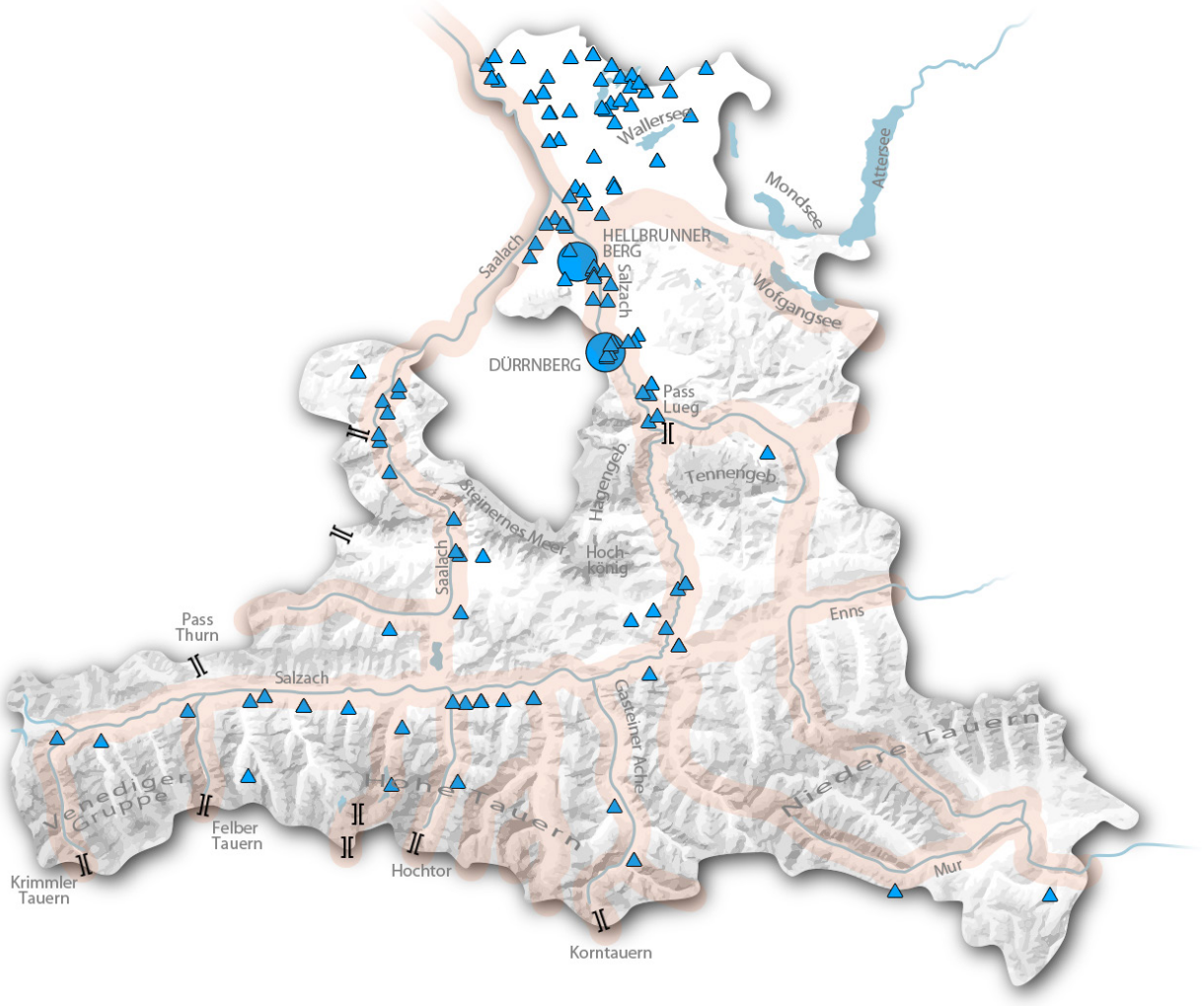


Figure 24.1. Map of today's *Bundesland Salzburg*, the Salzach Valley region and Hallstatt period sites (H. Wendling, map base: S. Müller, Barcelona).

In addition to the excellent topographical situation, a diversity of mineral resources played a fundamental role in the development and supra-regional communication of the Salzach area, at least since the Early Bronze Age (Stöllner 2011; Stöllner *et al.* 2012; Wendling 2018a, 33-43). In the second half of the 2nd millennium BC, copper mining started in the Mitterberg region, where two main economic factors -the supra-regional trade and the exploitation of resources- are clearly symbolised in the well-known Pass Lueg deposit (*ibid.* 72-76; Lippert 2011). The hoard, which was laid down at an important bottleneck of the Salzach Valley, contains the crested helmet and a bronze axe as signs of economic and political power, and in addition pickaxes and some copper ingots as symbols for the mining of ores and the access and control of resources.

At the beginning of the Iron Age, in Hallstatt C, a further intensification of contacts with the south can be observed, which finally culminates during Hallstatt D and the Early La Tène period. This intensification is certainly related to the second outstanding source of raw materials, salt, which was obtained in the nearby, but structurally very different, centres of Hallstatt and Dürrnberg (Stöllner 2002a; 2002b; 2007). The mining on the left side of the Salzach and the shipping of the vital resource led to exorbitant wealth and a focal position in an ancient 'global network'. In connection with the excellent traffic conditions offered by topography, salt and trade became driving forces in the development of the Dürrnberg from a 'special economic zone' to a proper 'salt metropolis'.

24.2 Assessing settlement complexity

The evaluation of prehistoric settlement complexity has been a defiant task in archaeology, especially in the broad field of pre-Roman, *i.e.* Iron Age societies in Europe (*e.g.* Collis 2014). Within the framework of ancient

urbanisation research and against the background of a specific prehistoric situation of sources, models of city definition were used that were borrowed from ancient history, at least in German-speaking archaeology. As a 'checklist approach' they were intended to make the existence of certain defining characteristics of a 'city' or 'town' objectively verifiable. The most commonly used concept, Frank Kolb's set of criteria for an ancient city (Kolb 1984; 2007), is based on the definition and criteria of urban spaces, which have been used in modern urban geography since Max Weber (1921). It names six classification features: topographical and administrative unity of the settlement, population of several thousand inhabitants (places around 1000 inhabitants are considered borderline cases), pronounced division of labour and social differentiation, diversity of the built environment, urban lifestyle, and the role of the settlement as a central place for the surrounding area.

For prehistoric conditions, however, only the economic and social differentiation, diversity of buildings and architecture, and proof of centrality seem to be sufficiently assessable. Furthermore, the qualitative and quantitative assessment of the individual criteria remains problematic both in this case and in other approaches which focus on prehistoric examples. Ambiguous formulations such as 'sub-urban/pre-urban' or 'early urban/protourban' give a rough idea of the stage of development, but are hardly suitable for a concrete approach (cf. *e.g.* Hänsel 2005; considering the Heuneburg, cf. Kimmig 1983, 86). Rather, they reflect a fundamental uncertainty in dealing with the concept of urbanisation, and often also an apparently conscious avoidance of clear denomination (Jung 2017, 20-21).

For a plausible definition, recent archaeological research on the ancient city has highlighted the dynamic character of urban development and the relative dimension of the quality of urban space. Robin Osborne (2005, 4-7), for example, characterises ancient urbanisation as a continuous process, which has a gradual, transformative character "as a phenomenon which admits of degrees". This qualitative assessment of the degree of urbanisation is one of the central points of an innovative approach developed by an interdisciplinary working group for the German Archaeological Institute. An "Archaeological Catalogue of Criteria for the Evaluation of Urban Spaces" allows a qualitative and quantitative assessment of the urban status of prehistoric settlements at a certain point in time or in individual settlement phases and settlement areas (Fröhlich and Wendling 2013, 40-41; Wendling 2013, 461-462; 2018d, 166-171). Here, criteria were formulated that are verifiable in an archaeological way and, as variable attributes, allow for a fluctuating, gradual qualification within the framework of a polythetic classification. In this way, they avoid the problem of a binary 'yes/no' evaluation in the manner of a 'checklist approach' (see also Fernández-Götz *et al.* 2014, 8-9). The criteria are:

- Continuity of use and sustainability of urban settlement.
- Topographical seclusion and compression of building and infrastructure.
- Functional and formal differentiation of building structures.
- Role as a centre of social interaction and political communication.
- Finally, and of paramount importance, concentration and diversification of crafts, trade, and service facilities.

The basis of these attributes is in most cases the relative expression compared with simultaneous examples of low complexity. Although an archaeological approach to such settlement units is often problematic, the rural, agriculturally orientated base -the farmstead or hamlet- can provide a proxy value. However, whilst those criteria are deliberately intended to achieve measurable and mathematically calculable values, no such qualification can be provided in the context of this paper. Nevertheless, I will try to assess the variable settlement complexity of the Dürrnberg Special Economic Zone with the help of the criteria mentioned above. In doing so, external influencing factors, but also the intrinsic impulse factor of the Dürrnberg as a social, economic, and cultural catalyst, and as an agent of urban complexity will be critically examined.

24.3 Dürrnberg settlement complexity

24.3.1 Concentration and diversification of crafts, trade, and service facilities

Trade and contact are prime movers of social change and differentiation and thus fundamentally foster settlement complexity in local and regional perspective. As an eminent example of supra-regional communication, the so-called 'Southern Imports' from Greece, *Magna Graecia,* and Etruscan Italy are a characteristic element of the West Hallstatt circle (Eggert 1989; 1991; Fischer 1973; Kimmig 1983; Wendling 2015, 225-228). For the '*Osthallstattkreis*', however, those contacts were frequently considered to be of peripheral significance or a temporary phenomenon in comparison to the more central Golasecca culture, for example (Kimmig 1983, 30-32). Recent finds and reconsiderations of the routes and impact of southern goods in the eastern Hallstatt sphere and the evolving La Tène culture have considerably altered this view. Dürrnberg and nearby Hellbrunner Berg (identified by some as the easternmost so called 'princely seat') at the

Figure 24.2. Appropriation of external stimuli of material culture becomes evident in the spectrum of the Dürrnberg beaked flagons (*not to scale*): the Etruscan original from grave no. 59 (left) is reproduced in ceramic (grave no. 353) and leads to an indigenous adaptation of the flagons in the Early La Tène period (Salzburg Museum and Keltenmuseum Hallein; photos: R. Poschacher, T. Rabsilber).

Figure 24.3. A tiny fragment of an Attic black-glaze bowl was recovered from the so-called "valley settlement" at the foot of Dürrnberg. It corresponds to the completely preserved *kylix* from Dürrnberg grave no. 44/2 (Keltenmuseum Hallein; photo: C. Kossmann).

ambiguous border of these two Early Iron Age cultural spheres played a prominent role in these networks of communication and exchange (Moosleitner 1979; Stöllner 2002c, 405-408; 2015a; Stöllner *et al.* 2003; Wendling and Irlinger 2017). Down-the-line barter or gift-exchange of eastern alpine societies via passes and communication corridors transferred Mediterranean objects, ideas, and also people to the salt distributors, who controlled the gateway to Central Europe.

From very early in Dürrnberg's occupation -salt mining started in Hallstatt D1, c. 600 BC and soon was followed by local funeral activity- an influx of foreign goods and acquisition of blatant wealth through salt exploitation and distribution became manifest in burial furnishings. In Hallstatt D2/D3, towards the end of the 6th century BC, imports from Etruria and Greece occurred in considerable numbers. An early example is a beaked trefoil jug in female burial no. 59 (fig. 24.2) (Rabsilber *et al.* 2017, 40-47). These original imports were later imitated

in different materials and forms by local craftsmen, as can be seen with a contemporary ceramic jug from grave no. 353 (*ibid.* 501-517; Wendling 2019, 172, 187). Eventually, the *Schnabelkannen* reached their heyday in the Early La Tène period with the Celtic beaked flagon from Dürrnberg grave 112 as one of the most famous objects of Iron Age archaeology in Europe (Moosleitner 1985; Wendling 2018c). In addition, a large number of ceramic and wooden imitations with an open or tubular spout from both Dürrnberg and Hellbrunner Berg testify to an intensive indigenous reception and appropriation of southern models (Dehn 1969; Delnef 2003; Hell 1930). This appropriation included both material culture and customs or ideas, like the notion of collective feasting and conspicuous consumption.

The reception and transformation of external stimuli is illustrated by an Etruscan *stamnos* with only one handle -the second is a modern, apparently false addition- that was deposited in grave no. 63 (Pauli 1978, 33). The custom of separating handles from grave vessels is a common funerary feature in prehistoric Italy, at least since the Villanovan period (Guggisberg 2004, 185 with note 46). A similar action is attested at the Hallstatt C (8th/7th century BC) cemetery at Uttendorf on the upper Salzach. In this instance, a single fragment of an Este-culture ceramic *situla* served as a symbolic or prestigious item with special meaning (Moosleitner 1992, 38-39; Wendling 2018a, 108-109). The underlying custom of destruction or manipulation of grave goods may be associated with deliberate mutilations of human bodies regularly attested in the Dürrnberg graves (Wendling 2018b; 2020). Such practices in the ritual treatment of material culture reflect phenomena that were widespread in the burial customs during the Urnfield Period and before, not least in southeast Europe (Chapman and Gaydarska 2007; Duerr 2013; Harrell 2015). Numerous examples of manipulations of grave goods can be found in the following Iron Age in Hallstatt Central Europe and Archaic Greece (Alexandridou 2013; Augstein 2019). Most likely, in this case the Salzach corridor also played an important role as a cultural recipient and source of further inspiration and transmission of ideas (*e.g.* Repka 2018).

As a more substantial reference, the number of foreign goods illustrates the extensive network in which Dürrnberg interacted from a central position due to its vital resource (Zeller 2002a; 2002b; 2003). The La Tène A period chariot grave no. 44, whose inventory includes Baltic amber, a cowrie shell possibly from the Indian Ocean, remains of grape wine in a huge bronze flask, and apart from other prestigious items, an Attic black-glaze bowl from Athens' *kerameikos* amply signify this focal position at the zenith of Dürrnberg's prosperity (fig. 24.3) (Pauli 1978, 311; Penninger 1960, 357-363; 1972, 76-80; residue analysis: Specht 1972). Similarly, an Etruscan *situla* apparently thrown into the river Salzach at Laufen, some kilometres north of Dürrnberg, together with the beaked jugs and *stamnos* reflects the acquisition of foreign drinking vessels, but also the appropriation of associated customs and traditions (Heger 1973). Furthermore, Dürrnberg's role in the transformation and dissemination of exotic goods has recently been underpinned by a quite singular find in the Iron Age 'valley settlement' at the foot of Dürrnberg (cf. Penninger 1974; Stöllner 1996, 95-99): Another tiny fragment of an Attic black-glaze *kylix* was recovered from an unstratified context near an alleged harbour, where salt was shipped to destinations in and beyond the Alps (fig. 24.3). This specimen additionally closes the gap between the upper Italian or Adriatic area of origin and a concentration of Greek pottery in Bohemia, which according to this, in the 5th century BC made its way north via the eastern Alps and the Dürrnberg junction (Bouzek and Dufková 2015; Bouzek *et al.* 2017).

This Early La Tène system of economic and cultural connectivity as represented by grave no. 44 perpetuates an earlier, Late Hallstatt 'global network', which, however, partially operated in another direction. This Hallstatt period network is best represented by the combination of grave goods in one of Dürrnberg's richest female graves in the Eislfeld necropolis (Wendling 2019). Burial gifts in grave no. 353 include a headdress of hollow golden balls and hair rings, a variety of fibulae, one of them gold-plated, a set of very rare bronze vessels, a ceramic imitation of an Etruscan beaked jug, and a very unusual glass spindle whorl. The distribution of the types of those grave goods in the circumalpine region draws a very vivid picture of trans-regional communication and reveals far-reaching contacts of the Dürrnberg population at mid-1st millennium BC (fig. 24.4). Close, possibly personal, relations are particularly evident to the western Hallstatt region, while strong impulses came from *Caput Adriae* and northern Italy (Wendling 2014; 2019, 184-188). Raw material for numerous coral inlays from Dürrnberg or a unique glass cup from Hellbrunner Berg also originate from there. Like two more cups from Hallstatt and one example from nearby Helpfau-Uttendorf (AT-OÖ), this vessel possibly came from Most na Soči (SL) with its large number of similar vessels (Haevernick 1958; Moosleitner 1979, 69-70; Stöllner 2002c, 155-156; Wendling 2018a, 110). The glass whorl, which in turn illustrates the appropriation and passing on of cultural-ideological content with a peculiar female-related religious-social meaning, originates from the same area (Wendling 2019, 184-185, 189; cf. Metzner-Nebelsick 2009). Other, more 'profane' groups of materials had to be imported from far away for further processing and the production of objects for local use, but also for re-export in long-distance trade. Above all, these include raw materials for special goods, such as graphite for ceramic production, lignite

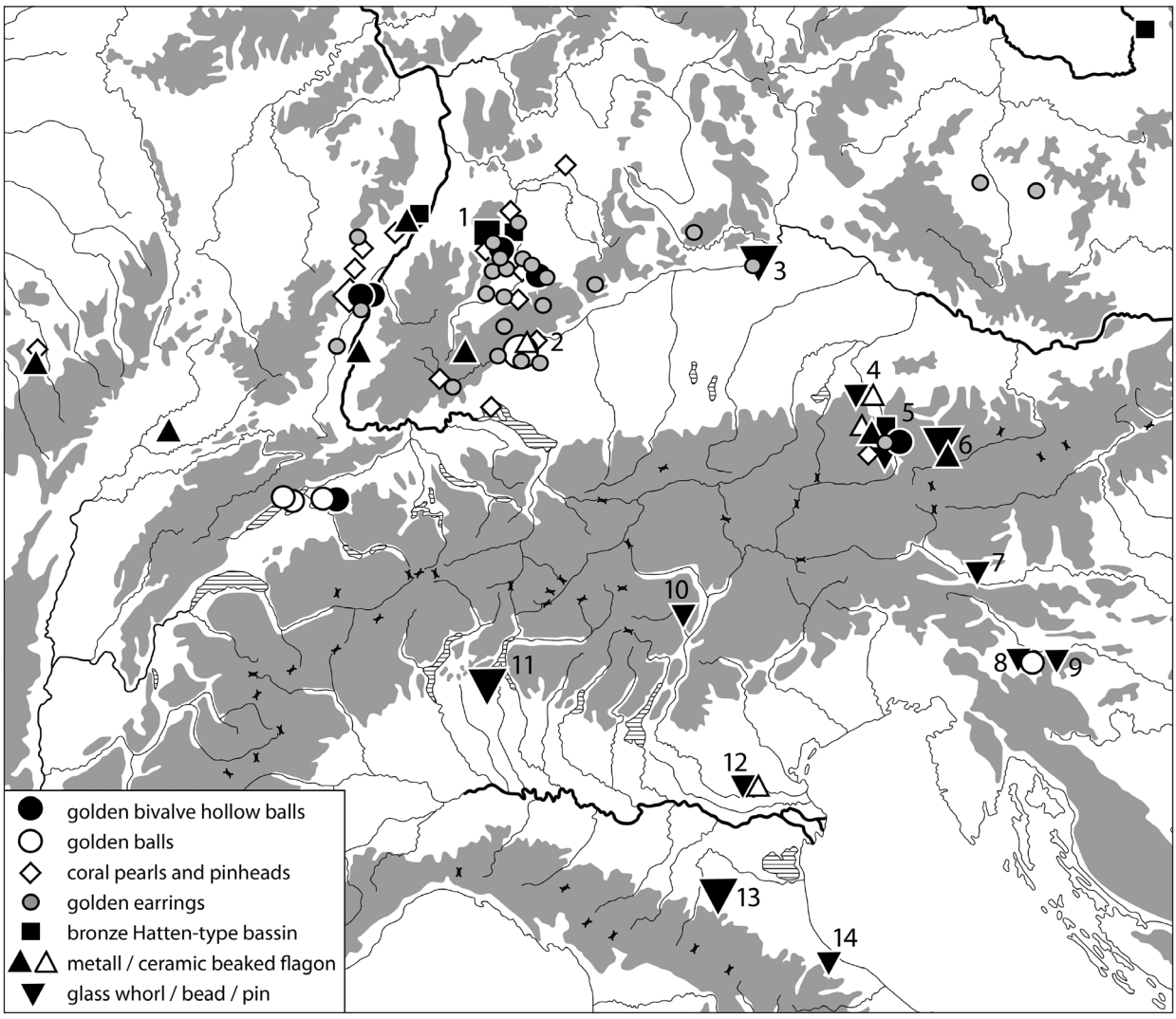


Figure 24.4. Import and appropriation of bronze vessels, gold jewellery, and glass items from grave no. 353 illustrate widespread contacts of the Dürrnberg community in the Late Hallstatt period: 1 Hochdorf – 2 Heuneburg – 3 Ilmendorf – 4 Dürrnberg – 5 Hellbrunner Berg – 6 Hallstatt – 7 Frög – 8 Magdalenska Gora – 9 Stična – 10 Sanzeno – 11 Como – 12 Este – 13 Bologna – 14 Verucchio (Dürrnbergforschung, H. Wendling).

or sapropel and raw glass mass, and raw metal (iron, copper, tin), as well as gold and silver. Thus, as a 'global player' in a network operated by a reciprocal system of cultural, economic, and social input and dissemination, Dürrnberg may literally be termed a *metropolis*.

This focal position in trade and exchange also worked on a sub-regional scale. Here, Dürrnberg is incorporated into a reciprocal system of supply and demand, which includes animal and vegetable food, and objects of daily use, but also building and raw materials (Stöllner 2002a, 84-88; 2007, 318-322; 2015a, 331-332; Stöllner *et al.* 2003, 179-185). Contacts with the inner alpine region take an intermediate position between long-distance and local trade. These brought raw materials and finished products to the salt centre, but possibly also suggest the influx of people to the Dürrnberg. Peculiar ceramics from the Rhaetian Central Alps, which are documented in several settlement and burial contexts, may also indicate the presence of 'foreigners' in a 'cosmopolitan' environment (Zeller 1992).

The extraordinarily good preservation of finds in graves, settlements and in the salt mines allows detailed statements on the food and consumer goods supply of the Iron Age community on a more local basis. Analyses of faunal remains show that Dürrnberg was dependent on the supply of live animals, especially older cattle, both for the food supply of its inhabitants and for the production of secondary goods (Stöllner *et al.* 2003, 167-171; Pucher 1999; 2015). Furthermore, the predominance of cattle

bones in several samples may indicate further processing of slaughter products that were re-exported to the surrounding area after local preservation with salt. The same economic mechanisms may apply to the supply of leather and bone products to the Salzach region (Groenman-van Waateringe 2002; Russ-Popa 2005). Other crafts practiced on the mountain, such as pottery- and textile-making, metal, or wood processing, may also have served a more local-regional sales market in the immediate vicinity (Stöllner 2002a, 85; Stöllner *et al.* 2003 152-154). The supply of wood for house and mine construction is likely to have been covered by a rather local catchment area. Botanical and dendrological analyses confirm a systematic, albeit not necessarily sustainable, timber industry (Boenke 2002; 2015; Lobisser 2005, 128-133; Stöllner *et al.* 2003, 158-163). Similar to the supply of meat, the supply of vegetable food is likely to characterise the Dürrnberg as a place of consumption and only to a lesser extent as a place of production. Cereals and pulses as the miners' primary foodstuff may have been imported from the flat landscape of the Salzburg basin, whereas local horticulture and collecting activities may have met the demand for vegetables or (wild) fruit (*ibid.* 146-149; Boenke 2002; 2005a; 2005b; 2015; Stöllner 2002a, 88; Swidrak and Schmidl 2002). In addition to salt intended for the regional market, there were also special products whose efficient production is only conceivable in a central location with economic dimensions such as Dürrnberg. Metal goods and tools, but above all individual fancy goods such as bronze, glass and jet jewellery, but also fine textiles as attested so delicately in the salt mines, were probably delivered to the surrounding area (Stöllner 2002a, 85-86). Consequently, in addition to its obvious role as a centre of long-distance trade, Dürrnberg was most likely integrated into a local exchange network that supplied the agriculturally unfavourable settlement location with subsistence goods. In return, the mining centre expanded its initially highly specialised salt production to include a range of everyday consumer goods and speciality goods. Concentration and diversification of trade and service facilities could hardly be greater.

The same applies to the diversity of craft production, some sectors of which have already been briefly mentioned (Lobisser and Löcker 2002; Moosleitner 1991, 170-172; Stöllner *et al.* 2003, 158-161; Zeller 1984b). Craftsmanship on Dürrnberg includes -as a rather basic commodity- wool processing and textile-making. Finished products and tools, such as fragments of wooden carding tools, spindle whorls, weaving weights, and sewing needles, as well as the textiles preserved in the salt mines document both areas (cf. Grömer 2009; Lobisser 2017, 313-315; Stöllner 2005). As activities carried out by women and girls on a household-level, they had a high symbolic and social value, which could sometimes take on a religious dimension (cf. Wendling 2019).

Semi-products, waste, and tools are proof of iron and non-ferrous metal smiths, and forgers. The large amount of high-quality bronze jewellery and vessels in the Dürrnberg graves reveals the level of craftsmanship and hints at a local specialised workshop. However, whether the famous Dürrnberg bronze flagon was produced on-site, is a matter of debate (Moosleitner 1985, 91). Apart from finished goods, re-assessing of older finds proves the presence of a goldsmith's workshop in the Early La Tène period. In the vicinity of a house in the Ramsautal settlement, fragments of ceramic casting moulds have been identified, which were used for creating bar-shaped ingots (Stöllner 2018; Schachinger and Wendling 2019, 182-188). Tiny golden globules or *prills* were microscopically determined as residues of the casting process on the moulds' surfaces (fig. 24.5). The local production of gold ingots poses some questions, however: local scrap metal or gold in smaller quantities may have been externally acquired and cast into bars in order to fall back on material deposits for future precious metalwork. In addition, the bars could also have served as an end or intermediate product and means of accumulating wealth or redistributing taxes or revenue. In this respect, the presence of early Celtic gold coins is of interest, as they demonstrate that Dürrnberg was an active part of a supra-regional monetary system beginning in LT C (Schachinger and Wendling 2019, 178-179; 186).

Ubiquitous ceramic residue and waste is evidence of local potters' workshops, who had been producing highly specialised mass goods on the potter's wheel since the Early La Tène period. A support plate of a potter's wheel is a unique example of the Iron Age use of this new technique (Moosleitner 1974). In the Later La Tène period, the industrial manufacture of glass arm rings and beads used a similar technology. Residues of glass production have been found in the Ramsau Valley settlement (Brand 2002, 110-111).

Pyxides and their lids, wooden bowls, cups, and vessel bottoms were produced with the rotating mechanism of the lathe (Lobisser 2017, 267-272). These were mainly made of local pip or stone fruit, however raw material for a walnut *pyxis* is probably of external, northern Italian or upper Adriatic origin (*ibid.* 426; Küster 2008). Moreover, the shape of the *pyxides* does not imitate domestic ceramic models, but Greek archetypes. Since corresponding originals made of ceramics, alabaster, or glass from the Mediterranean have not yet appeared in a Central European context (Bonomi and Guggisberg 2015), an import of organic pieces can be assumed.[1] Examples of wooden lathe-made *pyxides* are extremely rare, with specimens from Early Iron Age Scythian burials having been interpreted as local imitations of Greek ceramic originals (Rieth 1941, 94-96).

1 However, this is apparently not the case with a *kylix*-like vessel from Uffing at Staffelsee in Bavaria, which may be a local imitation (Capelle 1976, 25-26; Kossack 1959, 106-107; Rieth 1941, 88).

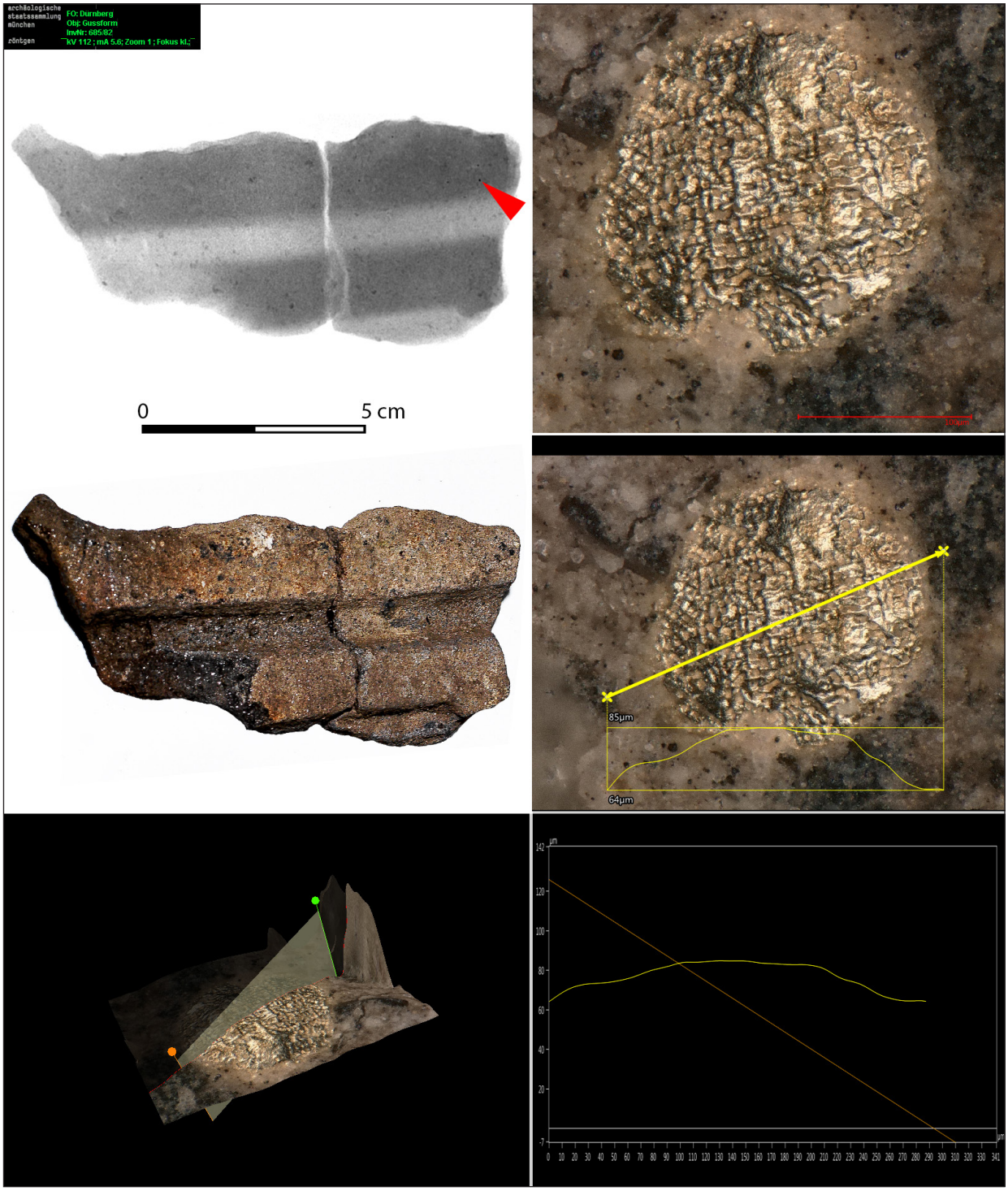


Figure 24.5. Microscopically and radiologically proven gold beads confirm that ceramic moulds were used to cast long, rod-shaped gold ingots (Salzburg Museum; photo: S. Friedrich, Archäologische Staatssammlung München).

Other cylindrical wooden cans were recently excavated at the Hallstatt period "Bettelbühl" burial mound near the Heuneburg (Krausse and Ebinger-Rist 2018, 53). Quite similar in form, they were made from boxwood, which apparently was not available near the Heuneburg at this time and thus also suggest the importation of either raw materials or finished objects.

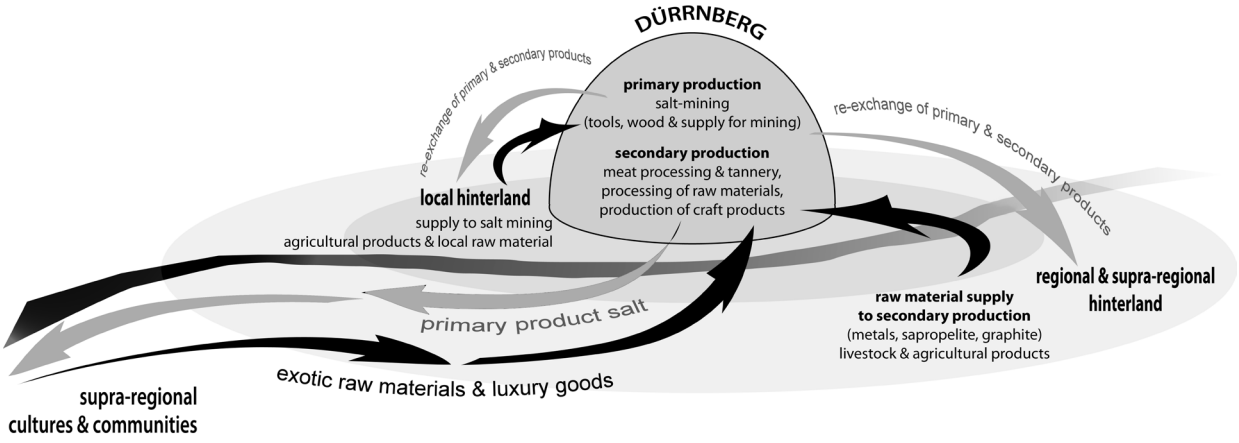


Figure 24.6. Economic model of the Dürrnberg salt-mining centre and its connection with sub-regional, regional, and supra-regional communities and cultures (H. Wendling, after Stöllner *et al.* 2003, 180 fig. 37).

On Dürrnberg, the use of the lathe is further proved by wooden conical cores, representing production remains, and was also used for the efficient production of regularly formed Hallstatt period amber beads. Carvers worked 'exotic' organic materials like amber, lignite, or coral, as well as bone and antler, for example used for knife handles. In woodworking, they produced elaborate furniture: grave no. 352 preserved relics of a delicately carved and painted death board or sofa (*kliné*) (Wendling 2017, 55). Remnants of wooden musical instruments (lyre and pan flute) appear as products of specialised wood processing, while also conveying social significance (Lobisser 2017, 318-324). Other wooden items include tools for weaving, knee shafts for axes and pickaxes, the latter used for mining salt (Boenke 2005b, 475). Pine shavings were needed in huge quantities to light the underground galleries and had to be split on site in the various supplier settlements.

The economic diversity of the Dürrnberg mining settlement is fundamentally different from the conditions in settlements in the immediate and distant surroundings (fig. 24.6). Although the economic structure is based entirely on the monopoly position as a salt supplier, it became a 'self-runner' beyond salt production over time. In this respect, Dürrnberg had for a long time -until the emergence of the large settlements of the Late La Tène period- been unrivalled in terms of both quality and quantity of crafts, trade, and service facilities. As an equivalent to those later phenomena, which became widespread in Central Europe from LT C, Ferdinand Maier (1974) referred to Dürrnberg as a "large industrial settlement" (*industrielle Großsiedlung*).

24.3.2 Centre of social interaction and political communication

It may come as a surprise that despite the large number and variety of cemeteries, graves, and burials, no conclusive interpretation of Dürrnberg's social structure has yet comprehensively succeeded (*e.g.* Pauli 1978, 505-520; *contra* Aspöck *et al.* 2007, 121-123; 138). In addition to the fragmentary and biased funerary record, the integration of settlement and -above all- mining data offers unique perspectives of social interpretation (*ibid.*; Stöllner 2015a, 332-333; 2015b, 341-342; Stöllner *et al.* 2003, 184-185). Still, the special character of social differentiation in historic and contemporary mining communities makes conclusive interpretations difficult (Stöllner 2012). At the same time, Dürrnberg reveals so many peculiarities in all areas of material and ideological culture which render any comparison with other Iron Age communities rather problematic. However, for the criterion of social (and political) communication, general indications meaningfully underpin the status as a complex centre even within a supra-regional comparison.

Whatever interpretation explains the apparent imbalance in the quality and quantity of tomb furnishings, this reflects a social diversity that ranges from prominent to subordinate members of society. Although the temporal inequality of the burial places makes it difficult to make firm statements, a general social fragmentation seems to be evident, which is effective in individual kinship groups or lineages. This social differentiation may also be reproduced by analysis of palaeofaeces which document uniform eating habits and widespread parasitic infestation (Aspöck *et al.* 2007; Boenke 2007). In an integrating approach, Thomas Stöllner suggests the 'Celtic clientship system' for explaining differentiation in wealth and status of miners and alleged political/economic elites (Aspöck *et al.* 2007, 123). It has been

assumed that this social system is a consequence of intra-familial differentiation due to inheritance rules, which have hardly been considered as a socio-structural phenomenon in Iron Age archaeology (Wendling 2010). Such a segmentary lineage society is based on kin-related ties and may well exhibit differentiation in rank and individual prestige, possibly caused by inheritance (Brandt 2010, 17-19; Service 1962). As a model for the Dürrnberg mining community, it was already postulated in principle by Ludwig Pauli and Ferdinand Maier, and may be reproduced both in the context of graves and in the method of mining (Maier 1974, 339-340; Pauli 1978, 505-510). Recent mining archaeology seems to support the interpretation of what Stöllner (2015a, 332) calls "clan units", which invested in mining and trade as segmentary population groups. The fact that considerable parts of these "salt families" (Maier 1974, 339-340) actually worked underground could be indicated by individual, large-scale mining caverns, which required continuous and broad investment of labour (Aspöck *et al.* 2007, 110; Stöllner 2002a, 80-81; 2015b, 341; Stöllner *et al.* 2003, 136).

Leather children's shoes in the mine suggest that considerable sections of the population were involved in these economic activities. The evidence of strenuous child labour stands in curious contrast to the furnishing of some Early La Tène children's graves with numerous amulets, which were intended to protect small children from danger and harm in a most precarious phase of life (Pauli 1975, 15-26). Analysis of a unique sort of human legacy preserved in the salt mines, impressively illustrates the generally poor living and working conditions below and above ground. In addition to the food remains preserved in human palaeofaeces, the parasite finds in particular paint an unembellished picture of existence in a highly confined and unhygienic space, which raised social interaction to a forced high level (Aspöck *et al.* 2007, 113-115; Boenke 2007; Stöllner 2002a, 81; Stöllner *et al.* 2003, 146-152).

The political interaction of the salt centre with its immediate and distant surroundings was assessed ambivalently: As a 'service provider', the Dürrnberg would have been approached by external customers and thus have taken on a role as an economic and political subject to external powers (*e.g.* Kossack 1982, 103-104). However, the aforementioned variety of finds of supra-regional origin suggests that the salt metropolis took a more active role in economic interaction and consciously directed the salt supply (fig. 24.6). Such an economic leading role is only possible through active political communication with neighbouring and more distant participants in the system. To this extent, the highly complex production and trade structure forces constant political interaction in the form of alliances and economic pacts, trade agreements, and marriage ties. The exotic goods in the graves are the result of this reciprocal exchange of gifts between supplier and buyer (Stöllner 2002a, 83).

Beyond the obvious signs of social differentiation and political interaction in the graves and in the economic mechanism, few structures provide concrete evidence of the criteria mentioned. However, these show a well-rehearsed and generally profitable social interaction. For example, the drainage ditches built in the damp settlement area of the Ramsau Valley, which were continuously kept open and separated the individual houses, are proof of a community-based infrastructure. Such products of a superordinate group identity may have politically and socially merged the subunits, which were separated both in cemeteries and in clan-operated mining districts. Whether this reflects and adapts tendencies in urbanisation in the Mediterranean is a matter of discussion. In these cultures, early urban patterns "emerged by synoecism of clan-structured families" (Tomedi 2017, 197; transl. HW).

Furthermore, religious beliefs and cult practices are regarded as fundamental mechanisms of social and political communication. They are particularly visible in the manifold funeral customs with complex concepts of post-funeral adoration of the dead (Lavelle and Stöllner 2018, 148-151; 2019, 279-288; Wendling 2018b, 168-170; 2020). Certainly, the funeral itself was a major occasion of social interaction involving the manipulation of dead bodies, extraction of grave goods, or modification of graves (Weiss-Krejci 2018). This is particularly evident in the complex custom of cremation in special areas with multiple pyres (Wendling and Wiltschke-Schrotta 2015, 308). The burning of the dead involved particular ceremonies, including deliberate destruction of objects and, most likely, offerings of foodstuff. Corresponding non-funeral rites may have been performed in public ceremonies at special cult areas. These ceremonies may have comprised communal feasting, burning of ceramic vessels, and offerings of animals. A burning site ("*Brandopferplatz*") in the upper area of Dürrnberg may have been used as a place of such communal religious gatherings (Zeller 2002b). Similar offering sites, *e.g.* Salzburg-Morzg "Goiserberg" and "Hellbrunner Berg", Bad Reichenhall "Langacker", and Kuchl "Rehrlpalfen", indicate separate religious communities in the region, which forged their communal identities in their respective places of worship (Wendling 2018a, 56-58). This may also account for two geological features that attract the view both from Dürrnberg and from the depths of the Salzach Valley: The so-called "Barmsteine", huge upstanding rock cones quite difficult to access may have served as visual foci and ideological landmarks for the adjacent population. Similar to natural features elsewhere, these sites may have been used as places of worship or initiation (Bockisch-Bräuer and Mühldorfer 2016). However, without any archaeological evidence, these interpretations remain mere speculation.

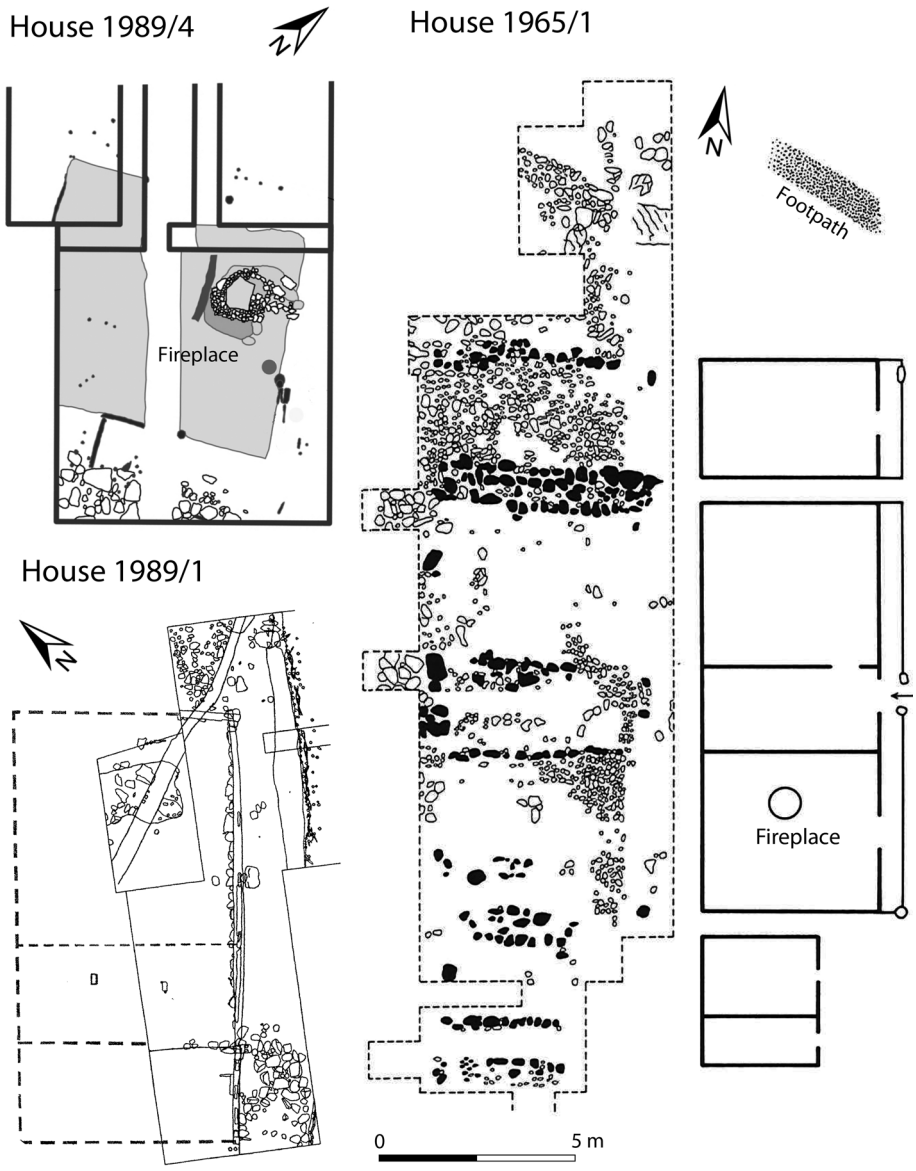


Figure 24.7. Ground plans of buildings in the major settlement in the Ramsau Valley and its vicinity (after Pauli 1986, 269 Abb. 62; Lobisser 2005, Abb. 76; courtesy of T. Stöllner).

24.3.3 Functional and formal differentiation of building structures

However difficult it may be to correlate the structural and content backgrounds of the buildings, formal complexity is one of the most measurable values in an archaeological context. Unfortunately, the length-width index only offers an adequate value if the number of ground plans is sufficiently large, so the few Dürrnberg layouts do not provide a sound database. Furthermore, many ground plans are only recorded in sections, so only vague statements can be made about original size and overall shape. Most of the buildings were uncovered in the main settlement in the Ramsau Valley, in other areas of the Dürrnberg only smaller sections of settlement areas were documented (Lobisser 2005; 2015; Moosleitner and Penninger 1965; Zeller 1984a, 8-24; 1984b, 200-201; cf. Brand 1995).

Dürrnberg houses, which otherwise offer one of the best insights into Iron Age wooden architecture, follow a rather homogeneous scheme (Lobisser 2005, 138-141; 2015, 352): At least four ground plans show long rectangular shape and, with dimensions of up to 13.4 x 5 m (House 1982/2), some of them reach considerable dimensions (fig. 24.7). The frequent interior division in this group into three segments speaks for a different use of the individual areas of the house. In addition to their residential function, parts (rooms?) of the buildings may also have served commercial purposes, as the above-mentioned mould fragments in the vicinity of House 1982/2 suggest. They furnish evidence of a goldsmith's workshop

in or nearby the rectangular building. Different fireplaces, which were used as religiously connoted cooking facilities or as commercial furnaces, further indicate functional variability. Craft use was likely in house 1989/4, where a fireplace measuring 1.6 x 1.6 m indicates a metal or glass workshop (Lobisser 2005, 141-144). The special architecture of the building underpins the difference in use compared to the multifunctional rectangular buildings. While those were constructed as foundation beam buildings on a stone base, the small, square workshop building (5.4 x 5.2 m) was a post and beam construction. House 1989/3C is an intermediate in terms of form and structure: The swell-beam building consists of an almost square main room, to which a small porch is attached, as in the case of the long rectangular buildings. Here, too, it is likely that it was used for craftsmanship. This also applies to a small La Tène A/B square block wall construction on a stone foundation measuring about 5 x 5 m, which was excavated in 1996 at the "Lettenbühel" area (Zeller 1997, 30-32). Iron slag and a crucible for bronze smelting attest to metal production. A La Tène C/D pit house that was recently excavated at the "Hochbichl" hill is also likely to have been used commercially (Preinfalk *et al.* 2015, 329). This dwelling type would of course have been impractical in the damp ground of the Ramsau Valley and thus may rather be preserved at other higher elevations on the Dürrnberg. Whether positive anomalies in geomagnetic measurements represent such settlement structures or burial chambers cannot be decided without excavation.

Additionally, the differentiation of the Dürrnberg built environment may be transposed into the third dimension, since numerous wooden remains of the rising buildings are preserved in the wetland of the Ramsau Valley. They show a rich variety of wall constructions, ranging from round timber, beam, and plank walls to wickerwork constructions generally plastered with clay (Lobisser 2005, 29-55; Lobisser and Löcker 2002). Roof cladding also included different types, for example with wooden hanging and laying shingles or possibly thatched roofing (Lobisser 2005, 55-60). Unfortunately, the variability of the architectural solutions, unlike the length-width index, cannot be adequately translated into a measure of settlement complexity. This is due to the problematic quantifiability *per se*, as well as perhaps being a result of social differentiation within a segmentary lineage society. The ethnographic record shows that diversity of material culture and technical or formal variability in building design, which is otherwise quite homogeneous, is a common feature of lineage-related settlement layout (Brandt 2010, 20-21).

Finally, another area of settlement research provides at least relative insights into the settlement complexity of Dürrnberg and its immediate vicinity. Although there are no house locations in the valley settlement on the banks of the Salzach, a functional differentiation can be concluded from the different location of the two settlement areas (Penninger 1974; Stöllner 1996, 95-99). It is unclear whether the complete concentration of the 'trade' sector at the port site on the Salzach bank was accompanied by structural and, above all, social distinction. Hallstatt and La Tène period burials in the vicinity of the settlement could, however, be signs of an independent, socially and ritually closed community. The complex interplay of production and distribution of settlement at the separate locations can be compared, at least in principle, with patterns of other large ancient settlements, such as the structural and content-related distinctions between *arx* and *suburbium* or *(akro-)polis* and *chora* (cf. Kimmig 1969, 97-98; *critically* Jung 2005, 184-185; Schweizer 2008, 402). Similar interpretations may be valid with regard to settlement location on Dürrnberg itself. Both the Late Iron Age settlement on "Hochbichl" and the Late Hallstatt/Early La Tène period occupation on "Ramsaukopf", high above the settlement in the Ramsau Valley, mark a distinctive spatial separation (Irlinger 1995). However, whether this distinction represents a segregation of a single social group or rather a communal task in favour of the entire mining population cannot be sufficiently verified.

24.3.4 Topographical seclusion and compression of building and infrastructure

The concentration of residential and commercial buildings in clearly defined settlement areas is one of the most significant features of complex or urban structures in prehistoric times (fig. 24.8). The criterion can be easily quantified theoretically by relating the total settlement area (or, as a proxy, the excavated area) to the built-up area. On Dürrnberg, however, this is problematic because of the small-scale, scattered excavation trenches and the long-term focus on burial archaeology. In the largest settlement excavation to date on "Hallersbichl" 2015, no house locations were uncovered, whereas in the Ramsau Valley only partial ground plans were revealed. Moreover, the excavated area seems to be too small to draw reasonable conclusions and does not necessarily represent the entire settlement complex. The index would thus not integrate empty or less densely built-up areas in other, peripheral zones. Consequently, if a viable solution is to be found, another approach must be used as a proxy for the overall settlement density: The number of phased floor plans can be recorded in whole numbers which gives at least an approximate prospect of settlement layout and density in the Ramsau Valley based on the 1988/89 excavations (Lobisser 2005, 351). Occupation started c. 460 BC (Hallstatt D/La Tène A) with two rectangular houses on elevated platforms separated by passageways and open drains. In La Tène A (c. 400 BC), occupation intensified with three houses covering the same area. The overall pattern represents a very regularly and densely occupied zone

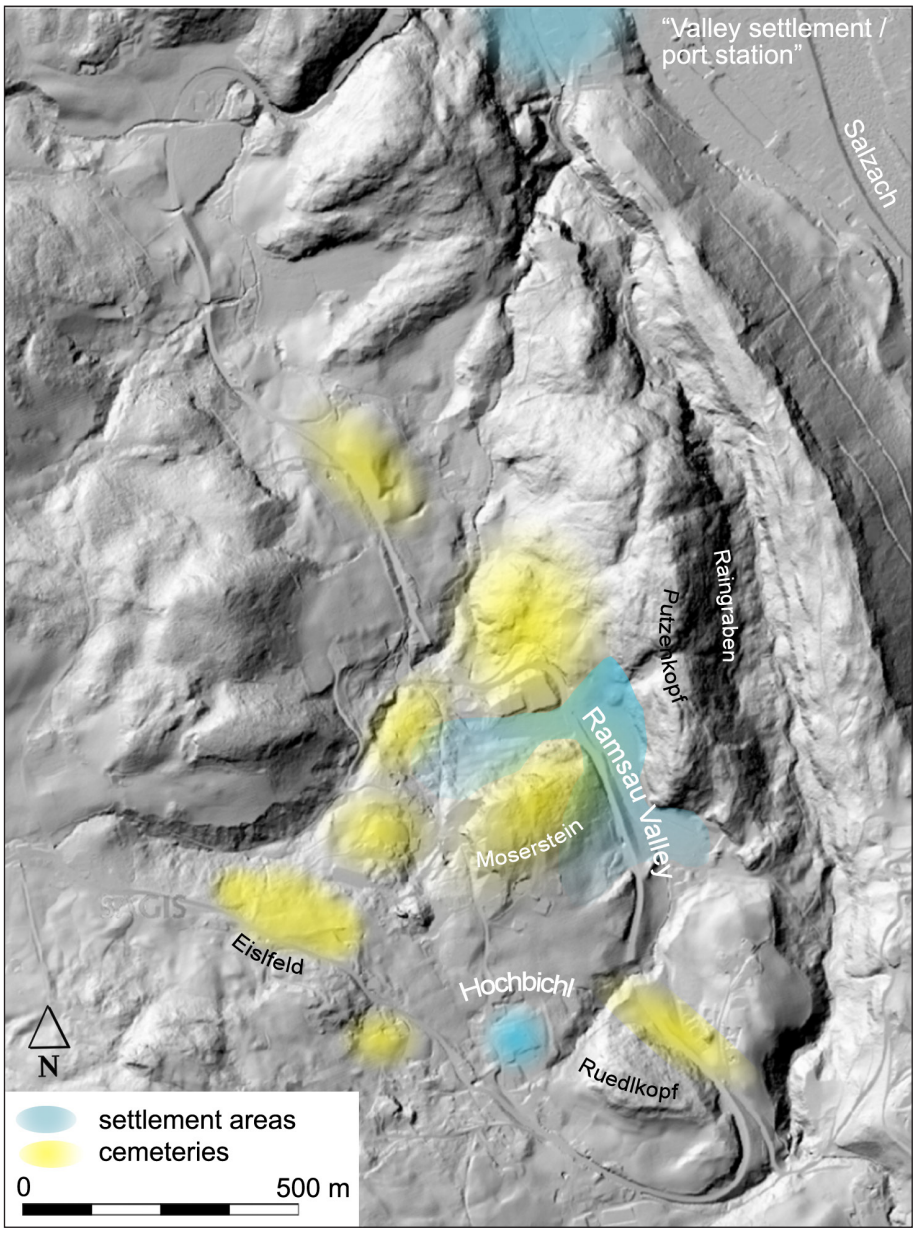


Figure 24.8. DEM of Dürrnberg with cemeteries, major settlement areas, and lowland settlement ("port station") in the Salzach Valley (Dürrnbergforschung, H. Wendling; map base: SAGIS).

with directly adjoining houses and narrow corridors and drainage ditches which were reinforced by wattle walls. No less than about 300 simultaneously existing house locations are assumed in this central location (Aspöck *et al.* 2007, 110; Stöllner 1998, 139; Stöllner *et al.* 2003, 159). After the settlement was affected by extensive flooding, the last phase in LT B/C shows a thinned-out occupation with two houses within the excavated area in the 3rd century BC (Lobisser 2005, 351).

Thus, at least in the central area of the main settlement of the Ramsau Valley, an extraordinarily densely built-up zone existed at the height of the economic activity, which, according to excavation, continued to the edge of the valley and the adjoining slopes (Moser 2007; Moosleitner and Penninger 1965; Zeller 1984a). The compressed settlement structure and aligned buildings with a homogeneous layout (with a few, functional exceptions) is only superficially a sign of minor complexity. The limited archaeological record may rather disguise elaborate social structures: The uniform settlement and building layout thus reproduces characteristic patterns of segmentary lineage societies by forming a body of joined uniform settlement units representing corporate segments of society (Brandt 2010, 19-21).

The central settlement in the Ramsau Valley is supplemented by other settlement areas which probably were located in the vicinity of the scattered cemeteries and beyond (Stöllner *et al.* 2003, 172-177). The overall pattern

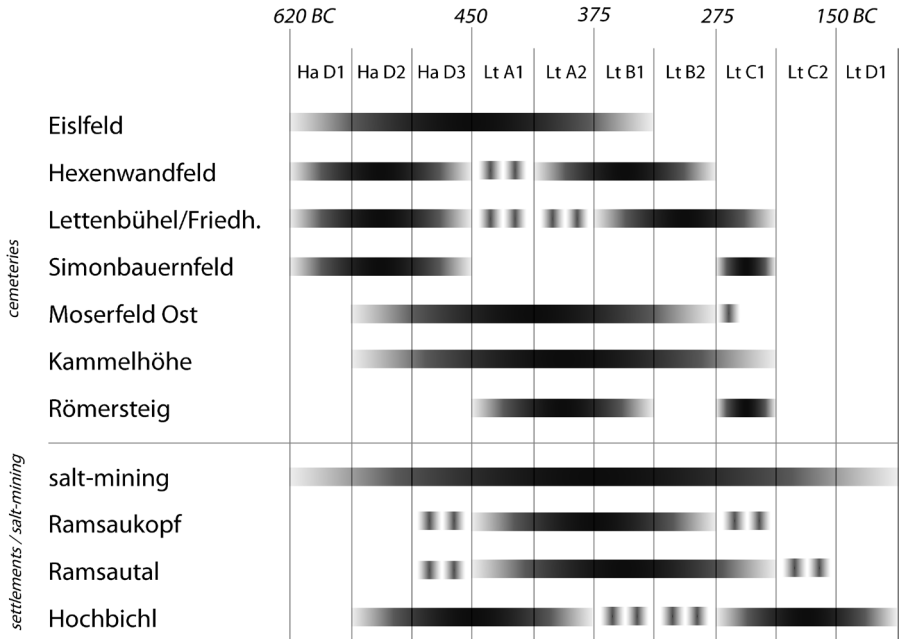


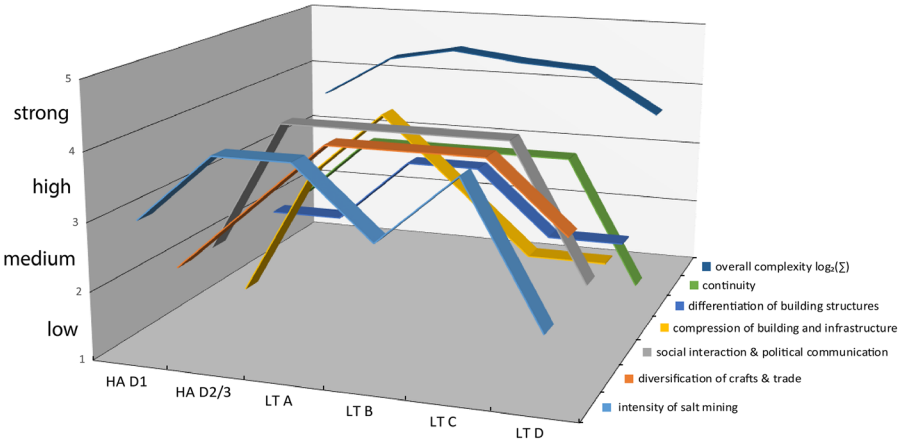
Figure 24.9. Schematic chronology of Dürrnberg settlements, cemeteries, and mining activity (Dürrnberg-forschung, H. Wendling).

of occupation on Dürrnberg may reflect social (or ritual?) separation within the entire population. However, it seems inappropriate to infer social from structural complexity or vice versa in an attempt to define the urban character of a settlement and its inhabitants. For example, ethnographic analogies of polyfocal centres are similar both in structure and extent to the settlement patterns of the Dürrnberg and other Early Iron Age centres like Bourges in central France (Moore 2017, 288). As low-density centres, some African settlement clusters constitute foci of multi-polar occupation and economy, however, they do not reveal any coherent urban patterns.

The general distribution of settlement finds on Dürrnberg reflects a massive population concentration and density of building structures that is hardly recognisable in contemporary settlements in the surrounding area (Brand 1995; Stöllner 2002, 90-91). Although calculations of the population figures are only possible with reservations (cf. Schumann in press), they are based on solid assumptions about the mining performance and its residues. Estimates are based on 1,000-2,000 people as permanent residents during the heyday of the Special Economic Zone (Aspöck *et al.* 2007, 110; Stöllner 1998, 138-140; 2002a, 80-81; 2015a, 332; Stöllner *et al.* 2003, 159, 184). With regard to the population and the differentiated, yet decidedly dense building structures, a highly complex community existed on the Dürrnberg at least from the 5th to the 3rd century BC. Its quality in comparison to contemporary settlements in the area of the Late Hallstatt/Early La Tène cultures, which were predominantly characterised by rural structures, can certainly be described as "urban".

24.3.5 Continuity of use and sustainability of the urban settlement

The chronological dimensions of the Dürrnberg settlement are sufficiently well defined by finds from graves, settlements, and mining (Stöllner 2007, 331-334) (fig. 24.9). However, the exact beginning of mining activity cannot be sufficiently deduced, since any prospecting and preparatory work up until the deposits worthy of mining were reached can only be roughly outlined (Stöllner 2015b, 336). At least the beginning of salt mining can be narrowed down quite precisely to the first quarter of the 6th century BC (d567 BC) and correlates with the relative chronological data from the oldest burials (Sormaz and Stöllner 2005; Stöllner 2007, 324-325). Although there is quite a fluctuation in intensity and spatial distribution, especially in the settlement system and the use of the various burial sites, there is evidence of continuous settlement, economic, and burial activity from this time until the 3rd century BC. The apparent end of activities in the course of La Tène C (3rd century BC) is due to changed burial customs and thus does not represent a real discontinuity. Evidence of mining activities up to the last century BC and, above all, the latest numismatic and archaeological evidence from the settlement area on the "Hochbichl", however, attest to the continuity in settlement until the first half of the 1st century BC (Wendling and Irlinger 2017, 14; Schachinger and Wendling 2019, 171-172, 189-190). Traces of subsequent intensive Roman occupation are, however, not known in this Late La Tène settlement focus on Dürrnberg. The end of salt mining, or its presumed relocation to present-day Bad Reichenhall, also remains obscure (Stöllner 1999, 69-74; 2015b, 342). A few fragments



	HA D1	HA D2/3	LT A	LT B	LT C	LT D
overall complexity log2(sum)	3,58	4,25	4,46	4,32	4,25	3,58
intensity of salt mining	3	4	4	3	4	2
diversification of crafts & trade	2	3	4	4	4	3
social interaction & political communication	2	4	4	4	4	2
compression of building and infrastructure	1	3	4	3	2	2
differentiation of building structures	2	2	3	3	2	2
continuity	2	3	3	3	3	1

Figure 24.10. Schematic attempt to assess the variable complexity of the Dürrnberg salt metropolis on the basis of social, economic, and structural criteria (Dürrnberg-forschung, H. Wendling).

of *terra sigillata*, a handful of Roman *fibulae*, and three worn coins of Trajan and Hadrian (Schachinger and Wendling 2019, 190) rather signal the meagre aftermath of a flourishing community. Five hundred years of intense economic activity is a timespan that sufficiently justifies the integration into the spectrum of Iron Age complex settlements - even more so, as it seamlessly spans the gap between Late Hallstatt and Early La Tène, which affected a number of allegedly 'urban' sites in central Europe.

24.4 Dürrnberg as centre, town, metropolis?

The interpretation of major Early Iron Age settlements in the western Hallstatt Circle (and partly in the Early La Tène culture) has been the subject of numerous discourses since Wolfgang Kimmig (1969) first addressed them as "seats of nobility" (*Adelssitze*). Their definition, denomination, the social role of their rulers, their economic basis, and -related to this- their connection with contemporary cultures, especially south of the Alps, are still central subjects of Iron Age archaeology. The history of the 'princely seat' problem has been extensively discussed elsewhere (Jung 2005; Schier 2010, 375-380; Schweizer 2006; 2008; cf. Wendling 2015). In the last two decades, intensive research at various sites has increasingly shown that the individual hilltop sites, which were long subsumed under the delusive term 'princely seats', can hardly be described as a homogeneous phenomenon (cf. Krausse 2010; Sievers and Schönfelder 2012). Rather, depending on geographical transport connections, local availability of raw materials, previous occupation with a specific ideological background, and individual settlement and social dynamics, very different factors seem to have contributed to the emergence and development of those central locations (*e.g.* Rieckhoff and Biel 2005, 85-86; Brun and Chaume 2013, 336; Schier 2010, 391).

Recently, the complexity of those 'princely seats' has been discussed against the background of 'urbanisation' (Fernández-Götz 2018, 119-126; Krausse *et al.* 2016; critically Rieckhoff 2019, 58-59; Schumann in press). Thereby, "the socio-geographical definition of urbanisation as a diffusion of urbanity, *i.e.* urban lifestyle, allows us to distinguish between settlements that fulfil all the criteria necessary for cities and secondary, pseudo-urban structures" (Schweizer 2008, 410; transl. HW). The question inevitably arises, however, how the "criteria necessary for cities" can be measured at all. In addition, one may critically reflect on the purpose and aim for which the term "urban" is intended to be used. In recent discussions on urbanisation in antiquity and prehistory, it has become clear that a static and rigidly differentiated definition of the 'concept of the emerging city' is hardly helpful. It is not a gain of knowledge to distinguish "sub-urban" from "early urban" or "fully urban" settlements (Fernández-Götz *et al.* 2014, 9). A dynamic approach to an urbanisation process "which admits of degrees" (Osborne 2005, 7; cf. Nakoinz 2013; see also Fernández-Götz this volume) should be able to better grasp the changing complexity of Iron Age central settlements.

Where does Dürrnberg fit into such a process of becoming complex? Obviously, the salt settlement in the 6th century BC is a new foundation 'on a greenfield site', which initially focused solely on exploitation of the vital resource (Stöllner 2002a, 86) (fig. 24.10). Without knowing by whom the founding initiative was carried out, its origin thus resembles some new foundations in the course of the Greek

colonisation of the Mediterranean (Tsetskhladze 2006-2008). In some of these, too, raw material deposits or supply, may have played a decisive role in the choice of settlement location (cf., however critically, Trejster 1996, 146-148). Soon after the development of salt mining, an intensification in regional and supra-regional contacts due to the distribution of salt and the necessity of subsistence supply, which was quasi-forced upon the specialist miners' community, became apparent. Quite abruptly, the salt centre was consequently integrated into a global network of economic, social, and political relationships. Dürrnberg instantly reached the highest level of the settlement hierarchy in central Europe with regard to both intensity and frequency of contacts and structural complexity. The steady increase in economic differentiation was accompanied by an intensification of social interaction and political communication. The Dürrnberg attracted goods, ideas, and, above all, people from far away on both sides of the Alps. The highly complex economic mechanisms and social structures can be seen not least in the centralisation with simultaneous differentiation of settlement areas and building forms. The complexity of the processes of salt production and distribution and the inseparably interwoven social and political structures cannot be valued highly enough. As a singular "special economic zone", Dürrnberg is difficult to compare with other central settlements of the Late Hallstatt and Early La Tène periods. It stands out as a solitary feature of the regional and supra-regional settlement structures (Stöllner 2007, 334-342; Stöllner *et al.* 2003, 184-185). In this respect, Dürrnberg was one of the major nodes of transmission of cultural traits in a wide spanning European network. It worked as a magnet for cultural stimulation and personal pursuit of success, but also as a catalyst and transformer of external impulse - possibly including the urban lifestyle that began to develop in the south (Brun and Chaume 2013, 330-333; Tomedi 2017).

Eventually, it becomes obvious that large parts, if not all, of the economic power of the Dürrnberg was based on the exploitation of salt. However, the exorbitant success achieved by Dürrnberg's mining districts from the very beginning is due to the interplay of mineral deposits and the ideal geographical location for trade and exchange. In contrast to Hallstatt, which Dürrnberg was bound to overtake economically over the course of time, this is the reason for the special quality of the mining district: A 500 BC global player at the centre of a worldwide network with a unique mineral feature, Dürrnberg can justifiably claim the title of an European Iron Age salt metropolis.

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I am most grateful to the publishers for giving me the opportunity to elaborate on a topic that I was only 'virtually' able to present at the conference in Milan in 2019. I hope that things, which may not have been as clear 'via Skype', become more coherent in this paper. If this is the case, it is certainly also due to the valuable comments of reviewers and editors, who contributed to improve the argument. Wolfgang Lobisser (Vienna) has kindly granted access to his unpublished dissertation and Thomas Stöllner has kindly provided excavation plans of the Ramsau Valley.

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