Making cities

Economies of production and urbanization in Mediterranean Europe, 1000–500 BC

Edited by Margarita Gleba, Beatriz Marín-Aguilera & Bela Dimova
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Chapter 10

Attached versus independent craft production in the formation of the early city-state of Padova (northeastern Italy, first millennium bc)

Massimo Vidale & Paolo Michelini

Together with the nearby early urban settlement of Este, Padova is one of the two main city-states that ruled the plains of northeastern Italy between the Tartaro and Tagliamento rivers (Fig. 10.1) in the Iron Age (first millennium bc).1 Padova developed from a network of minor settlements established in the late Bronze–early Iron Age within a double, S-shaped meander of the Medoacus river, which flowed inside a larger riverbed abandoned by the Brenta river after the end of last glacial maximum (Balista 2005; Mozzi et al. 2017).

Wide enough to be navigable, the Medoacus connected the town with the coast where it debouched near the mouth of another river, the Piave, coming from the inner Alps. Since the eighth century bc, the Piave valley was controlled by a chain of medium-sized centres, whose material culture shows important connections with the central place of Padova (Capuis 2003). Both the Medoacus-Brenta and the Piave valleys gave access to copper and iron extraction areas in the mountains, within a radius of 100–200 km from the floodplain settlements; the same routes connected the communities of the plains with the Raetic region of the inner Alps, and the centres of the trans-Alpine Halstatt Culture. Moreover, a southern road connected Padova to Bologna, central place of the Villanovian Culture in the Po valley.

In the late ninth century bc, the area surrounded by two meanders of the Medoacus, about 90 ha, was extensively occupied, with large gaps, by groups of dwellings or residential estates. During the eighth century bc, the town grew rapidly to fill the entire settlement area with houses and workshops, most probably attracting people and craftsmen from towns and villages of a wider region (Gamba et al. 2014; Capuis & Gambacurta 2015; Ruzzante 2015–2016).

Since the eighth century bc, houses were set in regular grids of streets and collector ditches, which had to be periodically cleaned. Around the town, there were three large cemeteries, on the eastern, northeastern and southern margins of the settled area (Michelini & Ruta Serafini 2005). The two halves of the city, separated by the river, were probably linked by a wooden bridge, replaced by a more substantial stone one in the first century bc. The nature of this urbanization process – the relationships between the rural village communities of the surrounding territory, their peripheral craft industries and those of the household communities which grew in the centre – are still largely unexplored.

During the sixth–fifth centuries bc, Padova upgraded itself to a true urban centre. The ethnonym Patavinos (‘native inhabitant of Padova’) appears in a sixth-century bc votive inscription from a sanctuary in Altino, a port close to the mouth of the Piave. Inscriptions on boundary stones mention a public authority called [-]edios, while the local urban community called itself teuta. On gravestones, part of the male elite adopted the title ekupetars, or horseman, as did the Roman upper class (Marinetti & Prosdocimi 2005; Marinetti 2015; cf. Gambacurta in this volume).

In the fifth century bc, the first elite houses appeared with stone-based walls and possibly two storeys, larger than the common dwellings and divided into several rooms, with a direct access to the river banks. Two of these houses have been located so far: one contained an inner room where copper was melted and cast, the other one was flanked by a simpler house where similar activities were carried out.

From the fifth century bc onwards, while Este, the other main city-state of Veneto, lost its cultural and economic supremacy, Padova gradually became the leading city-state. Local craftsmen and traders interacted with Greek and Etruscan merchants. Historical sources mention a successful defence against a party of raiders from Sparta (Livy X.2–3), and when Romans began to colonize the Po valley (from the third
century BC onward), Padova was their most important local partner. In the wake of fast-expanding economic interests, and because of the common need to stop the expansion of Celtic groups, Padova soon became a crucial ally of Rome. The two early states fought together against Hannibal in the Second Punic War, opening the doors to a fast and peaceful integration of the entire northeastern Po plain with the Roman polity (Buchi 2002).

Within the double meander, the continuous growth of anthropogenic layers from the Late Bronze Age to modern times is almost entirely due to rebuilding and filling/dumping processes. While modern trenches and layers have severely damaged the uppermost medieval and late Roman levels, the early Roman and Iron Age layers below are often well preserved. In the core area of the west meander, archaeological deposits of the first millennium BC reach a depth of 3–5 m above the original alluvial surfaces.

Materials and methods

For these reasons, Padova may be considered a low, extensive archaeological mound (Mozzi et al. 2017), whose stratigraphic series were randomly observed by the means of a punctuated series of deep vertical trenches. In fact, records of the city’s deposits by the Italian Ministry of Cultural Heritage for more than six decades (De Min & Ruta Serafini 2005) offered us a unique opportunity of monitoring the evolution of the craft industries of Padova across a millennium. De Min et al. (2005) briefly presented no less than 94 rescue investigations in the urban settlement area. The present study emphasizes the diachronical variations of the craft production systems (as Tosi 1984 did in a different archaeological context). Following Kelly (2009), each craft is considered in its idiosyncratic organization, adding, in the course of time, to the complexity of the general framework.
In the absence of any form of relevant historical record, the research is entirely based on archaeological evidence. In fact, contemporary Latin writers recorded only macro-historical processes and quite late events linked to the elites. Selected from about one hundred excavations made in the settlement area, dating from the eighth to the first century BC, 29 urban locations yielded material evidence of performance in situ or in the nearby areas of one or more craft activities (Fig. 10.2). Information came from systematic scrutiny of about 40 published articles.

As some workshops were active for centuries in the same spots and in different periods of urban development, the total number of contexts here considered amounts to 76 workshop contexts, 26 of which could be reliably ascribed to metallurgical, 24 to ceramic and 10 to bone/horn processing. Other craft sites had to be recorded without a precise chronological assignment. Although indicated on the map in Figure 10.2, these workshops were not included in other aspects of the present study. Whilst the evidence thus gathered cannot be considered statistically significant for a realistic evaluation of the global historical process under scrutiny, it nonetheless may support the reconstruction of meaningful trends.

The Iron Age chronology of the Veneto region, to a large extent, is based upon ceramic sequences, reconstructed from both settlements and well-studied cemeteries. Chronological estimates are partially subjective, because when the pottery of the craft locations is typologically homogeneous, a single, short event cannot be distinguished from a time span of 25–50 years. Single-period attributions, as a consequence, should be taken as maximum values, and some craft occupations might have lasted less than the mentioned duration.

Following a long debate on the periodization of the grave furnishings of the cemeteries of Este and Padova that cannot be dealt with in detail here (Peroni et al. 1979; Chieco Bianchi 1987; Bondini 2010), we adopted a threefold chronological division: Period 1 (825–575 BC); Period 2 (575–325 BC); Period 3 (325–25 BC). They represent developmental stages of the same sequence; the last period includes the merging of Padova and its institutions with the Roman state.

Figure 10.2. Padova, general cumulative map of the craft locations, c. 825–50 BC (P. Michelini).
Excavations in the centre of Padova, still a dense living city, were not carried out in the framework of a coherent archaeological project, but during rescue operations dictated by recent renovations of ancient buildings and urban blocks. As the sites were dug strictly within the perimeter of modern courtyards and rooms, in many cases, the craft occupations and their facilities were only partially explored.

The craft indicators here considered are patches of burnt soil and pieces of dismantled installations, unbaked or overfired ceramics, forming and finishing tools for pottery; metallurgical ovens, metal scraps, copper slag and prills, tuyères, crucible fragments and moulds for copper/bronze casting; smithing ovens, iron slag, semi-processed items, and hammer-scales from ironworking. Horn and bone processing is attested by pieces of raw materials, splinters and unfinished items.

The record for spinning and weaving, still poorly categorized or ambiguous, for the moment was excluded from the study (Costin 2007, 146–7), although the scanty evidence available to date was discussed by the authors in another paper (Vidale & Michelini 2018). So far, the distribution of spindle whorls and loom weights within or near common dwellings was considered in terms of possible private household activities, or cottage-level manufacturing organizations. On the other hand, as tanks and drains grew continuously through time in number and size, more abundant and better controlled water flows were perhaps needed for washing or dyeing textile fibres and leather production. The study of the textile and clothing industries in Iron Age Padova certainly requires further dedicated research from new viewpoints.

Because of lack of proper archaeological categories, other craft industries, although equally or even more important, such as the preparation and serving of food and alcoholic beverages, woodworking and basketry or goldsmithing, for several reasons may not have been immediately recognizable. When the deposits with evidence of craft activities were clearly delineated by architectural partitions (hut floors, courtyards and their lateral spill channels, dumping grounds and pits), their size was assessed with confidence. In these cases, our measurements are meant as maximum potential figures. When craft activities only left isolated tools or sporadic processing waste in secondary contexts of deposition, it was impossible to estimate the spaces where production had taken place. Such cases, and those where craft indicators were reported without detailed contextual and spatial information, were given a conventional minimum standard value, hinting at the presence of a unknown workstation in the nearby areas.

Site formation processes further complicate the matter. Most sites were abandoned or purposefully destroyed, leaving filled pits, remains of dismantled kilns or ovens, and scatters of slag and ceramic or metal-based artefacts in secondary context of deposition. Such layers are often truncated by later occupations. Thus, different types of discard, abandonment and destruction behaviour have hardly comparable outputs and differently affect the extent of the deposits. However, for the purposes of this study, the total occupied surface, including dumps and dumping grounds, regardless of the deposit formation, was taken as a gross proxy measure of the relative importance of each craft activity. While this arbitrary choice may flatten part of the archaeological interpretation, it also makes the latter holistic, more inclusive and representative.

General patterns of industrial location

Figure 10.2 shows the overall distribution of all 76 loci of the three periods considered in the study. The craft areas of Iron Age Padova are randomly and rather uniformly dispersed within the two large loops of the river. There is no evidence of nucleated and technologically oriented clusters or urban ‘craft quarters’, nor is there a difference between the eastern and western meadow. Moreover, workshops of the same industries never concentrated together. The only exception might be site 3, where in Period 3, between c. 175 and 50 bc, at least three well organized ceramic workshops were active side by side. The limited extent of the rescue operation prevented the excavators from confirming the presence of a local potters’ neighbourhood. If such industrial resident communities formed in the city, they did so in a late stage of the urbanization process.

When the craft areas are mapped for each of the three consecutive chronological periods (Fig. 10.3a–c), the distribution gets looser but does not change in a significant way. However, while the distribution of ceramic workshops and/or working areas in the city centre is random, metallurgical and horn/bone workshops, frequently linked together, seem to follow the river banks. Because in the last two millennia the core of the western meander hosted the main monumental areas that have been less frequently excavated in recent times, Figures 10.2 and 10.3a–c may exaggerate the apparent proximity of craft areas to the river banks. If real, however, such preferential association of metalworking with the waterfront could be explained by technical constraints (access to water, safer and easier transport of raw materials). From the Iron Age onwards, the elites seem to have built the best houses in front of or near the river. Here, boats – a crucial factor for controlling the waterways and access to the
Attached versus independent craft production in the formation of the early city-state of Padova

Figure 10.3. Padova, location of the craft areas and workshops in the early urban core: a) Period 1 (825–575 BC); b) Period 2 (575–325 BC); c) Period 3 (325–50 BC) (P. Michelini).
surrounding lands – could be safely kept and maintained. As in several cases remnants of craft activities were found in the ruins of these elite houses, one of our goals was to investigate in detail, as far as possible, the records of the relationships between architecture and the unearthed industrial deposits.

The production cycles of horn/bone and metalworking intersected, as knives and tools required handles of bone and horn/antler. Thus, the two activities were performed in the same spaces and contexts, rather than in nearby specialized workshops.

The absence of neighbourhoods where ceramic and/or metallurgical crafts were preferentially performed was observed in other late prehistoric contexts of central and Mediterranean European early cities (Wells 1996, 91). This may suggest absence of coercion (see discussion below), but also that the families involved in craft production did not intermarry (or were not allowed to), and so remained dispersed in the same urban premises. We presume that, without forming cohesive communities, craft groups had no compact social identity or special residential status, and therefore were discouraged from claiming social and economic control of parts of the city and thus affecting its economy. Recent surveys of the craft sites of the Roman period at Padova (Cipriano & Mazzochin 2017) show that, in the first century AD, all craft workshops were rapidly expelled from the inner residential area, and moved to extra-urban areas (Fig. 10.4), where their occupation surfaces often intermixed with burial grounds.

### Methodological issues

Our quantitative approach, dealing with the vast but fragmented network of archaeological windows we are considering, involves a number of methodological concerns. In this regard, readers might note minor variations between the statistics proposed in Tables 10.1–10.3 and the general database in Table 10.4. This is because some areas with co-occurring crafts could be considered together as a one workshop space, or split

<table>
<thead>
<tr>
<th>Period</th>
<th>Ceramics no. of craft areas</th>
<th>Total area (sq. m)</th>
<th>Average size (sq. m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (825–575 bc)</td>
<td>9</td>
<td>473</td>
<td>52.55</td>
</tr>
<tr>
<td>2 (575–325 bc)</td>
<td>8</td>
<td>270</td>
<td>33.75</td>
</tr>
<tr>
<td>3 (325–50 bc)</td>
<td>4</td>
<td>302</td>
<td>75.50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Period</th>
<th>Copper/bronze no. of craft areas</th>
<th>Total area (sq. m)</th>
<th>Average size (sq. m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (825–575 bc)</td>
<td>4</td>
<td>54</td>
<td>13.50</td>
</tr>
<tr>
<td>2 (575–325 bc)</td>
<td>11</td>
<td>135</td>
<td>12.27</td>
</tr>
<tr>
<td>3 (325–50 bc)</td>
<td>4</td>
<td>73</td>
<td>18.25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Period</th>
<th>Iron no. of craft areas</th>
<th>Total area (sq. m)</th>
<th>Average size (sq. m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (825–575 bc)</td>
<td>1*</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>2 (575–325 bc)</td>
<td>4</td>
<td>73</td>
<td>18.25</td>
</tr>
<tr>
<td>3 (325–50 bc)</td>
<td>7</td>
<td>164</td>
<td>23.43</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Period</th>
<th>Bone/horn no. of craft areas</th>
<th>Total area (sq. m)</th>
<th>Average size (sq. m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (825–575 bc)</td>
<td>4</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>2 (575–325 bc)</td>
<td>4</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>3 (325–50 bc)</td>
<td>1</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Period</th>
<th>Water facilities no. of craft areas</th>
<th>Total extension (sq. m)</th>
<th>Average extension (sq. m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (825–575 bc)</td>
<td>1</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>2 (575–325 bc)</td>
<td>3</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>3 (325–50 bc)</td>
<td>5</td>
<td>100</td>
<td>20</td>
</tr>
</tbody>
</table>
Table 10.2. Variations through time of the maximum area of all craft occupations considered together, expressed in sq m: total number, total maximum area, average size (calculated by dividing the sum of the surface of all the areas active in the period by the number of areas). Here are also considered other, less well-defined craft areas, such as firing activities n.d. or metalworking activities n.d. Multi-craft areas are considered as single workshops.

<table>
<thead>
<tr>
<th>Period</th>
<th>Total number of active craft areas</th>
<th>Total maximum area reached (sq. m)</th>
<th>Average size of craft areas (sq. m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (825–575 bc)</td>
<td>23</td>
<td>598</td>
<td>26.00</td>
</tr>
<tr>
<td>2 (575–325 bc)</td>
<td>25</td>
<td>522</td>
<td>18.60</td>
</tr>
<tr>
<td>3 (325–50 bc)</td>
<td>18</td>
<td>612</td>
<td>29.10</td>
</tr>
</tbody>
</table>

Table 10.3. Padova, average duration in years of the main craft occupations for each chronological period. In this table, the average duration was calculated within the boundaries of each Period, and not across the whole sequence.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Period 1 825–575 bc</th>
<th>Period 2 575–325 bc</th>
<th>Period 3 325–50 bc</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. areas</td>
<td>Duration</td>
<td>No. areas</td>
</tr>
<tr>
<td>Ceramics</td>
<td>9</td>
<td>61.11</td>
<td>5</td>
</tr>
<tr>
<td>Copper/bronze</td>
<td>4</td>
<td>56.25</td>
<td>11</td>
</tr>
<tr>
<td>Iron</td>
<td>1</td>
<td>25.00</td>
<td>4</td>
</tr>
<tr>
<td>Horn/bone</td>
<td>4</td>
<td>56.25</td>
<td>4</td>
</tr>
<tr>
<td>Water facilities</td>
<td>1</td>
<td>25.00</td>
<td>3</td>
</tr>
</tbody>
</table>

Figure 10.4. Padova, the extrurban location of craft industries in Roman times (P. Michelini, after Cipriano & Mazzochin 2017).
in different industrial occupations. When we found it impossible to disentangle in space and time the material evidence of different crafts, these latter were scaled in order of apparent relative importance, and the space in question was consequently sub-divided and ascribed, in proportion, to each industry.

‘Duration’ of craft industries by Periods refers to the presumed length of continuous occupation of a craft location from its birth in the given Period to its end, also beyond the upper chronological boundary of the Period of origin. Data for Period 3 are conditioned by what happened during the advanced romanization (last quarter of the first century bc), when industries shifted to the periphery. While evaluating the average area of the occupations of different crafts in time, we considered all industries active within the time boundaries of each of the three Periods.

For the sake of simplicity, when measuring the workshops’ size, if several superimposed craft areas were found in a single urban location, and in the same chronological partition, we considered only the largest occupation, and, in the calculation of the average values, the site was considered as a single workshop. For assessing the duration, in contrast, we took into account every single occupation.

The craft industries through time

To date, there is no evidence that glass or amber beads were locally made. This absence is significant, as these luxury goods had been manufactured in the eastern Po plain since the late Bronze Age (thirteenth century bc), and were produced in large quantities around the eleventh century bc. Such beads (although rare) appear in the furnishings of elite graves in Padova from the ninth-eighth century bc on. Recent chemical studies of the brightly coloured glass beads found in graves of Padova dated to the sixth and fifth centuries bc suggest that they were probably imported from different external sources (Angelini, personal communication; Olmeda et al. 2013). Stoneworking, too, is not apparent, either because it was not performed in town, or

### Table 10.4. Padova, the development of craft industries as monitored in 29 craft workshops in the early urban centre: General database (P. Michelini).

<table>
<thead>
<tr>
<th>SITE</th>
<th>Period 1</th>
<th>Period 2</th>
<th>Period 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Est EBA - IIIB</td>
<td>Est EBA - IIIB</td>
<td>EBA - IIIB</td>
</tr>
<tr>
<td></td>
<td>IIIB - II</td>
<td>IIIB - II</td>
<td>IIIB - II</td>
</tr>
<tr>
<td></td>
<td>IIIB - I</td>
<td>IIIB - I</td>
<td>IIIB - I</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>I</td>
<td></td>
</tr>
</tbody>
</table>
due to a documentary gap. Meanwhile, the absence of evidence for wood working and basketry, important productive activities, is most likely due to the decay of organic materials.

Tables 10.1–3, Figures 10.3a and 10.5a (data summary in Table 10.4) reveal that, in Period 1, at the beginning of the urban growth, the craft industry most represented in the urban area was pottery production. Copper processing is evident at site 2 and in another location. A surprising result of our survey is that no iron-smithing forge has been recorded at Padova before c. 575 BC, whereas iron tools, weapons and ornaments are prominent in elite graves at least from the eighth century BC (Cupitò et al. 2014).

In Period 2 (Figs. 10.3b and 10.5b), Padova seems to have hosted a growing number of copper-bronze processing areas (the metal alloys and, in general, the industrial characteristics of these workshops have not yet been studied in detail), witnessing a productive intensification and diffusion in the urban network. In general, proliferation of such areas seems to be connected with the production of rather insubstantial ornamental goods and status symbols. Such activities, to a great extent, ended in Period 3 (Figs. 10.3c and 10.5c), after the threshold of the fourth century BC, during what looks like a sudden (and relatively late) growth of the iron-working sector.

New craft locations: size and size variations through time

In our sample, the total area occupied in the urban core by all craft industries, taken together, does not vary much across the three Periods (Fig. 10.6). On the whole (values in Table 10.2, Fig. 10.7), moving from Period 1 to Period 2, the number of new workshop and craft areas, even if engaged in different crafts simultaneously, increases slightly, while the total space dedicated to craft production slightly decreases. Their average size, by contrast, diminishes appreciably.

In terms of individually occupied areas (Fig. 10.8), most craft occupations ranged between < 10 and 20 sq. m. Since the beginning, working areas were contained within the spaces of common urban dwellings

Figure 10.5. Bar graphs representing the number of new manufacturing areas per craft active in each period: a) Period 1; b) Period 2; c) Period 3 (P. Michelini).
Moving from Period 2 to Period 3 (Figs. 10.7 and 10.8), while the total craft occupation area grew, the number of industrial sites decreased, as a function of a noticeable growth in average size of the craft locations. However, in general, craft locations remained relatively small. Only in the last centuries (Period 3), some major urban workshops surpassed (in terms of floor space and/or accessible dumping grounds) the traditional limits of the urban dwellings. While in Period 2 the size of the copper processing areas is double that of the earliest iron-smithing workshops, in the following Period 3, the difference is less clear, because copper processing was turning into a marginal or subsidiary activity of developing iron-working production.

Locations with tanks, pits, water ducts show a gradual growth throughout the three Periods (see Table 10.3, Fig. 10.5). These sites remain difficult to interpret, but reflect a growing control and more efficient circulation of water supplies in the urban core, possibly to the advantage of various craft tasks (see above).

**Figure 10.6.** Bar graphs representing the maximum total area occupied by craft production sites in each period (P. Michelini).

**Figure 10.7.** Graph showing the number of new craft areas activated in each period, matched with their average size and duration (P. Michelini).

(rectangular houses measuring on average about 12 × 4 m), or in nearby courtyards or open spaces. Looking again at Figure 10.8, only some ceramic production areas of Period 1 and 2 needed around 100 sq. m, above the average size of the common urban dwellings.

**Figure 10.8.** Bar graph of the frequency distribution of dimensional class (scaled per 10 sq. m) of craft areas, per period (P. Michelini).

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**Duration of urban craft workshops**

Most of the earlier craft areas (of the eighth–seventh centuries BC) lasted one to two generations or probably even less (Table 10.3, Fig. 10.7). A specialized copper, bone and horn processing workshop of the earliest Period, site 2, is anomalous. Hosted in a rectangular roofed shelter beside a house, it was in action for more than a century (four generations of coppersmiths or more). This permanent workshop
is the only metallurgical unit with a long duration in the earlier phases of the sequence. A similar situation is observed for contemporaneous and nearby pottery making areas: there are various short-lived and small craft locations, in contrast to a single, long-lasting workshop near the main copper processing area (Fig. 10.9). Similarly, in the following period, among several less durable copper-processing loci, only a few had a longer life (a century and half or more). However, on the whole, the average duration of metallurgical units noticeably increased.

In Period 3, even if the life of the later workshops was suddenly interrupted by the changes brought on by the merging with Rome, one witnesses a general increase in duration for most craft workshops. In these last centuries, pottery making workshops more than doubled their life-span, suggesting that this craft had become a hereditary occupation. We propose that potters, as a consequence, had assumed defined social identities in the fast-developing urban social scenarios. Horn and bone processing, on the other hand, clearly became a secondary ephemeral activity. Perhaps this craft became an itinerant specialization. If the duration of these short-lived production loci is not counted in, the strong increment in the duration of other industries would be even more apparent.

In general, Table 10.5 and Figure 10.7 (black line) show that craft locations, in the time span of eight centuries, became gradually stabilized units of production in the overall socio-economical framework of the early city. At present, we have no data for the duration of the extra-urban industrial sites of the Roman period.

Ceramic, copper and iron processing sites: size versus duration of activities

In the scatterplots of Figure 10.10a-c, we correlate the size in square metres of all pottery, bronze/copper...
and iron workshops with their life span in years as production units. In every case, correlations between size and duration are positive (Table 10.5). This shows that, across eight centuries, workshops lived longer as they grew in size, a symptom of a very gradual integration and economic stabilization in a developing early urban and possibly market context. Eventually, a correlation that gets stronger for metals, and particularly for iron, would be well explained by the expanding role of this metal and its market in an early city state at the threshold of its absorption in the economic sphere of the Roman state, its trade interest, and its military economy.

**Discussion**

Having thus defined the main chronological trends of variation in craft industries in the urban space of Padova, a long set of fundamental questions remains unanswered. For example, in the picture outlined:

What are the sociopolitical relationships between producers and consumers? What is the nature of remuneration and how does it vary by the social scale at which production is ‘specialized’? How does remuneration vary depending on the social identities of the producers and consumers? What are the implications of being a producer or consumer of a particular good in terms of social identity, power, authority, autonomy, and the like? (Costin 2007, 149).

Or again:

...Under what sociohistorically constituted and contingent circumstances did social property relations develop which facilitated the expansion of commodity production, the market and specialization? What were those social property relations? How are they related to the development of the divide between town and countryside, urban and rural? How and under what circumstances
were artisans removed from community-based production? How and under what circumstances did households become significant production units? (Patterson 2005, 322).

These questions – forgetting any simplistic, unilinear correlation between presumed ‘levels of specialization’ and the issue of easily distinguishing attached from independent forms of production – take us back to:

1) **the general pattern of industrial location**, and
2) **the relations of production**, i.e. the crucial links between craft groups and consumers (the question of remuneration being discussed in a following section).

**General pattern of industrial location**

The urban elites were provided with pottery, other ceramics and metal artefacts by a loose constellation of craftsmen that worked in household-sized dwellings (Fig. 10.8). Yet, if it is true that ‘…establishing the social identity of artisans working in elite contexts remains somewhat problematical and under-conceptualized’ (Costin 2007, 151), the same can be said of complex crafts like copper and bronze working in Padova’s networks of standard rectangular houses across great part of the settlement sequence.

According to influential normative typologies of the spatial patterning of craft specialization, inspired by ascending or linear models of social evolution (e.g. Rice 1981; Tosi 1984; van der Leeuw 1977; 1984; Costin 1991; critical review of terminology and implications for modes of production in Costin 2007; for lithics, Rosen 2010), a similar dispersion of craft workshops would argue against direct political control of production by the elites. In principle, household-scale manufacture is commonly interpreted as independent. For example, Gary M. Feinman states that:

...past modes of circulation and economic interaction have been shown ...to be far more complex and variable than Polanyi’s scheme envisioned...redistribution has been called into question in many global contexts, and, generally, archaeologists have found far less evidence of direct political controls over production and exchange than may have been thought 25 years ago...if much craft production was situated in houses, such manufacture would be difficult for political authorities to monitor or control directly (Feinman 2008, 1117; see also Feinman 2013, 456).

This view might apparently question the idea of attached production, and fit with Peter Wells’ idea (1996; 2007) that some craft systems in late prehistoric Europe were not centralized, and with Robert Erenreich’s (1991) perception of a fundamentally independent, heterarchic organization of the production and distribution of iron commodities in Iron Age Britain. However (criticism in Kelly 2009, see also Costin 2001), many factors may affect dispersed workshop distributions, including – to mention only a few – the relative values of raw materials and other economic variables, ideology and social display, transport, security, recycling strategies, socio-technical networks and inherited social obligations.

**Relations of production**

Patterson describes pre-capitalist societies as characterized by a condition of:

...extraeconomic coercion...where the direct producers possess the means of production individually and the state and its associated classes extract goods and labor power directly from the individual production units rather than from the community as a whole (Patterson 2005, 329).

Note that such definition would keep the putting-out systems, known from later historical contexts, within the range of the organizational solutions compatible with our archaeological evidence (for textiles, Vidale & Michelini 2018). Short-lived occupations and single tools lost in the urban network might hint at manufacturing activities entrusted by the elites to independent workshops; in this case, the raw materials would have been provided by the elites, while tools and facilities would have been properties of the artisans.

However, the available evidence does not support such interpretation. Rather, we argue that in the early city-state of Padova, craft dispersion did not necessarily imply independent production. At least two elite houses included, or were endowed with, substantial metallurgical facilities. The isolated standard houses where crafts were performed might have belonged to skilled artisans working episodically for their patrons even at a distance. Service provisions may have taken place on a part-time basis, or even belonged to clients and service groups that might have hosted craft specialists on request ad hoc by the elites (for their own use or for contractually binding gifts to clients and allies; see Gibson 1996). In the absence of specialized craft quarters or neighbourhoods, the co-occurrence of few long-lasting workshops and more ephemeral small ones in the urban core area does not rule out a
monopoly of the elites on certain types of goods and services, on the involved raw materials, or on the tools and models of the required artefacts. As a matter of fact,

…the manner in which control is exercised is highly variable. It can be exerted tangibly or intangibly, directly or indirectly...control can be found in some or all components of the production system, including access to raw materials, access to all forms of knowledge necessary to craft effectively, technical choices... labor deployment and organization, object appearance and information content, and the distribution of finished goods (Costin 2007, 152).

As remarked above, the scatterplots of Figure 10.10 suggest that a gradual increase of size of the workshops also involved longer activity time-spans in the same houses. Yet, even the evidence of a longer duration of craft workshops can be interpreted in different ways. In Period 2, new legal frameworks may have granted to metalworking families certain rights of property over permanent urban lots. On the other hand, it might have been due to a coercive development of occupational hereditariness. This solution would also favour the learning of skilled craft techniques in metalworking and pottery making. The ethnoarchaeological work of Roux and Corbetta (1989) stressed a functional link between hereditary occupations and the spread of wheel-throwing in traditional potting communities, as the potter’s wheel requires skills that are acquired in long years of family-based training. This theoretical reconstruction perfectly fits the general evidence for Padova’s Period 2.

Although excavation data are largely unpublished, important, even though indirect and somewhat less expected links between producers and elites were observed within the excavated craft areas. In the main copper smithy of Period 1 (Questura, site 2, a sheltered working floor attached to a probable elite dwelling), a tuyère fashioned in the shape of a horse head (horses were prestigious symbols of aristocracy in the ancient Venetic society, Fig. 10.11), and abundant fine feast- ing pottery, unusual in a craft workshop (Fig. 10.12), were discarded. In the same context, evidence of high-quality shares of pork meat and unusual dumps of large amounts of poppy seed suggest that near the foundry might have been occasionally located a kitchen for rich banquets (Michelini, Vidale, Rottoli and Tecchiati, ongoing research). Did coppersmiths, occasionally, cook for the banquets of their lords? Or could the foundry, on occasions, be used by specialists for preparing meals for larger groups of guests? We still do not know enough to answer these and similar questions.

In the same metallurgical workshop were found stag horn combs (possibly used in textile production) in different stages of wear and restoration (Fig. 10.13). The teeth of such combs were renewed by re-cutting them deeper with copper saws, valuable tools evidently kept in the workshop. This suggests that similar copper or bronze tools were kept in working spaces attached to the elite residences, where they were crucial for controlling different manufacturing cycles, and wool processing would be a very interesting possibility. Finally, in a second nearby sheltered space, a coeval pottery-making facility was also active, attested by a firing location and scatters of highly overfired sherds. The whole context might resemble a multi-task compound at the service of an elite residence, but its partial excavation and unique evidence does not allow further speculation.

Figure 10.11. Padova, Questura, site 2. Ceramic tuyère in the shape of a horse head from a metallurgical workshop, eighth century BC; note the nozzle, burnt due to exposure to high temperature (M. Vidale; courtesy of the Museo Civico, Padova).
Greek and Etruscan pottery but also wine from Greece (Fig. 10.14), as fragments of Attic transport amphorae indicate.

Finally, in the Early Iron Age, specialized craft tools appear in elite graves at Padova (De Min et al. 2005, 153–7), as well as at Este (Franzin & Vidale 2017), and other Iron Age city-states of the Italian peninsula (Iaia 2006). Sets of artisan tools de-functionalized in early graves may have demonstrated the possession of costly and visible production means, and consequently, the control on important sectors of craft production.

Figure 10.12 (above). Padova, Questura, site 2. Cluster of fine feasting pottery (fine black-burnished bowls) dumped on the floor of the metallurgical area; nos. 29 and 285 are decorated with bronze studs; end of the eighth century BC (from Ruzzante 2015, 16).

Figure 10.13 (left). Padova, Questura, site 2. Antler combs from the metallurgical workshop: note the different stages of wear and breakage of the teeth. The comb at left underwent an attempt at renovating the teeth, using a bronze saw, but its utility was exhausted. Such combs might have been used in textile production (C. Reggio et al., ongoing research).
Chapter 10

A historical reconstruction

The evolution of industrial systems of Padova may be better explained ‘from the centre’, than from the viewpoint of the history of the local elites who were finally made obsolete by the emerging ‘middle classes’ in the late first century BC (Bandelli 1998; 2007). In the light of the present, partial record, as Padova initially grew, mainly potting families were admitted to its centre. While the first potting workshops seem rather ephemeral, from c. 650–600 BC, the production of ceramic vessels may have turned rapidly into a hereditary occupation. This change came together with the adoption of vertical kilns with perforated grids (Fig. 10.15) and the potter’s wheel, in the context of a rapid adjustment of local ceramic technologies to the standards of the Mediterranean craft communities of the time.

In the first centuries of the city’s life, the demand for pots, jars and beakers might perhaps be linked to the spread of feasting and ritualized communal drinking, required by new levels of social stress and by the need to coordinate politically the urban community, exploiting the personal charisma of new, perhaps supra-local leaders (Skalnik 1987, 599). Alcoholic beverages and the emotional landscapes they generate blunted interaction problems within a heterogeneous social body, surmounting different internal ethnic identities and social fault lines. Feasting made easier the processes of identity construction ‘…along a variety of social category and boundary distinctions, including age, gender, class, family or lineage, occupation, ethnicity, and religion’ (Dietler 2006, 223).

In the first half of the eighth century BC, material culture changed radically, thus visualizing the identity of the historical Iron Age Venetic peoples. The construction of new cultural identities was part of a political project, first led by the elites of Este and Padova. In this process, direct control over craft production might have been strategic.

New pottery types, ornaments and probably dress fashions materialized (in the sense of De Marrais et al. 1996) the adhesion to the early urban community. The distribution and display at feasts and other public events of highly visible material symbols could regulate the membership of families.

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Figure 10.14. Sherds of Attic pottery from workshop areas in Padova: a) black-figure fragments of a lekythos from site 3 (530–510 BC), droop cup from site 11 (530–510 BC) and floral band cup from site 16 (late sixth–early fifth century BC; from De Min et al. 2005); b) fragments of red-figure skiphos from site 16 (late fifth–late fourth century BC; from De Min et al. 2005); c) fragment of wine amphora rim (fifth century BC; from Malnati & Gamba 2003).
 metals witness the technical proximity and cognitive intersection between potters and smiths, certainly favoured by their concentration in the early urban core.

Coppersmiths may have worked discontinuously under the control (direct or indirect) of high ranking families. In Period 2, their multiplication and dispersion reveals the absence of ‘socially cohesive neighbourhoods’ (in the sense of Feinman & Nicholas 2012) based on occupation, or on similarity of manufacturing processes (Miller 2007; consider the proximity of different industries also in the light of classical ‘least-cost’ Weberian models of industrial linkage and involved variables, in Bale 1981, 46–76). The single copper workshop founded in the eighth century bc, Questura, site 2, worked for more than a century near a partially excavated residential house, for a longer time than other copper-processing workshops in the centre. How far this difference is due to a sampling accident, to chronology, or to two concurrent modes of copper production, is difficult to say at present. However, the rather uniform spread of copper workshops in the urban core, particularly in Period 2, resembles – as far as we can see – the apex of a Löschian demand and trade area cone (Bale 1981, 64), possibly deformed at the edge by the mentioned ‘waterfront effect’.

The apparent absence of iron-processing workshops until the end of the sixth century bc is also intriguing. It may be due to limited exposure and sampling accident, because the typological study of the iron weapons and tools found in the early graves compellingly suggests local types rather than imports (Cupitò et al. 2014). Perhaps the production of iron objects from the eighth to the early sixth century bc was centralized in few houses that still await discovery. Iron forging might have been scanty and episodical enough to leave ephemeral or no trace at all in the archaeological record. Or, perhaps, the elites of Padova were strong and influential enough to obtain iron tools and weapons made ad hoc from outsiders, without direct administrative and physical control of the industrial sectors involved. Iron artefacts might have been imported as finished goods together with tin, precious beads in amber and glass, or the coral inlays applied since the sixth century bc on some bronze brooches; or even accepted as tribute or high-rank gifts. The smithing of iron artefacts only spread from the late fifth–fourth centuries bc. The mismatch between the late evidence of production of iron and its early use in funerals ultimately requires more data and further consideration.

Although the degree of technical skill of ironworking in this period is still unexplored, contemporary smiths outside Padova were able to combine the properties of early forms of steel and wrought iron for making special objects (Ehrenreich et al. 1988–1989).
There is little doubt that similar ornaments were lavishly displayed during major ceremonies of the life cycle. The intensification of copper/bronze production, together with bronze-studded and tin foil-decorated pots (Fig. 10.17), reveals subtler distinctions of status. While such ornaments were generally made with tin bronze alloys, workshops also kept semi-finished bars and small ingots of copper and leaded copper (called in Latin *aes*), apparently used as a medium of exchange, as a form of proto-currency. These small, mostly shapeless ‘ingots’, in northern Italy, are distinguished by the absence of tin (Bietti et al. 1996; Guida et al. 1998; Fenzi et al. 2009), whereas finished prestigious...
ornaments and utensils were made, as a rule, of binary Cu-Sn alloys, with different, low percentages of lead.

Tin mining areas are absent in northern Italy. This rare metal had to be imported from remote areas, and procurement networks were probably managed by the elites and high ranking traders through long-distance trade and traditional alliances. Once alloyed with copper, tin could not be removed from cast metal objects; nor was it simple to remove lead from copper (but perhaps leaded lumps could be re-melted with pure copper, lowering, in case of need, the percentages of lead while casting substantial copper items). In this light, standardized forms of proto-currency made of leaded copper would have been better used in terms of exchange value, as a medium for remuneration and hoarding, while tin-bronze ingots and scrap materials were meant for the production of prestigious ornaments, weapons or tools (mainly having a use value, given their symbolism and display relevance for the elites).

Onset of proto-currency and the issue of remuneration

The growth of Padova’s craft sector was also related to the distance of procurement and the difficulty of access to the transformed raw materials. Ceramic workshops, which presumably used locally available clay at the beginning are more represented than metallurgical locations. Conversely, copper-processing workshops, for which raw materials came from the radius of 100–200 km or more, entered the physical and economic space of the city only at a slower speed. But two or three centuries after the foundation of Padova, copper-based metallurgy reached a peak.

Presumably, when surplus and an increased volume of exchange abundantly surpassed subsistence economy, producers focused on manufacture and exchange of circulating wealth, a sphere of activity that commonly intensifies during periods of intense political development in early state contexts (Brumfiel & Earle 1987). Between the sixth and the fourth century BC, the proliferation of small-scale copper-working areas, conditioned by competitive display of status of a larger aristocratic elite (mostly evident in the form of an increasing amount of graves with abundant furnishings of medium richness), coincides with the diffusion in Venetic settlements of the first standard fractions of copper and leaded copper as a form of proto-currency.

At present, it is unclear whether leaded copper aes lumps and bars became more common because they were used for remunerating a growing number of craftsmen, or rather because increased production for status display allowed coppersmiths to intercept and accumulate growing amounts of this form of metallic value.
wealth. Whatever the case, from the late seventh or mid-sixth century BC, at Padova and in other early cities of northern Italy, copper bar fragments and other aes ingots began to appear in hoards, in domestic or craft locations of various magnitude; more frequently, aes lumps were ritually deposited as isolated specimens in graves.

Since our Period 2, metallic wealth in the form of aes made commensurable goods and services previously provided along traditional social institutions and bonds: the richest households could now efficiently remunerate craft and service specialists, in a fast growing economy that gradually embedded the staple finance of the rural hinterland, a process that in early states is generally accompanied by a substantial increase of centralized political control (Brumfiel & Earle 1987). But in a classic Marxist example of ‘historical contradiction’ (sensu Pivovarov 1998), proto-currency bars and ingots of leaded copper somehow formalized a move away from the circulation of tin-bronzes, traditionally monopolized and displayed for status by the elite groups. If these media made remuneration more fluid and efficient, soldering the peripheries to the centre, and taxation easier for the city’s administrators, they also allowed less controllable forms of diffuse accumulation, enabling traders and craft specialists, in the context of growing urban markets, to be active actors and interpreters of the negotiations of social status (Flad & Ruby 2007; Sennet 2008).

With the later development of iron-working in Roman times, the growth and consolidation of larger iron workshops eventually superseded previous forms of limited-scale metal production. This reflected the rise of a more open market economy and successful networking with more diversified industrial and strategic interests. The iron workshops of late pre-Roman Padova, in fact, gradually developed the potential for mass-producing weaponry for the army and also new agricultural tools. In the following centuries, the same productive network would have provided large quantities of nails for carpentry – the true markers of the Roman economic revolution – needed to build large houses and monuments with concrete: a crucial step for a more dynamic urbanization.

Conclusion

While Peter Wells (1996; 2007) and others seem to maintain that, in early European cities, independent, small-scale production persisted despite major socio-political shifts, through the middle and late Iron Age, the craft workshops of Padova question independent craft production as a mode of production embedded in urban growth. Spatial dispersion of craft workshops within an early urban network does not necessarily imply independent production. Rather, tools put to use to elite ideology, the circulation and consumption of luxury goods within workshops, the involvement of craft groups in feasting, the centralization of valuable tools, and the fact that the largest houses of Period 2 owned or temporarily hosted their own copper-processing workshops, all point to centuries of attached, rather than independent craft production.

If we are right in arguing against traditional models that superficially linked scattered workshops with low levels of socio-political organization, the economic space and function of early urban craft networks seems to have been constantly monitored by the elites for their immediate political needs ‘…to secure privilege and inequality through the exercise of economic, political, military, or ideological power’ (Costin 2007, 154).

Attached production, however, might have created the grounds for its own change. As synthetically pointed out by Brumfiel and Earle (1987, 4):

The production, display and distribution of wealth are politically important activities because they are means by which rulers define their own social statuses and the statuses of others, with all the rights and obligations hitherto. Because of this use value, wealth acquires an exchange value, and can be used as a means of payment for services rendered the state. When wealth and subsistence goods are freely exchanged, wealth comes to serve as a true currency (our emphasis).

Later, the evolution of a substantial scale of a strategic craft like ironworking seems to have been required by the absorption of the city into the Roman state, that made meaningless the traditional strategies of internal socio-political competition through the display and consumption of bronze-based ornaments and status signs. The diverging trajectories of copper and iron-based metallurgy ultimately seem to support Costin’s functionalist thesis (2005, 1073) according to which ‘…by definition, the products of attached specialists serve to uphold institutionalized sociopolitical differentiation, but the products of independent specialists do not’.

Notes

1. For a recent update on the current state of knowledge of ancient Venetic culture in the Iron Age, see Capuis & Gambacurta 2015. See also Capuis 1993; Malnati & Gamba 2003; Capuis 2008; Gamba et al. 2013.
2 For example, the space needed by a ceramic workshop, for simple technical constraints, was greater than a location meant for cutting bone and/or horn.

3 The study is an elaboration of the evidence gathered and summarized in the PhD thesis of the second author, now published in its entirety as Michelini 2020, at the Department of Cultural Heritage, University of Padova.

4 These sources are mainly gazetteers, and a few monographic publications in Italian that appeared since the second half of the past century. The full bibliography is not included due to lack of space. For archaeological data, see references in De Min et al. 2005.

5 One of the reasons is the well-known ‘Hallstatt plateau’ in the 14C calibration curve from c. 800 to 400 bc (Reimer et al. 2004; Hajdas 2008, 16, fig. 10), that makes very difficult a more refined and independent chronological framing for the crucial phases of the urban growth. We continue using here the traditional chronology of the Iron Age of northern Italy, even though recent studies, based upon refined methods of absolute radiocarbon dating (van der Plicht & Nijboer 2017/2018; Gimatzidis & Weninger 2020) rather retro-date the earliest Iron Age of the peninsula by c. 100–150 years, thus giving its urbanization dynamics much deeper historical roots; this would have important implications for the case of Padova as well.

6 Terracotta spindle whorls, isolated loom weights and spools are common in investigated occupation layers. Clusters of loom weights and burnt beams are usually interpreted as looms, but so far in northern Italy have been found only in extra-urban locations, when suddenly abandoned after major episodes of burning.

7 Firing activities n.d., horn/bone processing, working areas with water facilities n.d. = 4 sq. m; copper/bronze casting, iron smithing = 6 sq. m; pottery making = 8 sq. m. Such values, fully arbitrary, are proxies for the space needed by a person crouched on a small-to-medium craft installation.

8 A systematic definition of the relationships between the activity of these production units and the consumption of copper-bronze products (mainly in the form of grave offerings in the peripheral cemeteries), to date has not been attempted.

9 Like the pillared open space excavated at Poggio Civitate (c. 630 bc), where craftsmpeople worked ivory, textiles, bone and horn, copper and iron, and also made pottery for an elite family, as described in Nijboer 2006 (see Tuck in this volume).

References


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Chapter 10


Attached versus independent craft production in the formation of the early city-state of Padova


Large and complex settlements appeared across the north Mediterranean during the period 1000–500 BCE, from the Aegean basin to Iberia, as well as north of the Alps. The region also became considerably more interconnected. Urban life and networks fostered new consumption practices, requiring different economic and social structures to sustain them. This book considers the emergence of cities in Mediterranean Europe, with a focus on the economy. What was distinctive about urban lifeways across the Mediterranean? How did different economic activities interact, and how did they transform power hierarchies? How was urbanism sustained by economic structures, social relations and mobility? The authors bring to the debate recently excavated sites and regions that may be unfamiliar to wider (especially Anglophone) scholarship, alongside fresh reappraisals of well-known cities. The variety of urban life, economy and local dynamics prompts us to reconsider ancient urbanism through a comparative perspective.