An Introduction to Late Antique Cross-Craft Studies

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Abstract. The study of crafts and trades in the ancient Mediterranean world has garnered increased attention over the last decade, including through the investigation of cross-craft or inter-industry relations among craft producers. This body of literature represents a range of distinct approaches – including co-production, cross-craft interaction, skeuomorphism, and multicraft – each derived from different disciplinary perspectives, yet collectively these inter-industry approaches are offering new and important perspectives on social and professional networks of artisans, technological developments, and economic organisation of ancient industries. In this introductory chapter, we outline the current trajectories in cross-craft studies and their too often overlooked significance for the study of Late Antiquity.

Keywords. Craft production, cross-craft, Late Antiquity, multicraft, skeuomorphism

Material culture studies understandably separate artefacts into material categories, but these arguably are artificial divisions that result in a fragmented view of Antiquity. Nearly every archaeological project or museum collection relies on material specialists to analyse recovered finds (ceramics, glass, metals, textiles), interpret processes of production and the *chaîne opératoire* (from raw materials to production and then to discard), and contextualise manufacturing techniques and technologies (such as cameo cutting, moulding ceramic lamps, carving stone, or working bone). This is a pragmatic and typically successful

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approach to the analysis of overwhelming and heterogeneous assemblages. However, this organisation results in studies published according to materials rather than the archaeological and cultural context.[1] Segmenting the material record in this way has established boundaries in the study of ancient craft work that are at odds with technical and sociological analyses – analyses that increasingly highlight how widespread collaborative, cross-industry networks were and the dynamic agentive roles of makers in these arrangements.

Connectivity-focused approaches to the process and experience of craft work in the ancient world are identifying the degree to which different industries and professional trades were not only interconnected but interdependent. While these cross-craft relations have rarely been studied for Late Antiquity, in this volume alone potters are shown to have supplied builders with ceramic wasters for construction, glass and lapidary makers exchanged technical knowledge of carving, and sculptors and metalworkers worked together to erect public statues. As will be demonstrated through each of the papers, the connections between trades were commonplace and integral to the economies of Late Antiquity.

AN OVERVIEW OF CROSS-CRAFT STUDIES

While cross-craft studies remain relatively rare for Late Antiquity, this is not so for the study of other regions and periods. Consequently, wider discussions of cross-craft production are worth reviewing briefly, as inter-industry relationships have been importantly defined in many ways and for many purposes. Some scholarship has focused on the material consequences of cross-craft influence, which can help us to better understand the strategies and mechanisms of technological in production processes and stylistic change in product appearance. Other approaches to cross-craft consider the topic differently and attempt to detail the socio-economic structures in which these encounters occurred. The two sets of approaches are inherently related, of course, and the following paragraphs highlight some of the seminal works that helped develop these ways of thinking about cross-craft relationships.

In a pioneering volume on cross-craft interactions, Patrick McGovern compiled archaeological and historical examples of technological transfers between ceramic production and other industries. McGovern was mostly concerned in understanding technological change in a broad, cross-cultural sense and thus conceived and appreciated interaction expressed through technological change.[2]

[1] For similar critique, see J. Russell, 'Byzantine *Instrumenta Domestica* from Anemurium: The significance of context', in R.L. Hohlfelder (ed.) *City, Town and Countryside in the Early Byzantine Era* (New York, 1992), 133–154; L. Lavan, E. Swift, and T. Putzeys (eds), *Objects in Context, Objects in Use: Material Spatiality in Late Antiquity LAA5*, (Leiden, 2008).

[2] McGovern was expressly interested in cross-cultural manifestations of cross-craft before Late Antiquity, illustrated by the phrase 'within the same or different cultures' in his definition, P. E. McGovern, 'Ceramic and Craft Interaction: A Theoretical Framework', in P. E. McGovern,

Technological change in crafts, he argued, could be considered alongside other technological 'revolutions' and had major implications in long-term economic and societal change. Focusing on ceramic industries, which were ubiquitous across many cultures,[3] he observed three kinds of exchange mechanisms that reflected important technological crossovers: direct transfer or borrowing of techniques; adaptation; or imposed changes involving minimal input on the part of a craftspeople or via indirect intermediaries.[4] This interest in technological transfer provided an important early avenue for studying relationships among industries, and McGovern insightfully articulated different ways in which technological ideas might be conferred. Rather than adopting technologies according to a simple model of rational efficiency, artisans were understood to have been culturally embedded in economic decision-making processes.

Other scholars have considered the evidence of cross-industry interaction through the finished visual form of products. For example, an object made in one material may reference another class of material (such as glass evoking rock crystal[5]) or specific objects produced in different media (such as pottery emulating basketry[6]). These *skeuomorphs* represent 'a way in which artisans adopt and transfer characteristics of one medium into another',[7] and while such transfers and

M. D. Notis and W. D. Kingery (eds), *Cross-Craft and Cross-Cultural Interactions in Ceramics* (Westerville, OH., 1989), 1–11, at 1.

[3] McGovern, 'Ceramic and Craft', 2.

[4] McGovern, 'Ceramic and Craft', 1. For more recent literature addressing technology transfer and craft learning, see for example P. H. Smith, *From Lived Experience to the Written Word Reconstructing Practical Knowledge in the Early Modern World* (Chicago, 2022). On social networks traced through technology transfer, see in particular S. Conway, O. Jones and F. Steward, 'Realising the potential of the social network perspective in innovation studies', in O. Jones, S. Conway and F. Steward (eds), *Social Interaction and Organisational Change: Aston Perspectives on Innovation Networks* (London, 2001), 349–66; M.-A. Dobres, 'Archaeologies of Technology', *Cambridge Journal of Economics* 34/1 (2010), 103–114; L. Foxhall, K. Rebay-Salisbury, A. Brysbaert, 'Tracing Networks: technological knowledge, cultural contact, and knowledge exchange in the ancient Mediterranean and beyond', in E. Barker, S. Bouzarovski, C. Pelling and L, Isaksen (eds), *New Worlds from Old Texts: Revisiting Ancient Space and Place* (Oxford, 2015), 281–300. On professional associations in Antiquity, see for instance O. van Nijf, *The Civic World of Professional Associations in the Roman East* (Amsterdam, 1997); S. E. Bond, *Trade and taboo: Disreputable Professions in the Roman Mediterranean* (Ann Arbor, MI., 2016); P. F. Venticinque, *Honor Among Thieves: Craftsmen, Merchants, and Associations in Roman and Late Roman Egypt* (Ann Arbor, MI., 2016).

[5] Pliny, *Historia Naturalis*, 37.10, ed. K. Mayhoff, *C. Plini Secundi naturalis historiae libri XXXVII* (Stuttgart and Munich, 1967–2002. On the glass chapter in the early fourth century AD *Diocletian's Edict of Maximum Prices* (16.1–4) and the higher cost of decolourised *Judaean* glass as opposed to common green-blue *Alexandrian* glass, see H. G. Meredith, *Word Becomes Image: Open-work Vessels as a Reflection of Late Antique Transformation* (Oxford, 2015), 15–19 for bibliography.

[6] C. Knappett, 'Photographs, Skeuomorphs and Marionettes: *Some Thoughts on Mind, Agency and Object*', *Journal of Material Culture* 7/1 (2002), 97–117; J. H. Blitz, 'Skeuomorphs, Pottery, and Technological Change', *American Anthropologist* 117/4 (2015), 665–78.

[7] A. Brysbaert, 'Cross-Craft Interactions', 336. Vickers and Gill define *skeuomorphism* as 'the manufacture of vessels in one material intended to evoke the appearance of vessels regularly made in another' M. J. Vickers and D. Gill, *Artful Crafts: Ancient Greek Silverware and Pottery*

adaptations may not rely on close, inter-personal interactions among artisans, they do require inter-media engagement on the part of makers and a translation of techniques between materials.[8] Consequently, there are several possible social interpretations of *skeuomorphs*,[9] and there is tremendous potential for a given *skeuomorph* to represent material translation through the cross-craft transmission of ideas concerning aesthetics and styles. Identifying a meaningful and explicit reference from a causal resemblance, however, is challenging, and Carl Knappett has argued in this regard that *skeuomorphs* can function as a hybrid, composed of both an icon (physically resembling the thing being represented) and index (associated with its referent, such as smoke for fire).[10]

The difficulties in identifying purposeful choices in referencing other materials is all the more challenging in contexts of complex social and cultural encounter. Drawing on the theoretical framework of the *chaîne opératoire* in her study of Eastern Mediterranean Late Bronze Age cross-craft, Ann Brysbaert has studied production techniques and perceptions of form in order to 'fully comprehend the social relationships and identities that are shaped and negotiated through people's interactions.'[11] In this cross-cultural context of the Late Bronze Age, *cross-craft interaction (CCI)* – or the 'production processes, circulation/ distribution patterns and consumption of the final product' – is seen as part of a more complex, multifaceted structure of relationships in which producers are embedded.[12] Brysbaert's intention is to disentangle influences that derived from other crafts from those associated with other cultures and, by consequence, she classifies material expressions of interaction. These include *skeuomorphs* and *composite objects* or *features*; the latter is the result of either mixing materials (such as adding minute quantities of gold and silver to raw glass to make it change colour) or integrating two or more materials into a single object or feature.[13] Brysbaert includes two additional expressions of cross-craft interactions, described as 'obvious foreign elements in an existing technology' (e.g., use of a foreign language or iconographic system) and the 'lack/limited presence

(Oxford, 1994), 106. For example, the shapes of metal prototypes may be evident in roughly contemporaneous pottery. Caution is necessary when suggesting that such transferals were restricted to expensive materials represented in cheaper materials, such as Vickers and Gill, *Artful Crafts*, 189, or even that they were necessarily intentional.

[8] McGovern's 'Ceramic and Craft'. See also Knappett 'Photographs, Skeuomorphs and Marionettes', 97–117; Brysbaert 'Cross-Craft Interactions', 325–59.

[9] See above n. 10 and 11.

[10] Knappett 'Photographs, Skeuomorphs and Marionettes', 97–117.

[11] A. Brysbaert, 'Cross-craft and cross-cultural interactions during the Aegean and Eastern Mediterranean Late Bronze Age', in S. Antoniadou and A. Pace (eds), *Mediterranean Crossroads* (Nicosia, 2007), 325–59, at 325.

[12] Brysbaert 'Cross-craft interactions', 325.

[13] On composite objects, see for instance silver book covers, ivory inlays or pierced silver openwork vessels with blown glass liners, see discussion below. See also A. St. Clair, *Carving as Craft: Palatine East and the Greco-Roman Bone and Ivory Carving Tradition* (Baltimore and London, 2003); Meredith, *Word Becomes Image*.

of specific technological facilities' (i.e., sharing equipment, tools, fuel, facilities).[14]

In another important cross-culturally comparative volume, Izumi Shimada highlighted the potential for inter-industry interactions to illustrate new perspectives on production organisation.[15] Shimada uses the term *multicrafting* to refer to craftworkers who were closely connected in some way (i.e., physical proximity, familial relations, speciality, or a combination of these) and who performed most or all of at least two distinct crafts. Their work was spatially proximate and manufactured for consumers outside of the household.[16] This collaboration he terms *coproduction* and describes as 'a form of multicraft production in which artisans specialising in different crafts collaborate in the design and manufacture of products (i.e., a feedback relationship).'[17] Shimada thereby underscores the significance of production activities that are organised to intensify and coordinate different, inter-reliant crafts in the nearby spaces and in sufficiently large quantities to supply market activity.[18]

In such vertically integrated contexts, workers might dedicate their skills to the *coproduction* of composite objects, they might share raw materials, or they might co-rely on the by-products of each other's craft process. In addition to the joint use of space and equipment through a collaborative production process (i.e., vertical integration), the co-ordinated use of a shared space and equipment might also have been used at different times through staggered production (i.e., seasonal changes to production regimes). Such work environments and arrangements might present fertile ground (by chance or design) for production experimentation and innovation, as well as new opportunities for material and labour exchange.

As illustrated, the literature on multiple trades and crafts working together is wide ranging. Some approaches to cross-craft interaction focus on shared techniques of production and object similarities – viewing these phenomena as much more complex processes of artisanal interaction that involved agentive makers, complex decision-making, and material engagement. In doing so, these

[14] Brysbaert 'Cross-Craft Interactions', 336–7. These characterisations, however, might not have the same resonance in Late Antiquity. For example, what constitutes a 'foreign element' has been the subject of recent debate, such as M. Pitts and M. J. Versluys (eds), *Globalisation and the Roman World: World History, Connectivity and Material Culture* (Cambridge, 2015); E. Hovden, C. Lutter and W. Pohl (eds), *Meanings of Community across Medieval Eurasia: Comparative Approaches* (Leiden, 2016); W. Pohl, 'Introduction: Early medieval Romanness – a multiple identity', in W. Pohl et al. (eds), *Transformations of Romanness: Early Medieval Regions and Identities* (Berlin, 2018), 3–40.

[15] On 'production as a material and social product and process', see I. Shimada, 'Introduction', in I. Shimada (ed.), *Craft Production in Complex Societies: Multicraft and Producer Perspectives* (Salt Lake City, 2007), 1–21 at 4.

[16] Shimada 'Introduction', 5. Shimada's emphasis on retail production hints at a difference between post-production alterations, and repairs.

[17] Shimada 'Introduction', 6. On professional associations, see above n. 4.

[18] On the term *multicraft production*, see Shimada 'Introduction', 5. On close proximity and cross-craft producers, Brysbaert 'Cross-Craft Interactions', 333–5.

have brought to light the often overlooked yet critical role played by the producers themselves. Other approaches more explicitly focus on the organisation of production. These attempt to reconstruct the economic and social structures encouraging and sustaining cross-craft interaction. As this brief survey has demonstrated, cross-craft studies are opening important new avenues for our investigation of ancient craft production, economy, and labour, and as will be demonstrated in the following section, there are clear intersections with and implications for the study of Late Antiquity.

LATE ANTIQUE CROSS-CRAFT STUDIES

Craftwork has garnered considerable interest in the last decade, particularly in scholarship on earlier Greco-Roman trades and professional identities and workshop organization studies.[19] This body of scholarship has attempted to better appreciate the place of crafts- and trades-people in society, the economic organisation of everyday work processes, and the cultural significance of changing styles, techniques, and technologies of production.[20] The recent flourishing of craft studies is also evident in the study of Late Antiquity, but for this period discussions of cross-craft or cross-industry relations in the period unfortunately remain rare. This may be surprising for several reasons, not least because the archaeological and historical records of late antique craft and industry are especially rich, and it is a period that has been characterised by the increasing archaeological visibility of craft workers and merchants, particularly in urban centres.[21] Work on villa estates and in monastic contexts is also increasingly

[19] For important collections on urban craftworkers and traders, see A. Wilson and M. Flohr (eds), *Urban Craftsmen and Traders in the Roman World* (Oxford, 2016); K. Verboven and C. Laes (eds), *Work, Labour, and Professions in the Roman World* (Leiden, 2017); E. Lytle (ed.), *A Cultural History of Work in Antiquity* (London, 2019). See also E. Stewart, E. Harris and D. Lewis (eds), *Skilled Labour and Professionalism in Ancient Greece and Rome* (Cambridge, 2020); H. Hochscheid and B. Russell (eds), *The Value of Making: Theory and Practice in Ancient Craft Production* (Turnhout, 2021). On work in the medieval period, see V. L. Garver (ed.), *A Cultural History of Work in the Medieval Age* (London, 2020).

[20] A. Brysbaert, 'Introduction: tracing social networks through studying technologies', in A. Brysbaert (ed.), *Tracing Prehistoric Social Networks through Technology* (New York and London, 2011), 183–203; Foxhall et al., 'Tracing Networks: Knowledge,' 281–300; A. Van Oyen, G.W. Tol, R.G. Vennarucci, A. Agostini, V. Serneels, A. M. Mercuri, E. Rattighieri, and A. Benatti, 'Forging the Roman Rural Economy: A Blacksmithing Workshop and its Tool Set at Marzuolo (Tuscany)', *American Journal of Archaeology* 126/1 (2022), 53–77.

[21] On late antique producers and merchants in urban centres, see the sixth-century Treatise of Construction and Design Rules for Palestine by Julian of Ascalon; C. Saliou, *Le traité d'urbanisme de Julien d'Ascalon: Droit et architecture en Palestine au VIe siècle* (Paris, 1996); B. S. Hakim, 'Julian of Ascalon's Treatise of Construction and Design Rules from Sixth-Century Palestine', *Journal of the Society of Architectural Historians* 60/1 (2001), 4–25. See also E. Zanini, 'Artisans and Traders in Late Antiquity: Exploring the Limits of Archaeological Evidence, in W. Bowden, A. Gutteridge and C. Machado (eds), *Social and Political Life in Late Antiquity*' (Leiden, 2006), 373–411; L. Lavan, *Public Space in the Late Antique City*, 2 vols. (Leiden, 2020); E.A. Murphy and

documented.[22] In fact, some scholars have seen the appearance of workshops in such great numbers as reflecting a new social and economic status of craftspeople and tradespeople during the period.[23]

The record of late antique crafts and trades is, however, not just highly visible, but it is also sometimes highly refined, with datasets of the period demonstrating the persistence of numerous specialised crafts and trades within single communities, as well as the important institutional role of professional associations.[24] Perhaps a choice example might help to illustrate. The urban community at Korykos in Asia Minor maintained an unusual local epigraphic habit of recording professional titles on funerary inscriptions during the fifth and sixth centuries CE.[25] These titles have long been used to argue for a highly specialised economy in this modest coastal town, yet they also spark ideas concerning the inter-related nature of industry. For example, among the professional titles, some individuals at Korykos were described by multiple professional titles. Certain dual titles were clearly related in terms of skills and materials being worked; for example, makers of luxury breads also made sweets.[26] However, in other cases, the relations between the two professions are less obvious. For example, an individual was described as both a fuller and papyrus maker and a potter also produced goat-hair fabric.[27] It is therefore possible that composite objects or skeuomorphs might have been the production of a single hand trained to work in different materials. Meanwhile, there were also loom-makers at Korykos, which attests an occupation that supported other producers through the making of specialised infrastructure, while the appearance of wool carders and gem engravers demonstrates the roles of workers specialised in particular stages, tasks, or techniques of a production process.[28] What becomes clear in this one example is that even in a relatively small urban community like Korykos, crafts and tradespeople were connected to one another through work specializations and complexly networked production processes.

I. Uytterhoeven. 'Late Antique Industry in the Urban Public and Private Spaces of Asia Minor', *Adalya* 25 (2022), 137–59.

[22] Such as, B. Munro, 'The Organized Recycling of Roman Villa Sites', in C. N. Duckworth and A. Wilson (eds), *Recycling and Reuse in the Roman Economy* (Oxford, 2020), 383–401.

[23] J.-P. Sodini, 'Archaeology and Late Antique Social Structures', in L. Lavan and W. Bowden (eds) *Theory and Practice in Late Antique Archaeology* LAA1 (Leiden, 2003), 25–56; Zanini 'Artisans and Traders', 373–411.

[24] J.-M. Carrié, 'Les associations professionnelles à l'époque tardive: entre munus et convivialité', in J.-M. Carrié and R. Lizzi Testa (eds), *Humana Sapit: Études d'Antiquité tardive offertes à Lellia Cracco Ruggini*, Bibliothèque de l'Antiquité Tardive 3 (Turnhout, 2002), 309–32.

[25] F. R. Trombley, 'Korykos in Cilicia Trachis: The Economy of a Small Coastal City in Late Antiquity (Saec. V–VI) – A Précis.' *The Ancient History Bulletin* 1/1 (1987), 16–23; E. Patlagean, *Pauvreté Économique et Pauvreté Sociale à Byzance, 4e–7e siècles* (Paris, 1977).

[26] Patlagean, *Pauvreté Économique*, 167.

[27] Ibid.

[28] Trombley 'Korykos in Cilicia Trachis', 20.

Recognising highly specialised professions that must have relied on other specialists offers one line of evidence with which to speculate on late antique cross-industry relationships, yet understanding how their work process might have been structured and organised relies on other bodies of information. Most notably, scholars have argued that some craft specialists worked within vertically integrated production processes.[29] This conceivably might include multicraft arrangements with workers in proximate spaces for which there are several examples described in this volume. Yet this surely is not the only means of coordinating work across professions, and other types of arrangements might also be proposed. For example, Cameron Hawkins has argued, based on specialised professional titles and Roman legal structures, that certain production processes, particularly those involving commissioned luxury items, might have been organised according to sub-contracting arrangements in the Roman period.[30] According to this model, highly specialised artisans operating independent workshops could have been subcontracted to execute particular stages of the production process, and materials might have moved between workshops and between the hands of different artisans. Multicrafting, vertical integration sub-contracting might therefore offer just a few models from the period with which to interpret archaeological work contexts.

Just as the late antique records of professional title imply regular and complex relationships between industries and skilled professionals, so too does the material culture of the time. This is because late antique material culture is often characterised by complex *bricolage* aesthetics involving the mixing of materials and a reliance on cross-craft and cross-industry ties in ways that are perhaps more noticeable and defining than in the craft traditions of other periods. This is evident in 'composite' artefact crafting traditions – for instance, gold-glass medallions with painted additions[31] and pierced silver openwork lamps produced with a free-blown glass liner and metal suspension chains.[32] The production of such multimedia artefacts necessitated highly skilled labour work the individual components.[33] This *bricolage* style is likewise evident in the construction techniques of the period, which could intermingle any combination

[29] Peacock describes processes of horizontal and vertical integration within the context of Roman pottery manufactories; D.P.S. Peacock, *Pottery in the Roman World: An Ethnoarchaeological Approach* (London, 1982).

[30] C. Hawkins, 'Manufacturing', in W. Scheidel (ed.) *The Cambridge Companion to the Roman Economy* (Cambridge 2012), 175–94; for an example identified from Late Antiquity, see E.A. Murphy and J. Poblome, 'A Late Antique Ceramic Workshop Complex: evidence for workshop organisation at Saglassos (Southwest Turkey),' *Anatolian Studies* 66 (2016), 185–99.

[31] See C. R. Morey and G. Ferrari, *The Gold-Glass collection of the Vatican Library*, *Catalogo del Museo Sacro della Biblioteca Apostolica Vaticana* (Vatican City, 1959).

[32] For example, Meredith, *Word becomes Image*, cat. figs. 11, 46, 69–76, 78, 90.

[33] Such as D. Kinney, '*Spolia: Damnatio* and *Renovatio Memoriae*', *Memoirs of the American Academy in Rome* 42 (1997), 117–48. Recently, for example, S. V. Leatherbury, 'Iconoclasm and/as Repair', *RES: Anthropology and Aesthetics* 75/76 (2021), 154–67.

of stone, brick, and mortar. Such aesthetic principles and production techniques inherently relied on the comingled use of multiple materials, and as a consequence cross-industry and cross-craft perspectives provide an especially compelling means to understand the aesthetic choices and technical skills required of the period.

Furthermore, as has been alluded to, these composite artefacts and buildings brought together not only a diversity of materials in a single creation but those reassembled materials were often curated or salvaged components.[34] The material culture of the fourth through eighth centuries CE has been frequently characterised by practices of reuse – whether of Classical Roman material or that of near contemporaries, such as Umayyad reuse of late antique material culture.[35] The examples of such reuse for the period are ample and range from portable objects appearing in secondary contexts (e.g., gold-glass roundels,[36] silver panels transformed into Christian book covers[37]), to imperial portraiture (appearing as a trophy or symbol of subjugation[38]), and to architectural *spolia*. As a result, such reworkings are brought together as complex composite creations.[39]

[34] M. Ponting and D. Levene, '"Recycling economies, when efficient, are by their nature invisible". A first century Jewish reycling economy' in M. J. Geller (ed.), *The Archaeology and Material Culture of the Babylonian Talmud* (Boston, 2015), 36–65.

[35] Such as the reused Roman columns found especially in the hypostyle hall of the Great Mosque at Cordoba, Spain.

[36] On third- and fourth- century gold-glass vessels moved from domestic to funerary spaces likely as grave markers in the catacombs of Rome and Hungary, see Morey and Ferrari, *Vatican Gold-Glass*; H. G. Meredith, 'Engaging Mourners and Maintaining Unity: Third and Fourth Century Gold-Glass Roundels from Roman Catacombs', in J. Rüpke and R. Raja (eds), *The Role of Objects – Creating Meaning in Situations (Lived Ancient Religion). Religion in the Roman Empire* (Tübingen, 2015), 219–41; S. Walker (ed.) *Saints and Salvation: The Wilshere Collection* (Oxford, 2018).

[37] For a pair of gilded silver book covers, see for example the mid-sixth century CE Sion Treasure book covers portraying Christ between Saints Peter and Paul, Washington, D.C., Dumbarton Oaks, http://museum.doaks.org/objects-1/info/35131 and http://museum.doaks.org/objects-1/info/35142 (accessed 27th June 2023).

[38] On perhaps the most well-known example, see imperial portraits on reliefs and sculptures from the time of Trajan, Hadrian, and Marcus Aurelius re-carved in the early fourth century AD into the likeness of Constantine on the latter's Arch in Rome, Italy, J. Elsner, 'From the Culture of Spolia to the Cult of Relics: The Arch of Constantine and the Genesis of Late Antique Forms', *Papers of the British School at Rome* 68 (2000), 149–84. On dishonour and revised imperial portraiture, see for instance mid-sixth century CE figural mosaics at the Palace of Theodoric at S. Apollinare Nuovo in Ravenna, Italy, J. Herrin, *Ravenna: Capital of Empire, Crucible of Europe* (Princeton, N.J., 2020). See also F. Vittinghoff, *Der Staatsfeind in der römischen Kaiserzeit. Untersuchungen zur Damnatio Memoriae* (Berlin, 1936); C. W. Hedrick Jr., *History and Silence: Purge and Rehabilitation of Memory in Late Antiquity* (Austin, TX., 2000); M. Prusac, *From Face to Face: Recarving of Roman Portraits and the Late-Antique Portrait Arts* (Leiden, 2011).

[39] For instance, see J. Elsner, 'Late Antique Art: The Problem of the Concept and the Cumulative Aesthetic', in S. Swain and M. Edwards (eds), *Approaching Late Antiquity, The Transformation from Early to Late Empire* (Oxford, 2004), 271–309. This practice of course continues. As one notable example among many, see the addition of later inscriptions to Roman gems, such as D. Kinney, 'Ancient Gems in the Middle Ages: Riches and Ready-mades', in R. Brilliant and D. Kinney (eds),

Such non-linear production processes that have been seen as defining for the period frequently required the involvement of numerous different specialists, both in the retrieval and recovery of materials and their refabrication. These styles thus served not only to draw together skilled work in the creation and co-production of new composite works, but the refashioning of manufactured materials also set limitations and parameters on later production processes. The diverse motivations for employing existing materials and the varied organisations involved in retrieving and supplying them have been well considered for the period,[40] and interpretations range from economical and pragmatic recycling to ideologically or spiritually motivated curation.[41] In the case of the latter, curation has been seen to reflect a commentary on the previous instantiation.[42] Yet the process of reworking materials also connected artisans across time and space, and artistic works and buildings of renown might be highly regarded for their technical or artistic achievement, invoking and engaging artisans through a sort of professional social memory. In this sense, cross-craft interaction between craftspeople might not only involve connecting contemporary artisans but also those of earlier generations as well.

Late Antiquity thus appears rife with evidence with which to investigate inter-industry ties, and the growing body of literature investigating artefacts, monuments, epigraphy, and workshops can draw on current research trends in order to demonstrate just how common and critical cross-industry relationships were in the period.

Reuse Value: Spolia and Appropriation in Art and Architecture from Constantine to Sherrie Levine (Farnham, 2011), 97–120.

[40] M. Greenhalgh. 'Spolia: A definition in Ruins', in R. Brilliant, D. Kinney (eds), *Reuse Value Spolia and Appropriation in Art and Architecture from Constantine to Sherrie Levine* (London, 2011), 75–95.

[41] On the shift to an increasingly ceremonial Late Roman period, see for instance the acclamations in the introduction to the *Codex Theodosianus*. For a material expression of this phenomenon, see the increasingly acclamatory inscriptions on honorific public statuary, C. Roueché, 'Acclamations in the Later Roman Empire; New evidence from Aphrodisias', *Journal of Roman Studies* 74 (1984), 181–99. Imagistic script blurs boundaries between text and image. On containers, see for example Meredith, *Word becomes Image*. For monograms, see A. Eastmond, 'Monograms and the Art of Unhelpful Writing in Late Antiquity', in B. M. Bedos-Rezak and J. F. Hamburger (eds), *Sign and Design: Script as Image in Cross-Cultural Perspective (300–1600 CE)* (Washington, D.C., 2016), 219–36. On illuminated manuscripts, for instance B. C. Tilghman, 'The Shape of the Word: Extralinguistic Meaning in Insular Display Lettering', *Word & Image* 27/3 (2011), 292–308.

[42] On emulation as resistance, see J. Elsner, 'Cultural Resistance and the Visual Image: The Case of Dura Europos', *Classical Philology* 96/3 (2001), 269–304; D. Jolowicz and J. Elsner (eds), *Articulating Resistance Under the Roman Empire* (Cambridge, 2023). On production in Late Antiquity, see for example G. Peers, 'Late Antique Making and Wonder', in S. Cosentino (ed.), *Ravenna and the Traditions of Late Antique and Early Byzantine Craftsmanship: Labour, Culture and the Economy* (Berlin, 2020), 33–58. On reuse in Antiquity, such as textiles or wood, see for example I. Bogensperger, 'The Multiple Functions and Lives of a Textile: the reuse of a garment', in M. Harlow and M.-L. Nosch (eds), *Greek and Roman Textiles and Dress: An Interdisciplinary Anthology*, (Oxford, 2014), 335–44; R. Sands, 'Life beyond life: Repair, Reuse, and Recycle – The Many Lives of Wooden Objects and the Mutability of Trees', *Archaeometry* 64 (2022), 168–86.

PRESENT CONTRIBUTIONS TO LATE ANTIQUE CROSS-INDUSTRY STUDIES

This special issue's contribution lies in bringing late antique producers and the objects they made into wider discussions on cross-craft and inter-industry studies. In doing so, it draws attention to the unique features of the production environments of the era. Each paper focuses on different subject matter (i.e., specific industries, materials, production processes), and each contributor has framed their analysis according to different parameters (e.g., a work project, a city, an industry). Collectively, these articles present important case studies for the period and demonstrate innovative approaches to the topic of cross-craft.

The first article, 'Late Roman Glass Carving as Cross-Craft' by Hallie G. Meredith, directly confronts the limitations of approaching ancient crafts and trades according to strict materially defined categories. Investigating evidence for glass manufacturing, Meredith argues that glasswork has been approached as a single industry when it should instead be understood as multiple industries. Drawing upon textual, archaeological, and artefactual evidence, she maintains that the full production process was actually handled by different specialists in different workshops at different points in the *chaîne opératoire*. While primary production (making of raw glass) and secondary production (glass working and blowing) are well understood to have been performed as separate stages in the sequence of production, she sees additional craft specialisations (such as glass carving) as employing other techniques and requiring different skills.

In 'Cross Craft Collaboration in the Production of Public Monuments: Examples from the High Empire and from Late Antiquity Compared,' Christopher H. Hallett takes a closer look at statuary from the city of Aphrodisias in Asia Minor. Employing the rich evidence of workshops and finished sculpture from the city, he is able to identify the roles of numerous skilled and unskilled workers in the production and erection of public statuary. In comparing evidence from the city dating to the Roman period and Late Antiquity, he is also able to suggest that shifts in the number and roles of workers occurred in response to changing styles and functions of Late Antiquity.

The contribution by Elizabeth A. Murphy and J. Riley Snyder, 'Bound by Binders: Multicraft Organisation and Industrial Interdependencies of Lime Production for Mortar in Late Antiquity', revisits the issue of industry definitions and cross-industry interactions, but the authors employ an unusual class of material in investigating the production and use of lime. As an industrial product manufactured for use by other industries, lime was a material that fundamentally existed for and depended on the demands of other industries, ranging from medicine to tanning. It was also a material that was made and consumed in great quantities in Late Antiquity, particularly by building industries, and in tracing the *chaîne opératoire* of lime production and its use in mortar production, the authors demonstrate complex webs of connection with many other industries involved at

various points in the production process. Describing the reconstruction as a 'networked *chaîne opératoire*', Murphy and Snyder highlight how these cross-industry links were maintained in different contexts and through different organisations of production.

The article by Beth Munro, 'Interactions between Industries in Late Antique Church Construction in the Western Provinces', investigates the issue of multicraft and cross-craft interaction in Late Antiquity using a different approach. She centres the discussion specifically on church construction during the fifth through seventh centuries in the western Mediterranean. As the primary form of monumental building for the period, churches reflected major investments drawing on skilled labour and work crews. They therefore provide a useful case study with which to highlight the social dynamics and actors involved in a single work project. Seeing these churches as composite creations that necessitated the coordination of intricate, multi-phase production processes, she reconstructs different workforces and work flows spatially and temporally through the archaeological and textual records. In doing so, she reveals the dynamic social networks the coalesced around and sustained these important community building projects.

Rubina Raja's paper, 'Disentangling Cross-Crafting, Reuse, and Recycling in Late Roman Gerasa (Fourth-Seventh Centuries CE)', investigates the processes of cross-crafting, reuse, and recycling by examining thick, dense fill layers in 'messy' contexts from Gerasa (Jordan). Employing the concept of 'circular economy', she interprets recycled ceramic waste as part of a regenerative economic system that seeks to reduce resource input and waste to a minimum. Raja discusses the role of these contexts in advancing our understanding of complex processes in urban spaces in the late antique period in the Eastern Mediterranean, while also advocating for more detailed and holistic material culture studies.

As is evident from the scope of these articles, this collection adopts a purposefully broad definition of *craft* to refer to an activity involving skill in making things by hand. Consequently, the papers featured in this volume incorporate manufacturing works under the moniker of *craft* that by anyone's definition would be considered artisanal craftwork (such as glass working), but they also include what might be considered artist productions (for instance, sculpture) and even productive works that might more typically be classed as industrial in character (e.g., construction work, lime production). This is intentional, as the collective and comparative study of such productive works have implications concerning training (such as apprenticeships for highly skilled production activities that require multi-step production in materials), economic frameworks (such as business arrangements and professional networks[43]), as well as the production and trade of critical craft materials (such as lime manufactured

[43] On subcontracting, for instance, see C. Hawkins, 'Manufacturing', 175–94.

for crafts and building mortars, or natron for Roman glass).[44] The papers collectively present case studies demonstrating evidence of cross-industry ties that were embedded in very different artisanal contexts and production organisations. Examples that are discussed also represent different scales of production – from small domestic operations[45] to independent workshops, project-based work sites, and even large manufactories.[46] Each contribution also relies on distinct archaeological materials (e.g., glass, stone, lime, metals). Consequently, these cases have been analysed using a wide swathe of methods, including archaeometric studies, contextual interpretations, and stylistic and technical analysis of artefacts. Furthermore, the articles also offer a broad view on the topic by collectively drawing on a diversity of inter-industry relationships, including cross-craft technological transmission,[47] multi-craft, coproduction, skeuomorphism, and circular economies. As such, this volume provides important new case studies on cross-craft interaction and sets a new direction in the study of Late Antiquity.

The studies incorporated in this issue therefore will present a wide-ranging and valuable collection of case studies with which to offer broader statements on the status and role of cross-industry relationships of the period and the professional networks of knowledge exchange.[48] This should serve to better illuminate what types of inter-industry arrangements occurred in different socio-economic contexts (e.g., centralised imperial or municipal works, multi-craft workshops, private subcontracting) – and offer new late antique examples for wider discussions on craft production that blur the lines between narrowly (i.e., materially) defined industries and processes that fall outside of linear economic models of production-distribution-consumption. The considerable

[44] On natron, see M. Phelps, I. C. Freestone, Y. Gorin-Rosen and B. Gratuze, 'Natron Glass Production and Supply in the Late Antique and Early Medieval Near East: The Effect of the Byzantine-Islamic Transition', *Journal of Archaeological Science* 75 (2016), 57–71.

[45] Such as a room in a house, outdoor or unknown space only known by a spoil heap, for example Late Roman ivory and bone carving from Palatine East in Rome, see A. St. Clair Harvey, 'Carving in the Center: Evidence for an urban workshop on the Palatine Hill in Rome', in G Bühl, A. Cutler and A. Effenberger (eds), *Spätantike und byzantinische Elfenbeinbildwerke im Diskurs* (Wiesbaden, 2008), 249–70.

[46] Such as Kom-el Dikka in Alexandria, see M. Rodziewicz, *Les Habitations Romaines Tardives d'Alexandrie à la Lumière des Fouilles Polonaises à Kom el-Dikka*, *Alexandrie III* (Warsaw, 1984).

[47] On the operational sequence, see pioneering work by A. Leroi-Gourhan, *Le Geste et la Parole, 1* (Paris, 1964); A. Leroi-Gourhan, *Le Geste et la Parole, 2* (Paris, 1965); A. Leroi-Gourhan, *Gesture and Speech*, A. Bostock Berger (trans.) (Cambridge, MA., 1993). Recently concerning processes such as Late Roman carving, in glass or marble, see for example H. G. Meredith, 'The Late Roman Unfinished *Chaîne Opératoire*: A new approach to inscribed glass openwork', *American Journal of Archaeology* 127/1 (2023), 119–39; B. Russell, 'Roman Stone Carvers and Their *Chaîne Opératoire*', in H. Hochscheid and B. Russell (eds), *The Value of Making: Theory and Practice in Ancient Craft Production* (Turnhout, 2021), 71–88.

[48] On repetitive production suggesting a lower degree of skill, such as basket-making (perhaps purposely for meditative making by monks, see J. Stoner, *The Cultural Lives of Domestic Objects in Late Antiquity* (Leiden, 2019), 73–91.

insights of multicraft studies have not been fully applied to Late Antiquity until now. An examination of the phenomenon of cross-craft in the fourth through eighth centuries offers a richer, fuller perspective on the history of interconnected production and producers, revealing networks of makers and more complex socio-economic and artistic relations than previously appreciated. Overall, as the following articles will undoubtedly show, cross-craft studies represent an exciting new paradigm impacting multiple fields of study.