Research into metal technology in Late Antiquity has arguably been neglected. Within wider studies of ancient metallurgy, scholarship has tended to focus on the origins and early development of techniques and practices in specific regions of the ancient world, such as Anatolia, Mesopotamia and the Near East, where the occurrence of metal ores upon the earth’s surface led to their earliest exploration and the first experiments in the field of metallurgy. In part, this approach may be justified by the fact that the evolution of metal technology was very slow and gradual, being the last raw material to be exploited in ancient times, except in Anatolia, where the earliest metallurgical finds have been associated with pre-ceramic levels. Consequently, it is important for scholars of Late Antiquity to keep abreast of general synthetic publications reflecting this wider context, in addition to the specialised literature devoted to their own period.

Recent interest in late antique metal technology has not led to an even coverage of all geographical regions and chronological periods. For example, in the West, there has been considerable interest in this period, with much research being undertaken on the continuation of techniques and practices throughout all historical ages, including Late Antiquity and the Early Medieval period. Conversely, in the East, scholarly attention seems to have focused mainly on the Bronze Age to the Early Iron Age, and then jumped forward to Islamic sites, thereby leaving the Classical and Early Medieval periods largely uncovered.

The available evidence comprises both excavated material, and the material derived from the scientific analysis of metal finds and related waste products. In general, archaeo-metallurgical structural remains (e.g. furnaces, workshops, hearths, working floors, storage pits) are poorly preserved and often not very spectacular. In these circumstances, the archaeological record is often not of a high quality, especially for classical and late antique sites in the East, where modern excavators mostly aim to discover monumental architectural structures and sculptural decoration. However, to produce a record useful for studies of technology,
it is important to document all of the typical residues formed during different stages of metalworking during an entire production cycle, from the mining of the ore to the eventual finishing of an object, taking into account the circulation and daily use of the finished product. In order to understand the production of any metal at a given time, in a given area, one needs to know the applied techniques, and the location, size, extent and socio-economic context of the activities involved in each step of the production line (mining, smelting, working). Last, but not least, it is important to consider the consumption purposes of a product, in terms of the level of demand that might exist and its intended use. Such factors are again determined by specific socio-economic settings.

Scientific analyses of metal finds and related (waste) products have resulted in a wide range of geological, geochemical and geophysical observations, related to mining provenance and production/working processes. Unfortunately, these studies have tended to communicate their results in very specialised vocabulary, making it often difficult to gauge from them the exact nature, extent, scale and time-span of the technological procedures involved in metal production and the social, economic and ecological contexts within which they were carried out, both at regional and site level. Such specialist work requires disciplined historical interpretation in order to be applied to studies of ancient technology. One complicating factor is metal recycling. As in all periods, this can affect the nature of analyses, and should be constantly borne in mind.

Our current knowledge of late antique metallurgy is uneven. We know very little of late antique metal mining, as very few remains dating from this period have been identified. This leads to a suspicion that the period saw a far less intensive and less organised exploitation of metal resources than had earlier periods. Where metalworking in general is concerned, we know the most about iron, especially from the Early Medieval West. This is most probably related to the boom in the iron industry in the Early Imperial era, which led to the mass production and, equally, mass consumption of this latest metal to be exploited. Excavation reports have paid more attention to small finds of iron and copper alloy, though more systematically in the West than in the East, as a result of differing excavation interests and strategies. Likewise, smithies and other urban metal workshops are better documented in the West than in the East in the classical era and Late Antiquity. The prestige of silver finds has resulted in an impressive number of artefact studies,