

# I Introduction

*The riches of the earth were hidden for a long time, and the trees and forests were considered to be the supreme gift bestowed by her to mankind. These first nourished him, their foliage cushioned his cave and their bark clothed him; there are still races that live this way. — Plin. HN 12.1<sup>1</sup>*

Wood was arguably the most valuable natural resource utilized by the peoples of the ancient Mediterranean. Wood was a primary, and in some cases the only, component of tools, housing, household implements, modes of transportation, containers, and scaffolding. Many large public structures, from bridges to theaters, were built of wood. Wood was used as well for dyes, waterproofing materials, and pipes; it provided the sole source of energy for cooking, heating, smelting, and firing clay.

The cultivation, harvesting, transportation, and working of wood in a world without heavy machinery or power tools must have employed many people. Some of these were highly skilled. In the Roman world, the accomplished woodworker was a craftsman capable of carving fine moldings, inlaying and veneering exotic species imported from distant corners of the empire, and fastening disparate pieces of wood with an admirable variety of joints requiring no metal hardware.

Framing carpenters developed an intuitive knowledge of the structural capacities of different species of wood and, in departure from their Greek counterparts, recognized and exploited the enormous strength of trussed roofs and decked floors. Indeed, Roman builders understood that, with the exception of the dome, spaces just as vast and unencumbered by interior columns as those covered with barrel or groin vaults could be spanned with wood. Thick wooden beams were vital for the construction of scaffolding, construction forms, and lifting cranes, without which the most monumental of masonry buildings could never have been built.

Transportation in the Roman world depended upon the skills of the woodworker. Wood was the primary material used for all manner of carts, wagons, wheels, and, of

course, merchant ships. Roman legions depended upon ready supplies of timber for military success. As a resource that was readily procurable in virtually all areas of the Mediterranean, wood was employed by the military for bridges, fortifications, and siege machines, including heavy artillery.

Timber not destined for the sawyer was employed for fuel. Without this single most important energy source, the Roman baths would have been inoperable, iron and bronze nonexistent, pottery, roofing tiles, and fired brick unobtainable.

The importance of wood in the Roman world is easy to overlook for an obvious reason. Modern discoveries of wood in Roman contexts are extraordinary; the survival of wooden artifacts requires unusual circumstances of environment. Carbonized beams, furniture, and everyday implements have been found embedded in the volcanic mud of Italy's Herculaneum. Plaster or concrete casts of decomposed wooden objects that have left imprints in fallen ash at Pompeii and Oplontis allow us to view ghostly images of wooden artifacts. The wet subsoils of northern Europe and Great Britain have preserved waterlogged timbers and tools; shipwrecks also yield valuable information. At the opposite end of the environmental spectrum are the dry climates of Egypt and the Middle East, where wooden objects from many historical periods have survived to the present day. While some of the most important wooden artifacts recovered in modern times have been lost—the immense wooden barges of Lake Nemi in Latium are a tragic example—other spectacular finds continue to be reported, and, just as important, the methods, if not always the money, now exist to preserve them for future study.

The scattered archaeological recovery of wooden artifacts and the evidence these finds provide are enhanced by related artifacts, such as tools, metal fittings, and depictions of tools, buildings, carts, boats, and wooden implements on wall frescoes, relief sculpture, and mosaics. The rectangular cavities left by wooden structural members in the walls of brick and stone structures can still be seen, as can the imprints of wooden planks used to frame vaults of concrete.

No less valuable for the history of Roman woodworking is the literary record. The importance and pervasiveness of wooden objects in Roman life are clear from the many references preserved in the extant corpus of Latin—and contemporary Greek—literature. Some of these references are technical and specific; best known is the commentary of Vitruvius, an architect and military engineer loyal to both Julius Caesar and, later, Octavian. Vitruvius devoted himself to the composition of his famous treatise *The Ten Books of Architecture* (*De Architectura*) at the dawn of the Roman empire, in the late first century B.C. Vitruvius's discussion of building methods, materials, and kinds of structures affords a wealth of terminology that would otherwise be lost, even if the ideals he espouses, in the form of proportional relationships or orientations of buildings and their constituent parts, seem to have been ignored by ancient builders more often than not.

For the types of trees and their uses Pliny is our most important Latin source. Although no botanist, Pliny studied and closely followed the works of pioneering Greek predecessors. No doubt the most important of these was the philosopher Theophrastus

(ca. 370–285 B.C.), a brilliant and favored pupil of Aristotle. Theophrastus inherited his mentor’s garden (not to mention the Lyceum itself) and wrote two books about trees and other plants (*Historia Plantarum* and *De Causis Plantarum*). Many, if not most, of Theophrastus’s observations were based upon notes made by Aristotle, other written sources, and even student researchers. Born four centuries later, Pliny (A.D. 23–79) devoted six books of his *Natural History* to commentary on the typology of trees, woody plants, and their uses; much is derived directly from Theophrastus, but Pliny also provides a distinctly Roman perspective. Despite the achievements of such early naturalists, in the absence of canonical and universal methods of illustrating and describing plants, the transmission of botanical knowledge was severely hampered (Baker 1978, 20), and the modern scholar is commonly frustrated in trying to identify a specific tree when confronted with an ancient reference (Rackham 1996, 38).

Such shortcomings notwithstanding, a book such as this would be far the poorer without any access to the ancient voice. As Russell Meiggs pointed out in his landmark study *Trees and Timber in the Ancient Mediterranean World*, “There are indeed very few Greek or Latin prose authors who will not yield useful information (about trees and their uses) if diligently searched” (1982, 32). In the glossary attached to this book the focus is upon Latin terminology, and, as will be evident, the language of the Romans for the practices of carpentry was as rich as the applications of the craft were varied. Poetic sources are also important for terminology. Poetic metaphor can be used to reveal the function of an otherwise obscure technical term, despite Meiggs’s caution that specific words may be substituted for one another to satisfy the needs of meter or literary allusion.

Interest in the technical aspects of Roman construction over the past century has been keen, to the degree that certain areas of ancient construction, such as the marble trade, have become subspecialties within the larger field of classical archaeology. The majority of attention has been focused upon masonry construction and the classification of Roman concretes and their various facings. Nevertheless, Roman woodworking has not been ignored. This particular field has enjoyed closer scrutiny over the past few decades as archaeologists have better learned to recognize and preserve fragile wooden artifacts, or at least document the remains carefully before they are lost. An increasing number of archaeological reports include an evaluation of the species of trees used for wooden artifacts; even microscopic traces of wood can now be analyzed and identified.

An early inspiration for this book was Hugo Blümner’s four-part *Technologie und Terminologie der Gewerbe und Künste bei Griechen und Römern*, published between 1875 and 1887. Blümner’s encyclopedic approach included documentation of Greek and Latin technical terminology of all types of Greek and Roman technology; he was also an acute observer of the physical remains extant during the mid–nineteenth century. Other modern scholars were interested in famous structures for which ancient descriptions exist but no actual remains have been discovered. Two examples come immediately to mind: Julius Caesar’s bridge constructed over the Rhine River and the basilica Vitruvius himself built on the edge of the civic forum of ancient Fanum, a Roman port town

on the Adriatic. Caesar's bridge was a structure built entirely of wood, while at Fanum wooden beams played an important role in the roofing of the basilica, as they would in virtually all similar buildings built over the course of the empire. From the ancient descriptions that have survived, precise for their time while elusive for the modern student, laborious analysis (for example, Saatman, Jüngst, Thielscher 1938) and ingenious restorations have been proposed.

Our knowledge of the timber trade and the types of trees used by Roman woodworkers was considerably enhanced by Meiggs's aforementioned book on trees and timber published in 1982. Meiggs was less concerned about technique than with the history of the timber trade in both Greek and Roman settings. His study includes not only an impressive compendium of ancient sources that address the topic of ancient woodworking, but vital commentary on the species of trees used and on the ambiguity that characterizes the categorization of trees provided by ancient writers of Greek and Latin.

The topic of ancient woodworking techniques has been addressed primarily by European scholars. Perhaps the most influential of these studies has been that of Jean-Pierre Adam, whose book on Roman building techniques was recently (1994) translated from French into English and published in the United States. Lesser known but also full of useful analysis, written from an engineer's point of view, is C. Giuliani's *L'edilizia nell'antichità* of 1990. Both Adam and Giuliani, like their predecessors, treat woodworking primarily in the context of architecture and only as part of a larger overview of ancient building techniques.

Specialized tools developed for the woodworkers' trades during the Greek and Roman periods in many cases survived unchanged in form and function until the early twentieth century. Recent studies of Roman tools, such as Wolfgang Gaitzsch's *Eiserne römische Werkzeuge* (1980), have added new finds and analysis to a long tradition of interest in this subject, including the groundbreaking studies of W. M. F. Petrie (1917) and William Goodman (1964). Actual Roman tools, some in a pristine state with their original handles, can be seen in the regional museums of Europe and Great Britain.

Ongoing excavations in Britain, and especially London, have exposed tons of waterlogged timbers from the Roman period that have survived from both boats and buildings. This wealth of material has inspired a flurry of new research by archaeologists like Damian Goodburn and Peter Marsden. The sheer volume of the material discovered here and elsewhere (such as the prehistoric lakes region of northern Italy) means that there is much still awaiting careful study.

This book treats Roman woodworking from a broad perspective, building upon the works of predecessors and offering new analysis and evidence. Greater emphasis will be placed on tangible evidence than on speculative reconstructions. The topic is a vast one, and it would be presumptuous if not impossible to cover every dimension of the woodworker's trade in a single volume. At an early stage in the project it was decided not to integrate the subject of shipbuilding as a discrete topic. While some of the

techniques of joinery and tools used by shipwrights are included in the study presented here, the techniques of lofting, constructing, and outfitting wooden ships are complicated enough to deserve a comprehensive treatment of their own. Even with these self-imposed limitations, the present volume aspires to examine the language and the practice of Roman woodworking through the types of literary and archaeological evidence just described, in a way that a classicist, historian, or modern woodworker can understand. The main text of the book consists of an overview of the tools, raw materials, and applications of ancient woodworking as well as the careers of its practitioners. To parallel the main text a comprehensive glossary has been organized so that words connected with woodworking and the timber industry can be consulted in either Latin or English. Definitions fall under the Latin terms, where they are known; English equivalents are cross-indexed. Each definition concludes with a sampling of quotations from Latin authors to illustrate how the term was used in an ancient literary context. Latin authors are listed alphabetically according to the conventional abbreviations of the *Oxford Classical Dictionary*.