Technology has been a focus of archaeology since its inception beginning in the days when museum curators wrestled with how to display objects. As archaeology became a recognized discipline technology remained in the forefront, principally considered an economic force or as a means of defining the level of sophistication of a culture. Beyond that, the objects (the material) took center stage. More recently, perhaps stimulated by our ability to conduct sophisticated analytical studies of material culture, our views of technology have shifted toward the social significance of technology and the materials from which they were produced. In this view, archaeologists consider technologies as a means for understanding social behavior; an aspect of technology introduced as central to debates in the New Archaeology. These ideas have taken different turns in the last two decades. As the list of books below indicates, while many archaeologists remain interested in the economic aspects of technologies (no denying that and it’s very important), there has been a shift toward the social aspects of technologies. These studies reflect on familiar topics, regarding consumption (technologies and materials as “things”), craft production and social identity, gender and class, social agency and technological choice. To these more familiar ways of viewing technologies, we will add non-material resources into which humans intrude their technologies, such as landscapes, agriculture and pastoralism, other topics that students will explore. There are no cultural boundaries, either archaeological or ethnographic, spatial or temporal or topical.

Books Available at the Bookstore - Some are very expensive! Let’s discuss before you purchase them.


Other books from which excerpts will be read: A. Wylie, Thinking from Things. F. Bray, Technology and Gender. R. M. Netting, Cultural Ecology. A. T. Smith, The Political Landscape.

Other journal articles and chapters in books also will be drawn upon. They will be available in hard copy for Xeroxing or on pdfs.

In order to understand why we worry over certain issues concerning technology, we need to step
back and study the intellectual history of the very idea of “technologies” and the ways in which old concepts influence our current thinking. For this reason, I have provided an outline of this early history as a general overview of past views on the study of technologies, what some archaeologists now refer to as “the standard view:” and issues related to economic archaeology, processual and post-processual models, new analytical techniques as aids, etc. With this background, the focus will shift to case studies drawn from around the world and various technologies, according to student interest.

Students are responsible for active participation in the class. This participation includes thoughtful commentary on assigned readings, projects, presentations and lectures. In some instances, you may need to work with another member of the class on a presentation or brief paper, for example, of an assigned reading. For a final project, you will select a topic, prepare a paper to be read by other members of the class. One person will be assigned to critique your paper and lead a discussion. The logistics of this are that you will submit the paper on week 1, providing copies for all in the class, and on week 2, the reader will critique and lead a discussion. After the discussion, students can revise their papers or if they are satisfied, submit the as is. We will work together on these various projects.

The course outline follows some key points in the Intellectual History and Archaeology. This discussion of my views on technology will provide us with a set of concepts to work with as we read more current literature. In the course, we will touch on these issues and come back to them again and again as they enter back into more current arguments. But we will read the originals of various theorists. I especially would like you to think about how these concepts have influenced the archaeology of the cultures you study.

In very broad outline, they include four major trends—evolutionism, anti-evolutionism, neo-evolutionism and functionalism—drawn from the works of early European prehistorians, social anthropologists and sociologists and Americanist anthropologists. For archaeologists, evolutionism and European prehistorians with their classificatory schemes, for example in 1819, the works of C. J. Thomsen left a lasting legacy. - The earliest attempts to classify archaeological materials were influenced by evolutionary concepts of the Enlightenment and precede the articulation of Darwinian evolution. In 1819 (and published in 1836), the Danish archaeologist, C. J. Thomsen, and later in 1867, Gabriel de Mortillet ordered social life into stages according to subsistence and “cultural” criteria in which Ages (Stone, Bronze, Iron) were correlated with periods (Paleolithic, Neolithic, etc.) and Epochs (based upon distinctive artifact types and manufacture). In this way, the development of subsistence economies and cultural complexity came to be linked with certain types of materials and levels of technological skill.

These ideas lead easily into notions of human progress and cultural evolution from the simple to complex. V. Gordon Childe, among the major advocates of conventional classification schemes, argued that since people act upon and alter their environment by means of tools, technology should serve as the basis for classifying different types of societies. A good source for these notions is Man Makes Himself, a great read, first published in 1936, if you are interested in technological knowledge and the development of social, political and economic institutions (Trigger 1989:256). Scholars that influenced Childe were Marx and the stage theory developed by Lewis Henry Morgan, who had divided history into three major periods linked to
technological innovations. His sequence, a complex blend of typologies like those of deMortillet’s social hierarchies and Thomsen’s material hierarchies, linked technological innovations with levels or types of social organization. Although Childe did not totally embrace the unilinear evolutionism of his predecessors because he acknowledged that entrenched ideologies could impede “progress”, technological changes and the introduction of bronze are linked to new social forms.

Anti-evolutionism - In America, late 19th and early 20th century scholars had begun to rethink the entire concept of evolutionism and human progress. The anthropologist, Franz Boas, was among the strongest of its opponents. He questioned stage sequences like the ones advocated by Childe and adopted strong anti-evolutionary methodologies (Leacock 1973:12). With respect to technology, Boas was successful at demonstrating that indigenous cultures were not dependent upon western contact for technological advancement but were capable of change, thereby casting doubt on the whole question of the relationship between technologies and advancing complexities.

Neo-evolutionists - A swing back to evolutionism occurred in the late 1950s in somewhat altered form from its earliest adherents. Neo-evolutionists strongly emphasized environmental factors as critical elements in evolution, an effective return to the relationship between technologies and what was now termed cultural evolution. In archaeology, there was a strong influence on theories developed by cultural anthropologists, especially Leslie White (borrowing from the field of thermodynamics White conceived of societal development as a system made up of component parts) and Julian Steward (combining ecological factors with social ones), his theory of cultural ecology emphasized the importance of the environment and technological developments in setting parameters to cultural and social developments. Sociocultural systems took distinctive forms that were the result of adaptations to the environment and culture itself was defined as the means by which groups adapted to their environment or an extrasomatic means of adaptation (Wylie 1986:103).

The importance of technology as a prime mover in social and cultural developments gained wide acceptance in archaeology during the 1970s (the New Archaeology) through the 1990s as a consequence of the adoption of ecosystems theory and methodological advances. Lewis Binford was one of the major proponents of the theory, emphasized the interrelatedness of technology, social organization and ideology. The heavy emphasis on technologies as major factors in adaptation to natural landscapes made it appear as if technology were self-propelled rather than subject to social action, since they effectively extracted technologies from their historical circumstances.

A kind of turning point came when analytical studies of technology became possible through the use of high tech industries, such as neutron activation analysis for sourcing of raw materials, and microscopic techniques borrowed from materials analysts. The more thorough examination entailed in the laboratory analyses made it abundantly clear that early technologies required greater skill and were much more complex than archaeologists had at first realized.

The sum total of the evolutionary, anti-evolutionary and neo-evolutionary trends in archaeology remain to be written, as there continue to be adherents, albeit in modified form, to
each of these positions. Some archaeologists are revisiting evolutionary theory (Dunnell 1989), though now variation is stressed and functional attributes are separated from those conditioned by processes of cultural transmission (Dunnell 1989). With respect to ecosystems theory, theoretical constructs have been softened so that the implementation or rejection of technologies is conceived as the result of human action against environmental constraints and potential limits. Nevertheless, in spite of these changes and rethinking of basic concepts, the residue of earlier beliefs on the supremacy of technology in effecting societal change has remained unexamined with few exceptions to be discussed below and much as historians of technology had excluded all but high-tech technologies from contemporary definitions of “technology” (McGaw 1996), many archaeologists continue to emphasize “hard” materials like bronze and iron, in distinction to “soft” ones like textiles, as critical factors in the shift to more complex forms of social organization.*** See below for some works by historians of technology.

Technology, culture and society. One final trend more difficult to trace with respect to origins but central to current arguments about technology is the integrated nature of technology, culture and society. Early on, V. Childe (1936), somewhat contradictory to the overall emphasis of his work on social evolution, had noted that technologies (their physical structure and end products) reflected world views and mental templates of the societies in which they were made and used. At the same time, others, most notably the French archaeologist, Leroi-Gourhan, although he spoke of the evolution of technologies, gave substance to the idea that embedded within the physical structure or production process of an object were culturally constructed mental templates. His methodology, referred to as a “chaine operatoire”, implied that the gestures that were repeated in producing an object were specific to a given culture and that embodied templates that were habitually applied to other aspects of cultural life. The strong emphasis on “ideological” constraints in production--choice of material, production sequences, technological strategies and final product-- as reflections of social choice and human agency in effect reverses the arrow of causality with respect to the technologies adopted by a society.

These ideas have their origins in two related but somewhat different intellectual traditions. There is a clear line of descent from Leroi-Gourhan to his mentor, Marcel Mauss, and from Mauss and Emile Durkheim. Mauss, an ethnologist, believed that culture was transmitted through gestures such as are evident in a society’s approach to technology, for example in the procedures followed by artisans in the production process. In that sense, he believed that technological traditions, its repeated gestures, much like language, reaffirmed social solidarity. These ideas, in turn, follow from Mauss’s early training by the sociologist, Emile Durkheim, who emphasized aspects of society that promoted social stability. Yet, another line can be traced through the structuralist approach developed in linguistics studies, especially the structural linguist , deSaussure who emphasized the connectedness and constructedness of meaning, where “meaning is the product of certain shared systems of signification”, in this case embedded in language (Conkey 1989:138). There is the connection then between the two theoretical developments in the belief that repeated words or gestures embody deeply held cultural conceptions of order and the right or wrong way of performing certain actions in which these concepts easily translate to gestures or production choice much like Leroi-Gourhan’s chaine operatoire. What they share is seeking a universal quality.

These ideas have been elaborated upon and modified by a number of contemporary
archaeologists and ethnologists, principally attempting to broaden to the theory beyond seeking the structure behind objects to a more fully developed understanding of the context of social action. Archaeologists now, in their reconstructions of the structure behind objects, are asking an altogether different set of questions. They are less interested in the universal qualities sought by their predecessors and more in historical contexts, as Margaret Conkey (1989) asks: “Having accepted that these are meaningfully constituted cultural products, can we access the referential context(s) of social action within which they were made and used?” (Conkey 1989:153). If the making of things constitutes social action on matter, then how do these actions reflect or effect specific meaningful contexts?

**Enter technological style** - technological style, American style, in the sense that specific ways of making and doing are embedded in social and cultural contexts. The archaeologist, James Sackett (1982), for example, emphasizes that choice and selection of technologies, given a number that could serve the same ends, is based on cultural traditions. Therefore, they serve to identify social boundaries, though such acts may not be intentionally geared to that end.

Pierre Lemonnier, on the other hand, follows closely from Leroi-Gourhan in his believe that operational sequences (in his case, the reconstructed production processes of everyday objects in a tribal society) are the result of social learning and repeated actions on matter that are reflective of world views.

The work of Heather Lechtman, whose focus is on symbolic structures in Andean metal working and weaving. In her view, technological style is more than an expression of ideology and argues that production processes are modes of “expressions of cultural ideals, incorporating ideological concerns of the society at large” (Lechtman 1993:273).

**Material culture studies and Craft Production.** Archaeologists define material culture in broad terms to include objects (ceramics, textiles, etc.), architecture (buildings, bridges, dams, etc.) and materials associated with particular industries (plows, fishing implements, etc.). These materials are studied for a variety of purposes, the most basic being their division into taxonomic categories principally to establish chronological and geographical controls, in which “like” categories are considered chronologically and geographically, sometimes culturally, coincident.

**Stylistic and technological criteria.** Stylistic and technological criteria serve as a basis for identifying differences in skill, aesthetic preferences, and handling of materials. Technology studies frequently involve the employment of a wide array of laboratory techniques, such as neutron activation for raw materials sourcing, and microscopic study for technology reconstruction.

**Practice theory** - Finally, two agency-focused theories that are popular among archaeologists today are Giddens, structuration theory, and Bourdieu’s (1977) habitus. In the production of objects, people produce things that “are part of a society’s structure and/or habitus” (Hegmon 1998:269); thus they are active social agents that reproduce and change their societies.
The ideas discussed in the above are the basic framework from which we will move on. I am most interested in “moving on” but not treating these early ideas as “discards”. Let’s really think about technology and move on to the creation of better ways to model its place in society and the circumstances under which humans have selected, practiced, rejected and sometimes produced new things.

**Historians of Technology who Ask Social Questions about technological choice**


1994. Early American Technology. UNC Press. For various bibliographic references on technologies of all sorts.
