Who’s the Winner?

Politics of Textile and Building Trade Artifacts in Middle Age Europe

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Francis Bacon wrote in his *The New Atlantis* that science and technology were a miracle benefiting all people, saying, "The College of the Six Days Work... had evolved over nineteen hundred years into a true blessing for the people, who were now the beneficiaries of advanced arts and sciences."¹ Bacon, however, believed in science and technology as a faith. He did not see that technological advancement gave power and authority to certain classes at the expense of others. As Langdon Winner has said, "the technological deck has been stacked long in advance to favor certain social interests, and that some people were bound to receive a better hand than others."² In most cases of technological advancement, labor has suffered setbacks in its power, often times becoming deskilled.

Winner has argued, in his *Do Artifacts Have Politics?*, that artifacts have politics, and this is the reason why certain groups are favored by technological developments. Technological artifacts are the characteristic systems, structures, and devices of human institutions and activities. By politics, Winner means the structure of power and authority in human organization, as well as the activities that take place within those structures. While agreeing that social determination of technology has some merit, he says that these arguments discount the effects of the things themselves. He stops short of “naive technological determinism,”³ but states a medial argument. He claims, “that the machines, structures, and systems of modern material culture... embody specific forms of power and authority."⁴ Winner does not just say that technology is used in a political way, which is patently obvious, but rather that politics are designed into the artifacts themselves. While Winner’s argument focuses on the artifacts of modern technology, these same arguments can be applied to the artifacts of the European Middle Ages. The textile industry and the building trades in this
period provide prime examples of artifacts that were inherently political, and had social relations built into them.

The textile industry was structured in the putting-out system in the beginning of the Middle Ages. This system embodied the power structures of the age. In this system, a cloth merchant bought raw wool and "sold it to the weaver, who took it home to sort, card, spin, and weave, with the help of his wife and children."\(^5\) The weaver then sold the unfinished cloth back to the merchant who sold it to a fuller for finishing; the fuller sold it back to the merchant who sold it for dying. Finally the merchant bought the finished and dyed cloth and sold it in market. "Thus [the merchant] bought and sold the wool four times... with a large proportion of the markup going to [the merchant], who was protected at all stages of the transaction against market fluctuations and other reverses."\(^6\) In the putting-out system, the merchant was able to take advantage of his middleman position and make extraordinary profits, at the expense of the wool producers, weavers, fullers, and dyers. Gies and Gies say that, "The age placed few restrictions on the exploitation of labor,"\(^7\) but I would say that the exploitation of labor was inherent in the putting-out system.

This technological system, an artifact of the age, had the power and authority of the cloth merchant built into it. Winner has said, "In the processes by which structuring decisions are made, different people are differently situated and possess unequal degrees of power as well as unequal levels of awareness. By far the greatest latitude of choice exists the very first time a particular... system... is introduced."\(^8\) The design of this system was flexible, in that there were no technical details that required this design, but the putting-out system was chosen due to politics, and so politics became embedded in the putting-out system. In fact, it was the
cloth merchant who designed the system, “mak[ing] himself the entrepreneur in what has been called ‘a factory scattered through town.’”

The textile industry underwent many technological innovations throughout the Middle Ages. The horizontal loom, with a boat shaped shuttle and foot treadles; the waterwheel-powered fulling machine; and the spinning wheel were some of the early innovations, applied to wool. Even as these technological changes were adopted throughout Europe, the putting-out system remained in place. Later, as the cotton industry came to prominence, growing exponentially in the late stages of the Middle Ages, the rate of innovation also grew greatly. John Kay’s flying shuttle, patented in 1733, was applied to the cotton industry in the 1760s. It allowed a doubling in the speed of weaving. James Hargreaves’s spinning jenny, patented in 1770, allowed a single person to do the work of 10, thereby displacing female spinsters. Richard Arkwright’s water frame, patented in 1769, also joined the technological fray. “They were joined by Samuel Crompton’s spinning mule in 1779, so named because it was a technical hybrid of the jenny and the water frame.” These new artifacts required centralized power supplies, and performed multiple steps in the textile production process. Consequently, the distributed, decentralized form of the putting-out system was no longer technically or economically viable, if the new technologies were to be used. The new developments, therefore, led to a new technological system that would replace putting-out. “In the organization of work, while the putting-out system survived in eastern Europe, it was gradually replaced in the West by the beginnings of a true factory system.”

Andrew Ure described the ideal characteristics of the factory system as concentration of workers in one complex, common work discipline, high degree of mechanization, centralized power source, and production for a mass market. The textile factory system exactly fits the Winnerian description
of, "an ongoing social process in which scientific knowledge, technological invention, and corporate profit reinforce each other in deeply entrenched patterns that bear the unmistakable stamp of political and economic power." Each new technological innovation further intensified mechanization, centralization and common work discipline, but required a large amount of capital to institute. The capitalist factory owners, the descendents of the moneyed merchants of the putting-out system, were able to embed their power into the factory system to an even greater extent than the merchants of the previous era. They not only controlled the economics of the system, but also the pace of work and the very structure of workers' lives. In the factory system, workers performed many different tasks at different locations within the factory. These tasks had to be coordinated, and many of these timings were determined by the central power source and the automated tasks that were performed. Consequently, the artifact of the factory rather than the manager imposed work discipline. The social structure and the power relationships were determined by the artifact itself, after the political elite had chosen the artifact as the standard model.

Cathedrals were one of the main artifacts of the building trades in the Middle Ages, and as such had politics embodied in them. Cathedral building experienced great technological improvements, especially in the 12th and 13th centuries, which were essential in embedding these politics. Both "ecclesiastical and lay lords" promoted the building of cathedrals in the cities of Europe. The church used the sale of indulgences to raise funds, offering salvation for money. The economic growth of the cities underwrote much of the construction. As a few cathedrals were built, more and more came up, as cities competed on the height and exquisiteness of their cathedrals. "The wave of philanthropy [by lords, merchants, pilgrims] merged with a series of architectural inventions on the flowering of a new style of church
architecture. Merchants had financial reasons to support cathedral building, because a large cathedral drew many pilgrims, who contributed money to the local economy. Thus the promoters, the possessors of political strength, who provided the impetus for building cathedrals, had their authority and clout reflected in the design of the artifact.

Pope Gregory the Great’s 6th century directive of depicting scriptural scenes on church walls for the illiterate masses, reiterated in 1025 by a synod at Arras, was a moving force behind the development of the cathedral in its Gothic form. “Thus church builders were pressed to create larger churches, with more complex floor plans and better light.” The three main developments in building craft that allowed these objectives to be met were the ogival arch, the rib or crossrib that derived from it, and the flying buttress. The ogival arch and associated crossribs put the strain of support on pillars rather than whole walls, allowing the addition of windows, thereby increasing light. Flying buttresses allowed an expansion of the size of cathedrals. These improvements coupled with other improvements allowed for an increase in the complexity of the design. “In its final form, the Gothic church rose from a ground plan in the form of a cross, with nave (space for the congregation) and choir (space for the clergy) separated by a transept, and with an apse at the eastern end, usually consisting of an ambulatory and a number of chapels.”

The large nave allowed a large number of congregants to attend, thereby compelling large numbers of people to be influenced by the Church. As a consequence of the building structure, the power of the church was enhanced. The transept, separating the clergy from the regular congregation, added importance to the clergy, just through an architectural detail. The stained-glass windows that were abundant in the churches cast the dominion of the church over a wider group of people. Even, “St. Bernard, whose Cistercian
Order played a leading role in diffusing the Gothic style... could see the value for the laity of the Bible in glass and stone,”25 despite feeling that they were too ornate. He realized that this was a way to capture the attention of the illiterate masses. The guilds that contributed many of the windows represented themselves in a very positive light. The apse, especially when containing relics of saints, was a good technique for drawing pilgrims, because pilgrims were always interested in these artifacts. This feature of the cathedral embodied the merchants’ central role as promoters, and the power they derived from it. “Nothing like the Christian cathedrals had ever been seen in cities before, yet they became at once familiar and even convenient additions, often used for secular purposes.”26 The inherent secular usability in the design gave the lords and other lay leaders a rostrum for retaining and expanding their power.

David Landes wrote that, “the substitution of machines—rapid, regular, precise, tireless—for human skill and effort”27 was one of the main categories of innovation in the Middle Ages. The machines that developed from this innovation embodied the politics of the period, and contributed to further developments in technology and society. The new machines resulted in the deskilling of laborers, and hence the weakening of their clout. The power and control was placed into the hands of a central command, which directed operations. The cathedrals that were built in the Middle Ages further increased the power of the Christian Church, as well as the other promoters. The process of building cathedrals was centralized in the hands of a head architect-engineer who directed all construction, and so this social group also had its power built into the building process. Overall, throughout the Middle Ages, various social groups gained and lost power in the human organization structure because of the chosen artifacts. This structure of power and authority was embedded in the artifacts, and these artifacts
contributed to future developments in politics, technology, and society, further benefiting the advantaged social groups.

13 Ronald Kline, lecture, September 21, 2001
14 Ronald Kline, lecture, September 21, 2001
15 Ronald Kline, lecture, September 21, 2001
18 Ronald Kline, lecture, September 19, 2001
20 Ronald Kline, lecture, September 7, 2001