Action The designer, experimenting with the material properties of various glues, accidentally as it were, produced a glue which would stick only temporarily – thus seemingly a failure in terms of 'designed glues.' But, instead of simply casting aside the new propertied invention, the designer began to think of possible new uses and chanced upon the idea of page marks for hymn books. (Latour, 1987, 140) Thus, a new use, both unintended and unplanned, led to what today is a massive market for Post-It products. One could say, were one to adopt Latourean language, that the non-human here transformed the human (designer) with its actant, material behavior! I have frequently employed a similar example. Take the million year old 'hand-axe,' the chipped tool from pre-modern hominids which is usually thought to be a scraper and butchering tool, although no one knows the possible uses which could be many, and the small, sharp earlier-thought-to-be-detrius chips from the hand-axe, which are now recognized to have been used for cutting and even, possibly, surgery, and we get an archaic version of the Post-It story.

Allow a quick pause with respect to the designer-intent model of technological development: it should appear by now that the 'designer fallacy' may well be the rule rather than the exception. While it may be the case that some technologies have come into being and performed as 'intended' by their designers (I admit, I can think of none which have served solely in this way), there would seem to be none which can not be subverted to other, to unintended, or unsuspected uses and results. This is frequently the case for an initial design and even more so for later modified designs. Moreover, whether simple or complex, the same indeterminacy seems to apply. As artifactual, technologies seem potentially to contain *multiple uses or trajectories of development*. If even the simplest artifact, an Acheulean hand axe, can be used for multiple purposes, it differs little in outcome from the purposely designed multi-task tool, the Swiss Army Knife. Indeed, multi-tasking may be an emergent pattern for contemporary technologies. Some have begun to hold that the trajectory of multi-tasking for information technologies, is toward a single big and a single small multi-tasking instrument. The mobile technology which, like the Swiss Army Knife, is a cell phone, digital camera, bar-code reader, email device, etc., etc. is the single small multi-tasking technology, while the large home entertainment unit (TV, DVD, computer screen, etc., etc.) connected to the economic, entertainment, communications dimensions of life, is the big multi-tasking instrument; and while much of this remains technofantasy, it is plausible technofantasy.

Fantasy, however, is one type of *imagination* which also plays a role in, behind, and throughout design activity. I think a case can be made that in the high Middle Ages, a form of technofantasy began to emerge which, at first slowly, but with acceleration, began to shape the form of culture in Europe, which in turn pointed towards the saturated technological culture of today. Lynn White, Jr. has argued that there was something of a technological revolution which occurred in this period. The construction of high-standing Gothic cathedrals called for machines and architectural techniques not employed previously. Admittedly borrowing interculturally from, first the Moorish styles which entered Europe no later than the 10th century, but taking these to greater extremes, Chartres, Notre Dame, Cologne, all borrowed flying buttresses and glass-stone frillery. What might not be

noted, however, was a similar shift in imagery in the world of fantasy. The fantasy paintings of the Bruegels remained largely 'organic' or 'animal-like' fantasies. Devils, dragons, demons, large monsters, clearly were 'biomorphic' however fantastical. But by the 13th century, machines began to play fantasy roles. Roger Bacon described fantasy machines, such as self-propelled ships, underwater craft, flying machines and other impossible-to-build machines for the times, machines which were later 'visualized' in the 15th century by da Vinci in his notebooks (discovered and publicized by the Futurists in the 1920s). I am hinting that a specific mode of technology imagination or fantasy began to take hold. This probably was a life-world reflection, since many of the radical new machines which began to appear and be developed in Europe had earlier, in other forms, come from the multicultural trade, journeys, and experiences of the cross-cultural exchanges between Islamic culture, the Mongolian invasions, and the post-Marco Polo adventures to the Far East. Lynn White, Jr., Joseph Needham, and others began to recognize this cross-cultural trade of technologies by the middle of the 20th century. Spices, gunpowder, the compass, silk, windmills, as previously mentioned, all migrated to Medieval Europe, and were adapted and developed. Optics, better known by Al Hazen (1038) than the West, ended up on a trajectory of lens making which led to the optical inventions of the telescope and microscope which drove the early scientific revolution, instrumental technologies provided the infrastructure of science itself.

All of this today is relatively common tender. But it needs to be seen in the light of the 'designer fallacy' I am addressing here. Each new invention which came into Europe, often first a matter of fascination, became adapted into new uses and developments. While China invented gunpowder, it did not successfully produce a *cannon!* But by the Thirty Years War, cannons were being used to demolish French castles at the rate of dozens per week. (DeLanda, 1991) It is with this observation that I will now begin my move away from the 'designer fallacy.'

However some material capacity comes to human awareness (discovered by accident, through experiment, through found discovery, or – I suspect rarely – planned out from design) once that capacity is emergent and clear, some possible 'trajectory' is suggested. One could say, the explosiveness of gunpowder "suggests" uses. But, those uses will also be likely to be culture-relative, at least at first. Long before the cannon, feudalism had produced the land-castle system, wherein the lords who were to protect the populace had built defensive keeps. A many centuries-long form of contest centered on strategies of defense with supplies and means of defending against the attackers, a strategy which tended for a time to favor the well stocked and designed castle. Siege machinery, too, grew in complexity over the centuries, in an evolution from Roman times with trebuchets, catapults, and the like. None of these engines, however, could easily breach walls – which the cannon could do.

In terms of design history, the cannon is in a sense pre-modern. No one knows who 'invented' the cannon, although many attempts to create a workable cannon were made, including the production of early, fire hardened wooden cannon barrels (not too successful). The cult of the individual designer had not yet come into being.