speaking, however, there is nothing "natural" about this at all. Economies and job markets are not part of nature, they are systems created by people. The way jobs "flow" is a result of how we design the artifactual systems they are part of. Treating this as natural leaves no basis for assuming responsibility for what it may entail.

Treating artifactual and human systems as natural ones, in particular, amounts to what I call "counterfeit naturalism." If "naturalism" can be defined as understanding something in natural terms (lightning as being caused by weather conditions rather than by Zeus), then "counterfeit naturalism" would mean understand as natural something that is not, particularly when this can be misleading. In this respect, counterfeit naturalism entails at least two significant pitfalls bearing on our understanding of systems.

First, the more we engage in counterfeit naturalism, the more likely we are to diagnose problems and design solutions that may be appropriate to natural systems but not to artifactual or human ones. If we think of the flow of jobs to the cheapest provider as natural, it could make sense to design governmental policies aimed at avoiding interference with this "natural" process. (Indeed, this can even include a sense of "natural" standing in for "good" or "proper.") However, if we think of this in terms of systems we have made, it could make more sense to consider policies designed to redirect or curtail that flow.

The second issue derives from the fact that we generally do not see ethics as part of natural systems. We may hold ourselves responsible for how we treat nature, but we do not find ethics at work within nature itself, particularly in any way that entails the notion of responsibility. No one holds hurricanes morally responsible for the damage they cause. We do, however, hold people morally responsible for what they do with the aid of tools or teams. So, counterfeit naturalism undermines our ability to deal responsibly and effectively with the ethical aspects of human and artifactual systems because it treats them as natural systems that, like hurricanes, have no obvious moral dimension. If the flow of jobs is taken to be a natural occurrence, it would make no more sense to debate the ethics of it than to debate the ethics of the tides.

This is also seen when we attempt to justify our design choices by making claims like "we are going with what works" or "my opponent's plan won't work." Comments such as these point to the functional aspects of human and artifactual systems, but imply that, like natural systems, they are without a values dimension. Appealing only to the functional obscures the role that values play in shaping both the choices we make and the consequences of those choices. Our design choices are never solely about what will and will not work. They are also always about the aims we want to further and what we consider appropriate ways of pursuing them. Keeping the discussion at the level of what supposedly will and will not work misses, or dodges, the need to deal effectively with the values inherent in all design choices.

3.2 Design and Values Infrastructures

Just as natural systems can, and artifactual systems should, afford the purposes of human systems, human systems have what I call "values infrastructures" that

inform the way we treat nature and how we design artifacts. A values infrastructure is made out of what is valuable to individuals and groups about themselves, the physical and social spaces within which they live and work, the various means that they employ to do what they do, and so on.

The connection between our values infrastructures and what we do is a strong one, though at times not acknowledged, as counterfeit naturalism suggests. What is valuable to you plays a significant role in what you consider worth doing, how you like to see it done, with whom you choose to associate, what goals you think are worth striving for, etc. (for a similar treatment, see Schein, 2004 [orig. 1985]). What we find valuable shapes what we do. (By definition, if values did not influence how we act, it would be odd to call them values.) That is, the design of a community's artifacts both embodies and affords the expression of the values to be found in its values infrastructure. (Getting a sense of an individual's or group's values infrastructure can be tricky. I have found that if you ask people what their ethics or values are, they are often uncomfortable. However, if you ask what is valuable to them about their job or the spaces in which they live and work or their associations with other people, an interesting and useful conversation often ensues. And if they can show you, or you can observe examples of this in the course of their actual work practice or social interactions, the picture of the values infrastructure can become even more robust.)

The importance of values infrastructures to the design of technological artifacts and the social practices they are embedded in can be seen in the case of a project team I observed in a high-tech research and development laboratory. The team was designing an early computer conferencing application that could establish a network of "virtual offices" through audio and video connections along with the virtual equivalent of pieces of typical office equipment, such as a whiteboard, a filing cabinet, a book case, etc. A primary aim in the development of this application was making it possible for each user to design a virtual office, through his or her computer, by setting up and configuring audio and video links and organizing the virtual office equipment. Others in the network would then be able to "visit" the virtual office through the computer network, have meetings via the audio and video connections, while also consulting documents in the virtual filing cabinet or illustrating ideas on the virtual whiteboard, etc. When an office holder is out, a "visitor" could leave messages on the whiteboard, get documents from the filing cabinet. if permitted by the office holder, etc. (The "virtual" elements of such gadgets constitute a particularly provocative example of technological artifacts as "prosthetic.")

The team leader decided early on that the application should be designed to be as flexible as possible. His idea was that each end-user could in turn design a virtual office that would fit his or her individual needs and style. I spoke at length with him concerning this, and quickly learned that he was passionate about this flexibility. He gave maximization of flexibility as a reason for the team's design choices at various levels of the application. When we first discussed this, he gave examples from what may be the most obvious elements of the interface, such as whether or not to have a virtual whiteboard, where to locate it, and deciding who could have access to it. But as we discussed this further, he took the matter of flexibility down