

## Three Stories About Technology Practices

It is commonly thought that our contemporary world is shaped by the forces of enterprise and science. This belief assumes that the rise of modern science, more than any other single factor, marks the great divide between traditional agrarian cultures that go back to the dawn of recorded history, and the modern technological societies of today. It is also thought that the technological marvels of the twentieth century owe their existence to modern science. While some challenge these beliefs, it is certainly true that our culture is deeply influenced by the institutional activities of science, and that the development of technology is a major force in global and environmental change.

Given these beliefs, and given the widespread concern of scientists and non-scientists for the integrity of ecological processes, it is odd that there is not a more concerted effort to understand technology in a comprehensive and ecological way. It seems clear that we urgently need a holistic understanding of the practice of technology that includes its organizational, cultural, technical, and environmental dimensions. Here our aim is to pursue a comprehensive, philosophical understanding of human *meaning* in technological societies, and the significance of technology in recreation, work, and our relationships to nature.

To facilitate our pursuit of comprehensive understanding, and to help us see practices as whole activities, let us begin by considering three stories about technology practices. Stories and narrative forms embedded in larger mythic contexts provide the most comprehensive accounts of human meaning and purpose. These forms are easily overlooked when we concentrate on the technical aspects of technology, or when we focus only on a specific problem. The narrative descriptions enable us to bring tacit as well as explicit meanings and relationships into the open and enable us to view the larger context in which the technology practices are

set. They also enable us to appreciate the personal and uniquely cultural aspects of human technological activities.

Although our culture takes pride in its nonmythic, scientific worldview, this very worldview is part of a larger cultural setting that contains mythic elements, in, for example, its ideas of progress and historical destiny. The mythopoetic dimension of everyday life is the context from which we tell the stories that illuminate the purposes and understandings of our personal lives and of human life in relation to work, technology, and nature. For purposes of the present inquiry, we view stories and narrative forms as the smallest whole units of meaningful context. We resist the tendency in modern disciplines toward abstraction and reductionism which ignores, or even rejects, the primacy of stories in favor of nonconcrete, impersonal theories. Throughout this inquiry we will be reinterpreting our culture's mythic backgrounds, exploring its contemporary stories through concrete examples, and illuminating larger ideals of ultimate values by reconnecting them with our mythic past. With this in mind, let us now consider the first of three stories.

### I. *Stonemason*

There once was a medieval stonemason named Peter. One day he was cutting a stone to fit into the wall of a cathedral he was helping to build. He had worked on this particular cathedral all of his adult life, as had his father before him. His family had been stonemasons for several generations. As a stonemason he understood the esoteric symbolism associated with cathedrals (for example, the stone upon which and out of which the church is built). The stone he was cutting was part of a design that embodied this symbolism. The cathedral had been commissioned by Catholic religious authorities, and the designs worked out in consultation with them. As the stonemason was cutting the stone, he was considering its place not only in the overall design of the building but also, symbolically, in the church. A passerby stopped to watch him work. After a while, he asked the mason, "What are you doing?" The mason was at first at a loss to answer, since he was concentrating on the design the stone had to fit into, and reflecting on the symbolism of the design. Without a lengthy explanation he could not tell the stranger about *that* aspect of the activity. So, after some silence, he said, "Cutting a stone for that [pointing] part of the wall."

It is true that the mason was "cutting a stone", but he was doing other things as well. He was helping to build a wall, and fitting a stone into a design rich in meaning. His activity was also part of a much larger undertaking. He would not have been cutting the stone in that way, had

it not been for the traditional values, as well as the organization, which made the construction possible. Even if he had known how to cut stone, he could not have taken part in cathedral construction in the absence of the religious and philosophical context that gave rise to the creation of such buildings. Economic factors were also part of this building activity.

The technical skills that evolved in the building trades developed, not only because of technical improvements through practice of the craft, but also through the values that the culture placed on certain kinds of construction, both practical and symbolic. To help build a cathedral was not only a job, but also a dedication to a higher purpose. Other cultures had the skills, tools, and organizational capacities to undertake such projects, but lacking the religious and other values (the esoteric "church") related to such constructions, they built no such cathedrals.

This example illustrates the degree to which technological activity, as the exercise of skills, techniques, and the specific use of materials and tools, is part of an integrated, cultural practice, not all of which is immediately visible. Such practices bring together place, materials, skills, techniques, tools, power, organizational capacities, communal values, and aims. Understanding technology requires an understanding of the interrelationships among these different factors, set within the larger context of place, history, and human activities as natural processes.

But what are we trying to see when we look at whole technology practices? Clearly, if we focus only on the hardware and machines of technological activity, we will lack comprehensive vision. A truck is what it is, as a technological object, because it is used in a context of purposes that define trucking activity. A truck placed in a culture lacking transportation systems and vehicular concepts could be almost anything but a truck for that culture. In the film, *The Gods Must Be Crazy*, when a Coke bottle is dropped among the Bushmen, it becomes many things, but it is not seen for a Coke bottle. Technological devices by themselves, apart from their cultural practices, have no inherent meaning. What they are as instruments is defined by their larger, practical, cultural context. Just as an explosive black chemical is not gunpowder in the absence of the culture of guns and weapons, so a truck is not a truck in the absence of the cultural context that values and uses trucks for hauling and similar activities. Names and naming, like tools and technology practices, are part of a meaningful cultural context. Single concepts do not have meaning apart from such contexts.

## II. Zen Monastery

Our second story is set in Japan. Many years ago, a person from the West journeyed to Japan to study Zen Buddhism. After a certain amount of

effort, he was admitted to a Zen monastery. He was told to watch what went on, and also to take part in some activities. One day, while he watched the monks go about their routines, it dawned on him that much of their work could be organized more efficiently. He made notes on how the work could be improved, so that the monks could accomplish more with the same effort and have more time for formal meditation.

When the opportunity arose, the young Westerner spoke to a senior monk. He explained his ideas on how they could improve their productivity. The monk listened patiently and agreed with the young man's observations; their work could be made more productive if they adopted his suggestions. He thanked the visitor for his thoughtfulness. However, he then said, "There is only one problem. We do not regard our work as anything other than the practice of Zen. We are not trying to be more productive. We do not distinguish between time spent in formal meditation in the Zendo (place of formal meditation), and time spent working in the garden or kitchen. It is all the same to us." The monk made clear that the aim of monastic life is not productive efficiency. The monks' work is part of their way of life. Their way of life is the study or practice of Zen, and zen (meditation) is their way of life. In not differentiating between the two, he affirmed that their activities were unified by a common dedication and practice (zen) running through all they did. In contrast to modern Western and Eastern technology practices, the monks did not see their work as one thing, their religious devotion and spiritual discipline as another, and their leisure activities as something further. For them, these are all part of Zen. The practice of zen (as living meditation) applies to chopping wood and carrying water, as well as to formal sitting on a cushion in the meditation hall.

This example illustrates how technology practices can be carried on as part of a unifying spiritual discipline. In this case, there is no separation between the sacred and the secular. This is one reason Zen teaches that *samsara* (the rounds of daily life, death and rebirth) is *nirvana* (the cessation of unsatisfactory life), since spiritual realization is to be found nowhere but in full attention to one's immediate daily life. In the unity of Zen practice there are no dualities, no separation between mind and body, work and spiritual discipline. Such a unified practice is complete in itself, as it is.

In the context of the Zen monastery, then, the idea of pursuing technological progress as something that leads to more power and greater productivity has no point. Although a Zen monk could understand someone caught up in such a pursuit, he or she might see this person as driven by the passions and confusions of the ego. Zen is complete in the skillful practice of zen in daily life, not in looking to the future or in seeking power over nature and others. This story prompts us to examine the

defined purpose of pursuing technological development: ever increasing technological power. Attempting to justify this goal leads us to reflect on larger purposes, the meaning of life and ultimate reality. This in turn can lead us to reflect on the meaning of work and how to find satisfaction in ordinary daily activities, such as digging in the garden, as well as in our remunerative occupations such as piloting a plane or teaching a class. In this reflective process we are led to consider the nature of the self.

### III. *Climbing a Mountain*

Finally, let us consider a third story. Several years ago a group of U.S. mountaineers organized an expedition to ascend a high, unclimbed Himalayan mountain. In keeping with their society's emphasis on efficiency and technical expertise, they carefully organized their team so that it included rock climbing experts, ice climbing experts, liaison experts, medical experts, and so on. The climb was conceived as a type of technical undertaking, a technological activity, best pursued by means of a division of labor based on expertise. A member of the expedition later said that they ran into problems as soon as they got on the mountain. They originally planned to have the experts direct those parts of the climb for which they had the greatest expertise. The results were not what the team expected. In brief, the experts climbed for their fellow experts, not for the team as a whole; for example, only those with advanced rock climbing skills could follow where the rock climbing experts led, for these experts wanted to test their skill and ability; and so, too, for the ice climbers. The rest of the party, non-experts, wanted to take easier, safer routes. The conflicts, which developed because of a clash between experts and other members of the team, were resolved when it was decided that the non-specialists would have a major role in planning the route. The rock experts led on the ice pitches, and the ice experts on the rock ones. The climb went forward as a whole team effort, since all members of the team could participate.

This example helps to highlight how, because of their education and training, people see problems in a particular way, in terms of their own expertise, technical competence, and professional perspective. Technology practices designed by such a division of labor, as an exercise of specialized skills, often create problems for society as a whole, since the resulting systems are built and used by people who do not share the expertise of the designers.

In our society, technology practices are often designed solely by experts. The practices are then simplified to make them accessible for the use of nonexperts, but their technical "sweetness" makes their inner

workings very difficult to understand, except to small groups of technicians. This often results in alienation and disempowerment for the user. Highly technical solutions to problems that are a result of failings in whole practices often generate additional problems in part because non-specialists are excluded from the design process. To go back to the climbing example, the experts' pursuit of technical difficulty and elegance created additional problems for the team as a whole. These could be solved only by shifting to a holistic approach. The overall strategy for climbing the mountain was changed, and in the process an enlarged understanding of the cooperative undertaking, which was necessary, emerged. This understanding was a result of the group working together as a community with each member contributing his or her own wisdom to the decision making process and thereby "owning" the activity more fully.

These three stories invite us to consider whole practices whose failings are rarely due only to technical causes or problems. Each story calls our attention to different central features of technology practices, and yet each is open-ended. Our analysis of them has only scratched the surface of what they could tell us about technological activities. The last story, in particular, is useful in helping us to appreciate failures in the way a whole practice is constituted.

#### IV. *Ecology of Technology*

One of the most prominent failings of modern technology practices is their negative impact on the ecosystems of the Earth. The buildup of greenhouse gases and other degrading effects on the atmosphere are obvious examples of such impacts. Many now realize that to reverse the greenhouse effect will require large-scale modifications of our technology practices. A few obvious examples of destructive practices are removing raw materials from forest lands by clearcut logging methods, the inefficient use of fossil fuels in transportation and production, and petrochemical methods of farming.

We cannot solve the problems created by these bad practices through technical means alone. Their solution requires that we redesign whole practices, but before we can do this, we must understand the practice of technology as an integrated, comprehensive activity and process—we must consider the *ecology* of technology. Such an integrated approach based on the ecology of technology is necessary in the designing of new practices that meet the criteria of appropriateness. These include not only ecological balance and harmony, but also requirements for social justice and economic sustainability. Holistically designed appropriate technology

practices would allow us to enlarge and improve our selves and relationships. In short, we need a holistic philosophy of technology that appreciates all dimensions of technological activity, including the technical, cultural, organizational, and environmental aspects, and how these are interrelated. This philosophy of technology must be ecocentric.

The cathedral builder in our first story was engaged in an art with sacred dimensions. We too need to see the creation of new technology practices as a sacred art, and like the Zen monk in our second story we need to find ways to master the desire for excessive power. These dimensions will assist us in using technology practice to become good, nonviolent citizens of the Earth. As moral agents we are responsible for designing and creating technology practices that are not harmful. They should cause no needless suffering to other persons and other beings, just because these beings have less power than our technology gives us. Unfortunately, many of the technology practices now being developed, such as the genetic engineering of new organisms, represent serious threats to the ecosystem, especially in the service of immature power seeking. For the survival of all that we love, we have a sacred obligation to understand where these developments could take us. We need to see how alternative practices could avert the potential disasters that are now threatening.

In our reflections on the environmental dimensions of technology practices, we must consider the way in which our modern industrial culture has seen humans in relation to nature. This brings up not only the question of how we have seen nature, but how our perceptions of it are changing. The dominant view in industrial culture has been that nature is a source of raw materials to satisfy human needs and wants. Controlling nature through the use of large-scale applications of technology has been a major drive of this culture. This effort has, more than anything else, redefined who we are, since industrial culture is affecting the natural world in profound ways.

Some have recently gone so far as to say that nature is about to die (Merchant 1980). Others have even claimed that nature has already come to an end (McKibben 1989). The gist of these claims is that human impacts have become so pervasive, magnified, and driven by modern technology, that there is now nowhere on Earth we have not altered. The dominant view in the modern West, as mentioned, has seen humans as apart from nature. With the knowledge of science and the power of technology we can now control nature, originally beyond our control. We defined ourselves in relation to this conception of nature as something apart from us. Some now argue, in the light of our impacts on nature and wilderness, that humans must redefine both themselves and nature. In so doing, we will redefine our relationships to nature, since it is being

reshaped by our concepts translated into technological activities, and is becoming a human artifact.

While we recognize that our conceptions of Human and nature are reciprocally related, we disagree with the claims of nature's death. To claim that nature has come to an end suggests that there can be no return to natural balance. It is to believe that we cannot restore our own naturalness. This parallels the claim that wilderness no longer has any meaning, since all wilderness must now be protected as defined by our laws, whereas formerly we thought that we needed to protect ourselves from it, since it was something totally separate from us. The early European settlers in North America perceived nature as a wilderness to be subdued. Nature as wilderness was seen as threatening, a place to fear, and a place to be tamed. This conceptual purity implies conditions which in fact did not exist for Europeans either in their native places or in North America. There was no pure wilderness in North America corresponding to *this* concept, when the European settlers arrived. By then, the whole continent was occupied by humans whose ancestors (we believe) had come over from Asia earlier, probably via the Bering land bridge. For the aboriginal people the continent was not a vast wilderness waiting to be subdued. Humans were part of nature, nature was part of them. They made no distinction between wilderness and civilization. In their shamanic worldviews, their ancestors and spirit helpers were kin to themselves and to the animals and plants.

The lesson to be learned from the above considerations is that we need to understand "naturalness" as a matter of degree, as well as an ideal within our stories of human life. In this inquiry into technology practices we recognize that nature is not static. As a creative process it is constantly changing, as are we. For humans, nature is in part concept, but it is also experienced as a creative, evolving process expressing itself in the world and in us. As cultural creatures, however, it is possible for us to distinguish ourselves *conceptually* from nature, and to see it as an object. Modern culture has desensitized us. We often don't hear the authentic voice of nature that speaks softly in our own hearts, for it is drowned out by the noise of our own technological (cultural) activities and artifices.

Our need to reconceptualize nature can be met most powerfully and effectively by revising our dominant stories and myths. Our stories need to appreciate degrees of purity in our concepts of nature and wilderness, and their relationship to civilization. We need stories that give us a clear idea of what wilderness, left to itself, is, so as to be more aware of how and in what ways we are affecting nature. Stories and myths that give us comprehensible ideas of nature and wilderness must be an explicit part of our efforts to understand existing technology and to design new appropriate practices.



We have the knowledge and skills, and access to the wisdom necessary to alter the effects of our technology on nature. Restoring nature is often a matter of merely letting it be, but in order to do that we must change ourselves so as to limit our own intrusions on it. This requires some form of spiritual discipline that returns us to our own natural selves. We will say more about this in later chapters. To cite a specific example of needed change, the erosion of farm and forest soils can be halted so that restoration and natural healing will take place. The rate of restoration is directly related to changing our technology practices, guided by a sense of urgency and commitment to ecocentric values. The major form of change needed in all resource industrial activity is toward practices that work *with* nature rather than those that attempt to control it. In order to make this change we must first understand that we are misguided in our attempts to control and gain power over nature and other humans. This understanding comes from developing deeper insight into the ecology of the human self and its cultural and personal mythologies.

A commitment to redesign our practices as a whole, so that they are ecologically wise and harmonious (ecosophic), must include philosophical, spiritual, and practical dimensions, which can be fully expressed only through the narrative power of stories and myths. These give us our sense of meaning as a culture and as individual humans, and they can teach us how to relate wisely to ourselves, to each other, and to nature and wilderness. Like the stonemason, we need to understand the esoteric symbols that reveal the stories we live by. Like the Zen monks, we need to see our daily technology practices as coextensive with a spiritual discipline that applies to all aspects of our lives. And like the mountaineers, we need to see that design of appropriate practices depends on drawing from the wisdom of the whole party, that is, from our whole community, not just from the fragmented activities of specialists and experts. Experts and specialists need to redefine themselves in terms of human wholeness, rather than identifying themselves only as, for example, chemists or engineers. With these changes in attitude, awareness, and practice, we will realize that the sacred is to be found in our secular work. Our secular practice will then become sacred precisely because we will respect, honor, and love ourselves, one another, our homes, and other beings. As a result, all of our relationships will be harmonious. How all of this can be integrated into our work and technology design through a comprehensive philosophy and practice will be outlined in the next chapter and explored in depth throughout this book.