Is Preservation Technology Neutral?

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This article, originally the keynote lecture from APT's 2006 conference, presents a philosophical inquiry into preservation decision-making.

Fig. 1. Cape Hatteras lighthouse being moved. Courtesy of Western Carolina University.

The title of this paper, "Is Preservation Technology Neutral?", will undoubtedly cause many to wonder just what it is that they are about to read. Let me begin by sharing a personal experience that happened about twenty years ago. Prior to that time I was asked by clients, owners, and contractors on an almost-daily basis as part of my work as a structural engineer, "Can we do such-and-such a thing?" My standard reply was that I would think about it and let them know. I would go back to the office, make a few calculations or do a little research, and then respond. But my epiphany came when I realized that I could answer the question before it was even asked. I realized that we can do practically anything nowadays in constructing and preserving the built environment. It suddenly occurred to me that the proper question to ask now was, "Ought we do such-and-such a thing?" The inquiry had shifted from the technical to the philosophical and the moral. I was totally unequipped to answer this question and began making inquiries to satisfy my newfound need.

This sea change in my own conduct was directly connected with the theme of the 2006 APT Conference, "When Modern Becomes Historic," where this paper was first presented. The conference title implies that there is a notable difference between technologies that apply to traditional preservation needs and those that apply to the more contemporary. So, too, with the realization that the technological question being posed to me had taken on a different dimension — and this transformation had clearly occurred during my working career, now fast approaching 50 years. So what has changed over these 50 years in the delivery of technological solutions? Are these new approaches truly a watershed or simply another generation marveling at "progress," just as almost every generation has done before?

I want to share some of the answers that I have discovered in my inquiry about this issue that began in earnest about 15 years ago when I started teaching a course for graduate students in architecture called the Philosophy of Technology. Indeed, I soon found that I was not the first to have asked this question: "Ought we do such-and-such a thing?" Not by a long shot. There has been a whole new body of work under the rubric of philosophy of technology, including scholarly societies; university courses, programs, and majors; and articles and books published in both the popular and university presses. Yet most of those who have explored this question are not technologists but rather philosophers. In the fields of architecture, engineering, and preservation, however, we seem concerned mostly with the products and processes made possible by technology — bigger, better, faster, cheaper, newer, more unique, more durable, more ingenious, more efficient, etc.

What does preservation seek from technology? Most practitioners could answer that quite easily. A client or a student comes to us with a problem, we apply all of our best brain power and arrive at a brilliant solution. Just looking at the titles of the papers submitted at APT conferences and in the *APT Bulletin* demonstrates that preservation technologists have found an infinite number of nifty solutions to delicate and difficult problems. But isn't it about time that we technologists took hold of our own destiny and made the ethical decisions ourselves without being preached to by sociologists and philosophers?

There are many levels of technology on which one can ask this question, "Ought I do it?" The most famous example is the scientists and technolo-

Fig. 2. Solomon R. Guggenheim Museum, New York City. Courtesy of Vertical Access.

gists who created the atomic bomb. At the Trinity test site in New Mexico, where the first bomb was successfully exploded, scientist Kenneth Bainbridge famously muttered to Robert Oppenheimer, "Now we're all sons of bitches." Obviously the stakes in preservation are much different from those in atomic science. Still, the reverberations created by the atomic bomb are a warning that we all should be concerned with the outcome of our technological enterprises. A group of concerned atomic scientists did protest to the powers in command that the bomb not be used on a human population in Japan but rather exploded over Tokyo harbor as a demonstration of its power. Moreover, they were certain that it would lead to a successful outcome of the war while at the same time not lead to condemnation of the creators of the weapon.

When was the last time one of us protested the use of our powers of technology because we thought they were being used improperly?

Preservation Case Studies and Ethics

What I'd like to discuss are some instances where the question might have been asked, "Ought I?" Some are from our office's practice and some are not.

Two dramatic examples of buildings that were moved come to mind. One is the historic 1870 Cape Hatteras lighthouse. Originally located some 1,500 feet inland, it was only 300 feet from shore by the 1970s due to the migration of sands on the barrier island. When it became apparent that the land form of the barrier islands off the coast of North Carolina was changing and endangering the foundations of the building, the National Park Service embarked on a program to move this iconic structure. For more than 30 years heroic engineering efforts had attempted to control the erosion of the sand surrounding the lighthouse. Engineers tried seawalls or breakwaters to fend off the frontal

Fig. 3. Crack monitor installed at the Guggenheim Museum. Courtesy of Robert Silman Associates.

attack of the waves, groins or jetties to prevent lateral movement of sand, and dredging, dune construction, and vegetation to build up the beaches, but all of these failed. None could defeat the power of the sea.

Ultimately the decision was made to move the building inland some 2,900 feet to preserve it from destruction (Fig. 1). For years many ecologists and organizations devoted to study of the coastal environment have decried the efforts of the National Park Service and others to preserve built infrastructure on the barrier islands as they shift in position. And after a brilliant and epic (and expensive) plan to move the Hatteras lighthouse was conceived and executed, these same people asked the question: just because the technologists were able to accomplish this move, should it have been attempted? They had an alternate solution — allowing the lighthouse to become a ruin as a symbol of our occasional inability to defeat the forces of nature and an acknowledgement of the littoral drift of coastal land forms. And while reviewing the pros and cons of this example, remember that if similar conditions had presented themselves 100 years ago, no one would have thought to move the building; it would have become a victim of the forces of nature, and all would have remembered it fondly in photos and other lore.

Another situation involving moving a historic building was the enterprise of dragging the 4,000-ton historic Empire Theater on West 42nd Street in New York City to the west some 170 feet. This project was supposedly necessitated by a development plan to place a 25-screen movie complex on the site of the historic theater. Historic-preservation consultants finally agreed that it was not the exact location of the theater that made its landmark status significant, and the New York City Landmarks Preservation Commission approved the move. This massive building was moved in just three hours (after months of preparation, of course). Once again a great technological triumph for the engineering community. But was it the right thing to do, just because it could be done? Could a different, if less efficient, development plan have been adopted, and the theater left in its original position?

Another example presents a different sort of preservation dilemma. A couple of years ago Robert Silman Associates was awarded the contract to study the structural deficiencies in the concrete facade of the Solomon R. Guggenheim Museum in New York City, the last major building that Frank Lloyd Wright saw completed before his death in 1959 (Fig. 2). The firm made a bold promise to the client: that the painted concrete walls could be prevented from cracking in the future and thereby the frequency of maintenance greatly reduced (Fig. 3).

In order to accomplish our mission we had to undertake an extraordinary campaign of analysis in which the building could be studied as an integrated whole, not merely, as had been done in the past, as a series of individual, attached pieces. The necessity for this approach arose because Wright did not want to have any expansion or control joints to appear in these walls but rather to have a continuous flow of smooth, spiralling concrete. Thus the actual building, constructed partly of poured-in-place concrete (the basic structural frame) and partly of shotcrete (the exterior walls), was indeed one giant monolithic chunk of concrete and had to be understood just that way. After an extraordinary analysis effort, including what is probably the largest and most complex laser modeling ever done, the results revealed the precise movement of the building and its likely causes.

It is indeed possible to arrest further cracking and create a painted monolithic spiral as Wright would have chosen, but this scheme would require wrapping the exterior gunite walls with a bonded fiberglass and epoxy coating, much like a boat hull. It would be irreversible but very smooth and beautiful and able to retain a durable, crack-free painted finish for many years. Assume that it will not change the environmental characteristics of the interior of the museum. Although we can do this, ought we? The result would be a different exterior coating than was ever there, but it would fulfill the original design intent. Is that reason enough to warrant its adoption? This as-yet-unresolved issue has strong supporters on both sides, but quite clearly the technology that is possible today to repair the facade was not available in 1959 to Wright during the original construction. Would he have used it if he had it at his disposal, and, if so, is that reason enough to allow it today?

Fig. 4. Shepard Hall, City College of New York. Courtesy of Robert Silman Associates.

Those who are adamantly against this solution argue that it is the original artifact that must be preserved, not the design intent. With all of the cracks and blemishes, they say, it is this finish that has come to be known as the surface of the Guggenheim Museum for 48 years and it should be kept that way. Since crack fillers and surface coatings are much better than they were 40-odd years ago, it could be maintained as it has been in the past.

Finally there is the example of what is perhaps the largest historic-facade restoration ever undertaken in the U.S.: the repair of Shepard Hall at the City College of New York, the first public higher-education building in the country (Fig. 4). Built in 1903 to 1908, the original building is a huge, four-story affair, cloaked in indigenous Manhattan schist stone with terra-cotta ornament in the ornate collegiate Gothic style. Just before the centennial of the building, all of the terra cotta had failed, along with much of the original fieldstone. The terra cotta has been replicated with thin-shell replacement units made of a synthetic, resin-based material sprayed into molds and erected as individually supported pieces on galvanized-steel subframes (Fig. 5). Many educators have gaped at this huge restoration, which indeed is quite spectacular in appearance, and have said, "We could have built three new modern academic buildings for what it cost to restore this arcane one." That is an oft-heard complaint against the preservation movement. Indeed, many religious organizations are very reluctant to spend what they consider exorbitant sums on historic preservation, claiming that it is too expensive and compromises their basic mission of providing for their congregation and community.

Although it may seem that these examples are outside of the realm of technology, are they really? Shouldn't everyone in the preservation field have a part in making these decisions whose outcome we figure so prominently in? And there remains a crucial question: What is the process for determining the

Fig. 5. Galvanized-steel supports for resin-based, thin-shell units replacing original terra cotta at Shepard Hall. Courtesy of Robert Silman Associates.

correct answer to problems like this, without reliance on social scientists who specialize in raising these sorts of philosophical issues?

The Formal Philosophical Basis of the Argument

Attaching any sort of value systems to the practice of preservation has never been part of the discipline. Thus, at this point, it is necessary to appropriate the techniques of philosophers, because they are the ones who have both framed the questions and tried to answer them.

First, it should be remembered that most readers of this *Bulletin* are technologists of one sort or another and that the sponsor of the *Bulletin*, APT, proclaims its last name to be *technology*. Each of us should and must be concerned with the application of technology as we practice our craft, whether it be building conservation, object conservation, architecture, teaching, materials science, engineering, landscapes, or another specialty.

As a structural engineer, not a professional philosopher, the viewpoints that I find most interesting are those that relate most closely to our practice rather than the more purely theoretical. On the other hand, philosophy is nothing if not theory, so the abstract must be considered, as well. But I confess that my research has been limited to those topics that interest me; there are many other very stimulating areas that I will not touch upon. Although theory is fundamental, much of what needs to be explored relies on every-day experience and common sense.

Where do we start? Before addressing whether or not preservation technology is neutral, it is important to clarify some definitions, first differentiating technology in general from science and then locating technology somewhere within the broad spectrum of philosophical principles.

What are the differences between science and technology? Science is often said to pursue knowledge, while technology applies this knowledge in practice and in the production of artifacts. Before the Enlightenment this distinction was quite clear, but in contemporary science it has become blurred as the use of technology is embedded in almost all scientific inquiry. Both the observer effect and Heisenberg's uncertainty principle state the dilemma succinctly: it is impossible to know anything with absolute certainty because the devices that allow observation and measurement alter the object of inquiry and affect its true state. Nevertheless, as preservationists we distinguish ourselves as technologists who are more involved with the practical applications of theory than with the discovery of those theories. As stated by Mario Bunge, the philosopher and physicist, "Science elicits changes in order to know; technology knows in order to elicit changes."[1]

Philosophers do not agree where to locate technology with regard to their own standard classification system. There seem to be four possibilities:

Epistemological. This system treats technology as a form of knowledge. But how do we differentiate the type of knowledge unique to technology? What makes it different from scientific knowledge or other types of knowledge? Clearly technology consists of practical knowledge, of how we act, not our mere behavioral characteristics. Does technological knowledge have its own principles and, more important, is it determined by contemporary, socially set conventions that vary from one time frame to another?

Sociological. Contemporary culture is very aware of the sociological norms that determine our current situation. Can it be said that technology is the determinant for most of our contemporary life, as religion was for the Middle Ages? Is it the relationship with society that has determined the character of our current technology or vice versa or neither?

Anthropological. Is it the intrinsic nature of man that shapes technology? Are all of our human activities related to technology or only some of them?

Ontological. Finally, is an understanding of technology to be found only in an understanding of our own Being? Has modern technology captured all the space that surrounds us, so that we might think of ourselves as prisoners or victims of it or at least no longer in control of it and therefore of our own destinies? Can we even understand our own Being, or has technology blocked the path to discovery?

It is, perhaps, unneccessary to determine an answer for the locus of technology. But it is important to acknowledge that even philosophers do not agree on the fundamental placement of technology. I have to confess that my preference is for the last venue, ontology, and I will return to this later.

We now are ready to examine the first question, not yet qualified in our inquiry by the modifier *preservation*: "Is technology neutral?" What do we mean by *neutral?* We really mean *value neutral.* And now *value* must be defined. What sort of inherent values, if any, does technology possess? This is a fundamental question at the core of the whole discipline. There is no correct answer to this question, and even today philosophers have lined up on various sides of the issue. Let's take an example of a process used in preservation to illustrate the point of values: paint removal. To analyze the surface of a historic building that has been painted, many layers of paint that have been applied over the years must be removed. We select a product to do the job and execute it. There are two types of value questions that can be posed about the project just completed. The first and most obvious has to do with accomplishing of ends. Our end, or goal, was to remove the paint. How well did the process work? We apply a value judgment in order to answer this question. If it worked well, we say it was a good product and process. If the results were negative, we say it was a poor product or process. This sort of value judgment is quite easy to understand and to exercise.

But there is a second and more complex set of values that needs to be examined. This is the evaluation of the goodness of the end. This is the point at which we come to the gap between the *is* and the *ought* and the point where ontology, the study of our Being, comes into play. Most of us believe in the preservation of the self and of our fellow human beings. This belief in the perpetuation of our species, as well as ourselves, is, perhaps, the most urgent purpose that we can claim during our existence. Thus we acknowledge that we have at least one purpose, if not many. Classical philosophy teaches us that to have any purpose at all is a good in

itself. All but the nihilists and existentialists grasp with intuitive certainty that a purpose, no matter what it is, is infinitely better than any purposelessness of Being. We are the only creatures in nature who are concerned with and inquire about our own Being. Because Being is not indifferent toward itself, its difference from non-Being establishes the first and most basic value of all, the principle of the good-in-itself.[2]

Having gone through this rather dense line of reasoning to establish the ontological basis of being able to say whether or not certain things ought to be done, we are now ready to pose it with regard to the paint-removal enterprise. The ethical inquiry into the goodness of the end raises a number of ecological ethical issues. Did the products used have a high VOC content? Did the removal process strip any hazardous materials, such as lead, that may have been handled in an unsafe manner? If the answer to either of these questions was yes, then perhaps we violated some ethical principles. Even though the goal was successfully accomplished, ought we have done it this way in the first place? The paint-stripping product can be said to have some inherent values even before it was used: it is not neutral.

The scientist is interested in paint strippers from a knowledge basis only. His quest is simply to develop a product that effectively strips paint. He wants to know what causes the paint to separate from the substrate and become pliable enough so that it can be removed easily. He seeks the chemical and physical properties necessary to achieve this goal. Such a line of scientific inquiry contains no embedded value for the scientist; thus, the paint-stripping product and process are said to be neutral from a purely scientific point of view. For example, if both Product A and Product B were available to remove the paint and both did the job equally well, but Product A was far superior to Product B in terms of environmental impact, the scientist would not alter his opinion on efficacy because of this. However, we can say that many or most aspects of modern technology deal with products and methodologies that are loaded with values and therefore subject to judgment. But was this always the case? Or has it changed in modern times?

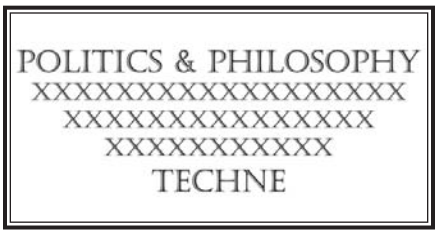

Fig. 6. Location of technology in hierarchy of human endeavor in Greek culture.

Certainly it was not always the case. Aristotle considered the question in his monumental work *Physics*.[3] He first distinguished between artificial and natural objects. In the latter case, the result of an acorn can only be an oak tree. The acorn is encoded to always produce the same result, time after time. Therefore, its properties are intrinsic. On the other hand, the oak tree may be cut into boards and used to make any one of a number of things. Thus, the properties of the oak tree itself are extrinsic; its products are not inherent to the oak tree but are imparted to it externally. If one plants an acorn, it is certain that an oak tree and only an oak tree will result. If one plants a piece of a bed, it is equally certain that a new bed will not sprout from the buried artifact.

Artificial objects result from a deliberate action that the Greeks called *techne*. These objects were produced to satisfy the necessities of life, such as food, shelter, and clothing, but they were not part of the scheme that the Greek philosophers promoted to celebrate the highest purposes of human endeavor. These highest forms of activity were considered to be politics and philosophy, in which order and perfect human nature are pursued for their own sake. It was the activities of techne performed by craftsmen that allowed the citizens of Greece the leisure to pursue these higher forms (Fig. 6). The objects produced by techne were means to an end; the pursuit of political and philosophical inquiry was an end in itself. Aristotle further stated that in the pursuit of politics and philosophy, contemplation was the highest form of human activity.[4]

Aristotle wrote about the production of an artifact in terms of techne, a process that was the result of four causes. Suppose that a Greek craftsman was making a pair of shoes. Using the commonly applied Latin translations of the four causes, we can say that the leather satisfies the Causa Materialis, the material from which the object is being created. The Causa Formalis dictates what the shoe will look like, notably its design or form. The maker of the shoe is said to fulfill the requirement of the Causa Efficiens as the creator or designer. And the Causa Finalis states the end purpose, or *telos*, of the technological enterprise — to protect the wearer's feet. Aristotle's definition of *cause* was not what we today associate with cause and effect. Rather by *cause* he meant how a thing came into being, how it could be brought out of concealment.

The Aristotelian view of technology can be summarized as an arrangement of tools, machines, material, and craftsmen that make possible the attainment of human ends. Technology was something to be implemented as simply as possible so that one could focus on the truly important further ends. Technology was therefore considered extrinsic to man's nature, its meaning ordered toward something else. If it had no meaning in itself, but was rather defined by this other and was completely activated by external and proximate forces, then it was a neutral phenomenon.

Thus, Aristotle developed a hierarchy of human endeavors in which technology appears in one of the lower positions. The goal of techne was to produce objects that were strictly instrumental to another, higher activity, an activity that provided the complete justification for the production of the object.

But we are no longer living in the Golden Age of Greece. Although Aristotle's conceptions were widely accepted for more than 2,000 years, his pyramid is now inverted, with techne achieving the top position (Fig. 7). This shift began with Francis Bacon and the philosophers of the early Enlightenment. Bacon started by stating simply that knowledge is power. And since the beginning of the Industrial Revolution at the start of the nineteenth century, we really have come to recognize that ours is a culture of means more than ends — or, at best, the means-ends relationships are completely blurred.

The very existence of modern technology is imbued with values. We cannot ignore their presence and say, as of old,

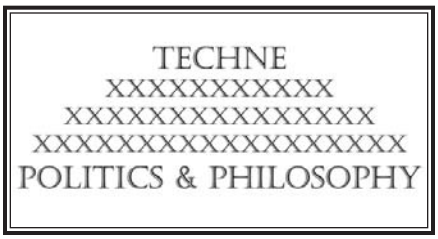

Fig. 7. Location of technology in hierarchy of human endeavor in twenty-first-century Western culture.

"technology, no matter how powerful, has no inherent value until it is employed and its potentialities realized." The great, oft-used example of this is the existence of our country's high-tech standing armies. Even if they were never used, by virtue of their very existence they possess an enormous value in establishing a power structure that can be used for any one of a number of causes, as we have so vividly seen in recent years.

An example from preservation will bring the discussion closer to home. Techniques called nondestructive evaluation (NDE) are used to peer into the insides of structures without disturbing them. Impulse radar, pulse velocity, impact echo, infrared thermography, magnetic detection, fiber optics, and real-time X-rays are the principal ones. The very existence of these technologies imparts a real value to them. Buildings no longer must remain unknowable, stolid monuments whose inner secrets are forever forbidden to diligent inquirers. These NDE technologies possess values simply by their existence, even before they are used. A good example of this value was the investigation at Fallingwater (Fig. 8). How much reinforcement had actually been installed in the concrete beams? It was evident from the rather acerbic correspondence among Frank Lloyd Wright, the contractor, and the owner that there was a dispute over the quantity of reinforcing bars, and work could not proceed until we knew exactly how many bars were in each beam. Chopping open the beams to look would have further weakened an already treacherous situation. Instead, by using impulse radar and magnetic detection a very accurate picture of the interior of the beams was developed without need for any destructive probes (Fig. 9). The project team knew of the ability of NDE before starting analysis, and these technologies therefore can be said to have possessed a value even before they were utilized. By the very existence of this technology the team could make a decision as to how to solve the problem, just as the very existence of a standing army influences a country's foreign and military policy.

There are nay-sayers to this approach, hard-liners who will maintain that technology is neutral until its actual application, no matter how sophisticated or elaborate or influential the process or artifact. They say it is the users who determine the value of technology, not the creators of it. You will have to make your own decision. But it is hard not to be haunted by Bainbridge's remark to Oppenheimer if we act precipitously.

The most eloquent statement of technology's transition from ancient to modern times was penned by Martin Heidegger in 1959 in his quintessential essay, "The Question Concerning Technology."[5] Heidegger is arguably the greatest philosopher of the twentieth century, while at the same time being one of its most reprehensible intellectuals. While I do not intend a diatribe about his political connections to the Nazi Party and the Third Reich, suffice it to say that he never stood up for or defended his non-Aryan colleagues, and although he did eventually quit the party, he never disavowed the goals of Nazi Germany. But let us confine our discussion to his work, which is unquestionably brilliant, although almost totally inaccessible.

Heidegger agreed that Aristotle had got it right when he described the four causes of an object coming out of concealment and being revealed. In Aristotle's time technology was indeed neutral. He then went on to say that although it was correct to consider technology neutral as it applied to handicrafts, when considering modern machine-driven technology, we had to go much deeper. Beginning with Aristotle's exposition of the production of an artifact as the process of bringing it out of concealment and then going through a semantic exploration of the word for revealing, Heidegger arrives at its relationship to the word for truth.

Then comes the statement that technology is actually a mode of revealing and ultimately of arriving at truth. But modern technology has in fact obscured our ability to get at this truth, and Heidegger finally implies that it blocks our ability to understand our own Being. In a brutal description he calls technology a challenging forth of our resources, a setting upon of nature. His beloved Rhine River has become nothing but a source for dammed-up power plants or a site for tour groups ordered up by the vacation industry. Indeed, even we humans have become nothing but standing reserve, merely one more item held at the ready for use by technology. Technology is no longer neutral in Heidegger's opinion but rather imbued with so many values as to suffocate our quest for understanding our own Being.

But Heidegger, after this terribly bleak examination of technology, offers the far-fetched notion that only art can save us from this all-consuming relationship that we have developed with technology. He quotes the poet Hölderlin in an effort to make his point:

> But where the danger is, grows
> The saving power also.

But we are left rather wilted after his scathing exposure of the power of modern technology, and the appeal to art falls flat.

What differences can we see in technology today from what it was prior to the Enlightenment? First, in earlier times, the actions taken under the name of techne were devoid of moral issues. The ancient Greek shoemaker was not concerned with obtaining dominion over nature. It was not possible to even conceive of such powers being granted to man. Today our all-consuming, ultimate goal is the constant need for self-validating advancements in technology. As we have seen and experienced, this colossal enterprise that we call technology is loaded with moral issues.

Second, items of ethical significance were between humans and did not involve the nonhuman element. Ethics were anthropocentric. Today we recognize that nature has rights of her own. The lines from Genesis 1:26-28 in which God creates humans and then proceeds to give them "dominion" or "rule" over all the earth, including the other living things, must be reinterpreted. We are

Fig. 8. Fallingwater, Bear Run, Pennsylvania. Courtesy of Robert Silman Associates.

Fig. 9. Fallingwater, using radar as a nondestructive evaluation technique to find reinforcing bars in concrete beams. Courtesy of Robert Silman Associates.

but stewards of the planet, not its conquerors.

Third, man as an entity was considered constant, not subject to reshaping by techne. In contemporary times we recognize that our essence is in a state of flux, always looking to be advanced or improved by the products of technology. If we cannot show constant progress, we think somehow we have failed in some way.

And finally, the consequences of human actions were immediate and proximate. In ancient times, even in the eighteenth century, a man could see the results of his actions immediately. The agent of the action and his object shared a common present. In modern times we often have no idea of the long-term effects of our deeds. We wield so much power that unintended results of our actions may be felt far into a future where we have no ability to predict the outcome. Furthermore, the results of our actions are often irreversible and cumulative, something unthinkable in past times.[6]

I hope that I have made a strong case for the distinction between classical and modern technology. Practitioners and consumers of contemporary technology must answer the question, "Is technology neutral?" Preservationists must go further and pose the issue specifically, "Is preservation technology neutral?"

I would answer both questions with a resouding no. To me it is quite clear that almost everything that I do every day, in both my personal and professional life, is loaded with predetermined meaning and value. Thus, almost every decision I make has some moral or ethical significance. And since I am an optimist and a strong believer in the preservation of our Being and our existence as beings, I question whether modern technology has impaired my ability to clearly understand the essence of my Being as a being.

Being (always capitalized) is that primordial condition, or ground, that allows everything else to come into existence. Heidegger called everything else — people, planets, flowers, jugs — beings (always with a small *b*), those entities that exist in the world. This difficult idea can be better understood through a comparison of Being with light. Without light, human vision would be impossible. Light is a necessary condition for seeing things. Likewise Being is the necessary condition for beings to exist. Without Being, without basic existence, no individual could exist. Also, just as one never actually sees light, but rather things lit by light, one never directly experiences Being, but rather beings which exist through Being."[7] Technically it is impossible to define *Being*, because one starts out by stating, "Being is . . ." As soon as you use the word *is*, you are trapped in a tautological snare. *Being* is a derivative word of *is*. Both words explain existence. You cannot use the same word to define itself. But if we let ourselves go and float a little above the world of semantics, we can pretty clearly understand what we mean by our Being. It is what allows our essence to come into existence and to flourish.[8]

I am not a Luddite, one who yearns for the simpler days before technology held sway. I am the strongest of advocates for using all of the latest technologies in both my private and professional lives. I cannot imagine not having a car or a computer or the techniques of NDE available. But having said that, I shudder to think of myself as a member of what Heidegger called the contemporary human race, the standing reserve. I certainly would like to have more control of my own destiny and, as a technologist, would like to act responsibly.

How can one do these things and still remain in the mainstream of contemporary life? I would return to the ontological urgency of understanding why we are here, what are our purposes. If preservation and evolutionary advancement of our Being surfaces to the top, then we must constantly ask ourselves the question "Ought I?" Our technological surroundings are not neutral. Preservationists need to constantly examine all decisions with the understanding that the technological means and methods at their disposal are preloaded with values, whether we like it or not. In developing and using modern technology, let us act as responsible stewards so that, as Gro Brundtland, the chair of the United

Nations World Commission on Environment and Development, said in a 1987 report, we may meet "the needs of the present without compromising the ability of future generations to meet their own needs."[9] This not only is a mantra of the sustainability movement but also needs to be applied to the broad spectrum of the use of technology in our modern world.

Other than my teaching efforts, I have not written a paper or given a public speech about this topic in more than nine years. The last time I was asked to speak about the philosophy of technology as it applies to the built environment, my audience was 500 engineers, planners, and contractors from the Swedish Road Builders Association, who had gathered for their annual convention in Göteborg, Sweden. I had the temerity to suggest that based on a theoretical analysis of the technologies involved in road building, roads were far from neutral and that perhaps new roads should not be built at all if we wished to do the environment a big favor. Needless to say, when I finished, there was a lukewarm round of applause, and at the coffee break immediately afterwards, I was totally shunned. Not a person came to speak with me or ask me a single question.

I hope that this paper will elicit a different response. After all, I am not asking readers to abandon their careers in preservation technology. I am only asking for the responsible application of technology. Let's make it part of the process to think about what we do before we do it. Let's try, as fairly as we can, to envision the outcome. Only then can we decide if we ought to do it.

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Notes

1. Mario Bunge, "Philosophical Inputs and Outputs of Technology," in *Philosophy of Technology,* ed. Robert C. Scharff and Val Dusek (Malden, Mass.: Blackwell Publishing, 2003), 173.

2. Hans Jonas, *The Imperative of Responsibility* (Chicago: Univ. of Chicago Press, 1984), 79–84.

3. Aristotle *Physics* book II, chapters 1–7.

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