An Implicit World View in Technology and Its Consequences for Contemporary Life

Kenneth Laine Ketner, BA, MA, PhD

The way in which technology is being used as the model for many of our thought patterns today requires urgent consideration, particularly for nursing, because background patterns of thinking that are commonly accepted in our present health care culture have tremendous implications for nursing research and the facilitation of a nurse's desire to promote health.

W e are aware of the benefits of studying and critiquing cultures other than our own. However, it is also one of our central duties to direct our powers of analysis toward our own culture. There is a complaint that this is impossible because, it is said, each of us is in a biased or interested position with regard to our own society. Yet perhaps you will agree that such a remark has little power, because as scientists the best we can do in any case is to develop hypotheses that are more or less confirmed. Furthermore, to flinch from studying our own culture would be a failure of nerve, not to mention the loss of an opportunity to face many serious problems through use of the resources of the scientific attitude.

When we begin to look at ourselves, we can identify several themes in our culture in need of such study. One theme that strikes me as requiring urgent consideration is the way in which technology is serving as the model for our thought patterns on a rather wide front. "Why is he raising such an issue in *Nursing Outlook?*" an objecting obliger asks. "Heck, he's not even a nurse," some others are thinking. I can only hope that after you digest this article you will be ready to respond to those factors for yourself.

> To flinch from studying our own culture would be a failure of nerve, not to mention the loss of an opportunity to face many serious problems through use of the resources of the scientific attitude.

My general thesis is that background patterns of thinking that are commonly accepted in our present health care culture have tremendous implications for nursing research and the facilitation of a nurse's noble desire to promote health. I will attempt to make this general claim plausible by briefly presenting one aspect of this picture, that is, some of the ways in which technological thought patterns dominate us, often unconsciously.

My reader is probably now thinking, "Get ready, he's going to bash technology"; however, I am not going to do that. I actually like technology. I practice it myself and enjoy its benefits. As the maxim says, technology alone is neither bad nor good, but its uses can be bad or good. Let us agree to adopt this maxim as a provisional, if somewhat vague, guide. In a parallel manner, I want to consider not technology as such but the thought patterns associated with it in our culture. There are good uses of those patterns, but what I shall describe are bad uses of technologically inspired thought patterns, namely, their uncritical adoption or employment in areas of human endeavor where their relevance is doubtful, to say the least. I am going to bash such bad uses of technological thought patterns. My aim, I should also add, is not to give you conclusive answers to these problems, but to put these issues before you.

TECHNOLOGICALLY INSPIRED THOUGHT PATTERNS

Specialization principle
One of the most distinctive features of technological life is the way in which division of labor occurs: A problem is broken into parts, and the parts into parts, and so on. We encounter an uncritical assumption if this aspect of the technological frame of mind is stretched to make the claim that ever-increasing divisions of labor or specializations should be used to

solve any problem or deal with any difficulty. Is this a wise way to attack *every* problem? This question is not addressed if, as is now commonly done, it is uncritically assumed that this approach *is* the one to be used in all cases.

The specialization principle brings me to a short digression concerning the practice of regarding hypotheses as facts, which is clearly associated with the general syndrome I am tracing. This practice is general enough to deserve a special name: the "fallacy of hypothesis/fact confusion." The aforementioned specialization principle, as it is typically deployed, is a good example of the fallacy of hypothesis/fact confusion. Other points to follow will also provide good examples of this phenomenon.

Narrowly confined research environments

Closely related to the specialization principle is the practice of working within narrowly confined research environments. Often these environments are closed systems or something very similar. One cannot deny that this practice has brought some fine results; the problem occurs when we assume that this practice ought to be applied to problems in all cases. Perhaps it should be applied to problems in all cases, but that is a hypothesis, not a fact. Indeed, there may be cases for which it is impossible to apply this practice, which is to say, we might at some point want to study some nonclosed systems. After all, the head bone really is connected to the neck bone; that is to say, connections, or relations—as opposed to separations or isolations—might be useful considerations in research.

Connections, or relations— as opposed to separations or isolations—might be useful considerations in research.

Control principle

The third feature, which I call the control principle, states (quite correctly, it seems to me) that the purpose of technology is control. The problem arises when the technological frame of mind is applied in areas in which its deployment or relevance is doubtful. The social sciences, among which I include nursing, provide a won-

derful example. The social engineering approach, as it has been called, is precisely the belief (essentially a technological one) that the aim of social science is, or ought to be, the control of some aspect of social life or even of an entire population.

Control, of course, always has an end in view. We have not done very well as a culture in asking ourselves whether, even though we can arrange the control factors, we should go ahead and do so without examining in detail the end of that control. For example, a bridge is, among other things, a new control over some aspect of the landscape. There are things we can do when we have a bridge that we couldn't do before we had one. Should we build that bridge simply because we *can* build it and someone will pay us to do so? The common answer is like the one presented by the National Rifle Association—"Gun makers just manufacture and sell guns, they don't use them criminally." Perhaps we should consider the system aspect of such a situation. A manufacturer doesn't just construct an item for the use of a particular private citizen; the very act of manufacturing the item is in effect a change in nature, which is a change in that which is common to all of us in this particular neighborhood. New potentials are present that did not exist before the manufacture and widespread possession of the item, and these new potentials could possibly affect us all as a community. Considering topics in health can be particularly interesting once one realizes that communities are involved. Communities are more than lists of individuals—system aspects must be considered as well.

An excellent example to use in thinking about this issue is the matter of second-hand cigarette smoke. A cigarette manufacturer might state, "We just manufacture cigarettes for those who freely choose to smoke them." We are beginning to see that this statement is inappropriate, because nonsmokers are adversely affected by the presence of cigarettes in the world. The same could be said of non-gun-owners and guns. The system aspect should be considered for many kinds of manufacture associated with health problems or environmental matters.

A recent issue of *Life* magazine concerning the proposed terraformation of Mars helps explain my point. Terraformation is the creation of a place on a planet other

than our own where organized human life can exist; this is achieved by inducing a breathable atmosphere from the planet's own resources, introducing and evolving appropriate plants and animals and habitat, and so forth. It would be what one could call astronomical engineering—technology on a grand scale. The entire operation would need to be very carefully planned over many decades to ensure the

---

To act without examining the ends and consequences of technology in terms of the common interest and good would be to engage in the uncritical application of bad technological modes of thought.

---

common good and health of the new Martians. It would be necessary to ponder carefully the potential of each technological step for the common good or common ill to avoid upsetting the delicate systemic process of terraformation. Here we see that the principle advocated by the National Rifle Association would be seriously out of place. Thinking about the terraformation of Mars might have the curious result of teaching us how as a community to stop ruining, through bad use of technology, the *one* planet we know to have already been terraformed! To act without examining the ends and consequences of technology in terms of the common interest and good would be to engage in the uncritical application of those bad technological modes of thought to which I want to call to your attention. This probably means that our provisional principle—a policy of no restriction upon manufacture—might require additional scrutiny with these thoughts about systems in mind.

Causation principle

Closely related to the topic of control is an assumption that I call the causation principle, which is rather widespread among those with a technological mindset. To have control, a causal environment is required, in which events are effects that can be controlled if one but understands the causes of those effects. Here again the

hypothesis/fact fallacy comes into play. In such instances many researchers simply assume as a fact what is obviously a hypothesis: namely, that the phenomena one desires to study throughout all science can be reached only through allegiance to the entire world view encapsulated in what I am calling the causation principle. Historically and perhaps psychologically, adoption of the principle of exclusive allegiance to causal styles of explanation has been encouraged by successes in technology. Recent research, however, strongly suggests that many phenomena of interest to science cannot be studied successfully on the basis of this hypothesis. I have space for only a cursory outline of this point. Inasmuch as these new findings in logic appear to be especially relevant to prominent social phenomena, and in particular to some prominent topics in nursing, perhaps we should organize a workshop on the matter.

In the late nineteenth century, Charles Peirce[1] advanced a claim that triadic relations are not reducible to relations that are exclusively dyadic. The hypothesis was independently rediscovered by Walker Percy about the year 1950. (Percy was one of those physicians who evolved into a great novelist.[2]) Because the hypothesis was independently rediscovered by Percy after it was discovered by Peirce, I like to refer to it as the Peirce/Percy principle. Recently, at the highest level of mathematical rigor, Robert Burch[3] showed conclusively that the principle is correct. Because of what is, I suspect, a close relevance between Burch's breakthrough findings and research topics in nursing, I hope one or more nurse-mathematician/logicians will become familiar with this book and pursue its connections to nursing topics. An account of the matter that is accessible to nonlogicians and nonmathematicians appeared in late 1995.[4]

If one considers that much of the phenomena one wishes to study, for instance in nursing, are triadic in their relational nature, then we can see why the vindication of the Peirce/Percy principle by Burch shows that an unconscious and uncritical application of technological modes of thought (specifically the principle of causation) to such phenomena will lead us nowhere as scientists.

This line of thinking is not limited to the social sciences. For example, the field of artificial intelligence has until recently

been dominated by a strict allegiance to the causation principle. Intelligence, of course, requires communication, and communication is not a causal process but a triadic relation between some transmitter (or object of communication) through some medium (or mode of representation of the object) to some receiver (or interpreter of the representation of the object). Thus attempts to consider all aspects of intelligence in terms of the unconscious hypotheses of the technological mind-set has led artificial intelligence away from its goals until recently, when researchers began to abandon their exclusive and unconscious allegiance to the causation principle. The work of Peirce, Percy, Burch, and their associates will have many important consequences in these and other areas in the future. Within nursing, whenever a researcher discusses relations, it is likely that this new breakthrough will be relevant. Another example is that Benner's[5] discussion of expert status might be supplemented and extended when considered alongside these new findings about the logic of relations. As I said, we need to have a conference on these developments as they pertain to issues in nursing.

Science and technology

We have not yet come to the most damaging aspect of the uncritical use of the technological mind-set, that is, the widespread notion that science is identical to technology. If this is coupled with another widely

---

An unfortunate consequence of the unfounded equation of science and technology is the notion that some study—say nursing—will not be a science until it acquires a technology.

---

held notion, that science can solve all our problems, it follows that people with this mind-set will conclude that technology can solve all our problems.

First of all, science is not equivalent to technology. Briefly, science is the will to learn the truth by following a method in which one makes guesses about what is true and then subjects these guesses to public

tests while being equally eager for confirmation or disconfirmation of the guess. In other words, science is an attitude and a general method, not a specific technique that is memorized and then simply mechanically (hence dyadically) applied over and over again. Consider it this way: Science discovers, while technology applies. If science and technology were equivalent, this rather large difference would not exist. An unfortunate consequence of the unfounded equation of science and technology is the notion that some study—say nursing—will not be a science until it acquires a technology. Some nurses are desperately seeking a technology by way of recipe-like uses of statistics, to name one example. But if you will allow a friendly outsider to make an observation, that is throwing a new-bloomed rose in the trash. This notion is also reflected in the widespread but highly misleading distinction between hard and soft sciences, with the hard sciences considered to be those with technologies. In reality, the hard sciences are those that study the more complex and recalcitrant phenomena; nursing, or the social sciences, for example. But hard or soft, the aim of all science is not to make some application or effect some preconceived change or end in the world but to learn the truth. In health matters, once we have the truth, applications will come naturally through our human instincts, a process so well illustrated in the life of figures like Nightingale or Wald.

If these attitudes are coupled with the aforementioned notion that technology can solve all our problems, then even our economic development may come to be dominated by technological modes of thought. For example, when a region is depressed financially, we as a society often respond uncritically by seeking an influx of industry or a research program to design new technologies that can be manufactured locally, or we bring in another imaging center for our hospital district. In short, even our political and economic horizons may be in the grip of a false technological mind-set. Such a mind-set is obviously wrong as an all-encompassing economic and political program. If it were correct, we would find New York City shutting down the Broadway district and replacing it with light manufacturing, art museums being forcibly converted to microchip factories, and

schools of music and concert halls required to become warehouses for laboratory glass. Of course, this is not happening, because nontechnological enterprises make many distinguished contributions to our economy.

Neglect of instinct

The final point I shall mention is what I call the neglect of instinct by the technological mind-set. This is perhaps best presented through a clear example used by Peirce. Imagine that you are walking in your neighborhood about dusk, and as you are returning to your home, you hear your mother screaming that she is being attacked by a villain. Would you stop to consider how her thought can lead to sound being produced by her voice box and how those sound waves can pass through the air, strike your ear, causally and statistically affect your nervous system, and eventually lead to the thought that this is your mother's cry and that she actually is in danger? If we stopped to conclude all these matters scientifically or technologically, we would not have time to act in such cases. It is well known that science takes time, sometimes millennia, to reach a correct or nearly correct result. Meanwhile, we must live and act. If we live under the false assumption that science/technology is equivalent to rationality or that it provides the means for living rationally, then the technological mind-set brings us to the strange point of denying or neglecting significant chunks of our humanness. It brings us to the strange point of making scientists/technologists the new high priests of our culture. They are like a memorable character in one of Percy's stories, who was understood to be an exceptionally great astronomer, who pursued his astronomical researches almost 24 hours a day for about a month on an isolated Olympian peak and then descended to his family for 2 days, during which he had bestially voracious sex with his wife and attended a couple of little league games with his son, only to return to the mountaintop on the

---

In health matters, once we have the truth, applications will come naturally through our human instincts, a process so well illustrated in the life of figures like Nightingale or Wald.

---

third day, where the cycle resumed.

Should it be surprising that some of the brightest and best young nurses "burn out"? Is this life? Are we leaving something out? It is strange that the continuing growth of the technological mind-set in our culture has brought us to ask such questions seriously, not humorously.

SUMMARY

To summarize, when the technological way of thinking is taken to the extreme it becomes a world view that is associated with a particular danger, in that it is not taken by its proponents as one of many competing world views but is considered uncritically to be a fact, not a hypothesis. Through a series of applications of the fallacy of hypothesis/fact confusion and through uncritical use of the technological frame of mind, one can inevitably become committed to an overarching physicalism, materialism, mechanicalism, and determinism, perhaps without even knowing that one has such afflictions.

My own discipline, philosophy, which I regard as a science in the broad sense previously mentioned, has not escaped being captured by this technological mind-set, much to its detriment. I refer readers who are interested in the plight of philosophy in this age to the works of Hilary Putnam,[6] Bruce Wilshire,[7] Ludwig Wittgenstein,[8] or Charles Peirce.[9] I take this step because I am not a machine, and if I didn't stop now, I would feel guilty about taking too much of your time. ∎

REFERENCES

1. Peirce CS. On a new list of categories. Proc Am Acad Arts Sciences 1868;7:261-87.
2. Percy W. The Delta factor. In: The message in the bottle. New York: Farrar, Straus and Giroux, 1975:3-45.
3. Burch RW. A Peircean reduction thesis: the foundations of topological logic. Lubbock: Texas Tech University Press, 1991.
4. Samway P, editor. A thief of Peirce: the letters of Kenneth Laine Ketner and Walker Percy. Jackson: University Press of Mississippi, 1995.
5. Benner P. From novice to expert: excellence and power in clinical nursing. Amsterdam: Addison-Wesley, 1984.
6. Putnam H. Renewing philosophy. Cambridge: Harvard University Press, 1992.
7. Wilshire B. The moral collapse of the university: professionalism, purity, and alienation. Albany: State University of New York Press, 1989.
8. Bouwsma OK. Ludwig Wittgenstein: Conversations 1949-1951. Craft JL, Hustwit RE, editors. Indianapolis: Hackett Publishing Company, 1989.
9. Peirce CS. Cambridge conferences lectures. In: Ketner KL, editor. Reasoning and the logic of things. Cambridge: Harvard University Press, 1992.

KENNETH LAINE KETNER is an adjunct professor of humanities at the School of Nursing, Texas Tech University, Lubbock.

Write!

Send letters concerning *Nursing Outlook* to the Editor:

Carole A. Anderson, PhD, RN, FAAN
College of Nursing
The Ohio State University
1585 Neil Avenue
Columbus, OH 43210

Letters may be edited for length.

Nursing Outlook®

The Official Journal of the American Academy of Nursing

TABLE OF CONTENTS