Chapter V
A Theoretical Heuristic:
Technological Forms & their Relationship with Ecological Communication

In the preceding chapters I have engaged mostly with a very narrow range of
academic interventions in the theorization of EC, let’s say the formulations of Bateson
and Luhmann, presently I turn my focus to a broad range of academic, populist, and
journalistic sources in order to examine possible and actual relationships that
technological forms have with ecological communication. As such, let me begin this
chapter with a short historical reference to Mahatma Gandhi, who has been held in high
esteem by a variety of constituencies for a number of reasons: one of which has to do
with his resistance against industrialization and modern technology (coupled with his
promotion of traditional technologies).

A brief sketch of Gandhi’s position as a critic of modern technology shall lead us
to a more structured exploration and theorization of technology’s relationship with
ecological communication. Wherefore, I would like to suggest that Gandhi’s resistance
to modern technology and industrialism was marked by what one could call a
universalistic humanism, but it was also highly contextual—rooted in the larger
opposition of British colonialism and a drive toward Indian nationalism, cultural revival,
and economic and intellectual autonomy. And, perhaps because of these contextual
demands, counterpoised by his equally strong preference for civil disobedience and non-
cooperation over violent reaction, Gandhi let himself be paradoxical rather than purist
even in this resistance. For example, he chose to utilize the railways—another modern
technology—to spread the word across the subcontinent against British colonialism, a
factor that has also been registered by the historians.

I would like to suggest further, however, that there were even more dimensions to
Gandhi’s personality than what our historians have unfurled to date: in that I could not
locate any focused inquiry into his facility with the mass media or the global media of the
time, despite an overwhelming evidence to that effect. Based upon my own feel of the
history, I can assure you that he was—much to the detriment of the British—both media-
savvy and peculiarly mediagenic. So, on one hand, Gandhi the-technology-critic
responded to the modern media with alacrity and utilized the railways for the purpose of
political mobilization; on the other hand, Gandhi the-popular-folksy-icon, grasped well the communicative possibilities and limitations of a society that was overwhelmingly oral and illiterate. It speaks to the heart of the issue at hand that, given all the above complexities, Gandhi chose a piece of technology—the spinning-wheel—to serve as a central political symbol. This choice assumes significance particularly in light of the fact that Gandhi’s politics as well as world-view retained an overall ecological ethic that underpinned his cherished goals of rural self-sufficiency and general economic prudence.

1. TECHNOLOGY AS A COMMUNICATIVE ENTITY

There are several theoretically-potent leads for us in the above historical reference; and, it would not be wrong to guess that they would have less to do with Gandhi’s political genius than with the implications of the spinning wheel! At the broadest level, the story of Gandhi’s spinning wheel is about the communicatively strategic and successful placement of a fairly mundane tool—which in itself was not part of any informational infrastructure by any means—within an asymmetric or imperfect info-sphere. Of course Gandhi is to credit for this placement, whereby one could speculate about why he chose the spinning wheel instead of any other tool, or even why he chose a piece of technology rather than yet another non-technological icon (knowing that he had put together an entire cultural iconography that was both politically innovative and anti-colonial). However, what interests me is to reverse this usual line of questioning—not just with respect to the above reference, but even generally—and move forward, for example, as follows: Whatever made the spinning wheel suitable to the sort of symbolic usage that Gandhi apparently put it to? Could there have been factors specific to this technology, albeit within its specific historical and cultural context, that made it score over others for that usage? Could a traditional (Indian) scientific theory, idea, or axiom have done just as well for the apparent and avowed purposes of Gandhi?

This deliberate turn in thinking—from the media-savvy and mediagenic politician to the tool of his choice—allows me to explore the general possibility, and propose the hypothesis, that technologies may: themselves command communicative agency; vary in the degrees to which they invite public or mass communication about themselves; and be indifferent, amenable, or vulnerable, to particular kinds of communication more than
others. Incidentally, this set of considerations is not of the same order as the relatively recently conventionalized dicta—especially in communication and literary theories—that “medium is the message” and “form is content.” Those dicta have typically emerged from, and are applied to, critical studies of media technologies or textual forms. Such studies typically demonstrate that these technologies—including literary forms—influence the content of their communication to the extent that they themselves become or constitute “the message.” Clearly, these studies have restricted their foci to communication technologies (whereas the scholarship on textual forms can be understood as its literary or linguistic dimension); moreover, they have rarely included the ecological in their considerations.

Both my objective and analytical framework differ from the above in that I do not plan to: scrutinize the social roles of informational or communication technologies (although they come into the picture briefly as one component); create an outline for the different kinds of communications there may be about technologies; or, focus on the theme of “technology and literary or cultural symbolism.” In place of all of the above equally legitimate alternatives for intellectual inquiry, I propose to make good on claims that: (1) to varying degrees, technologies assume, acquire, or assert roles for themselves that have discernible ecological (or environmental) import within a given communicative traffic; and that (2) behind that dynamics lie some general socio-epistemic principles that are identifiable. For example, Gandhi would not have been able to produce the same communicative results had he chosen the gun—or even something as obviously non-violent as the typewriter—instead of the spinning-wheel, for his peculiarly well-rounded political symbolizing. Those technologies would have clearly resisted, even failed, at least some of the various objectives of his overall communicative agenda: They certainly would not have lent themselves wholesale to the sort of eco-pacifist politics he otherwise practiced and pronounced. In other words, inasmuch as Gandhi brought the spinning-wheel into the orbit of his political semiotics, the tool itself was less than indifferent, and certainly not hostile, to its ecological ring: It was, in fact, positively disposed toward it as far as what ecology meant to the Indian society of that time.

On a higher level of comparison, we are also alerted here to the possibility that technology may differ generically from science in how it relates to the (ecologically-
sensitive) info-sphere: given that Gandhi did not lift any scientific theory or sutra from ancient or contemporary India for his communicative purposes (which he could have). Even if Gandhi had used a scientific theory—or principle—for his communicative purposes, he probably would have produced different results with the public because of the differential between the formative and interactive aspects of science versus technology in reference to (eco)communication. (A contrasting historical example is readily available in Hitler’s use of certain Darwinian principles to his own communicative ends.) This prospect adds at least two preliminary levels to our consideration: (1) whether and how technology differs from science in its communicative status within the info-sphere; and, (2) whether and how technologies differ among themselves as they relate to the ecological edge of the info-sphere—and how one may go about conceptualizing those differences.

The relevance of these theoretical deliberations to technology policy requires only a brief explanation. While few could logically argue that we could or should produce media-savvy technologies, fewer still are likely to disagree that we would be better-off with media-savvy technologists on hand. But, I believe that this savoir-faire on the part of the technologist cannot be restricted merely to whether he or she knows the media well: it should be extended to include a philosophical understanding of technology’s generalized relationship with the info-sphere (especially the media). I move toward articulating such a philosophical framework with the hope that the intended extension to the technologist’s savoir-faire would also retain its ecological obverse. What I mean is that developing our understanding of technology’s relationship with the media, especially environmental media, should not stop at merely improving our skills as “public relations officers” within the realm of technology policy; instead, it should go on to make us more eco-savvy as well.

2. TECHNOLOGY AS AN ECO-COMMUNICATIVE ENTITY:
TERMS OF INTEREST

Let me first define the three terms that are of central interest to us for what is to follow. For the sake of analytical focus, I restrict communication to refer to mass or public communication, especially as made possible by modern media. By ecological
communication, I mean to refer to (mass or public) communication whose immediate and vital focus is a non-human biospheric entity or phenomenon (or a set or sets thereof) that may or may not have a direct or indirect relevance to immediate or long-term human interests. While this definition precludes the majority of immediately human-interest media-coverage or public communication—such as news or literatures about politics, sports, the market, and so forth—it does not preclude those news or communicational items that are directly about an environmental issue that nevertheless has immediate and demonstrable consequences for any human populations.

As for technology, I restrict it to refer to mechanized and non-mechanized, metallic and non-metallic, hardware: i.e., to “solid” technologies. Generally, I do consider other relatively liberal definitions of technology—such as discourse-as-technology—useful and eye-opening, but they are certain to broaden our current scope beyond utility. To the extent that communication per se is the other end of my range of focus, accepting discourse (which essentially refers to specialized communication) as technology is simply not a fruitful analytical option.

But for different reasons, I also refuse to admit computer software as a technology: I believe that software is an independent, perhaps the latest, dimension of our intellectual existence—after technology, mathematics, and science! (In fact, I like to think of software as comparable to plasma, past solid, liquid, and gas.) Fortunately, conventional academic inclusion of software designing within the departments of computer science—a classification I disagree with otherwise—also effectively exonerates my own exclusion of software (development) from technology.

In defining technology for my present theorizing, I would also like to alert ourselves to the communicative distinctions among technology, human dereliction of duty, and substances: whereas news about an oil-spill does not automatically qualify to tell us about a technology’s general relationship to the media or public communication. Similarly, mercury pollution in itself does not qualify to fall within our current focus—until and unless it is traced to the prevalence of a particular technology, such as the mercury thermometer.

3. WHY SCIENCE-TECHNOLOGY DIFFERENTIAL MATTERS
Irrespective of my above definitions—which will slant my observations to a
degree—not many are likely to disagree if I say that technology differs from science in
that it affects people far more directly and concretely. Unlike science, technology is
something that can be touched and watched, which asserts itself against its surroundings
even in its idle state, and which makes itself audibly and/or visually unavoidable in most
situations.¹ For the foregoing reasons, technology is by default a socially interactive and
perceptual phenomenon with a stronger and more definitive ontological presence than
science. Even those technologies that are clearly used as means of knowledge (i.e.,
epistemologically)—such as telescopes, microscopes, communicative devices, or
laboratory instruments—have to be routinely encountered, maintained, or be kept “out-
of-the-way” as actual physical objects (ontologically).

By contrast, science exists in terms of (empirically verifiable and/or rationally
theorized) ideas and techniques of natural inquiry, controlled and replicable laboratory
performances, specialized institutional and individual memories, and published texts.
While science, like any other cognitive enterprise, has to depend on material contexts and
infrastructures both for its functioning and application, it in itself is abstract knowledge
abstracted from—and applied to conduct further—contextual and systematic inquiries
into nature.² One could argue, with a fair amount of analytical legitimacy, that science is
a matter of symbols, numbers, diagrams, and words once outside the laboratory or
observational field: but the same cannot be said about technology. Technology cannot
afford to be just, or even mainly, empirically verifiable “rhetoric” under any
circumstances—nor does it need to. Accordingly, one could inflate or deflate a
technology as communication only up to a point; beyond that, it has to exist and perform
tangibly within the public sphere.

This abstractionist, processual, and “notional” portrayal of science does not take
away anything from its influence on, or relationship to, humans: but it perhaps help us
understand how that influence or relationship must differ communicatively from
technology’s. Because science typically cannot manifest itself as manufactured physical
mechanisms, it must depend—to a much greater extent, and in qualitatively different
ways, than technology—on scholarly and popular media to gain recognition within both
specialized and lay communities. While science gets far less space than do other kinds of
news in mainstream press, most adults depend precisely on that news to perceive it. Not so with technology. People (can) not only read and hear about technologies, they (can) also see them in action and ascertain their utilities and limitations for themselves on a local or individual level (or at least believe they can). This civic aspect of technology is further reflected in the routine industrial investments into, and publicity about, making technologies more “user-friendly” or developing better user-interfaces. No such parallel quite exists within the realm of science. Hence, while we may find books such as “Biology for Dummies”—a purely communicative exercise—we are unlikely to hear about a user-friendly biology. In short, science, unlike technology, seems neither to possess nor need a truly civic concept of user-interface.

The implications of the above discussion on the communicative differential between science-technology can be put as under: (1) Science is more dependent than technology on public communication, especially the media, for its sheer presence: which also means that the probability of its being distorted, miscommunicated, or ideologically hijacked are greater; (2) Technologies have more leverage with the people than science by virtue of their direct and tangible presences among them, and are therefore less dependent on media; (3) But, technologies are more open to the media by default, and are generally more vulnerable to the public gaze as such; and, in light of the foregoing observations, (4) Technologies must constantly balance their “public leverage”—enshrined in their direct and tangible presences—with the countervailing factors of dependence on, and vulnerability to, the media, the info-sphere, the noosphere, and even—to use a term that Arjun Appadurai introduces—ideoscapes.³

Acknowledging the above points of differences between science and technology is an important analytical step in developing an eco-communicative view of technology that the academic disciplines of both “mass communication” and “environmental studies” have so far neglected.⁴ While there is enough research on science communication or “science and the media,” I cannot think of a comparable volume or quality of research explicitly or restrictively devoted to “technology communication.”⁵

Relatively recently, communication theorists and science and technology analysts have invested in identifying genres of specialized communication—such as risk, hazard, and disaster communications—but well within a general science communication
framework. The focus there displays enhanced scholarly appreciation for (or attention toward) the nuances of *outcomes*, whereas “science” and “technology” are allowed to get mixed up on a phenomenological level: without any explicit rationale. This negligence can perhaps be traced to the prevalence of a theoretical paradigm within communication studies that hinges upon the narrow equation between “the communicator” (typically scientists, technocrats, journalists, and other outspoken humans on a given issue) and “the communicant” (typically viewers, readers, or audience at large), *at the expense of* a generic focus on the epistemological nature of “the communicated” (i.e., whether it is a science issue or a technology issue or their specific mix).⁶

Furthermore, even economic theory has not invested itself systematically into linking technology, ecology, and communication (or media).⁷ Political, cultural, and literary studies (especially semiotics) seem to have made isolated advances linking those three elements in individual analytical projects—but not with articulate attentiveness to the ontologically-commanded communicative agency of technology and the relevance of the science/technology differential on the philosophical level.⁸

4. **HOW TO APPROACH TECHNOLOGY ECO-COMMUNICATIVELY**

Conventional generic classifications of technology can go only so far in helping us with its eco-communicative profiling. That is because technologies can (help) produce progressively similar or divergent eco-communicative results—or lend themselves to qualitatively different kinds of communications and not others: *irrespective of their specific functional identity*. For example, Gandhi could have used a technology *generically* very different from the spinning-wheel (a textiles technology)—such as the bullock-cart (a transportation technology)—while still being able to have retained most, if not all, of the content of his eco-political message. The hypothetical replacement of a textiles technology with a transportation technology makes only that much of an eco-communicative difference in the above case.

Targeting *individual* technological forms as a way to go beyond conventional *generic* classifications also would not work—for two reasons. One, individual technological forms multiply by the day on the unitary level, just as they disappear through the passage of time; and two, the prospect of examining each and every available
technological form and then establishing its relationship to environmental communication
or media asks for unreasonably large numerical accounting.

A possible way out of both the above problems—i.e., conventional generic
classifications and focus on individual technological forms—may well be to research
media outlets scrupulously, document their internal ecological references to technologies
(based upon an established definitional criterion), compile their statistical record, and
then articulate the underlying eco-communicative trends and principles. But, that is the
project that I must leave for the ambitious and diligent empiricist—preferably from the
discipline of economics or sociology: It would not only be a legitimate project, but also a
very desirable one.

What I have chosen to do, by contrast, is to conceptualize technological forms’
relationship with ecological communication theoretically, based upon my own direct
observation of technology’s place in global society on one hand, and my survey and audit
of relevant empirical and theoretical literatures and journalistic trends. On the basis of
the above, I offer a prototypical classification of technology from the perspective of
ecological communication rather than from the conventional angles of functionality,
utility, economic value, design, and efficiency. I do use older categories when needed,
but reinterpret them in accordance with the eco-communicative principles that I establish.
Let this compromise also indicate that I do not necessarily negate the older,
commonsensical view of technology as a tool: I only reject it for my eco-communicative
profiling because it downplays technology’s overall ontological presence by reinforcing it
as a mere means for humans to do something (else).

Resistance to the claim that technologies (can) command any agency other than
that vested in them by their designers, engineers, and manufacturers persists despite
overwhelming research to support that claim. By now I am convinced that that resistance
is rooted in a psychology of anthropocentric denial: Most humans feel too insecure
letting go of the fantasy that they are in ultimate control of their own inventions. That
said, I do not support the idea that technologies are or can be autonomous (even when
they go out-of-control), or that they have some mysterious essence (as many an
unsympathetic interpreter of Martin Heidegger seems to suggest). My premise here is
only that technology commands (eco)communicative agency owing to its ontological presence and tangible status within the interactive space.

5. **A SPATIAL VIEW OF TECHNOLOGY: PHYSICAL PRESENCE; CIVIC REFERENCE; LOCAL SYSTEMS OF SIGNIFICATIONS**

Let me propose to reconsider technology as a solid artifact designed presumably to command manipulation: through the occupation of a physical and/or civic space; within a physical and/or civic space; but, in reference to both physical and civic spaces (whereas, even the manipulations of a Mars Polar Lander are to be referred to the civic space on earth). Because they must carry out spatial mandates spatially that cannot completely bypass the overall civic reference, technologies by default must contend with their “given” manipulative and interactive roles (or sets thereof) within local systems of significations (or meaningful relations) as well.¹¹

As the reader must note, the three concepts that assume centrality in my proposed view of technology are: physical presence; civic reference; and local system of significations. The first refers to the unavoidability for technology to present itself physically, and in physical space, especially in order to be operational; the second refers to the customary clause for any and all operative technologies to present themselves to the human habitat by whatever means; and, the third refers to any local social arena. For being simultaneously physical and civic, a local system of significations is typically also: a living ecology in its own right; a socio-economic framework; and, a cognitive setting that ironically inheres its own general sense of what must count as (1) ecology; and (2) nature.¹²

Most probable scenarios mandate technology to activate its civic reference through its physical presence within a given system of significations in order to be functional. But, in other scenarios, and/or to varying degrees, as also depending on its specific form, technology may have to activate its civic reference despite its physical presence; or, it must actively pursue its civic reference because of its physical absence from the system(s) of significations it is designed to influence. This suggested measure of dislocation between a technology’s physical presence and its civic reference generates
communicative and eco-communicative possibilities—but well within local systems of significations.

The above formulations allow me to pose the following prototypical questions for my subsequent theorizing: Left to itself, how would a (genre of) technology appear or relate to a given info-sphere and/or media environment? What factors might affect the dynamics of that process? Can we outline those factors theoretically and reclassify a technology in light of the sort of (media or communicative) attention or neglect it aspires, or manages, to court or avoid? For a preliminary demonstration of where this line of inquiry may lead, let me briefly reminisce a distinction that Ashis Nandy makes between what he calls “modern” and “traditional” technologies. Nandy argues that, in contrast from modern technology, traditional technology “represents a form of technology that is embedded in the cultural psychology and psycho-ecology of a community,” whereas, “[w]hat identifies it is not merely its technical content but the beliefs, values, symbols and myths associated with it.”13 I would like to clarify Nandy’s distinction by mentioning that modern technology is not symbol-free; but, unlike traditional technology, it brings with it its own symbolism that is not so much as community-specific as generalized and massified. For all that, modern technology perhaps has more to introduce or prescribe to a locality in the name of symbolism, but less to represent a locality through it. Nandy’s distinction can be used to demonstrate a basic eco-communicative explanation. Wherefore, to the extent that developing traditional technologies asks for more ingenuity than either sophistication or resources, it is easier to command and distribute the skills necessary to reproduce, maintain, and use them compared to those for modern technologies. On that premise, traditional technologies have: a more equitable producer-user ratio; smaller probability of implementation or usage farther outside the geographical contexts of their origin and development; and, fewer alien users (and even producers) in need of being convinced of their suitability or utility. In all the above respects, traditional technology grows closely from within the local system of significations, where it also exists physically and locates its civic reference. This combination of factors makes traditional technology less likely to be a topic of formal communication as well as ecological communication. By contrast, modern technology
must overcome communicative disconnects at each of the above levels—*with the aid of the mass media*, and must thus open itself up to enhanced ecological scrutiny as well.

### 6. KINDS OF RELATIONSHIP TECHNOLOGY HAS WITH COMMUNICATION

In light of the forgoing reflection, I could identify the following *three* different kinds of relationship that *technology* may have with *communication, mass communication*, and the *media*:¹⁴

#### a. *(Relative) Dependence.* A (genre of) technology may *depend* more on (mass) communication than other technologies *because* it cannot present itself, for whatever reasons, as completely and/or directly and/or transparently to its users, consumers, and those affected by it (including even its producers). Such a (genre of) technology has, and/or wishes, to bridge the gap between its physical presence and civic reference by relying on the media.

A technology’s communicative *dependence* as such does not mean that the media covers that technology a lot: It only means that a relatively enhanced recourse to the media (or mass communication) is the surer way for that technology to introduce itself to its own sphere of civic influence—or to relate more *meaningfully* within a local system of significations. Alternatively, humans must rely on the media in order to come to terms with such a technology more than with others.

#### b. *(Relative) Vulnerability.* In comparison with others, a technology may find it more difficult to avoid media glare, or it may get more media attention than it needs or deserves. This propensity to attract unwanted mass communication about itself is what I shall call a technology’s (communicative or media) *vulnerability*. The property of vulnerability can be relativized to specific kinds or sectors of communication. For example, spaceships are extremely vulnerable to science and political news, but not so much to ecological news.

Notably, *vulnerability* contrasts in character from *dependence* even though both translate into a closer relationship between a given technology and a give mass media. In strictly theoretical terms, a technology’s dependence on the media may well make it more vulnerable as well to *eco*-communication.
c. (Relative) **Immunity**. In comparison with others, a technology may be more immune from mass communication. Typically, immunity is selective—by virtue of being relative to specific types of media attention.

Of present interest is the dynamics of a technology’s (possible) immunity from environmental media and ecological communication. Theoretically, eco-communication is a subset of (mass) communication: wherefore, if a technology avoids mass communication, then it must automatically bypass eco-communication. In reality, however, many technologies may be endowed with immunity selectively from eco-communication—while being heavily dependent upon, or vulnerable to, commercial or other kinds of communication.

I must underline that dependence, vulnerability, and immunity are relative in the following ways:

One, they are not perfectly exclusionary in the mutual terms. In fact, the typical scenario involves one kind of relationship dominating over, rather than ruling out, the other two. For example, no technology is entirely and only dependent: it can only be more or less dependent than either vulnerable or immune. (The same goes for the other two variables.)

Two, they are meant to situate a technology within the comparative context of fellow technological genres. Hence, while I might call a technology dependent in the course of the forthcoming analysis for the sake of simplicity, what I necessarily mean there is that the given technology is more dependent than other technologies.

Three, they situate ecological communication, also, in the comparative context of other kinds of communication. For example, a technology’s vulnerability to communication or mass communication as such does not translate into its vulnerability to ecological communication. Much in fact depends on the context. Hence, a vulnerable technology is typically understood to be one that is more vulnerable to ecological communication than to other kinds of communication.

7. **TECHNOLOGICAL FORMS AND ECOLOGICAL COMMUNICATION: PRINCIPLES AND CLASSIFICATION**
The above kinds of relationship between technology and (eco)communication emerge and operate on the basis of the following principles: Proximation; Temporality; Concentration; Anthropocentrism; and, Uncertainty. Further below I provide a detailed explanation and illustration for each of these principles; I also provide a classification of technology based upon them. However, I have devoted the final section of this unit to the eco-communicative profile of development technologies, which apparently do not follow any of the above principles with any uniformity. I also provide a basic graphical and mathematical depiction of these principles at the end of this chapter—after the concluding unit.

I must mention that the principles elaborated below do not necessarily work in strict exclusion: They may work in complex combinations, overlap, and even competition—presumably in particular and variable communicative contexts. For that reason, the classification of technology according to them is also not meant to be so much as definitive and water-tight as heuristic and fluid.

A. The Principle of Proximation: Proximate Versus Distant Technologies

Other factors kept constant, the more proximate a technology is to human settlements, the less dependent it is on ecological communication—and the less vulnerable. I must underline here that a technology’s proximity is not authentically established in reference to either individual humans or teams of professionals. When I say that a technology is more proximate, what I mean is that it is able physically to present itself closer—than fellow technologies—to the civic community that it is meant to affect. (Hence, a spaceship or a nuclear power plant is not a proximate technology—even though some humans have to stay close to it in order to maintain or work it.)

There are at least two lines of reasoning to support the principle of proximation:

One, proximity typically translates into humans’ conventional and collectivistic familiarity with, sense of control over, and normalization of a given technology: such that the proximate technology does not need to convince its users of its ecological suitability by taking recourse to the media. Contrarily, a community also does not feel
the need typically to represent a proximate technology on a larger (eco)communicative canvas or to access such a canvas in order to know about it—and, for all that, it may overlook the proximate technology for its strictly ecological implications. By contrast, a distant technology is more dependent on (specialized) communication in order to be known at all to the civic sphere of its potential influence. Chemical weapons and the technologies for their manufacture are extreme examples of distant technology: Their vulnerability to eco-communication should be seen as an extension of their dependence on (specialized) media.15

Two, proximate technologies use and more directly relate to local resources in terms of both their manufacture and operation, and are therefore already in a relative harmony with local ecology as well—at least to the extent that they do not stand out within the local systems of significations. This is one of the beliefs that underlie humans’ usage of proximate technologies, and which makes us less likely to reframe, or communicate about, such technologies for their effects on larger ecology.

All daily-use household equipments are rudimentary examples of some of the more proximate technologies. Relatively interesting examples include: borewells, waterscooters, septic tanks and modern Western toiletry, and birdfeeders. Each one of the above four technologies is particularly harmful to different sectors of ecology: borewells—especially because of their populist usage at the domestic level—are apt to deplete and salinize groundwater; waterscooters are bad for aquatic creatures; modern toiletry depends on water overuse and may lead to groundwater contamination; and domestic birdfeeders attract “mainstream” birds and encourage them to multiply typically at the expense of the rarer species (as the latter can only feed upon particular kinds of substances: and even if those substances are put in the feeders, the mainstream birds get to them sooner than latter). However, none of these technologies has been a significant topic or target for ecological communication.16

The principle of proximation encounters a curious paradox in the automobile technology. While being vulnerable to ecological communication, this technology is unlikely to receive “unreasonably” negative media attention relating to environmental protection. This is because an automobile by default balances the factors critical to the principle of proximation: It accommodates, frames, and/or encloses, but it also
“liberates” humans—let us say from the confines of a civic geography—and opens up newer vistas by making them more mobile. While being proximate, automobiles are automatically associated with distances; and, inasmuch as they are intrusive—especially because of the associated prospect of newer roads—they are also highly extensive. Moreover, automobiles are sufficiently complex in their operation or functioning—hence, people’s referrals to the communication about them (including such shows as the National Public Radio’s *Car Talk*)—but they are also equally sufficiently easy to use as well. Given the above paradoxical values, the automobile technology is enviably positioned in comparison with most others: The communication about it can never be overwhelmingly or disproportionately “ecological,” but nor can it be muted. The *ecological* communication about the automobile technology would typically peak with suggestions for internal modifications and improvements, instead of culminating into a blanket, generic opposition.

Notably, the concept of proximity that I have developed and illustrated until now is in fact quite static and even passive—as it presumes that there are relatively proximate and distant technologies. However, the *principle of proximation* itself asks for more dynamism and obliges me to observe, as if in retrospect, that the historically “successful” technologies have typically been those that have also progressively measured the distance between their respective physical presences and civic references. In fact, I am willing to go so far as to claim that the prospect of adding additional degrees of civic proximity to erstwhile, and otherwise, distant technologies constitutes an important feature of technological progress overall. Of course not all technologies need to cover distances in order to be “successful,” but that many must (or, in any case do) tells us that the *given proximity* of a technology has its own *dynamic* or *active* obverse that is aggressively regulated by technology developers. I shall call that obverse *proximation*, and attend shortly to its eco-communicative implications. As a follow-up to acknowledging the presence of this obverse, let me also add one more category—of *proximated* technology—to the previous pair of *proximate/distant* technologies, to round off my classification within this section.

Concerted proximation of previously distant technologies has become increasingly possible, desirable, and profitable because of the onward march of
capitalistic markets. This scenario typically allows, even encourages, proximating technologies to contribute to, and play into the processes of social atomization, individuation, self-centered personalization, and even economic parochialism: to the possible suppression of the civic, the social, the national, or the global. If a naive policy leader is advised by his shrewd superiors to reform a distant technology such that it could be brought effectively closer to home, advertising allows him or her to make-over further for the residual distance between the proximated technology and its users.

Such technological modifications or reforms are not typically understood (and certainly not advertised) in (eco)communicative terms, but in terms of increased sales and technological advancement. Sophisticated advertising may go a little further than that and promote such modifications in terms of consumer empowerment and democratization. (A prominent example is that of the Microsoft Corporation’s regular supply of so-called “essays” on “technology and society” to the Washington Post through the past several years.) But, when we look at these modifications (eco)communicatively, we realize that proximation may weaken community’s collectivistic—but autonomous—eco-consciousness, and divide it into bits of personalized self-interest managed by market forces. In many ways, this is the essence of consumerism; advertising adds to this weakening of collectivistic eco-consciousness by vigorously supplying the manufacturer’s version of the proximated technology.

The obverse of the same process is that the policy maker, with the support of engineering and design specialists, must minimize the actual health risks of a given technology before it could be turned into a product and be made proximate. That would be the right and the only thing to do in the ideal world; in reality, however, it is eminently possible, if not usual, that the stress gets to be on minimizing prices—affordability—rather than on making the artifact both healthier and eco-friendlier. Given that enhanced proximation renders a technology less susceptible to strictly ecological press—more susceptible to safety and health communication—the onus on the visionary policy leader is to view both the problem and the prospect of proximation not just in terms of prices or human health but also, and equally, in terms of its potential eco-hazard value and general ecological implications. Consumer advocates, on their part, should focus on informing their constituencies not just about the price-wars
or their woeful inadequacy, but also about the potential ecological impacts of proximate, proximated, and proximating technologies.

B. The Principle of Temporality: Newer, Older, Obsolescence, and Antiquated Technologies

In addition to spatial proximity, time influences the eco-communicative status of a technology. The relationship between the age of a technology and its vulnerability to, and dependence upon, ecological communication is strikingly non-linear—and so, very interesting. With time, a technology becomes part of our social life to the point that it appears natural: It becomes an essential ingredient of what a given community has imagined to be its living ecology. Enhanced temporal existence of a genre of technology also strengthens its civic familiarity, thereby weakening the technology’s dependence upon media for its introduction. One could say, then, that: The older a technology, the less likely it is to depend on media generally; on eco-media specifically. However, this trend of dependence is nullified and even replaced by that of vulnerability when older technologies start approaching obsolescence because of advances elsewhere, or because of the rise of a whole new technological paradigm. Under such circumstances, older technologies are apt to attract negative ecological press.

But the obverse is also possible on two levels: One, a new genre of technology is more prone to be questioned in the public sphere on all grounds, including ecological; two, media dynamics mandates that the media be interested mainly in things that are novel—a tendency codified in the idea of news. In reference to the latter: The media is on the look-out for newer technologies, and is therefore more dependent on newer than older technologies for its specific job of technological communication—extendable to its ecological fringes. Contrarily, a new technology has to expose itself via the media in order to introduce and sell itself to its potential users.

While new genres of technology are rather vulnerable to eco-speak, upgrades on older technologies do not have to be. In fact, the upgrades are apt to make themselves relatively newsworthy because their developers may want to project them as eco-friendlier as well.

The principle of temporality can now be summarized as under:
1. Other factors kept constant, the newer the technology is, the more dependent it is on the media—and hence more vulnerable to ecological communication.

2. Other factors kept constant, the older a non-obsolete technology is, the less dependent it is on the media, and so less vulnerable to eco-scrutiny.

3. As a technology approaches obsolescence—likely also because of newer, more sophisticated, alternatives—it: (a) first becomes more vulnerable to ecological communication; and, then, (2) has to depend on “communication” to be known at all. (In the latter case, the truly obsolete or antiquated technologies end up existing only in the books of history.)

Against the background of the above formulations, it is useful to point out that the tale about Gandhi and the spinning-wheel is not meant to serve as a paradox: whereby a proximate technology ended up attracting public attention within the realm of environmentalism. Instead, for being a staple and a proximate technology, the spinning-wheel was not a proper topic for the info-sphere until Gandhi—realizing its naturalized existence among many Indian communities (and within the Indian cultural subconscious)—pulled it out from the living context and projected it on the larger canvass of public consciousness. Prior to Gandhi’s intervention, the spinning-wheel was not dependent on, vulnerable to, or immune from, eco-communication—but nor was it averse to it within the historical context. And, Gandhi understood that.

Ashis Nandy notes that the “charkha had become ‘obsolete’ when the city-bred, Western-educated Gandhi remodeled and resurrected it as a ‘traditional’ technique with a new range of cultural, political and economic meanings ...”¹⁹ What I would like to add to Nandy’s observation is that, in a sense, Gandhi brought obsolescence to the charkha (or the spinning-wheel) in order to make it vulnerable (or open) to formal ecological communication—and exploit that situation to the positive ends. Notably, the charkha has since been an (eco)communicatively dependent technology: Most people around the world come to know about it by reading about it in the books of history; others, through the word of mouth, postal stamps on Gandhi, the Internet, or occasional (and nostalgic) media campaigns by devoted Gandhians or Indian governments.
On the whole, then, the eco-communicative dynamics of Gandhi’s spinning-wheel rightfully falls under the *principle of temporality*, rather than that of *proximation*, within my framework.

**C. The Principle of Concentration: Concentrative Versus Disseminative Technologies**

*Other factors kept constant, the more concentrative a technology is, the more vulnerable it is to ecological communication.* A technology can be concentrative in terms of investment and/or site-specific production requirements. These two conditions may or may not overlap (in that a capital-intensive technology could be split up into various components through the process of production and put on the global assembly line). But, what is important is to realize whether a technology concentrates in comparison (1) with other technologies within a given spatial vicinity, and/or (2) with technologies universally—in the abstract or hypothetical sense. The technologies that concentrate universally almost always benefit from the *principle of strategic significance* (explained later), which allows them to bypass their peculiar ontological exigencies. (Military technologies are the most prominent example here.) That leaves us, for our present consideration, with those technologies that concentrate within a given spatial vicinity.

The identification of a concentrative technology *as such* would have as much to do with the specific character of the local system of significations within which it operates as with the character and volume of its hardware (or physical presence). For example, a modern house is not a concentrative technology in the suburbs of Washington DC, but it would be if it is relocated to a remote rural corner of Ghana. That said, one could identify concentrative technologies *generally*—even in locally spatial terms—such as large factories, industrial plants, or mines.

Reasons why a concentrative technology is more vulnerable to ecological communication can be outlined as under. A concentrative technology: demands a disproportionate amount of all-round commitment from a given locale, resource pool, and ecology; presents itself far more clearly, identifiably, and inescapably in the physical terms; dominates the local community and the locale; and, is less likely to be portable or mobile—which makes it a fairly fixed target even in the long-run. Given these features,
concentrative technology need to be understood as probable de facto usurpations of alternative communicative possibilities for their given operational contexts.

What I mean is that concentrative technologies often act as huge communicative distractions for the local communities: They can go so far as to provide their civic references of operation a large body of self-serving—but otherwise alien—vocabulary and concerns. With the introduction of a concentrative technology, a community may realistically encounter the prospect of having to spend time communicating about that technology in competition with, and even at the expense of, the time that it would otherwise spend talking about itself, its ecology and lifestyle, or about alternative technologies. For all that, concentrative technologies clearly undercut the information or media value or status of other smaller and local technologies.

If concentrative technologies do not usurp disproportionate amounts of communicative possibilities outright, they at least stand to serve, whether their makers or financiers wish or not, as highly visible (therefore “loud”) challenges to the local, contextual, or communal communication about a range of topics. In that sense, their concentration in terms of resources, external or exclusive human talent, or land-grab, also both furthers and parallels the concentration of ecological significations within them. In short, by virtue of their relative regional dominance, concentrative technologies absorb a disproportionately larger range of eco-communicative significations at the expense of those of smaller, local technologies—and are therefore more vulnerable to eco-scrutiny and eco-speak.

Concentrative technologies can by-pass, overcome, or neutralize their eco-communicative vulnerabilities by a variety of means. If they are heavily dependent on, or associated with, some locally available mineral—such as in the case of mining technologies—then they could turn into economies in their own right, and hijack the local eco-communicative context by way of a large-scale semiotic replacement. Hence, mining towns, or manufacturing towns or, in a different scenario, leather-based localities: whose general identities or fames hinge upon the technologies they employ and the products they produce. For such technologies-turned-economies, ecology becomes that which the outsiders do not typically attach to them. These technologies perhaps succeed in banishing ecological communication: but only at the expense of creating an
environmentally negative image, at the national or global level, of their local systems of significations. The outside community’s financial interests, coupled with its sheer distance, may also prompt it to exclude these technologies from ecological communication—while including them prominently within economic communication—except if, and when, major disasters occur!

In contemporary semi-feudal societies and/or poorer national economies, local owners or promoters of concentrative technologies may hijack all local communication—but especially ecological communication—by actively converting every other pre-existing technology into a dependent technology. As part of that process, such owners and promoters typically resort to bribery and coercion. For being capital-intensive and complex, concentrative technologies lend themselves to such monopolistic practices; they can even demand such practices from their owners and promoters as a step toward their installment and subsequent functioning. Therefore, they are routinely protested on ecological grounds in their earlier stages of installment even in such societies. Heated controversies and protests over large dams in India, China, and Pakistan are a testimony to precisely this aspect of concentrative technologies.

Many developed countries, on the other hand, may divert selected concentrative technologies beyond their borders—such as in the form of Export Processing Zones or Tax Free Renaissances—where semi-feudal settings assist in an even more complete devolution of the local eco-communicative possibilities. One could also look at industrial lobbying and campaign finance as sophisticated forms of eco-communicative hijack in the richer democratic world. Both of these methods may bypass genuine democratic mandate and informed opinion that are otherwise the hallmarks of, what I would call, a nation’s eco-communicative transparency. A highly publicized example involving a concentrative technology and lack of eco-communicative transparency on the part of a local government is found in the controversy over industrial pollution in the United Kingdom’s Teeside conurbation. Recently, the United States also tested the limits of eco-communicative transparency via the controversy over oil exploration and drilling in the Arctic National Wildlife Refuge in Alaska.

D. The Principle of Anthropocentrism: Meat Technologies; Technologies of Polity; Mass Communication Technologies
Anthropocentrism accords a technology immunity from ecological communication. Better still: *The more narrowly and demonstrably anthropocentric a technology, the greater the extent of its immunity from ecological communication.* Before illustrating this norm, I must clarify that I am not in disagreement with the general idea that *all* technologies are anthropocentric (even though the ilk of birdfeeders, pet-entertainment products, and certain veterinary technologies do come to my mind as possible exceptions). All I want to stress here is that technologies retain degrees and versions of anthropocentrism, and the technologies of *meat, polity,* and *mass communication* seem to embody the three central variations.

In plain terms, the anthropocentrism of these three types of technology is played out in how they underline and consolidate the existential identity of humankind *in a privileged distinction from* the natural, especially, animal world. In that capacity, meat technologies respond to the physical frontiers, technologies of polity to the organizational frontiers, and mass communication technologies to the composite frontiers of subjectivity, consciousness, and perception: *between* humans and animals (as also the rest of the natural world). On the whole, these three technologies customize and heighten the general anthropocentrism that marks any and all technology—and thus secure for themselves a unique measure of eco-communicative immunity. I discuss the specifics of the above as follows.

1. **Meat Technologies**

I specify *meat technologies* to be those that are remarkably brazen in their human-centrism: Their operation hinges very clearly and directly upon the exploitative negation of other animal species’ bodies, lives, and habitats. These are the technologies that are based *solely* on a very narrow, and *hard,* version of anthropocentrism. (So much so that I would not extend this designation even to those technologies that incidentally harm other animal species, such as the US Navy’s notorious sonar system—which is known to have harmed the whales.) Thus defined, meat technologies can be regarded for their definitive contribution to—what Ashis Nandy would have called—the degeneration of objectivity into objectification (let us say, especially, of other animal species).21
Let me mention two examples of meat technology—whereas one of them is unconventionally classified here—and elaborate upon the second one: the technologies related to transplantation of animal organs into human bodies; and, commercial meat industry infrastructures. Both of these technologies facilitate in the increasingly clearer redefining of human society in distinction from animal kingdom—but with the discreet help of the media. With the exception of the fairly marginal animal rights activists, hardly any social sector is interested in bridging the communicative gap between the average urban human community and the centers of these technologies’ operations: except for the reasons of hygiene and sanitation. Hence, mainstream media may cover them—and has done so through the past few years—but mostly for their possible effects on human health rather than for the sake of the animals, and very rarely for any environmental reasons at large.

As a technological establishment, the modern slaughterhouse has effectively turned those once-upon-a-time *domesticated* animal species and *farm animals* into factory animals: that ought to be understood, even by meat industry’s own standards, as “manufactured” beings up for the ‘disassembly’ lines. Mainstream media gets interested in these animals whenever they get sick to the point of being potential toxic meats for human consumption, but it typically ignores them as ecological beings out of their proper habitats. Following the same logic, the mainstream media also bypasses commercial meat industry’s technological infrastructures in reference to the sort of ecological ethic they seem to uphold, encourage, or discourage.

This communicative dynamics is partly a result of the media’s de facto role as the unofficial mouthpiece for modern society’s overall anthropocentric interests. In having to occupy that space, the media cannot afford to go against such technologies—especially in the capitalistic societies of Asia Pacific and the West—as they codify those societies’ anthropocentric interests in their hardened, yet overtly generalized, moments. In this sense, industrial meat infrastructures create downcast, under-the-radar, and shady realities. While they basically hide a part of ecology from the media on the end of their central operative physical presence, they aggressively re-present it in strictly human-consumerist forms to the larger communicative realm—including to mainstream media,
as in advertising—on the other end of the fast food industry (which is their effective civic reference).22

Although industrial meat infrastructures have maintained such a broad immunity from mainstream ecological attention, they are being challenged by the communicative outreach of the proponents of organic foods and farming. The latter have appealed directly to the “progressive” media by talking health and ecology rather than (euphemized) gluttony and savings. The eco-speak of the organics would increasingly contribute to a situation wherein commercial meat infrastructures would be automatically and more extensively scrutinized. In light of that, one could say that avoidance of, or (self)exclusion from, ecological communication does not guarantee a technology a lack of ecological challenge. That aside, given the fact that the organics are still quite a minority, their eco-speak cannot compete in volume with the consumerist-speak of commercial meat industry (especially within the United States)—at least not in the foreseeable future.

2. Technologies of Polity

The more demonstrably and closely relevant a technology is to polity, the more immune it is from ecological communication. By technologies of polity I mean those technologies that assist in the core enterprise of rule and governance—especially as played out within the “strategic” realm. These are highly oriented and customized assemblages of a variety of technologies that have been purportedly improved, modified, or optimized—in mutual coordination or individually—to the strategic ends of governance. In the broadest sense, this must include all military technologies, intelligence devices, homeland security infrastructures and equipment, personal security mechanisms and gadgets—such as bullet-proof cars—as well as a range of communication technologies, including indoor parliamentary or courtroom technologies.

The technologies of polity take anthropocentrism to its most exalted form at all levels, whereby the idea of strategic significance mandates that the communication channels interested in them drop all other considerations, especially those related to the non-human world. This anthropocentrism is further strengthened by the introduction of ever-finer categorizing—such as “nation,” “economy,” “regional alliance,” (political)
“bloc,” and the like: so much so that the strategically important technologies often also end up as bones of contention among human populations themselves. Technologies of polity, in short, are the most elaborate mechanisms that manage not only to divert public and media attention away from ecology, but also to tangle it into an ever exclusionary and complex human world.

A typical display of the eco-communicative predicament posed by the technologies of polity is found in the measure of priority that Ramsey Clark, the redoubtable former Attorney General of the United States, seems compelled to exercise in his book, *The Fire This Time*. Wherefore, while Clark devotes one full chapter on the environmental damage caused by the high-technology warfare of the 1991 Gulf War, when it comes to the chapter on the role of the American media through that war, he admits that for him “the most important human concerns about war are how many people it kill[s] and injure[s], and what ... it [does] to the survivors ...”23 The magnitude of the effects of such radical technologies of polity on eco-communicative traffic is better grasped if we go back within Clark’s account and consider the details he provides about some of those technologies. Relying upon external scientific research, Clark points out:

U.S. nuclear arms facilities, weapons, and warheads are the greatest source and risk of nuclear radiation on earth. The Pentagon generates more than five times the toxic waste produced by the five major U. S. chemical corporations combined. Germany’s air force is responsible for 58 per cent of the air pollutants generated by aircraft in German air space. An F-16 jet fighter consumes nearly twice as much gas in one hour as the average American car uses in a year. Oil bought by the Pentagon, the largest U. S. consumer, could fuel all public transit systems in the United States for 22 years. Armed forces release almost two thirds of all ozone-depleting CFC-113 that enters the atmosphere.24

Evidently, the principles of proximation/distancing and concentration/dissemination simply pale in comparison with the version of anthropocentrism that the technologies of polity put forward in the name of strategic significance. Even though power and realpolitik run through them, these technologies are not reducible to *secretive* technologies at all. In fact, the technologies of polity exist as
much in full public view as within underground laboratories or military-industrial complexes—and in all possible forms (including as informational infrastructures and establishments). Therefore, an important reason why these technologies could reserve, or so strongly orient, the speak about themselves is that no communicative technology is alien to them as such, and no communicative establishment can afford to refuse cooperation with them. By extension, the technologies of polity usurp the communicative realm of significations on a far larger scale than site-specific concentrative technologies—but without incurring the latter’s eco-communicative liabilities.

That said, technologies of polity—at large—seem to have become increasingly vulnerable to ecological communication within the countries of Western Europe and North America through their historical transition through the pre-industrial mercantilism, industrialization, and the so-called post-industrialism. This change has come about partly as a result of the steady rise of ecological sentiment within their ruling classes: as a dimension of the ruling classes’ self-realizations as representatives of democracies rather than rulers of colonial empires. This eco-communicative attitudinal shift in the West is diametrically opposed to the developments during the same timeframe in several non-Western traditions and countries. Prior to Western colonization, many non-Western communities had polities inlaid with ecological ethic rooted in animistic or spiritually harmonious traditions. Those traditions significantly eroded in such communities’ native polities partially because of the introduction and spread of exploitative industrialization during colonialism, whereas post-colonial state-formation and political upkeep have only added to the momentum of that erosion. That said, democratic countries among such former colonies of Western nations are eco-communicatively more forthcoming than their non-democratic counterparts.

A relatively recent example of a broad ecological challenge to a technology of polity within the West is that of the opposition of the German greens to the NATO’s doctrine of nuclear deterrence: an opposition that they, incidentally, could not carry through to its logical conclusion. More to the point, what that episode shows is that the technologies of polity would not attract sufficient ecological communication because of media enterprising; they are much more likely to be brought into the eco-speak if polity
itself undergoes radical transformations. Even then, these technologies will remain more narrowly anthropocentric than any other technologies—and hence more immune from eco-communication.

Policy leaders must put their efforts into: bringing the technologies of their own interests as close as possible to the core sphere of polity; demonstrating them to be of strategic interest; and, convincing the political elite of all that. But that is what the policy leaders should do only if they wish to dodge eco-speak! The visionary policy leader, on the other hand, is likely to go beyond the rhetoric of narrow strategic and political privilege—and all the monetary sops that come with it—and to re-establish any or all of these technologies as firmly within eco-speak as they have been within mainstream political-speak. The best way to do that is by realizing and conveying that ecological interests are also the strategic interests for the world as a whole, and by initiating a dialogue on such privileged technologies with the green groups: before those groups come to power precisely on that platform!

3. Mass Communication Technologies

Other factors kept constant, the more instrumental a technology is to mass communication, the more immune it is from a strictly eco-press. This is because of the following reasons:

• Relevance to mass communication function allows, even mandates, a technology to serve as a means of knowledge and thus avoid significant scrutiny as an object—with its own physical impact on ecology. Hence, while we do have plenty of press that criticizes itself for bad ecological coverage, misinformation, or over-activism: very little of it quite relates to its own technological infrastructures and their possible ecological impacts.

Symptomatically, for example, Stuart Allan, Barbara Adam, and Cynthia Carter call 1969 the defining year for environmental journalism because that “was the year startling images of planet Earth were relayed from the surface of the moon.” Nevertheless, a cynical, contrary, pointer to the “ecological impacts” of mass communication technologies occurs in a brief casual reference in a 1988 article by Chellis Glendinning as follows:
The Earth’s aura is cluttered with metal objects. ... Between 1958 and 1976, the United States, the Soviet Union, France, Britain, and NATO launched a total of 2,311 military and nonmilitary satellites into the atmosphere. ... Together with all the lost wrenches, frozen human wastes, and spent payloads, there are some 15,000 human-made objects whirling in planetary orbit. ... What you can’t detect are the microwave and radar rays flooding the atmosphere from communication centers, radio towers, and satellites.26

Glendinning’s excerpt locates the potential for attending to mass communication technologies for their “polluting” effects. More precisely, the excerpt indicates that mass communication technologies would be confronted more often within the media for their polluting effects as they become unbearably numerous as products or individual units—especially as obsolete ones—and thus hard to avoid as mere physical objects. Indeed, communicative efforts of such advocacy groups as the California-based Computer TakeBack Campaign are an early response precisely to that situation.27 What such efforts also tell us is that the anthropocentrism of mass communication technologies is likely to succumb to the factor of time—but only at the sub-generic or product level. The genre of mass communication technology as a whole is unlikely to lose in its overall anthropocentric value.

If the satellites and other overarching communication infrastructures constitute the outer limits of the peculiar relationship between mass communication technologies and ecology, then specialized info-technoscientific enterprises such as bioinformatics, biostatistics, and biometrics constitute its radical inner limits. Were we to reposition ourselves from this end of the relationship, then we are apt to keep in mind Timothy W. Luke’s redefinition of the information revolution in his *Capitalism, Democracy, and Ecology*.28 Specifically, Luke cautions us that the information revolution has also been “an organizational revolution ... aimed at disembedding human communities from their mostly localized organic ecologies in natural bioregions.”29 He adds that the information revolution is further invested in relocating these disembedded human communities “within more globalized inorganic hyperecologies designed by others in artificial technoregions.”30
What is to note here is that the bio-informational technologies are in fact dependent on eco-communication for their self-promotion as exemplary or superior systems of universal significations. However, because they automatically serve, also, as learning or epistemological mechanisms for the experts, they are able to translate their eco-communicative dependence into a selective immunity from populist eco-critiques. Luke’s contribution, therefore, lies in showing the way to precisely such populist critiques; however, that contribution is unlikely to become popular within journalistic circles and mass readerships! The bio-informational technologies are far too strongly immunized from eco-communication to invite critical popular attention because of such stray academic efforts.

- Mass communication technologies facilitate in the representation of presumably inaccessible or hitherto insufficiently understood realities. In that capacity, they obligate their users to construct their own collective realities that hinge on those technologies and their specific effects—what Ursula Franklin otherwise calls, “shared experience carried out in private.” Hence, we encounter such specific phenomena as the readership of a Deccan Herald, or the audience of a National Public Radio. Franklin underlines the historical dimension of this phenomenon as follows:

  The printing technologies were the first ones that allowed people to take in separately the same information and then discuss it together. Prior to that, people who wanted to share an experience had to be together in the same place—to see a pageant, to listen to a speech. Then, printed text—quoted and requoted—yielded some of the common information. Now there are new, high-impact technologies and these produce largely ephemeral images. The images create a pseudocommunity, the community of those who have seen and heard what they perceive to be the same event that others, who happened not to have watched or listened, missed for good. ...

  In this manner, pseudorealities create pseudocommunities. But, what the above examples
indicate on the whole is that mass communication technologies are in a powerful position
to redefine what humans might mean by ecology, and are thus able to rescue
themselves—more than most other genres of technology—from erstwhile parameters of
ecological audit at any given point in time. As such, these technologies replace local
systems of significations with the relatively universalistic systems promoted by
technology developers, journalists, advertisers, and market pundits.

Therefore, Franklin’s charge that computerization has ushered in “asynchronicity”
in human life—“indicated by the loosening, if not the abandonment, of previously
compulsory time and space patterns”—contains a very elemental truth about the eco-
communicative implications and status of mass communication technologies as well.34
That is: Modern systems of information defy and alter some of the most basic local
ecological distinctions and definitions known to humans—let us say, for example,
between night and day—through their (potentially) asynchronous operation.
• Implicit in the ontology of mass communication technologies is the mandate to assist
humans in devising an articulate or communicative identity for themselves in distinction
from the natural world. In enforcing that mandate by default, mass communication
technologies turn out to be, on one hand, an extension of our anthropocentric linguistic
identity (whereas the notion of “discourse as technology”—which I discarded earlier for
the sake of this account—acquires a species-specifying meaning). On the other hand,
they relegate the non-human, especially animal, world to our cultural subconscious and
unconscious—in that animals end up appearing as literary images, photos, and films.

The latter point is borne out well in Akira Mizuta Lippit’s brilliant book, Electric
Animal, in which he argues that

Modernity can be defined by the disappearance of wildlife from
humanity’s habitat and by the reappearance of the same in humanity’s
reflections on itself: in philosophy, psychoanalysis, and technological
media such as the telephone, film, and radio.35

While Lippit’s historically-grounded philosophical analysis focuses on the effects of
wildlife’s “disappearance” on human imagination in the 19th century Europe and its
colonies—and the manifestations of that effect in technological representations (and
intellectual discourse), it seems equally important to consider what those technologies
appeared to have “gained” in the process. I believe that mass communication technologies by default immunize themselves from effective eco-scrutiny by becoming part of the distinctive communicative identity of humans as a species. In fact, under normal circumstances, the mass communication technologies are apt to be in the good offices of both the ecologist and the journalist by virtue of becoming, what Lippit would call, the “artificial unconscious ... established by the incorporation of vanishing animals.”

Notably, Lippit renders the emergent 19th-century forms of these technologies as “virtual shelters for displaced animals,” and the cinema specifically as a “vast mausoleum for animal being.” Thereby, Lippit’s analysis, while being a rare intellectual feat, pretty much ignores the mass communication technologies’ possible and tangible effects on ecology or animals. These technologies have managed to buy eco-immunity even within Lippit’s account presumably because of Lippit’s focus on their intimate contribution to the construction of human consciousness in distinction from the natural world.

F. The Principle of Uncertainty: Uncertain Technologies

By uncertainty, I do not mean to: invoke the so-called law of unintended consequences—and apply it to technology; refer to risks related to technical change; or, betoken possible inaccuracies or inefficiencies of particular technologies. Instead, I want, first, to remind us of the distinction I made between technology and science in which I underlined science’s abstract presence vis-à-vis technology’s de facto acts of balance between tangibility and abstraction. In light of that, I would now like to suggest that: Depending upon the gaps between their respective spaces of manufacture, operation, and/or consumption, technologies command or betray a range of cognitive abstraction in how they present themselves to, or are perceived by, humans. Hence, the uncertainty that I am referring to lies in the range of abstraction a technology must command or betray, whereas: the more extensive that range, the greater the uncertainty.

What is of immediate interest, however, is not so much as the grammar of the distinction between science and technology as their inexorable tendency to join hands; also of interest is how a technology may physically correlate with other elements or bodies. A technology is more “uncertain” than others in practical terms if: it is more
prone to being identified or confused with science; its sheer activation mandates a close and constant cooperation with science; its manufacture and operation necessitate regular input from card-carrying scientists; or, if its physical boundaries typically blur with, or into, other functional genres of technology, the atmosphere, objects, or biological beings. The principle of uncertainty within our eco-communicative context can now be established as follows: *Other factors kept constant, the more uncertain a technology is, the more likely it is to depend upon communication and be vulnerable to (ecological) communication.*

Elementally, uncertainty increases as technology moves from its simpler to more complex, and traditional to modern, forms (to use Nandy’s categories in the latter cases). Through these movements, technological forms lose in their territorial clarity but gain in atmospheric pervasiveness, constitutional and operational sophistication, and civic outreach. Altogether, these changes enhance the *range* of the abstraction that a technology must command (or betray). A good example of uncertain technologies is agricultural biotechnology: It is proximate to the people purely as a (finished or cultivated) product—such as seeds or genetically engineered foods—rather than as a tool or mechanism. What that means is that the agricultural biotechnology is not something that people could use *as a technology* or literally see it as such: They can only rely upon what they read or hear about it in the larger info-sphere; what they actually feel and touch are only its positive or negative “outcomes.” Furthermore, biotechnology’s strictly technological dimension practically ends with the threshold of the laboratory—and even there, a significant part of it may involve manipulation of the gene *as information*. All the above *abstracting* factors render agricultural biotechnology more of a conventional science to the public, and its (eco)newsworthiness can be traced to the dubious ontological status into which it is born (which is what makes it “uncertain”).

The remarkably aggressive media postures on the biotechnological debate—taken by companies such as the Monsanto Corporation, organizations such as the United Nations, or nation-states such as the United States and several members of the European Union—testify to the hopeless dependence of (agricultural) biotechnology on communication or mass media. From the opposite end, the media has also actively reached out to agricultural biotechnology (in order to add tangibility to its existence in the
eyes of the public)—and has tried to bring it well within the larger ecological debate. In fact, targeted media organizations, such as the Center for Alternative Agricultural Media (India), have emerged in response to the rise of agricultural biotechnology. Public accusations against agricultural biotechnology’s manifest products—such as the miracle seeds—of being eco-hazardous, élitist (read alien to local systems of significations), and genetically polluting are routine. All the above developments testify to this technology’s eco-communicative vulnerability.

The long-standing trade-tussle between the United States and the European Union over the prospective marketing of bioengineered crops and foods within Europe is an interesting display of the clash between the factors of uncertainty and strategic significance. The strategic significance of agricultural biotechnology is derived from the United States’ serious commercial interests. Given the historical profile of this dispute, it seems unlikely that this technology is going to win eco-communicative immunity because of the strategic significant argument. In fact, it is only through the factor of time, and by way of proximation, that agricultural biotechnology and its products would lose in the degrees of their dependence upon, and vulnerability to, (eco)communication.

Other prominent examples of relatively uncertain technology include intelligent machines and, what we would consider, futuristic technologies (including, for example, nanotechnology). Uncertain technologies that have grown, or are growing, from intensive defense research programs around the world have, or would attempt to command, more immunity from eco-communication than fellow technologies within their category. That is because they would fall within the strategically significant technologies of polity.

G. The Unprincipled Case of the Technologies of Development

In the broad sense, all modern technologies are (or would appear to be) technologies of development: perhaps in part because Development has been the dominant communicative paradigm of postcolonial, post-Second World War, global politics. (The Marshall Plan serves as the epistemological watershed in this respect.) I do not doubt the legitimacy of this definitional breadth, but it would be more useful for our purpose of eco-communicative theorizing if we first look at development
technologies in the narrow sense, which must include: all “basic” infrastructural technologies (such as electricity and phone lines, roads and rails, parking structures, and so on); daily-use commercial infrastructures (such as shopping malls, theme parks, or hotels); certain capital-intensive multi-purpose projects (such as dams and engineered waterways or canals); and all-but-latest genres of industrial or manufacturing units (simply because the latest genres themselves must fall under the so-called futuristic technologies).

Insofar as Development is to be located someplace other than at the cutting-edge of technological progress—even the Marshall Plan was essentially a thorough “catch-up” package for a war-ravaged Europe—it is always already slightly outdated. But that is exactly what empowers it, ironically, to transfer a sense of backwardness to the civic contexts it adopts to improve. Accordingly, development technologies seem always to be in the process of reaching out to erstwhile “underdeveloped” lands—even as the underdeveloped lands are expected to encounter them only as contextually new (and to realize that they have some “catching-up” to do with the rest of the world). This accords a paradoxical temporal status to development—as a genre of technology—within the (eco)communicative matrix. That paradox has the following result: For being generally old to the broader info-sphere, development technologies do not immediately constitute environmental news on the global scale. But, for being new to the contexts of their introduction, they are perhaps disproportionately vulnerable to local eco-speak. Hence, the broader—in some cases global—info-sphere welcomes news about development technologies in ecological terms typically when they have already created powerful local controversies.

In comparison with almost all other genres of technology, development technologies remain the more vulnerable to ecological communication because they activate several eco-communicative principles at the same time. These technologies are: distant but struggling through the process of proximation; concentrative that must disseminate; and, new to the context to which they are introduced. But that is not all. Development technologies also invest themselves, by default, in a radical redefining of local spaces, topographies, geopolitics, and habitats: in the image of urbanity. While latter-day policymakers and maverick social activists have made advances in the design
and promotion of village-centered models, the city still serves as the dominant ideal for most developmental projects. Partly because they carry such a homogeneous sense of space—but mainly because of their role in the spatial redefining itself—development technologies significantly affect local communities’ relationships to their pre-existing, fellow, and upcoming technologies.

Perhaps an unintended fallout of development technologies’ spatial absolutism is the questionability of their anthropocentrism in the local eyes, particularly in the short run. Local populace is often skeptical as to whether a new development technology would actually extend its interests; and, if yes, how. Worse, many members of the local community may fear the exact opposite from such a technology, dub the technology antithetical to their human interests, and identify with the ecological in order to secure any communicative space or semiotic significance for themselves. On the global scale, that problem is only magnified: illustrated in the ironical fact that development technologies are far more controversial in the developing and underdeveloped societies than they are in the developed ones.

In the less developed world, development technologies are prone to usurp unusually disproportionate volumes of communicative possibilities, command more of the novelty factor, more of the spatial redefining factor, and be remarkably concentrative in every way imaginable. Governments and elites of non-developed societies attempt to rescue these technologies from eco-communication by framing them as technologies of polity: They can even be thrust upon the info-sphere as technologies of strategic significance. However, state’s enforcement of development technologies as strategic technologies by default transforms their anthropocentrism into a class-specific sentiment—which further alienates the technologies from the local populace. In other words, most members of communities directly affected by newer development projects often come out believing that the projects are in fact going to benefit only highly specific, and perhaps non-local, social classes. But, in the long run, development technologies do get routinized—and the media cannot simply look around itself all the time and pontificate at the infrastructure that it must itself rely upon. For being part of the culture of development on the whole, modern media remains severely limited in terms of where
to locate “ecology,” and how to ascertain which technologies are relevant to the ecological news.

State machineries and corporations within the developed world may also resort to the strategic significance argument in order to legitimate and aggressively promote development technologies at the local level. However, unlike in the underdeveloped world, those institutions cannot rely on that argument as the sole or the supreme means: Development technologies within the developed world simply cannot be made to look more important than others. Hence, there is more pressure on state agencies and corporations to enter ecological communication regarding development technologies in the ecological way. That said, several corporate leaders from the developed world have successfully repackaged selected development technologies as units of industrial or manufacturing technologies, and transferred them to the underdeveloped world for their continued operation partly in order to avoid ecological communication and audit at home. This tactics has also allowed the developed economies to focus their domestic energies on technological sophistication rather than on mere expansion.

As a communicative paradigm, development is in any case a curious transposition of spatiality onto temporality. So, when we say underdeveloped, developing, or developed (countries), we effectively redefine spaces in terms of time, and accede to a measurement of time that is re-specifiable as economic, technological, or even political progress. This peculiar dynamics of possibilities has enabled the developed world to be understood, the more recently, rather speciously as post-industrial and/or post-developmental. Hereafter, the poorer world is increasingly framed in spatial terms, whereas the developed world assumes a predominantly temporal image for itself by attempting to embody the global (technological) future.

Despite the above conceptual and perceptual twists and turns, the overseas transfer of development technologies can at best be a short-term strategy to dodge eco-communication. That is because these technologies cannot be wished away merely as “economic gains” and “business opportunities” even in their global incarnations. They would continue to be vulnerable to eco-communication, basically for all the elementary principles I previously sited: only that in the new—global—scenario, they would, and in fact have had to for a while, encounter increasingly sophisticated global versions of eco-
communication. Indeed, if we look at the developed world as part of a hypothetical global communicative detail, then we are likely to find that, to much of the rest of the world, it stands for a questionable, elitist, and consumerist anthropocentrism. (Admittedly, the rest of the rest of the world nonetheless views the developed world as the example to emulate!)

One would expect that such a negative image of the developed world—within the global communicative detail—would make it a proper target of effective eco-scrutiny at the hands of global news-media. But that expectation is not met. That is because the developed world clearly dominates in communication and media technologies as well—to which the anthropocentrism is as much extended; wherefore, it does not necessarily have to confront itself eco-critically as a technology. Unlike on its own domestic turf, on the international stage the developed world freely recourses to different versions of the strategic significance argument. That said, one could find international ecological audit of the industrialized world in specialized literatures produced by scholars and academics from the underdeveloped world, on one hand, and in the oral communications of indigenous peoples, on the other.

Modern immigrant nations such as the United States, Canada, Australia, New Zealand, and South Africa (to some extent) can be considered large blocks of development technologies that once emanated from the first wave of European industrialization and modernization. They were the original global development projects for the old Europe, and were called colonies. Accordingly, a formal concern with ecological matters seems much more present in the informational or communicative histories of these immigrant countries than of their parent countries—especially if we include the native perspectives and the problematic of indigenous knowledges. So, while for the old Europe the new civilized world was part, predominantly, of its economic self-image—its own extensive, overdeveloped self—for the indigenous populations, it was equally, if not more strongly, an issue in ecological encroachment and semiotic usurpation. Hence, the internal communication histories of the new worlds must include in them the indigenous people’s ecological audits of Development.

Partly because of the aforementioned historical contexts of their origins, the development technologies have been the geopolitical and economic hardware for a
relentless (re)frame of human habitat. (The Marshall Plan only added a historic urgency and altruistic legitimacy to that role.) Hence, policy leaders have the most at stake when it comes to the connection between these technologies and ecological communication on the local level. They could follow the standard path of bringing development technologies as close to polity as possible—which they can, and often do, by relying upon the rhetoric of outstanding economic interest and even universal human progress. But, like I mentioned earlier, this strategy is only going to further radicalize the anthropocentrism that characterizes development technologies: because it would reserve for these technologies and their developers even broader, and disproportionately larger, spectra of communicative choices. As developmental projects become more intolerably loud within their contexts of physical operation, the affected populace, left with fewer communicative possibilities, is likely to identify itself increasingly with the distant and the ecological in order to secure any communicative space.

Perhaps the better strategy would be to “listen” to the local ecological rhythms and needs and let them dictate the tone and tenor of development (what is actually practiced is quite the opposite!).

Urban sprawl and associated ecological controversies at the local level indicate that the United States, at least, has simply not addressed the problem adequately at all. The dominant logic of zoning would continue to work toward ever sharper definitions of the human sphere, whereas development technologies would increasingly transform into, and serve as, large claustrophobic spaces that have gone way beyond being simply proximate or familiar. In such a scenario, the de facto distancing of nature stands to overrule the principle of proximation—and the distant would thus become more ecologically newsworthy by virtue of being non-technological.

In a sense, the discipline of anthropology, on one hand, and the ilk of the National Geographic on the other, constitute advance—even if ironical—communicative manifestations of the distancing of nature from the developed West through its modernist history. An underwritten representational ethic for these and similar other enterprises—such as classical ethnography and primatology—has been to identify distant, typically non-developed, realities as a mix of the wild, the chaotic, but also natural. This could be corroborated through a variety of scholarly and historical sources. However, for
being limited by space, I shall only point to the intertwining evidence that emerges from
two otherwise unrelated accounts as follows.

Those accounts are by two historians—Curtis M. Hinsley, Jr. and Nigel
Rothfels—respectively of the role of the Smithsonian Institution in the development of
American anthropology through the mid-19th to early 20th centuries, and of the evolution
of modern zoo in Germany around the same time. Neither of the accounts focuses on
the communicative or eco-communicative dimension of the phenomenon it explores, but
their findings can be interpreted as highly specific stories about the expansive, but
especially developing, Europe’s communicative responses to what lay beyond its
frontiers (given that the German zoo industry, with its spectacular advertising and
gimmickry, had been focusing on exotic animals). In order to reframe those findings, we
would need to go beyond the story about how the curious mix of Christian dogma and
Enlightenment ideals informed the 19th-century Europe’s belief in its cultural, scientific,
and technological superiority over the rest of the world.

I would suggest that an additional narrative also unfolded through those times,
whereby the expansive, developing Europeans felt the psychological need to look for
nature and ecology outside their own frontiers. It is as if the early prototypes of
development technologies retained within them the prototypical eco-communicative
foreclosure: The developing Europeans could no longer communicate about themselves
as part of nature, and were compelled to look outwards for that reference. I would further
suggest that it is as part of that maneuver, also, that the Europeans and their overseas
descendants tended to render “distant” humans and human societies in natural terms.

Anthropology appears to be a direct fall-out of, or response to, such eco-
communicative foreclosures for both the Europeans and the European settlers in North
America and elsewhere. Referring to the American anthropological scene, Hinsley Jr.
points out that “the anthropologist commonly functioned as a variant of the historian,
studying and justifying his own history and civilization through the Indian,” whereas “the
Indians were a natural wonder [like] the rivers, mountains, and valleys ...” This
naturalization of the distant human seems to touch its radical heights with Carl
Hagenbeck’s company’s decision “in 1874 to begin procuring indigenous people from all
over the world for presentation in highly profitable spectacles to European scientific
Eco-communicative reframing of the outgrowth of industrial museums and museum anthropology makes it even clearer that anthropology was an attempt by the White Europeans at seeking communicative alternatives while being besieged by their own prototype of development. Hinsley, Jr., notes:

American anthropologists belonged to a society caught in the paradoxes of its own progress. The celebration of civilized power that characterized American public expositions and museums between 1876 and 1917 could not completely hide a sense of loss and fear: loss of innocence and natural vigor, and fear that civilized man was also losing control over the products of his own genius. ... Caught between a fading human past and an uncertain technological future, anthropologists in the nation’s capital felt a particular responsibility to retrieve that past in order to take a hand in determining and shaping man’s fate.

The identification of the distant—of necessity to be understood hereafter in both geographical and psychological terms—with the natural hardly guaranteed it any physical or discursive protection. The combined forces of colonialism and emergent capitalism had already made sure that the distant, just like the natural, be conquered, controlled, and incorporated within the communication of, and by, the proximate. Hence, the so-called orientalist discourse of Europe, highlighted by Edward Said, on one hand, and such particular manifestations as the “gradual shift of responsibility for Indian affairs from the War Department to the Department of the Interior” within the United States through the years 1860-1890.

Were we to call the aforementioned tendency to equate the distant (and the other) with nature as Europe’s own anthropological moment, then we are apt also to conclude that its preconditions included a psychological exile of the European Self from the natural world—counterpoised by the desire to overcome that exile through concerted forms of communication. The undeniable exhibitionism, advertising, spectacle, public relations exercises, and rhetorical investments involved in the enterprises of natural history museums, circuses, and zoos—in their interlocking presence with those of “indigenous” peoples shows and slave trade—point to the peculiar communicative hankerings of the earliest developing human tribe, the White Europeans.
Given such eco-communicative origins of development technologies, and keeping in view the near-universal acceptance of Development as the general functional paradigm in our contemporary times, it seems expedient to train ourselves to look critically and closer into whatever appears to be spectacular!

CONCLUSION

I have tried to provide a theoretical heuristic for approaching technology from an eco-communicative perspective, and to articulate a generic reclassification of technology based upon that. For being a heuristic, this chapter is clearly far from a blueprint for either policy or activism: but I believe that it has philosophical relevance for both, and expect it to serve as one prototypical epistemological framework for future eco-communicative analyses—especially of technology life-cycles. I also believe that the perspectives that I have provided are relevant to our daily lives as thinking individuals, communicators, technology users, and ecological beings.

Several strands within my technology profiles may appear familiar to those that keep abreast of ecological critiques of technology generally or pay attention to the volume and character of technological usage on a day-to-day basis. I would urge such fellow-travelers to not let this sense of familiarity blind them to the novelty—strictly—of the eco-communicative vantage-point that I have identified, and used for the classification I have proposed.

In order to reach that vantage-point, I have tried throughout this chapter to focus on elemental levels of analysis. That move may occasionally appear too speculative, regressive, or unrealistic—bordering on hopeless radicalism on one hand, and intellectual mundanity on the other. In anticipatory response, I would like to suggest that effective acts of analysis and theory sometimes require hypothetical relocation of socially entrenched material truisms, such as technology, to their primordial states of existence. Contrarily, material truisms, for typically being the hardware of our lives, may themselves leave us—as critical analysts on the look out for alternatives—with little alternative other than precisely such a hypothetical relocation. However, even through this belabored relocation of the material truism called technology, I have attempted, as
much as possible, to inlay my eco-communicative profiles with both historical and contemporary examples.

My proposed eco-communicative theorization leaves us with the following points of reflection—and they are no less elemental in their inquisitiveness than has been the rest of this chapter:

First, we have to ask ourselves two primary questions: What is it that we want to communicate about more on a daily basis, and why?

Second, we should not have to be communicating about phenomena that we do communicate about anyway—and in the ways we do it. And, for all that, we should recognize the right, and assume the responsibility, to create alternative narratives about given technologies as well as alternatives to communicating about technology.

Third, we should not be quick to criticize or glorify (mainstream) institutions for communicating about technologies in the ways that they may do. Instead, recognizing the context-specific force of technology in its own right, we should perhaps focus on our inventive and technological practices themselves—and re-assess our complicity in the origin and promotion of technologies in reference to how they carve out spaces for themselves within the civic sphere, and what sort of spaces they are.

Fourth, there is enough merit, also, in trying to go beyond communication among humans in order to relocate technological interventions within the much larger sphere of non-human organisms and their intra- and interspecies communication. For example, birds are a routine nuisance for airport authorities, but we may also want to ask what airports might mean to the birds.

Fifth, promoting technology as a topic of ecological communication is not a flawless virtue: At best, it is a plea for green consumerism; at worst, opportunistic marketing. And yet, and for all that, eco-communicative transparency is a better policy option for a technologist than opaqueness.

Sixth, we would like to investigate the roles and statuses that might be accorded to selected technological forms by institutions other than the media—and how they might affect the flows of ecological communication. In the next chapter, therefore, I examine a democratic nation-state, India, in one of its brazen moments of manipulative interaction.
with the powerful technology of nuclearization, and I view that episode as a hijack of ecological communication on a grand scale.

Notes

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1 Stealth technologies serve as an obvious exception to this rule. However, I could alternatively argue that engineers and designers put in extra effort to add stealth to the regular order of technologies.

2 That many people view technologies as a “living proof” of science does not change anything: in part because scientists themselves have a very different conception of what constitutes scientific proof or evidence, as also of where to look for the validity (or manifestation) of science both as a total intellectual enterprise and as (topical or contextual) inquiries. A related popular insight that “there is always some science behind the workings of technology” also does not affect the truth of science/technology differential as it can be as promptly counterpoised by the idea that “there is always some technology behind the workings of science.” Lastly, even if I acknowledge—which I do not intend to—that technology is only a concrete, functional expression of science, I would like to remind us that that expression is called technology because it has ceased to be science.

3 Arjun Appadurai defines ideoscapes as “concatenations of images, [which] are often directly political and frequently have to do with the ideologies of states and the counterideologies of movements explicitly oriented to capturing state power or a piece of it.” Arjun Appadurai, Modernity at Large: Cultural Dimensions of Globalization, Public Worlds, vol. 1 (Minneapolis & London: University of Minnesota Press, 1996), p. 36.


6 Massimiano Bucchi’s brilliant critique of conventional theoretical models of science communication attests to my portrayal, except that Bucchi chooses not to address technology at all. To his credit, he also does not muddle science with technology in his case-studies, in which he articulates and deploys his own innovative theoretical and analytical models. See Massimiano Bucchi, *Science and the Media: Alternative Routes in Scientific Communication* (London and New York: Routledge, 1999).

7 That includes contributions to the economics of technology from such figures as Prabhat Patnaik, Sanjaya Lall, Nagesh Kumar, Richard R. Nelson, and Christopher Freeman.


9 For a lucid exploration of this view within the West, please see Langdon Winner, *Autonomous Technology: Technics Out-of-Control as a Theme in Political Thought* (Cambridge, Massachusetts: The MIT Press, 1978).

10 A relatively sympathetic view would suggest that his mystical style of writing aside, Heidegger uses the word “essence”—in his essay “The Question Concerning Technology”—as a synonym for “distinguishing feature.” Hence, in writing about the “essence of technology,” Heidegger perhaps means to highlight what he believes distinguishes technology from any other phenomena. In this interpretation, Heidegger’s essay turns out to be no more essentialist than any other attempts at defining technology and articulating its distinctive traits. See Martin Heidegger, “The Question Concerning Technology,” in *The Question Concerning Technology, and Other Essays*, Tr. William Lovitt (New York: Garland Publishers, 1977).

11 That technologies may assume their “given” roles in ways qualitatively and quantitatively different from the dream-world of their designers serves as a counter-proof for the importance of spatiality to technology’s communicative existence.


14 Despite the differences among communication, mass communication, and the media, I have put them together rather flexibly here. That is because the elemental overlap across them is more relevant and significant than are the differences. Moreover, I realized that exercising contextual discretion in using these terms through the course of the analysis is
preferable to establishing technology’s relationship to them on an individual basis. My ultimate concern, of course, is with the specific aspect of ecological communication rather than with any of these three phenomena; and, even there, contextual discretion overrules the desire for a generalized formula.

That said, the principle of strategic significance (which I define and elaborate later) rescues these technologies from both the dependence and the vulnerability by buying for them the supreme measure of secrecy. For that reason, such technologies, however distant, are ultimately to be understood as technologies of polity (a category I also define later).

In a rather unusual journalistic move, Roanoke Times recently reported an academic study that by default communicates about household technologies’ ecological impact. The title of the report suggests that these technologies would have probably escaped ecological attention on the part of the media but for the study’s focus on the social problem of divorce. See, “The Trashman Knoweth: Divorce Hurts Ecology,” The Roanoke Times, January 24, 2003: A7. Visit: www.roanoketimes.com

A prime example is that of the computer. From the days of the gargantuan central motherboard operable by isolated communities of experts, the computer has well-nigh become a highly domestic technology—at least in much of North America and Pacific Asia.

The general extent of misguided priorities can be gauged by the findings of a recent study of medical research within universities across the United States. The researchers, Justine Bekelman and Dr. Cary Gross, conclude that there is “strong and consistent evidence that industry-sponsored research tends to draw pro-industry conclusions.” See, “Researchers Challenge Validity of Medical Studies by Colleges,” The Roanoke Times, January 22, 2003: A5.

Nandy, note 13, p. 89

Peter Phillimore and Suzanne Moffatt describe and analyze how and why their scientific report on Teeside failed to convince the local government and industry of the unhealthy effects of industrial pollution. While accusing the local government of misappropriating their findings to divert attention from the industrial pollution, they also mention that “[Teeside] remains identified with steel and petro-chemicals in the 1990s, with ICI the dominant corporation on the chemicals side and British Steel the present-day inheritor of a number of separate steel-producing companies. These industries are visible from almost every angle in Tesside, as dominating physically as they are economically and figuratively in Teessiders’ lives.” Peter Phillimore and Suzanne Moffatt, “Industry Causes Lung Cancer: Would You be Happy with that Headline?: Environmental Health and Local Politics,” Environmental Risks and the Media, Stuart Allan et al., eds., (London & New York: Routledge, 2000), p. 107.


For all the frivolity and irrationality of PETA’s street demonstrations, I have to admit that this activist organization has furnished some of the most compelling videos in support of animal rights. PETA’s videos are typically based upon stealth coverage of slaughterhouse practices within the United States, and are accompanied by eco-savvy background commentaries. These videos essentially bridge the gap between the
industrial slaughterhouse’s physical presence and its extended civic reference—and do much damage to the infrastructure’s eco-communicative immunity. One could likewise compliment the National Anti-Vivisection Society (USA) for their publications such as the Animal Action Report.


30 Ibid.


32 Ibid.


34 Franklin, note 31, p. 150.


36 Ibid, p. 190.


38 Please visit: http://www.farmedia.org/

39 This is despite what Norman E. Borlaug and his ilk have charmingly and routinely argued, by making belabored, ironical linkages between the expensive sophistications of agricultural biotechnology and the populist objective of eradicating world hunger! See, for example, Borlaug’s “Science Vs. Hysteria,” The Wall Street Journal, January 22, 2003: A14.

40 Therefore, there is much merit in the public stance taken by Herve Gaymard, the French minister of agriculture, on the U. S.-EU biotechnology trade tussle. Gaymard has called for more patience: “‘You can imagine how much the Europeans have been shocked ... Wait a little bit until there is more acceptability of these products, and then the question will be naturally settled.’” See Justin Gillis’s report in Washington Post, “As Europe Simmers over War, Some Push for a Food Fight,” February 1, 2003: E01.

41 The risks of rushing through the process of introducing bioengineered foods in Europe have also been pointed out by David Byrne, the EU’s Commissioner for Health and Consumer Protection. See “EU Official Warns of Biotech-Foods Backlash,” The Wall Street Journal, January 21, 2003: A16.

This is not the case with many other technologies—including such proximate ones as the mercury thermometer, or the CFC refrigerator—which have created, or are prone to create, rather open or general environmental (and health) controversies prior to being understood as legitimate local ecological issues.

This is abundantly clear in the controversies related to dams in India. See: Arundhati Roy, *The Cost of Living* (New York: Modern Library, 1999), and *Power Politics* (Cambridge, Massachusetts: South End Press, 2002). See also, *How Do I Survive, My Friend?*, a film by Anurag Singh and Jharana Jhaveri, (Delhi: Jan Madhyam, 1996).


Hinsley, Jr., note 48, p. 22 and 51.

Rothfels, note 48, p. 9.

Hinsley, Jr., note 48, p. 84.


Hinsley, Jr., note 48, p. 146.