

Technology and Ecology

by [J. Stan Rowe](#)

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Technology has become the primary means by which humans interact with the Earth-home. An outcome of artifice guided by human beliefs and purposes, technology makes visible the deep beliefs that consciously and subconsciously motivate society. Through it the people/planet relationship is made explicit. Hence the importance of a critical appraisal of technology, of its effects on the world, and of the extent to which its various forms are appropriate.

Technology, the Big T, has been variously defined. All agree that it is more than hardware, more than machines, tools, material instruments. An inclusive definition of T is: a reproducible and publicly communicable way of doing things. The key word communicable shifts T into the world of ideas, language, beliefs, culture--which explains why T-transfer from industrialized to non-industrialized nations is difficult until, either directly by acceptance or indirectly by acculturation, the receiving populations adopt western values, beliefs, perceptions. To benefit from our technology they must first believe what we believe and want what we want. According to a recent Mercedes-Benz advertisement: "Technology is only opportunity knocking--the secret is to open the right doors." To be effective, T must be directed to the right openings, the right visions, such as owner pride and smooth high speeds in the Mercedes model M-B 300.

An essential part of T consists, therefore, of cultural ideas, especially the values and goals espoused by influential people--in our society by business people. Their materialist philosophy provides the inspiration and encouragement for industry's material production. The built environment, steadily expanding, is the visible expression of T's cultural authority, influence and growth. Progress is T and T is progress.

Technology as Progress

Faith in T is deep rooted. Aldous Huxley considered it the modern religion, its symbol a decapitated cross and the Model T Ford. T is our provider and in it we trust to give us our daily bread and deliver us from evil. Yet the Good Life so provided is not free. Environment has been picking up the tab, paying our way. Now its ability to support humanity's appetites and wastes is running out.

The conventional use of the word "progress" often preceded by a resigned or cynical "you can't stop it," brings to mind T's gifts to our consumer society: living better electrically, acquiring more machines, eating exotic foods, travelling faster, and perhaps some day visiting the moon and planets. Progress is living "high on the hog" for the largest possible percentage of the human population, using more and more energy and processing more and more materials from the Earth's crust. Will we continue to call it progress as it slowly kills us?

Progress in a finite ecosystem cannot mean the absolute ascendancy of one species. Progress must mean the achieving of a creative symbiosis within the Home Place, where sympathy and care are extended by the dominant species to the rest of creation. To transcend traditional preoccupations with our own kind, preparing to appreciate the Ecosphere with all that is in it, requires an understanding of T and how we have used it both to exploit and to distance ourselves from Mother Earth.

Exosomatic Technology--Appendages for People

Technology churns out a variety of artifacts: tools such as pile-drivers, media such as television, cocoons such as buildings and cars, all of which like spectacles and hearing aids can be hooked on the body to increase the wearer's abilities and pleasures. Aircraft are fast legs, attached to people by seat belts in order to increase their speed of travel. Submarines are worn to swim under the oceans, microscopes and telescopes to see better and farther, telecommunication systems (giant vocal chords) for long-distance information exchange, bulldozer and dragline are muscles for earth moving, computers extend the mind's scope. Transmitted from generation to generation by culture rather than by genes, T is the new means of human evolution, increasingly adding to human versatility, power and size.

From this perspective, T provides (in addition to biomedical inside-the-body gadgets) a wide range of outside-the-body or exosomatic instruments, extending human abilities to change the world and all that is in it. Side effects are extraction of vast quantities of "raw materials" from the planet's surface to manufacture the array of technologic products, and a return flow of wastes and poisons at all stages from primary production to obsolescence.

Initially, purpose shapes the instruments but soon like body parts they begin to inspire their own use. Just as those born with good vocal chords can with difficulty be dissuaded from singing, so a boy with a new hatchet finds much that needs chopping. The United Nations dictum, "Wars begin in the minds of men" is a half-truth. Wars are also encouraged by the availability of arsenals of shiny potent weapons whose purpose is destruction. Dis-arm-ament is effective because it amputates the striking arms, separates the muscle-toys from the aggressive boys, removes the temptation to let the exosomatic instruments "do their thing" at the slightest provocation.

If technological instruments are body extensions, may they not also be viewed as disfiguring outgrowths, as excrescences with pathological tendencies? Three potential afflictions we suffer from "wearing" our technological armour are gigantism, addiction and alienation.

Technology and Gigantism

All technologies whose goals are increased power and control effectively lead to gigantism. Machines behave like enlarged limbs and organs, demanding energy for growth, repair and reproduction just as organisms do. A North American, considered together with her exosomatic appendages, is 80 times the size of a Bangladesh peasant judged by appetite for non-renewable resources (fossil energy, minerals) and renewable (ecosystem) resources.

Each western person bestrides the world like a Colossus, leaving his Susquatch imprints on land and water through the massive extraction, consumption and waste of resources that enlarged body size necessitates. Head counts are misleading when technologic size is not factored in. Is Canada under-populated with 30 million people? Before answering, bring in the technologic multiplier, the energy use per capita, that indicates our impacts on environment. Considering that every Canadian stomps the Earth like 80 peasants, our country is vastly over-populated. Further, in a world of rapid population growth but fixed space, of polluted renewable resources and dwindling non-renewable

fossil fuels, the expectation that everyone can be an exosomatic giant on the North American model is unrealistic. The dream of the world's poor, who make up the majority of the human race, casts over the future a dark cloud that will only be dispersed when the rich nations begin to share by divvying up their wealth. Sharing is more realistic than depending on economic growth, for the world will never support at Canadian standards the six billion people expected in the year 2000. One billion could perhaps live as well as the citizens of Calgary and Winnipeg. Some say only 250 million.

The gigantism that industrial T confers is largely material. It effectively extends the power of our material bodies without doing much for our immaterial minds. Like a growing brontosaurus, T's body size has far outdistanced brain size. Encouraged to be consumers, we surround ourselves with more and more artifacts, increasing our appendages and faculties, while our reasoning power and modicum of wisdom stay the same, or shrink before the TV set. The distortion of the body/brain ratio creates feelings of helplessness. The common fear that machines are out of control, that they are running people's lives, suggests that exosomatic evolution has outstripped its rational management.

If the diagnosis is correct, we would do ourselves a favour by reducing exosomatic T to restore a better body/brain ratio. In industry, fewer mega-projects and more "soft" local developments would reduce our gigantism. In agriculture, a larger eyes-to-acres ratio would improve on the wheat-belt trend of fewer eyes on larger farms.(2) Instead, the favoured prescription is to keep T growing, not attempting to enlarge comprehension per se but to supplement and beef up brain power with the latest T: AI, Artificial Intelligence, that also doubles for Artificial Insemination. If only T could deliver AW, Artificial Wisdom!

Technology as Addiction

Because they give us power and pleasure, exosomatic instruments are addictive. When "worn" even for a short time they become necessities, difficult to lay aside unless replaced with better, more efficient models. The rancher turns in his horse for a half-ton truck. The youth moves up from motorcycle to muscle-car. For those habituated to fast movement through the air, surface travel--except perhaps for recreation--loses its charm.

Progress is traditionally conceived of as greater power, control and efficiency--not less. To suggest giving up powerful Ts on the suspicion that they are dangerous and destructive is to invite scorn and the accusation of wanting "to go back to the cave." Georgescu-Roegen thought that this addiction--as attractive to humanity as a flame to moths--is the greatest obstacle to a rational human ecology. He was pessimistic about cures for the pervasive dependence on exosomatic comforts. "Perhaps the destiny of man is to have a short, but fiery, exciting and extravagant life."(1)

Like addictions to drugs, sex and gambling, being hooked on T is controllable if not curable. The first step is recognition that we have a problem, that T is a predicament, which then suggests the need to understand it and find satisfying alternatives to its destructive facets. The sometimes brilliant philosopher William James thought that the moral equivalent to warfare was an all-out battle with Nature, a constructive alternative to killing each other! We have proved that such battle is an immoral equivalent, for it kills everything. Perhaps a moral equivalent to war can be found by distinguishing friend from enemy, separating appropriate T that assists our symbiosis with the universe from the poisonous and destructive T of heavy industry and military might, then launching an all-out attack on the deadly kind before it destroys the world and ourselves completely. Let us declare our debilitating addiction to instruments of power, and explore the possibilities of cutting Big T down to little t.

Technology as Barrier

T is also an alienating influence, interposed between people and the planet. As the manufactured milieu grows, contact between people and the Ecosphere is steadily reduced. The built environment acts as a filter and barrier that "progress" renders thicker and more opaque, gradually eliminating and shutting off nature's direct sensual stimuli. During the last eclipse of the sun over southern Saskatchewan, children in many schools were only allowed to view that celestial phenomenon on television. Watching TV in buildings without windows is the model of self-induced alienation, annihilating all sense of ecological roots and dependencies.

T has been described as arranging the world so as to minimize direct experience of it, an alienating effect that results in sensory deprivation. Cut off from Nature's sights and sounds, people end up in single-species confinement. Aloneness in the city, with nothing to sense but themselves and made-things, induces various psychoses. T's cages isolate people from the Ecosphere milieu, their biological and evolutionary home, as effectively as iron cages isolate lions from their savannas. Just as zoo animals deteriorate when deprived of their natural home surroundings, so also humans as earthlings deteriorate when, like the legendary Antaeus, they lose touch with planet Earth.

Technology as Placenta

From the standpoint of human ecology, T is the system of values, beliefs and techniques by means of which a society, a culture, taps into, uses and modifies the Ecosphere, in the process changing both itself and the surrounding system. T is the instrument of contact between people and the miraculous enveloping environment from which over four and one half billion years of evolution they came. T is the means by which humanity extracts what it wants from the Earth and returns what it does not want to the Earth, playing an analogous role to the placenta and umbilical cord connecting fetus and mother. Should the fetus imperil its host by excessive demands and generation of wastes (a likely effect of gigantism), then both will suffer. As with mother and fetus, the only safe and sustainable ecological relationship between people and planet is one of moderate demands in a symbiotic alliance.

The dependency of people on the Ecosphere is complete. Indeed, all organisms are inseparable from their environments except in thought, and life is more an attribute of the Ecosphere than of the organisms it encapsulates. The natural world and all forms of life within it are inter-penetrated. Sophisticated T does nothing to reduce the people-planet dependency, but it does magnify the possibilities for exploiting and poisoning the relationship. The onus is on humanity to develop a technology appropriate to the well-being of the Earth, a T that does not imperil the Ecosphere but contributes to its healthy functioning.

Conventional T is purposive and aggressive. Comprising values and ideas as well as tools, it urges its own uses which, given our cultural past, are people-serving in a short-sighted way. Unless we recognize this fact we slide into the popular "technology is neutral" mode of thinking that backs away from any kind of control over our inventions and shrugs off the need for ethical choices at T's leading edge. The ultimate nonsense is justification of war because of the technologic advances it brings--poison gases that later yield insecticides, tanks that are the models for better tractors. Danger lurks in the idea that nothing is wrong with any T, that it is only what we do with it, what we make of it, that can be judged ethically. This, said McLuhan, is the numb stance of the technological idiot.

Evaluating Technology

Many human problems are unsolvable in the humanistic context. What is more important, mother or fetus? If human life, actual and potential, is believed to be paramount, there is no conclusive answer. But in the context of the Ecosphere, knowing what we know about carrying capacity and of social

and environmental destruction due to over-population, most ecologists will come down on the side of the mother.

Similarly with T. What is appropriate and what inappropriate cannot easily be decided if the arguments consider only help or hindrance to people. Will it feed more of them, will it prolong their lives, will it make them more powerful, will it help them calculate faster? The usual conclusion is yes, do it, because people will be "better off."

A sounder standard for judgement is ecological, measured against the requirements for symbiotic survival in the Ecosphere. Then the measure of T's goodness or badness is its effects on the Earth system from which it draws materials and to which it returns wastes. Hitherto progress has meant more T, more industrial growth, more material goods, more wealth at the expense of the Ecosphere. Progress must be redefined as sustainable ecological relationships between humans and the Ecosphere, to which new kinds of T evaluated in the context of health and permanency can contribute. That is, ***T for two!***

An appropriate T will respect the air-water-soil-sediment-organism matrix that is the milieu of life. It will not knowingly extract renewable resources faster than they are renewed nor will it introduce toxins and pollutants into the planet's life space. It will certainly not play around with radioactive substances nor falsely advertize them as safe, clean and cheap.

Citations

1. Nicholas Georgescu-Roegen. "Energy and Economic Myths, Part 2." The Ecologist: 5(7): 52.
2. Wes Jackson. Altars of Unhewn Stone: Science and the Earth. 1987. North Point Press, San Francisco.

[Other Ecocentric Texts](#)