Jean Robert

ALTERNATIVE TECHNOLOGY

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Any reflection on alternative technology should prompt, as a first question, "alternative to what?" This question admits two possible answers. Either the phrase refers to different tools that better satisfy needs or it implies an alternative to the very idea that tools satisfy needs. To determine the proper answer it is necessary to consider the question in its historical and ethical contexts.

Historically, the concept of instrumenta, or of tools independent of the hand that held them, emerged only during the twelfth century. De Diversis Artibus, complied by Theophilus Presbyter, is the first 'handbook' on technology in Europe (Dodwell 1961). His carefully annotated drawings from the workrooms of the carpenter, the blacksmith, the tailor and others, illustrated devices disembedded from the activity of artisans. They thus depict, perhaps, the first classification of tools as such. Moreover, they typify an epoch that may be called the Technological Age, one characterized by devices that embody human intentions. The high Middle Ages had given a special position to instrumental cause, a conceptual variant of the Aristotelian efficient cause. For example, the hammer became an instrument or tool when conceptualized as a device intended for hammering. Instruments that embodied the intentions of its makers could, nevertheless, be taken up or left at will. For the centuries that followed, this subordination of tools to human purposes implied that technology was a means to personal and communal ends. This venerable understanding of technology still persists as if like a pentimento beneath a thin new veneer.

During the twentieth-century, technology was implicitly redefined as the application of industrial tools to the satisfaction of professionally defined needs. So defined, technology cemented the conceptual conflation of tools, needs, and the professions (Illich 1977). It reinforced the prejudice for industrialization, which was exported worldwide as Development (Sachs 1992). World-wide industrialization entailed the technological transformation of the world. While technologists engineered the machinery of industrial society, professionals shaped its basic creed: only a consumer can satisfy his needs. The dependence on commodities and services—the outputs of industrial society—promoted by the professional-industrial complex, demands that freely chosen ends mutate into professionally defined needs. By the mid-twentieth century, professionals had acquired a monopoly over defining needs; arrogating to themselves the task of imputing needs to citizens who were thereby turned into clients (McKnight 1977). Professionally diagnosed needs legitimized entitlements to commodities and services. By now, defenders of social rights claim that the equal consumption of these is a matter of distributive justice.

Unsurprisingly, experts prefer the first answer to the question concerning alternative technology. They insist that tools and needs can be better matched if needs are diagnosed more scientifically, tools developed more rationally, and services distributed more equally. Two objections must be raised to this answer. It is both historically anachronistic and unethical. In ethics, autonomy has priority over dependence. Since the professional-industrial

complex instills dependence on industrial outputs, any reflection on alternative technology must begin by questioning this dependence.

Two movements during the mid-twentieth century gave form to this realization. On the one hand, technology became the subject of disciplined philosophical and historical inquiries. This is exemplified by the contents of the path-breaking bibliography on the philosophy of technology compiled by Carl Mitcham and Robert Mackey (1973). On the other, the intuition of the possibility of subjecting tools to personal and communal ends coalesced into the Appropriate, or Alternative Technology Movement. Thus, the wit of the critical historian and philosopher was joined to the inventiveness of the alternative technologist. Each respectively elaborated the concepts and devised the tools necessary to foster freedom from dependence. A landmark in the recognition of the necessary complementarity of conceptual and practical tool-kits is the annotated bibliography on the subject prepared by Valentina Borremans (1979).

Among the most insightful twentieth-century thinkers on the philosophy of technology are, without doubt, Jacques Ellul and Ivan Illich. In The Technological Society (1964), Ellul analyzed, for the first time, the consequences of a society pervaded by professional technicians. He forcefully emphasized the erosion of ethics brought about by technicians of the professional-industrial complex committed to ever-expanding the means for unexamined goals. In Tools for Conviviality (1973), Illich argued that tools, in their technical aspects, can breach thresholds beyond which they become critical to society. When a tool acquires such a critical character, it inevitably and counter-productively affects the distribution of political power, the culture, and the social structure of the community which uses it.

By the last quarter of the twentieth-century, these reflections on the appropriateness of tools and institutions had identified three independent dimensions of public choice: 1. The **technical choice** between hard (oversized machines) and soft (smaller, local tools); 2. The **ethical option** between heteronomy and autonomy, respectively exemplified by homo economicus who is satisfied by consuming the products of slaves and machines, and homo habilis who seeks pleasure from doing and making things for immediate use; 3. The **political decision** between "right" and "left," where "right" refers to centralized decisions about goals and professional control over means, while "left" connotes the local definition of ends and the communal re-appropriation of means (Illich 1981; Turner 1978).

The technical choice, or the notion of the right size

In 1917, D'Arcy Wentworth Thompson published a study of the relation of shape and size in living beings and artifacts (Thompson, 1971 [1917]). His law of similitude states that every natural and technical shape is scale-variant, that is determined by its scale. According to J. B. S. Haldane (1956), the form of all natural organisms is covariant with their scale: a cow the size of an elephant would need legs as strong as columns and could hardly support its horns. The Austrian economist Leopold Kohr (1967) applied these ideas to economics and the study of societies and is therefore the pioneer of social morphology. For Kohr, the size of a political unit entailed a certain kind of polity, that is, a correspondence between the form of government and the scale to be governed. He was a major influence on, and a friend of, the

German-born British economist Ernst Fritz Schumacher (1975), whose phrase "Small is Beautiful," has become a world-famous lemma.

Schumacher is deservingly considered the father of the Alternative Technology Movement (hereafter AT). In 1961, he undertook a trip to India that changed his vision. Impressed by the inherent viability of Indian agriculture, he firmly opposed replacing the traditional ox-drawn cart by tractors (Dogra 1983). Instead, he imagined the carts equipped with ball-bearings and rubber tires. On his return to England, he founded the journal Intermediate Technology which would popularize the concepts of appropriate technology and later, alternative technology. Though superficially similar, the word 'appropriate' points to something that other terms do not: The fitness of shape and size; the balance of power between autonomous action and what is done for me; and the importance of subjecting the relation between means and ends to political deliberation.

During the 1970s and 1980s, the AT movement gathered strength through numerous journals, publications and associations. For example, a number of superbly documented books and articles were published: On alternative or appropriate technologies in general (Darrow and Pam 1976); on improvements to traditional rural practices (Devender 1978); on ecological houses (Farallones 1979); and on alternatives to energy intensive industrial technology (Lovins 1979). As individuals and small groups of citizens re-tooled their homes and villages, non-governmental organizations (hereafter, NGOs) began to proliferate and spread the good news that there were better means to meet ends than energy-intensive industrial technologies. Yet, the weakness of the AT movement is that it has almost exclusively paid attention to the technical choice between "hard" and "soft," so much so that it is often dubbed the "Soft Technology" Movement.

The Ethical option: homo habilis versus homo oeconomicus

Nowadays, distributive justice takes the industrial system for granted and strives to allot its outputs according to some equalitarian scheme. The alternative to this utopia of justice by arithmetic is equity, sometimes inaptly called participative justice. An equitable society is founded on an architecture of civil liberties that protects everyone's freedom to act. In an equitable society, each contributes threads to the weave of the social fabric rather than passively claim "outputs" from society. The enhancement of productive liberties does not mean a blind refusal to all claims to consumption. Rather, it implies the recognition of a hierarchy: just as autonomy is higher than heteronomy so also civil liberties are superior to social rights.

Many activists of the AT movement have rightly understood this hierarchy in demanding limits on tools. In contrast to the automobile, the bicycle is an example of an industrial product that fosters the autonomy of its users: it increases access without driving others off the road. Sewerage, once the glory of industrial hygiene, like the car, integrates every user as a compulsive terminal of a system. Clean, cheap, and often ingenious alternatives to the costly industrialization of shit removal suggest that freedom from other heteronomous systems is also possible when as intelligently worked out. Starting with Dr Nguyen's Vietnamese latrine in the 1960s, there are a great variety of high quality dry toilets that

unplug their users from the sewage pipes, reduce the destruction of land and waters, and cut a home's water bill by more than half (Nguyen 1981; Lehmann 1983; Anorve 1999).

The Political choice: who decides, where, for whom?

Proponents of alternatives to the service industry have emphasized that civil liberties can only be perverted by bureaucratic and professional government for the people. For example, from 1955 on, a group of Peruvian activists, builders, and lawmakers joined non-conformist architects and sociologists from Europe and the US to collectively give shape and credibility to an alternative understanding of poor neighborhoods (Turner 1968). They suggested that there were two ways of looking at a neighborhood. One is to evaluate the neighborhood in terms of its material characteristics as a bundle of "goods and services" that satisfy people's "housing needs." This will, almost inevitably, identify what people lack and petrify corrective measures into scientifically established and bureaucratically managed standards. It is associated with centralism, authoritarianism, professionally diagnosed needs and institutional services. But a neighborhood can also be understood as a set of productive relationships among its inhabitants. Such a commonsense view of people is sensitive to what people can do—their abilities rather than their deficits-- and will generate flexible rules that protect free people acting to fulfill their self-defined ends. The British architect John Turner became the most articulate voice of "housing" as the paradigmatic example of an activity that is not a need, and proved the feasibility of subordinating heteronomous tools to autonomous initiatives (Turner 1978).

Conclusion

Yet, during the late 1980s, AT became the Trojan horse of ever-new NGOs. Unfortunately, ends started to be confused with needs, and the promoters of NGOs became, all too often, shills for AT as a cheap alternative to high cost services. Governments started to support NGOs when they began to behave as ersatz professionals. NGO sponsored projects diffused AT to the third world as under-developed versions of the educational, medical, transportation or sanitary packages. Advocates of distributive justice fought for the poor man’s right to an equal share of industrial outputs. Though it had inspired the pioneers of the AT movement, equity, conceived as the civil liberty to decide what to do and how, was progressively neglected. Alternative technologies were not only conceived as alternative ways to satisfy needs, but, increasingly, as first steps toward the "real thing": Communal alphabetization as the baby steps to schooling, bare-foot doctors as unshod versions of the white coats, bicycles as cheap imitations of cars, dry commodes as training tools for flush toilets, and muscles as a painful alternative to fuels.

Hugh of Saint Victor, a contemporary of Theophilus, defined tools as appropriate remedies for man’s natural imperfections. In this sense, appropriateness, (Lat. Convenentia) refers to the proportional relationship between the radius of action circumscribed by man’s innate powers and the power deposited in his hands or under his buttocks by tools. Appropriate technology is the search for the fitting and proper relationship between means and ends. Accordingly, it has become all the more urgent to distinguish the alternative from the appropriate: Usually, the alternative is not appropriate.

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