

The 'Information Economy', Economics, and Ecology

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INFORMATION ECONOMY

William Melody (1987b: 1330) remarked that *all* societies, past and present – including 'the oral traditions of the most primitive tribes' – are or have been rich in information. He added, however, that in the 'developed' West, information and communication have changed. No longer does communication take place primarily outside markets; rather, the institutionalisation of information-generating organisations, and technological change (most, recently interactions among advances in computing and telecom), have induced ever-heightening commodification of communicative processes.

Fritz Machlup's 1962 book, *The Production and Distribution of Knowledge in the United States*, went a long way in directing economists' attention to the importance of markets for information. In that tome, Machlup estimated that in 1958 nearly 29% of output and 32% of employment in the United States were accounted for by knowledge industries. Several years later, Marc Porat (1976) announced that the information sector of the United States economy in 1967 had increased to about 46% of Gross National Product. He proclaimed that the United States was no longer primarily an agricultural economy, nor an industrial economy, but an Information Economy.

Policy makers in the United States and elsewhere responded quickly. After all, if information is central to the generation of wealth, then it had better be more strictly commodified, or so the thinking went. Governments, therefore, became keen on tightening and enforcing more vigorously intellectual property legislation. Even genes are now subject to copyright and patents in order to stimulate bio-technology firms and industries. Furthermore, governments have deregulated hitherto monopolised markets providing transmission services, and have made them subject to rivalry. Also they have introduced, to varying degrees, markets in cases where information had previously been provided freely or at low cost (public service broadcasting, public education, public data banks). As well, encryption technologies and ways of segregating and identifying information users so they can be charged directly for accessing information have been encouraged. Governments have also supported information highway infrastructures, anticipating that the production and exchange of digitised, electronic information will become increasingly important as the years go by.

INNISIAN 'BIAS'

Melody also refers, approvingly, to the Canadian economic historian, Harold Adams Innis, who, according to Melody (1987b: 1322), 'observed that any medium of communication is "biased" in its tendency to permit control over extended periods of time or over extended geographical space'. For Innis, inherent physical properties of every medium predispose it towards carrying certain types of information, and not to carrying certain other types. This notion of inherent selectivity, or bias, has been extended or applied to technologies generally (by McLuhan 1962, for instance), and to languages by Carroll and Whorf (1964).

It is important to note that Innis (1951: 8) regarded the price system as being a particularly space-biased mode of communication. Quoting Mirabeau, he wrote: 'The two greatest inventions of the human mind are writing and money ... the common language of intelligence and the common language of self-interest.' In fact, Innis (1956) saw the price system as penetrating and breaking asunder such time-binding, communal institutions as families, cultures and religions.

THE PRICE SYSTEM AND INNISIAN BIAS

Innis' recognition that money, or the price system, is an important mode of communication is certainly in accord with the thinking of mainstream economists. According to F. A. Hayek (1945: 525), for example, prices are 'quantitative indices (or "values")'. Every index or price, Hayek proposed, *is* concentrated information, representing the significance of each scarce resource relative to all others. Prices permit autonomous economic agents to adjust strategies 'without having to solve the whole puzzle [input-output matrix] *ab initio*'.

In fact, a large portion of the economics literature describes the purported effectiveness of the price system in communicating relative values; it also addresses certain obstacles to the effective functioning of that system (monopoly, externalities, uncertainty, public goods and so on). However, as Melody observes, the mainstream discipline has not addressed the price system in terms of Innisian bias, that is, it has not asked what types of information the price system systematically marginalizes or excludes, nor the consequences of those exclusions.

Here, I take up Innis' implicit challenge – to address the biases in the price system, and thereby identify properties of the Information Economy expected to result from its undue reliance upon this biased mode of communication. I do this from the standpoint of ecology.

ECOLOGY AND THE 'BIASES' OF THE PRICE SYSTEM

Five arguments are presented here to support the claim that the Information Economy, emblematic of a heightening in the commodification of information, is inherently destructive to the environment. This destructiveness is due to the selectivity or inherent Innisian bias of the price system.

Time

The price system is biased with regard to time. In Innis' terms, it is 'present-minded'. With regard to the past, it is axiomatic that 'bygones are forever bygones'. In other words, regardless of sunk costs, decision-makers following the dictates of the price system try to maximise the discounted stream of *future* earnings.

Likewise, however, the future too is trivialised. Assuming a 10% discount rate, US\$ 1,000 thirty years hence are worth only US\$ 57.31 today! Built into the heart of our monetary system of representation, then, is a sloughing off of both the past and the future.

Because they rely so heavily on the price system, then, we can expect information economies to denigrate considerations of continuity, community and tradition. According to ecologist David Suzuki, however, an awareness of and identification with the past is necessary for deep ecological awareness. Suzuki (1997) writes that aboriginal peoples, who possess profound ecological awareness, look to seven generations in the past (as well as in the future) before taking decisions.

Likewise, we can expect that information economies will be very cavalier about pollution, resource depletion and species extinction, simply because, according to their predominant mode of symbolisation, the future matters so little.

Exclusions

Not everyone or everything is privileged to register preferences in the price system. Systematically excluded or marginalised are the poor, the young, the unborn, trees, whales, insects and indeed all non-human species. The price system, then, is both an anthropocentric system of valuation, and an exclusive system in which the wealthy are given a much louder voice than the poor, and in which future generations are accorded no direct voice at all. Again, this contrasts with aboriginal cultures where other animal species are regarded as kin, and where attempts are made to listen to and speak for their interests (Knudtson and Suzuki 1992).

We would therefore expect information societies to create and tolerate environmental conditions dangerous to the poor. As the Brundtland Commission (World Commission on Environment and Development 1987) emphasised, however, poverty is itself an immense environmental issue, endangering the lives of rich and poor alike.

As well, societies governed by the price system may be expected to rob future generations of their birthrights to clean air, clean water and non-toxic soil, and to cause plant and animal species to become extinct at alarming rates.

Individual Valuations

Economic theorists have emphasised that the price system takes into account the preferences of individuals. A system of valuation based on individual maximisation, however, gives little or no accounting for group or collective well-being.

From an ecological perspective, life on this planet is characterised by total interdependence. Suzuki (1997: 130) writes: 'You and I don't end at our finger tips or skin. We are connected through air, water and soil. ... We *are* quite literally air, water, soil, energy and other living creatures'.

Consider briefly just the first element in Suzuki's list. Air is, of course, well recognised as a medium of communication. Air carries sound through condensations and rarefaction. Also, it transmits odours, informing sentient creatures of their surroundings through their sense of smell. Air can become visible when pollutants in high density are spewed into it, again informing us of industrial or other activity. Often air carries invisible pollutants, including radioactivity; but that too is communication, as recipients of such messages, can grow sick and die.

But for Suzuki (1997: 32, 37), air is a medium of communication in yet another, and far more profound sense. He writes:

We are [completely] embedded in air, all of us caught together in the same matrix. Air is a physical substance; it embraces us so intimately that it is hard to say where we leave off and air begins. ... Air is always within us and is as much a part of our bodies as any tissue or organ. We are a part of the air, which in turn is a part of all green plants and every other breathing creature.

In terms of Innisian bias, by systematically failing to transmit information reflective of radical interdependence among all organisms, the price system and the

Information Economy based on it, can be expected to cause hedonistic individuals to disregard the effects of pollution when making their wealth-maximising decisions, even though these actions poison all living creatures, including themselves, through continuous contamination of the air, water, and soil.

Knowledge

Individual preferences are based at least in part on knowledge. It is difficult, of course, to prefer something if one is ignorant of its existence.

In terms of ecosystem interactions, however, human knowledge is overwhelmed by ignorance. E. O. Wilson (1992) estimates that of all species extant on Earth, scientists have managed just to name perhaps 10%. Simply identifying a species and naming it, of course, is but a first step in learning about its interactions with other species. What we do not know, we cannot name; and what we cannot name, we cannot value. According to Wilson's estimate, then, 90% of the species on the Earth today carry no monetary representation, which is to say they are not valued by the price system. They are 'worthless' according to that system of valuation – even though individually or in combination these species contribute to the capacity of the ecosystem as a whole to sustain human and other forms of life.

In terms of Innisian bias, we would expect an Information Economy founded on the primacy of the price system to lead to alarming rates of species extinction. Indeed, estimates are that annually 20,000 species are rendered extinct.

According to other systems of valuation, for example those of indigenous peoples, by contrast, Nature as a whole is deemed sacred, to be of inestimable value. That valuation affects profoundly the nature of human interactions with the ecosystem by those holding that valuation.

Exponential Growth

Finally, the price system misrepresents the ecosystem in yet another way. Money, and indeed information of all types, can grow exponentially, seemingly without limit, through 'the magic of compound interest'. But the Earth is finite. Human population, human consumption of non-renewable natural resources, stockpiles of radioactive materials and other wastes, cannot increase indefinitely. Even in principle, however, the price system can give no indication of the limits of growth. This is because prices symbolise only relative, not absolute, values; prices, therefore, are silent with regard to the size of the economy relative to, and supportable by, the biosphere.

We would expect societies governed by the price system, then, to engage in uneconomic growth, that is to increase production and consumption well beyond the point where harms from this growth outweigh the benefits.

These five factors do not exhaust the problematic nature of the price system as an information system connoting value. It is an 'amoral' system of information that does not disclose violations of human rights and destructive environmental practices that go into the production of commodities. It may cause media, funded by advertising, to self-censor material unfavourable to the business community, including stories on environmental malpractices.

CONCLUSION

The Information Economy has been justly criticised on a number of fronts – for increasing inequalities both at home and abroad through user-pay principles, for eroding privacy and other civil liberties, for threatening indigenous cultures and so on. In this contribution I have argued that we should view it also as threatening human survival, because the price system upon which the Information Economy is premised is inherently biased in the information it is capable of carrying.

Rather than attempting to commodify increasing aspects of human life, thereby representing their value by prices, efforts should be made to extricate as far as possible human activities and nature from commodity exchanges and the price system. This would be in explicit recognition that humans and all other species share a common future.