

The informatization of development*

Harlan Cleveland

The new millennium opens the door to fundamental changes to make civilization fairer to all peoples. Ten concurrent revolutions stem from the huge transformation in our global information environment. The widespread of information – abundant, transportable, leaky, shareable – bodes well for a fairer world, undermining the structures of hierarchy and discrimination that have privileged those ‘in the know’. But the disadvantaged will need to work hard at learning how to use the powers inherent in this more accessible resource.

SUPPOSE that none of us had ever heard of the Christian calendar and its culture-bound presumption that we are about to begin not just another year but a new century and a new millennium. Would we still have reason to think that we are living in a time of fundamental transformation? I think we would. Even without the Year 2000 looming on our desk calendars – and the coming perils of ‘Y2K’ shouting at us from the media – the twin signals of crisis and opportunity are everywhere to be seen.

What the millennium *does* provide is a burst of surplus energy for change, a new motive to innovate, a feeling of excitement, and a special incentive to take stock and map new directions for a longer term – the Global Century and beyond.

Take stock of what? Take stock of the situation as a whole – in American slang, the whole schmeer. In a nutshell: We know now that the entire way of life in the modern world is not sustainable. It hardly matters whether by ‘long term’ we mean half a century or two centuries. Once we accept the prognosis, the crisis remains. Nothing short of fundamental transformation of our most powerful institutions – and underlying that, of modern thought and prejudice, will alter the ultimate catastrophe.

From means to meaning

Four years ago the late Willis Harman, an old friend of mine and a longtime co-conspirator in brooding about global affairs, helped launch a five-year inquiry called PeaceBuilding 21 and invited me to join in. It was, and is, a no-holds-barred effort to define, forecast, and perhaps welcome the fundamental cultural changes that seemed to

be in prospect. In our shared way of thinking, two ideas were central:

One idea was that everything really is related to everything else, and therefore to whatever one is trying to think through, or get done, right now. To focus on universal connectedness requires one to combine material observation with spiritual experience – and, quite deliberately, to blur the distinction between the two.

Modern, ‘Western’ science has focused on what can be learned from systematic observation and experimentation, with an intellectual rigour that withholds the accolade of ‘truth’ from what cannot be proved by the Scientific Method. Yet there seem to be many human experiences, and not only in dreams, that cannot aspire to the credentials of scientific ‘proof’ but are obviously vivid, relevant, and useful in day-to-day living and planning-ahead, for individuals and their families, groups, and communities – and are therefore, in some larger sense, ‘true’.

The other idea was a hunch about the macrotransition we are already in – ‘a shift’, Harman called it, ‘in the locus of authority from external to internal’, and a parallel ‘shift in the perception of cause from external to internal’. We sensed ‘a growing disenchantment with external authorities and increasing reliance on intuitive, inner wisdom and authority’. We resonated with the growing realization that ‘we humans create our own reality’, that we are ‘co-creators’ of the world we live in, and that ‘ultimate cause is to be sought not in the physical, but in consciousness’.

Willis Harman was not challenging the Scientific Method as such; it had been an important part of his own professional upbringing. What he seemed to be saying in his latter-day writings was that scientific rationality simply did not, could not, go far enough to explain the way human beings are able to think, and therefore to act. This led him to raise interesting – to some, disturbing – questions, not so much about means as about meaning.

‘The fundamental question as we look ahead’, he wrote not long before he died, ‘... is basically a question of meaning. What is the central purpose of highly indus-

Harlan Cleveland is the President of the World Academy of Art and Science, 161 Hubert H. Humphrey Center, University of Minnesota, 301, 19th Avenue South, Minneapolis, MN 55455, USA.

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email: hcleveland@compuserve.com

trialized and technological societies where economic production is no longer a central purpose, in part because it does not lead to a viable global future?’

From means to meaning . . . from external to internal . . . from unsustainable to sustainable There are intriguing hints here about the macrotransition we are already in. For if we are to move from a century of fear to a century of hope, we will have to move beyond a focus on the instruments human beings use to a focus on the human beings that use them.

A look ahead

On this first day of the rest of our lives, it may be useful to raise our periscopes for a 360-degree look around. My sweep of the horizon shows ten worldwide revolutions already transforming our world. They are concurrent, but not parallel – rather, they are intermixed, interwoven, interactive.

First – The sudden increase in explosive power has clamped a lid on the scale of warfare – a first in human history. The invention of weapons too big to use converted much of our big-power military strategy into an expensive information game. But it also leaves smaller wars in scattered places as the archetypical conundrum of ‘global security’ in the 21st century.

Second – Biotechnology, including the deciphering of information in living genes, presents humankind with a vast range of new ethical and political puzzles. Human cloning, which currently captures the headlines, is only one of them. In all sorts of ways, we human beings are becoming increasingly responsible for our own evolution.

Third – Computers, serving as prosthetic extensions of our brainpower, are replacing much of the repetitious drudgery people have always had to endure. They bring in their train new puzzles about the future of ‘work’. But the elimination of drudgery cannot be bad news for the generations to come.

Fourth – Linking fast computers with more reliable telecommunications enables us to model and simulate vast systems such as the global atmosphere, the human genome – and nuclear fallout from megaton explosions. This is sensitizing us to the consequences of what we people are doing to our natural environment – and might inadvertently do to ourselves.

Fifth – The widening spread of knowledge is creating a ‘skill revolution’ and a fundamental change in the technology of organization: pyramids and command-and-control are on their way out, *consultation* and consensus are increasingly ‘in’.

These five transformations are driven quite directly by scientific discovery and technological innovation. The

other five are facilitated, even intensified, by science and technology. But they are *driven* by universal aspirations of human spirit – by a widespread sense of entitlement to ‘enough’ (the fulfillment of basic human needs), and beyond that by equally basic human desires for a sense of achievement, justice, solidarity, and participation.

Sixth – A global fairness revolution is spreading as the spread of knowledge shows the disadvantaged in every society what they are missing – and provides them with new means of communication to express their rising resentments and help them ‘overcome’.

Seventh – The idea of human rights for everyone has become the first truly universal idea-system in world history. It has most clearly come to mean, in the first instance, rights for members of groups – not only for traditional minorities and political prisoners, but also for women, children, and the aging, for immigrants, for refugees, and for all manner of people once considered ‘untouchables’. But, nearly everywhere, the rights of *individuals* fall short of full recognition. And matching universal human rights with universal human responsibilities is mostly left to be worked out in the 21st century.

Eighth – Fierce loyalties to cultural identity with less-than-global communities – bonded by ethnicity, race, religion, ideology, and even occupation – are colliding everywhere *both* with the homogenizing cultures of globalization *and* with the human rights of individuals who happen not to belong to the in-group.

Ninth – An emerging ethic of ecology is producing a revolution in human self-control – based not on ‘limits to growth’ but on limits to thoughtlessness, unfairness, and conflict. The resulting international cooperation is producing, here and there, a ‘growth of limits’.

Tenth – Openness, market incentives, and the practice of pluralism are currently on display in some of the unlikeliest places. Authoritarian and totalitarian systems are simply unable to compete with looser systems that ‘go with the flow’ in the global flood of knowledge.

These global tides and currents are all related to each other. Indeed, modern biologists and ecologists have joined a long list of spiritual prophets, inspired poets, and secular philosophers in insisting that everything is related to everything else, that human beings are all somehow connected to each other – and that, in consequence, each of us has to try and think hard about ‘the situation as a whole’.

The striking thing about all ten of these global windshifts is the extent to which they all are rooted in or enhanced by the historically sudden spread of knowledge, that huge transformation under described by the pallid phrase ‘the information revolution’.

The information environment

I learned in Hawaii, where I once lived in the shadow of a volcano, that long before it blows, seismologists can hear it rumble: the volcano is clearing its throat. In trying to detect the seismic rumbling of our human futures, we social non-scientists also learn to look for relevant clues. Among our clues are the tools we humans fashion ahead of the eruptions that follow – because our tools are typically invented *before* we can imagine what they will be used for.

Scientists who study animals suggest that it's not quite clear that humans are in all respects brighter than some animals – brainier than dolphins, say. But it's surely clear from our short history on this planet that humans are much better than dolphins, or chimpanzees or elephants, at making tools. We mounted an agricultural revolution with 'the plow that broke the Plains'. We invented motors and brought forth an industrial revolution. And just the other day, we did it again.

In the great social event of the 1980s, we married computers to electronic communications and touched off another eruption of change that will affect everybody and everything – every political process, every business, every profession, every intellectual discipline, every 'settled' theory, every organized religion, every traditional culture – in the Global Century.

We cannot pretend to forecast just *what* will happen, or *when*. But we already know something more important: Why it will happen.

As far into the future as we can see, information will be playing the lead role in world history that physical labour, stone, bronze, land, minerals, metals, and energy once played. That requires us, who are now destined to live in the 21st century, to revise all sorts of assumptions we have treated as solid but now turn out to be fragile and flawed. We have to burn into our consciousness how very different information is from all its predecessors as civilization's dominant resource – because information is *symbols*, not *things*. The essence of this difference is that information is more accessible than the world's dominant resource has ever been before.

Information is not necessarily depletive: it *expands as it is used*. It is readily *transportable*, at close to the speed of light. Information *leaks* so easily that it is much harder to hide and to hoard than tangible resources. The spread of knowledge *empowers the many*, simply by eroding the influence that once empowered the few who were, as we used to say, 'in the know'. Information *cannot be owned* (though its delivery service can); so the phrase 'intellectual property' is surely an oxymoron. And giving or selling information is not an exchange transaction, it is a *sharing* transaction.

These six simple, pregnant propositions, as they sink in around the world and down the generations, should help us sort out some of the big conundrums that puzzle us as

we turn the corner to a new millennium. Let us see what they do to our thinking about 'development'.

Rising expectations, cascading revolutions

A doleful legacy of the 20th century is the still-growing gap between rich and poor – among countries and inside countries. As information – abundant, shareable, instantly accessible – now becomes the world's dominant resource, what does that do to the prospects for fairness?

Surely it means that people who get educated to handle information, who hone their analytical and intuitive powers, who learn how to achieve access to information and (even more important) how to select what they need from the information overload, will likely be better off and more fairly treated than those who do not.

In the industrial era, poverty was explained and justified by shortages of things: there just were not enough minerals, food, fiber, and manufactures to go around. Looked at this way, the resource shortages were merely aggravated by the propensity of the poor to have babies.

In the era just ahead of us, physical resources are elbowed from center stage by information, the resource that is hardest for the rich and powerful to hide and to hoard. Each of the babies, poor or not, is born with a brain. The collective capacity of all the brains in each society to convert information into knowledge and wisdom is the measure of that society's potential. Consider this measuring rod as you think about India's role – and China's, too – in the 21st century.

But there is a catch: Whether the informatization of the globe will actually mean a fairer shake for those who in earlier times have been the victims of discrimination depends mostly on what *they* do from now on.

Most of the fairness achieved in world history has not been the consequence of charity, good-heartedness, or *noblesse oblige* on the part of those who already possessed riches and power. Always in history, it seems, fairness has been granted, legislated, or seized when there was no alternative. And usually the reason there was no alternative was that the 'downs' were determined – or at least perceived by the 'ups' to be determined – to cast off their shackles and take the law into their own hands.

As information leaks around the world, very large numbers of people are learning about what goes on elsewhere – good things happening in places near and far that could happen to them if their leaders were wiser and more flexible, and bad things happening to other people which could fall out on them if they do not watch out.

During the revolutions of 1989–1991 that pulled the fraying rugs from under the Communist regimes of Eastern Europe, then swept into history the Soviet Union itself, the impatient crowds in the big public squares were moved not by distant visions of Utopia but by spreading information about neighbours, mostly in Western Europe, who were obviously getting more goods and services,

more fairness in their distribution, and firmer guarantees of human rights than their own bosses and planners seemed able to deliver.

The good news was that information leaked – and that sharing has long been the natural mode of scientific and cultural communication. The changing information environment was bound to undermine the knowledge monopolies that totalitarian governments had converted into monopolies of power.

The future is an ethical category

Those cascading revolutions a decade ago were dramatic in their details and unpredicted in their timing. But they were no surprise to those who had noticed the way the eastward information flow – by television, radio, facsimile, telephone and most of all by the written word – bred people's intolerance of longtime leaders who simply could not liberalize their policies fast enough to escape the people's wrath.

Around the world outside of Europe, the intensified spread of information was also enhancing the people's political aspirations on every continent – not so much selling them on Western concepts of freedom and democracy as persuading them, by the millions, that they deserved a say in policies that bore on their own lives and destinies.

Shortly before he died at the end of 1989, the Indonesian philosopher Soedjatmoko (perhaps the wisest wise man I have been privileged to count as a personal friend) spoke of the need for a political philosophy that reconciles freedom for the individual and fairness for the individual. Some human societies meld fairness with freedom better than others do. But none has yet met his prophetic standard. In dancing around this dilemma, he thought, we cannot expect much help from 'the older religions, ethical systems, and philosophies', because today's options, opened by the information revolution, did not exist when they were developed.

We will therefore have to learn, said Soedjatmoko, 'to enhance our capacity for moral reasoning, to deal with problems' for which 'we cannot find analogies in older, petrified systems of wisdom'. Unless we do that, we will be stuck with 'obsolete, fossilized social and political structures'. Then we would be destined 'to work hard for our own demise . . . in a world of very rapid change without fixed road signs'.

The learners in every society are starting to fashion their own road signs – some adapted from older systems of wisdom, some the result of new intellectual or spiritual inspiration. 'The future is an ethical category', Soedjatmoko was fond of saying, 'because we choose it ourselves'.

A global fairness revolution

The rich countries – and the rich people in every country – thus face a global fairness revolution, multiplying the

demands on a world economic system that still knows how to include only a minority of humankind in its benefits.

Both among and within the 'nation-states' of the 20th century, the old French warning retains its relevance: *Entre le fort et le faible, c'est la liberté qui opprime et la loi qui affranchit*. (In relations between the strong and the weak, it is freedom that oppresses and law that liberates.) But if law is too rigid and universal, as Aristotle had already figured out two and a half millennia ago, the urge for equality or fairness will arise to correct the law. A 'triple collision' (modernization versus tradition versus fairness) can be found in the recent and current history of dozens of countries, with local variations reflecting local cultures. Part of the stew of resentments seems always to be the complaint every child learns to make from infancy: 'it isn't fair'.

The key that unlocks 'growth with fairness', in the United States and India and elsewhere in the global information society, is widespread access to relevant education.

More than any one factor, it was that forward-looking early nineteenth-century decision to mandate free public education for every young US resident that enabled the American people to pull themselves out of 'underdevelopment'. Another wise educational policy, the Morrill Act of 1862, used federal land grants to set up university-based agricultural research stations and build a county-by-county extension service to deliver the resulting science directly to farmers. That made possible those 'amber waves of grain', celebrated in our loveliest national song, that are still today a centerpiece of the world food market.

Around the horizon of the developing world in Asia, Africa, and Latin America, the close connection between education and equitable development is now crystal clear: *The poor can get rich by brainwork*.

The Japanese amply demonstrated this theorem of wealth creation from the earliest dawn of the information era. Two of the most dramatic demonstrations in my lifetime have been India's Green Revolution in the 1970s – a public-sector initiative in which our host M. S. Swaminathan played so central a role – and the private-sector software surge in the 1990s that has made India a global player in the world's most phenomenal industry.

Also in our own time the hustling people of South Korea, empowered and emboldened by a national policy of universal education dating only from the 1950s, have become the newest members of the OECD, the 'rich countries' club. During the same half century, Taiwan, Singapore, and Israel have in their differing fashions demonstrated the close connections between brainwork and prosperity. Their economies have not only grown faster than those in other developing countries, but the benefits of that growth have been spread more fairly among their own people than in developing countries that