

A range of predictions for the future

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Ask a broad sample of thoughtful people what they expect the world to be like in 50 years; then plot the answers on a simple spectrum (as below) from “future misery” to “future luxury”. You are likely to find that the answers do not fall, as so many things do, in the “normal distribution” form that looks like a single symmetrical mountain. In a normal distribution, the largest number of responses may be found clustered at the center

with progressively fewer responses associated with points that lie progressively farther from the mean, so that the extreme positions are represented by two very thin tails. By contrast, the peculiar nature of the way people are thinking today about the future reveals itself as a bimodal distribution; as in Fig. 1, it has two humps.

The fact that our friends’ and acquaintances’ observations can be graphed and identified as a

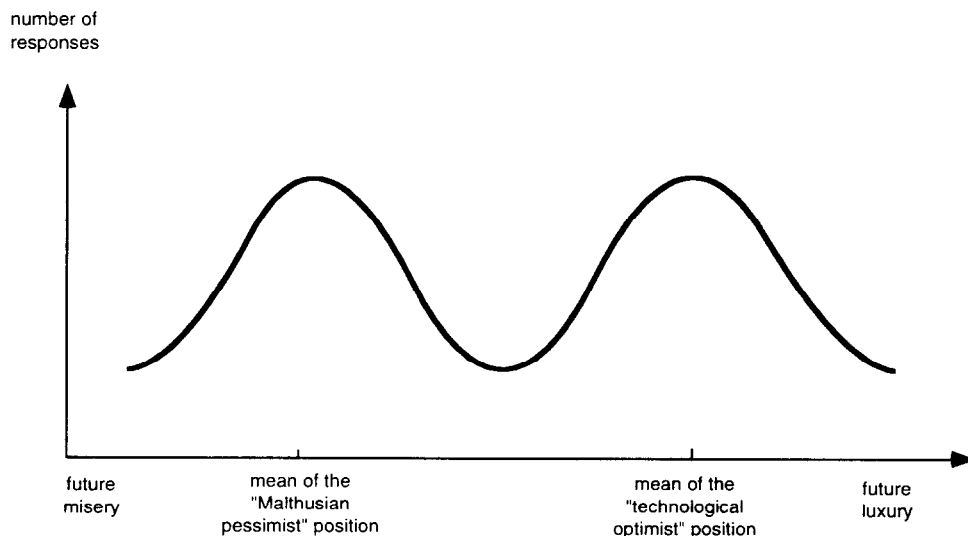


Fig. 1. Predictions on the future of human civilization: a bimodal distribution.

type of probability distribution does not, of course, make them “scientific”. The picture given here is, first of all, drawn from anecdotal evidence and, secondly, it is a picture of *what people think will happen*, not of what *will* happen. Nevertheless, the image is useful for getting a handle on understanding opinions, which, in turn, shape policy.

One meaning of this observed division of expectations into two groupings is that we are living in a time of great uncertainty, not just on small matters, but on issues of the most grave consequence. It seems possible to some reasonable people that human civilizations will collapse and human life, if it goes on at all, will return to the sort that Thomas Hobbes characterized as “solitary, poor, nasty, brutish and short”. To others, however, it is within reason to speculate that technological miracles will rescue us again, as they have done repeatedly in the three centuries since Hobbes’ death, and that an ever improving base of material well-being will continue to give humanity at least the option to continue its experiments in freedom, justice, and understanding.

The individuals whose expectations I have characterized in Fig. 1 as the position of the Malthusian pessimist cluster about the assumption that there is *no* group of inventions or investments that can permit us to continue living in the style, at the level of material affluence, taken for granted by the rich today.

– The most pessimistic members of this group (in the lefthand tail of the left hump) anticipate that we will not face this reality until we have so harmed the natural environment as to bring about an ecological and economic collapse, resulting in a vast collapse of population and of civilizations to be followed – if we are lucky – by a regrouping at a much lower level of resource use and (most likely) of civilization. This most pessimistic scenario would include, for example, a reversal of all the gains made by the less powerful groups in society – women, children, the poor, the disabled, etc.

– However, those on the more optimistic side of this grouping (closer to the middle of the spectrum) see a slower, gentler let-down, in which civilization continues to go forward and we learn how to maintain our essential values, and perhaps

also to feel that real human welfare is improving, while moving to less materialistic lifestyles.

The alternative hump in the “predictions distribution” represents opinions that gravitate towards a different basic assumption. The technological optimists assume that we will be clever enough to find new, benign technologies that will put a high level of consumption on a sustainable basis. The farthest to the right in this group – the far-out optimists – see no need to tamper with consumer behavior; they assume that the whole fix for anything that is wrong with today’s energy economy can be worked out on the supply side.

The dilemma is that we are faced with two sets of predictions regarding matters of the utmost importance where action is required; one can find intelligent people with respectable ways of thinking in either camp, and no certain way of deciding between them.¹ What is one to do? Ignore one set of possibilities and concentrate on the other? A better proposal might come in several parts:

- (1) Given the lack of credibility attached to the predictions of either paradigm, we need to prepare for both kinds of futures – that predicted by the pessimists *and* that to which the optimists look forward; at the same time
- (2) we should try to maximize the possibility that our preferred set of possibilities is given a chance to be realized, while
- (3) taking steps to ensure against even a small probability of the most pessimistic scenarios being realized.
- (4) We should also continue refining our understanding of the competing predictions, both by adding to our knowledge about the events which will determine the relevant characteristics of the future, and by familiarizing ourselves with the arguments that say why these events should lead one way or the other.

Against this backdrop it is interesting to look at two recent publications, representing intelli-

¹ These ideas were first worked out, without Fig. 1, in an introduction to the January 1991 issue of *World Development*. The proposal, below, for a four-part response to the dilemma, came out of discussions with Paul Streeten.

gent arguments near the center of the Malthusian position, with one rather more pessimistic than the other. *Environmentally Sustainable Economic Development: Building on Brundtland* is a collection of essays originally published by the World Bank and subsequently republished both by UNESCO and by Island Press (for convenience it will henceforth be referred to as UNESCO). *Beyond Interdependence: The Meshing of the World's Economy and the Earth's Ecology* was written originally for the Trilateral Commission (it will be referred to as TC). Its senior author, Jim MacNeill, was also the chief author of *Our Common Future*, the Brundtland Commission's Report to the United Nations.

The position of TC is strongly molded by a sense of political possibility. As the TC authors see it, they must deal with three hard-to-reconcile realities: (1) the needs of the poorer regions of the world are huge; (2) those needs *must* be met, for humanitarian even more than for political reasons; and (3) they will not be met to any major extent through sacrifices on the part of the rich.

UNESCO accepts the first two propositions; it is in relation to the third that the difference between the two books comes out most clearly. Given its more pessimistic assumptions about the tolerance of our environment for absorbing the results of a growing human economy, UNESCO falls back on sacrifices of the rich as the *only* possible road to an acceptable future: "...ecological constraints are real and more growth for the poor must be balanced by negative throughput growth for the rich." (UNESCO, p. 12) Assuming that sacrifices of the rich cannot be the solution, TC turns to technology.

The scenario which is almost never confronted directly by either book, probably because it is so morally abhorrent, is one in which redistribution does not occur; ecological collapse hits the poor soonest and hardest, causing Third World famine and disease on a scale surpassing anything ever experienced by our species; and the wealthy countries learn enough from that to reform their ways – not in terms of helping the poor, but in reducing their own throughput. That is the nightmare scenario which, I suspect, is in the back of the minds of most of the authors of the two

books. They have different ways of coping with such a nightmare.

One coping mechanism is the assumption that, if half the nations of the world (the poor half, which now contains well over three-quarters of the human population) go into a severe crisis, so will the rich half. That assumption does not solve the crisis, but it shields thinkers in the North from the untenable position of saying, "Well, anyway, we aren't the ones who will bear the brunt of the crisis."

The more optimistic way of coping is to seek realistic ways of averting the crisis on a worldwide basis. There is some hope expressed, at least in parts of UNESCO, that the means are actually at hand to do this, if everyone would be both rational and altruistic. Goodland, in particular, cites the "tremendous scope for reducing the energy intensity of industry and of the economy in general, [which] is why reductions in carbon emissions are possible without reducing standards of living." To support his contention that "a significant degree of decoupling economic growth from energy throughput appears sustainably achievable", he cites, for example, "the 81% increase in Japan's output since 1973 using the same amount of energy." (UNESCO, p. 20)

Similarly, TC points out that:

During the past two decades, economic and technological changes have resulted in a leveling off, or an absolute reduction in, the demand for energy and some basic materials per unit of production. The link between growth and its impact on the environment has also been severed. A new economy has begun to emerge, one that is more efficient and potentially more sustainable, marked by people producing more goods, more jobs and more income – but using less energy and resources for every unit of production, and more information and intelligence. (TC, p. 24)

Much more than UNESCO, the major part of TC is devoted to examining the ways that can be found to bring about the combination of rationality and, if not altruism, at least some kind of enforced sharing, which appears to be our best hope. On the side of enforced sharing, TC devotes a considerable amount of space to a discussion of bargains that may be struck between the rich and the poor nations, where each side will be willing to participate because each will gain

something from a purely selfish standpoint, as well as gaining from protection of the global commons. TC is particularly noteworthy for its attempts to bridge the gap between what *should* happen and *how* it might be brought about; chapter 4 includes a host of practical suggestions for environmental bargains involving the transfer of technologies and know-how, and financial arrangements.

While both of these books, and nearly all of the authors represented therein, have impressive “establishment” credentials, they are clearly not addicted to the economic theory now predominating with its overwhelming emphasis on “free” markets. TC suggests some reason for hope, considering the world’s shift from command to market economies, in the fact that market economies are generally more open to change in response to at least certain types of signals of ecological distress. However, markets must be augmented by policy: “The market is the most powerful instrument available for driving development... [but] it can drive development in two ways – sustainable and unsustainable. Whether it does one or the other is not a function of an ‘invisible hand,’ but of man-made policy.” (TC, p. 33)

In UNESCO, Von Droste and Dogse cite a number of reasons why policy makers tend to underestimate the value of environmental investments. Noting that rapidly increasing environmental cost “challenges the maxim that continued economic growth leads to increased global welfare”, these authors give some encouraging statistics on the productivity of environmental investment, e.g., “It is calculated that over a twenty year period, US\$4.5 billion/year investment in soil protection [worldwide] would reduce the annual cost of lost agricultural production by US\$26 billion.” (UNESCO, pp. 71–73) The issue of investment is especially well illuminated in recent work by Herman Daly. His essay in the UNESCO collection makes the point that:

the evolution of the human economy has passed from an era in which manmade capital was the limiting factor in economic development to an era in which remaining natural capital has become the limiting factor. Economic logic tells us that we should maximize the productivity of the scarcest (limiting) factor, as well as to try to increase its supply. This means that economic policy should be de-

signed to increase the productivity of natural capital and its total amount, rather than to increase the productivity of manmade capital and its accumulation, as was appropriate in the past when it was the limiting factor. (UNESCO, p. 29)

This observation, along with the emphasis upon complementarity vs. substitutability in the relationship between natural and manmade capital, is perhaps the most original addition to the debate. In a dialogue between Daly and MacNeill, one might like to introduce the possibility that there are three, not two, factors of production to be considered: natural capital, manmade capital, and what has been called “human capital” – the knowledge, skill and ingenuity that is developed through education and experience in individual humans. If there is any reason to lean toward the relative optimism of MacNeill’s position, it is the hope that, when the trade-off includes this third option, we may not reach such a stark conclusion as when it is only between the original two.²

Daly’s profound recognition of a turning point of relative scarcity of capital inputs leads him to emphasize, first, the necessity of shifting from a mindset which sees manmade capital as always able to substitute for natural resources (“natural capital”) to a recognition of the degree to which the two are complementary (“what good is a saw

² Daly does refer (on p. 33) to the “improvements in knowledge, technology, managerial skill, etc... that would increase the efficiency with which resources are used”, but he does so in the context of an argument where the emphasis is on the complementarity of natural and manmade capital, so that this subject is not explored as fully as it might be. For further discussion of the trade-off between land, labor and technology, emphasizing the “unbundling” of technology between its mostly material (“mm”) and its information intensive (“ii”) components, see Goodwin, “Lessons for the World from U.S. Agriculture: Unbundling Technology”, in *World Development*, Jan. 1991.

Neither UNESCO nor TC addresses the issue stressed in *Beyond the Limits* (Meadows et al., 1992): that a prerequisite to the development of self-correcting mechanisms in humans systems is the provision of timely, honest information (not distorted for political purposes). (I am indebted to an anonymous reviewer for drawing my attention to this issue.) What is needed for ecological sustainability is, in this case, very similar to what is needed for successful democracy.

mill without a forest? a refinery without petroleum deposits? a fishing boat without populations of fish?"); and, second, the necessity of recognizing that "the productivity of manmade capital is more and more limited by the decreasing supply of complementary natural capital" (the latter including both the productive and the absorptive capabilities of the natural world) (UNESCO, p. 30).

The two books discussed here, with their total of seventeen contributing authors, provide a rich set of points under the half of the curve in Fig. 1 that is associated with the position of Malthusian pessimism. Within this position, however, it is possible to glimpse two slim hopes: the no-growth hope exemplified by UNESCO, and the sustainable development hope exemplified by TC. It is easy to find persuasive reasons to doubt that either will actually happen: sustainable development opponents of no-growth point to political (and sometimes ethical or humanitarian) constraints; the no-growthers counter that sustainable development is scientifically impossible.

The point I want to make, in concluding, is that if, in fact, we begin to make the necessary changes in behavior, we are likely to find these two positions converging, as in practice they redefine concepts of welfare, growth and development. To put it another way, there is such a long distance to go from where we are to *either* a "no-growth" or a "sustainable development" scenario that proponents of each could work as hard as possible for years without getting to a point where their actions clash. By the time that point is reached we may have so much more understanding that the differences will be easily resolved.

Thus, both positions just distinguished would be likely to agree with the practical suggestions included in Goodland's comment that "merely meeting unmet demand for family planning would help enormously. Educating girls and providing them with credit for productive purposes and employment opportunities are probably the next most effective measures [for limiting population growth]" (UNESCO, p. 23). Both would likely be interested in the innovative policy instrument which Costanza and Perrings have been studying:

an environmental assurance bonding system in which the burden of proof (of whether a planned project is environmentally harmless or harmful) would be shifted from those who will bear the harm in the negative case, to those who will reap the profits in the positive (UNESCO, p. 88). Finally, though the more pessimistic might reject the relatively upbeat tone, both of these "Malthusian" groups would endorse the following prescription as to where to start:

Given the potentially catastrophic consequences of ozone depletion, global warming, species loss, and other syndromes, the cost of insurance against them is not large. The uncertainties surrounding military security are much greater and nations spend colossal sums to buy insurance in the form of armed forces, materiel, and highly unpredictable technologies. Environmental insurance is especially cheap when you consider that the most cost-effective measures against global warming are also the most cost-effective ways to deal with acid rain, deforestation, and other issues of more immediate concern. Moreover, up to a certain point, many of these same measures are sound investments in their own right, cutting energy bills and increasing a nation's macroeconomic efficiency and international competitiveness. (TC, p. 106)

Brundtland, MacNeill et al. hope that we will find ways of managing five- to ten-fold economic growth on a sustainable basis. Definitions of "economic growth" aside, this position will continue to be debated hotly by those whose thinking is more like the UNESCO group described here. This debate, however, is somewhat reminiscent of the story of the wife who says, "My husband makes all the important decisions: who should be President, what to think about the state of the stock market, and other things I don't understand. I just make the little decisions: what house to buy, whether to have a mortgage, where the kids should go to school..." The "little decisions" cited are, of course, the ones that are actually within the control of the average family. When we look at *Beyond Interdependence* and *Environmentally Sustainable Development* from the point of view of the long-range vision of where we should be going, we see real divergences; but when we look at the first steps that each would propose, they are quite similar. And the first steps are the ones over which we have the most control.

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