

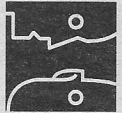
# A world that turns too fast

Unless humanity acts to slow its technological momentum, catastrophes will do it

In the last century the population of the planet has quadrupled and most of us now live in cities. At the same time, new technologies – including antibiotics, jet aircraft and the internet – have vastly extended our power as individuals, groups and societies. We live longer and more healthily, produce more stuff, travel farther and faster, control the world around us more completely and send more information to more people, faster, across greater distances.

These changes have sharply raised the density, intensity and pace of our interactions. Our social and economic systems now have many more entities – including people, organisations, corporations and technologies – and these entities have more links. They also pass more materials, energy and information among themselves more quickly than ever before.

When things happen faster, in greater numbers and with greater interactive complexity, we need more ingenuity to make the right decisions at the right time. That is, we need a greater flow of practical ideas to solve technical and social problems. Sometimes we cannot supply enough ingenuity to meet this soaring need. There is, if you like, an emerging ingenuity gap. Nearly every statistic that gauges the degree of connectivity among human beings or the movement of things, people and information, shows exponential growth. In the mid-1980s the whole world contained a few thousand host computers for the internet; by 1999 the number had soared to nearly 50m. In 1977, about \$18bn of foreign exchange was traded daily; today the figure is \$1,500bn. Between 1960 and 2000, a period during which the planet's population doubled, worldwide traffic volume – that is, the total number of kilometres travelled by people in cars, buses, trains, and airplanes –



## PERSONAL VIEW

increased more than fivefold. Between 1950 and 1988, worldwide volume of air transport alone increased almost 100 times.

This steep and seemingly endless rise in our connectivity and kinetic activity generally makes the social and economic systems we depend on more tightly coupled, synergistic and likely to exhibit abrupt and unexpected changes in their behaviour, or non-linearities as specialists call them.

We saw a good example in 1997 and 1998, when the international financial system, triggered by events in Asia, flipped back and forth between stable and chaotic modes. The system's immunisable components – including banks, trading houses, corporations, and governments – interacted intensely to produce vicious circles

and sharp surprises. Lightning-fast technology and round-the-clock, round-the-world trading gave the system little slack to absorb errors or sudden shocks.

These technology-driven changes in the complexity and speed of financial transactions have surged ahead of our capacity to manage them: economic theories do not give an accurate understanding of often chaotic behaviour; data on countries' economic performances are often poor or non-existent.

In the face of cognitive overload, managers and policymakers increasingly rely on automated procedures and on consultants with narrow technical expertise. And in the absence of strong economic theories and data, facile nostrums and fads become received

for us, says Thomas Homer-Dixon

wisdom. Hardly surprisingly, this wisdom usually supports the short-term interests of powerful economic elites.

Such trends are visible not only in finance and business but also in practically every domain of human activity – be it economic, technological, political or ecological.

From the rapid invention of new technologies such as micro-robots and genetically modified food, to our soaring emissions of carbon dioxide into Earth's atmosphere, we seem to have our collective foot slammed down on the world's accelerator pedal. It is time to think creatively about how we can slow things down, how we can ease up a bit on that accelerator pedal.

Some sceptics may respond that people have always perceived they lived on the cusp of chaos but in the end have usually managed well by marshalling their ingenuity and courage. But today's world is fundamentally different from that

of the past. The complexity and speed of our social and technological systems are unlike anything we have seen before and these factors are now pushing against the upper limits of the human brain's abilities. Ecologically, for the first time in history, we are moving materials, producing energy and generating waste on a scale that rivals nature itself.

If we allow the complexity and speed of the systems we have created to go on increasing unchecked and if we continue to perturb the deepest dynamics of our planet's ecosystems, these systems will sometimes fail catastrophically. In other words, non-linearities will simplify and slow things down for us, whether we like it or not.

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