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Fault-lines of globalised civilisation

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Abstract

A popular genre among professional futurists is trend extrapolation, identifying those aspects of the present that are likely to become dominant in the shaping the future. These are more likely to be eutopic than dystopic, and so the client receives some mild uplift, which is after all what the futurist is being paid for. This paper offers an alternative approach, which is to see what sorts of things might go wrong in the next century. It makes no claims about the likelihood of any particular one of them occurring, but aims to present a structured list that could be helpful in alerting us to the opening of any one fault-line to a significant degree. There may be an accumulating sense of gloom as one works through this analyses; but that should not be interpreted as doom. All societies have their ailments, most of which are not lethal and some of which are actually resolved in time. © 2000 Elsevier Science Ltd. All rights reserved.

1. The corruptions of meretricity

This term may be seeing its first occurrence right here. We may already know ‘meretricious’, coming from the Latin word for prostitute. To understand meretricity, we might make an analogy with ‘meritocracy’, the name given some decades ago by Michael Young to a society ruled by ‘merit’ rather than by birth or wealth. In this case, meretricity describes a state of affairs where no statement, be it of fact or of evaluation, can be taken at face value; indeed, one expects all such statements to be false, and to be of interest only as evidence of the source of the payment for them.

Given that advertising is now the great patron of art (in the TV commercials) as well as of sport and much culture in general, then to that extent it is undeniable that meretricity now dominates our lives. For advertising, when it is not simple lies (fake

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happy housewives feeding fake nourishing food to fake joyful offspring), becomes deliciously ironic, as in the UK Channel 4 commercials which become a puzzle: guess the advertiser before it is revealed. What better way to imprint the advertiser's name than through such self-conscious multi-layered nonsense? Indeed, meretricity finally spoke its true name when, in defending advertising to children, one spokesman for the industry recently said that even children are now so sophisticated and skeptical that they don't believe the adverts. Even before they lose faith in Santa Claus and the Tooth Fairy, the tots know that Ronald McDonald is a fraud.

To the extent that this is correct (and it is claimed to be supported by research) we are in a most peculiar situation in the education of the next generation. We are exposing them to a constant barrage of messages into which vast resources are poured to make them persuasive, all the time expecting that while still at a tender age they will see through them as lies. Having been conditioned to distrust everything they see on TV, why should they then be expected to believe what comes from other sources, be they at home or school (or, as some will remember, church)? Or indeed, why should they have any personal commitment to a truth that goes beyond convenience, since in their experience it is only the boring sort of information that even claims to be such.

I would be the last to assert that in no previous age was the populace, including children, exposed to systematic lies from all sources of authority. Falsehood, corruption and hypocrisy (as well as the promotion of hate and all sorts of viciousness) are indeed the characteristic condition of the consciousness industry down through the ages. But what is new now can be appreciated through a paradoxical epigram, which I believe is Dr Johnson's: hypocrisy is the tribute that vice pays to virtue. Now in the advertising age, we have gone beyond hypocrisy, and so virtue gets no tribute. The lies that are purveyed to the masses have absolutely nothing of the nobility of Plato's original conception, committed in the service of an ultimate social wellbeing. They are absolutely venal, serving only to secure a bigger market share for one corporation at the expense of its nearly identical rivals. We are thus in a condition of anarchy, unique among civilisations, in that there is no central ideological control over the formation of consciousness of the young.

This new false world of advertising even goes beyond the interesting problems of obligatory lying, which motivated theories of 'two truths' (faith and reason) from the Middle Ages onwards, or the reflections on reality-control in Orwell's *1984* [1]. For here, it is open and cheerful; no one believes in the statements, neither the makers nor (we are told) the receivers. They are there (with their load of money and artistry) to carry an implicit message, that the brand in question exists, and in some way does so interestingly.

In this way advertising might be considered a drug, in that it provides a pleasure which is known to be false, just like the sex-worker's terms of endearment. The advertising on which children are raised is part of their drug intake, as much as the sugar, salt and fat to which so much of that advertising is dedicated. And this junk-knowledge is so much involved with the junk-food or junk-gadgets it promotes, that the two sorts of drug are not easily distinguished. Also, the form of the meretricious learning fits its content, so that (increasingly) a whirling sequence of images, express-

ing and giving clues to a drugged perception and consciousness, substitutes for anything resembling a reasoned discourse.

Some aspects of a culture of meretricity were sketched in classic R. Bradbury's *Fahrenheit 451* [2]. In place of the books which were sought out and burned by the fire brigades (their new function), people had a full-sized continuous Soap, 'The Family', which even allowed them to participate (at a price). The short story concentrated on the classics of literate culture, kept alive in the personal memories of secret dissidents; perhaps there was no need to dwell on the utter debasement of all the other aspects of life, social and personal, in this culturally drugged civilisation.

What could be the consequences of the eventual dominance of meretricity in our civilisation? As we have been reminded by the bitter experience of those countries who have recently accessed to market economies, successful markets require regulation by 'institutions'. These require cultures which are antithetical to the market ethos, and so must be staffed by people with a world-view involving service, and with rewards that are less tangible and immediate than hard cash. In a culture of meretricity, where children grow up learning, roughly, that the grownups are all a pack of whores, where will be found the social mechanisms for inculcating these other, more subtle, values? (The TV programs, *The Simpsons* and *South Park*, can be interpreted either as an ironic protest at this situation, and/or contributing to it by showing how ordinary it is).

The dominance of meretricity would then affect, or indeed infect, all spheres of culture and even commerce, to say nothing of science and technology. Science and high technology are uniquely dependent on a non-market ethical code. The opportunities for successful cheating are so dense in the lived experience of the craftsmen who make research or development happen, that in the absence of effective ethical commitments the whole thing could become a joke. Published papers would be as phony as advertising. As I realised when I composed my book *Scientific Knowledge and its Social Problems* [3] this state of affairs already exists in the majority of milieu called 'scientific', that is in most fields in countries outside the metropolitan core, and in weak fields there. Hence the existence of quality anywhere became for me the phenomenon to be explained, and my explanation eventually was cast (surprisingly, for me as I was at the time) in terms of ethics.

In the Land of Meretricity, ethics is just another item of pretence. 'Cheating' would become a hollow term, perhaps used only ironically, since once everyone knows that the game is crooked, only fools play it straight anyway. There are plenty of countries where this sort of thing happens already. These are called 'developing', as if they are under our tutelage in truly modern ways, and can't help getting it wrong some of the time. That may well be one aspect of their reality; but another one is that (after generations of exploitation and oppression) the alien societal and cultural forms of 'modernity' were suddenly dumped on top of their own. They survive through adaptation and manipulation, not even needing irony to make sense of it all. In our own case, meretricity could lead to a social condition describable as 'post-modern' (without irony), in that only the forms and simulacra of a rule-bound modern society would survive, while the reality could be reminiscent of that of the early post-Communist world.

2. Runaway technology—the environment

It is popular just now with sophisticated defenders of our high-technology culture to remind us of its achievements, using the objective measure of the lengthening of the average life-span in developing nations, and (even more impressive) in the dramatic narrowing of the gap between that statistic and the corresponding one for the developed. The moral is that all we need to do is to fine-tune the technology, and we will be able to preserve its benefits while eliminating its costs. Against that rosy perspective, one can only point to the rapidly accumulating evidence of impending catastrophes from global climate change, on every scale from the local to the planetary. And this is not just some accidental feature of excess emissions of the relevant gases. The production of noxious wastes is a characteristic feature of urban civilisation, once affecting only localities and regions, but now poisoning the globe.

In that sense our whole technology is ‘runaway’; in the time needed to convert it from its present destructive course, it will have done its work of destabilising the ecosystem. And we are all too dependent on it, individually and collectively, to be able to move quickly in its modification. If the vision of Micah, of every man sitting under his vine and his fig tree, could be taken as defining the good life, then all this technological gear is another drug, buying an ersatz happiness to give people the hope or illusion of escape from the real miseries of the material poverty that civilisation imposes on the multitude, along with the spiritual deprivation suffered by the rest.

Even if we take the narrowest, geopolitical view, we find that the dependence on oil, rigorously maintained by the discouragement of alternatives, is a form of cultural suicide. We need not go all the way with Professor Huntingdon in supposing an eternal enmity between the West and Islam. But there are real conflicts of interest and culture, going back continuously for many centuries; and for the West to make itself dependent on Islam for the lifeblood of its industry and economy, is really offering hostages to fortune. But it seems that gambling on the goodwill of the oil sheiks is preferable to gambling on the diversification of economic power that would come with widespread alternative energy production.

Now that ‘the precautionary principle’ is making some headway in environmental policies, it is easy to perceive how pervasive has been its opposite, which we might call the ‘Pangloss Principle’ (‘all is for the best in the best of all possible worlds’). It is all a question of burden of proof: is a new development to be deemed dangerous until proven safe, or safe until proven dangerous? Of course, the terms ‘proven’, ‘safe’ and ‘dangerous’ must be given operational meanings in any practical situation; but the choice between principled burden of proofs is always almost clear. Even now, new chemical species are (in all regulatory schemes) deemed safe for release into the environment, unless they are obviously similar to others known to be dangerous. And of the vast number of artificial substances floating around in the environment, only a pitiful handful have ever been, or ever will be, tested.

It has been correctly observed that to become ‘precautionary’ about new chemicals would involve huge costs. Testing for a substance’s toxicity under even the simplest conditions is a lengthy, expensive, and inconclusive process. If we were to require

tests involving synergies of different substances, or damage to other species or to future generations, then progress in chemical technology would immediately grind to a halt. But that point illustrates the paradoxical character of our ‘progress’, or (expressed otherwise) a deep, characteristic, and perhaps fatal contradiction of our high-technology civilisation.

We have already had examples of deleterious consequences of new chemicals that could not have been anticipated except under the most pessimistic of assumptions. One is of the ‘Ozone hole’ caused by chemicals so inert that they are completely stable except under the (totally unexpected) special conditions of the upper atmosphere. Another is the ‘Xeno-oestrogens’, increasingly accepted as responsible for the harm to male reproductive systems in a wide range of species, in spite of appearing in the tiniest of trace doses [4]. We do not know what other surprises are in store for us, as ever more sophisticated chemicals are released in ever larger numbers, into the environment. In that sense, we are living on our luck; it is not science which protects us from destruction at the hands of our effluents, but only such robustness as our living systems happen to possess against novel assaults.

There have been a few major successes scored against runaway innovations; the special features of each case show just how difficult would be a general struggle for sane societal control. The first great victory, although still partial, was over civil nuclear power. This technology is uniquely vulnerable, for it was an innovative technology, labouring under (temporarily) covert connections with nuclear weapons, and presenting totally new problems in safety of operations and waste disposal. Further, nuclear power is realised in a small set of very large installations which need individual permission to operate; and so the opposition could mount a series of high-profile campaigns. Then it suffered a fatal loss of credibility when in the USA, shortly after its tame experts pronounced it safe, it experienced just the sort of accident that its critics had predicted. It was pronounced a ‘Mickey Mouse’ technology, and it never recovered credibility in the land of its origin.

Just now we are witnessing the emergence of global consumer power in connection with GM foods. One local consequence, in Britain, has been the destruction of whatever public trust remained in government experts after the BSE disaster. Indeed, the whole affair could be seen as an exemplification of the two strands of analysis that I have developed with my colleague Silvio Funtowicz. In general, we have a case of ‘Post-Normal Science’, where facts are uncertain, values in dispute, stakes high and decisions urgent [5–8]. For coping with such situations we need an ‘extended peer community’ including all the stakeholders in the issue; and we must admit ‘extended facts’, including investigative journalism and leaked documents. And the question ‘is GM food safe?’ could be seen as an exemplification of the NUSAP methodology [9]. For here the Numeral (a quantified risk) is meaningless; the Unit similarly so; the Spread (or ‘error bar’) the same. What counts is the Assessment of a claim (how reliable, or trustworthy), and for that we have the Pedigree, in this case nearly reduced to the question, ‘In whose pay is he?’

Exciting and hopeful as these developments are, we should keep in mind just how special are the circumstances. What triggered off the popular reaction against GM was the arrogance and effrontery of the major player, Monsanto, assisted by the

venality and deviousness of the UK government authorities. It seems that Tony Blair is happy to follow the focus groups slavishly whenever they point away from Labour policies, but to spurn them when they are against the incursions of global capitalism. Also, there was the combination of the apparent lack of need or even of immediate benefit of the GM developments, together with the unanswered fears that they might be deleterious as foodstuffs. As a reminder of the limits of this particular protest, we should remember that GM in the medical fields gets nearly universal approval, in spite of the deeper long-term problems that it poses.

It is true that there has been a deep shift in consciousness about several areas of technology, such as (in the UK) an appreciation of the limits to growth of private passenger transport. And all over Europe, 'organic' foodstuffs enjoy a rapid growth in markets in spite of their higher prices. But these piecemeal changes must be seen as elements of something that may lead to the necessary transformation of consciousness about ourselves in the material world, rather than as pieces of the full solution. It is, after all, much less than two generations since environmental consciousness reached the broad public (some 36 years ago, with *Silent Spring* [10,11]) and that is not a long time for a transformation of common sense. Whether we will make it, seems at this point a doubtful prospect.

3. Hypercomplexity

This is another new concept, which arises from the experience of IT systems whose complexity runs out of control. I have developed this concept out of reflection on the 'millennium bug' phenomenon. My concern has not been so much to predict its scale and effects, as to ponder on the question of how it was allowed to happen at all. The industry is about the most technologically sophisticated that one could imagine, where 'standards', specifications of codes and protocols, are being negotiated all the time. And yet this potentially catastrophic error was allowed to persist, up to the very last moment in some countries, and even beyond in others. The explanation goes through several levels, from the technical up to the moral and structural. At the end I introduce hypercomplexity, which here occurs as a result of a combination of 'sleaze' 'mathematical hubris' and 'technocracy'. This essay was originally prepared for publication on a Home Page, where it can be found, complete with references and acknowledgements. This is: http://website.lineone.net/~jerry_ravetz.

3.1. *What we know—and don't and can't know—about Y2K and its effects*

Some IT systems, including critical ones, will fail. Some 'Y2K compliance' measures will also fail. Some industrial, commercial, social welfare systems will also fail. There will be 'ripple effects' as some failures trigger others. Nuclear power, dependent on electricity supply, is a risk. There will be some serious social disruption, unpredictable but highly variable. How serious will it be? Will it last days—months—years? Inconvenience or catastrophe? We won't know until 2000, or until

the ‘aftershock’ of 29.02.00. (Did you know that 2000 is a leap year?) And after? How much of our equipment and systems will be beyond repair? Who knows?

Moral dislocation is likely to be caused by the mass experience of total vulnerability to disruptions, occurring in systems totally defined by science, and which could and should have been prevented but are now inescapable. There could be widespread ‘chronic community stress’, made worse by the invisible, insidious character of this man made disaster. Ignorance and impotence, having been vanquished by science and technology, now return with a vengeance. This is not only in connection with a perturbed natural world, but within a science-based technology that is at the cutting edge. We will be seen to have lost control, over the effects of something of our own making. Perhaps it is better to speak of the Millennium Debacle rather than the Millennium Bug.

3.2. *The responses*

These will be of the expected sorts. ‘Surely some mistake?’. ‘How could “they” let this happen?’ Where is the hidden hand that should be protecting us? Then there is the unreality of the prospect, so all-encompassing, complex, possible devastating, and unpredictable. Perhaps denial is a forgivable short-term strategy for coping! We witness the bizarre quality of the remedies (to stock candles and tins of food; to move to the countryside?). How can modern communities do without electricity, perhaps telephones, for some indeterminate time? Even for those who are aware, there is the dreamlike sense of apparent normality, while the clock ticks down. And suppose that the sceptics are right, and nothing much happens?

3.3. *The causes (by levels)*

At the lowest level, is that of the computer codes: two digit date codes, as known for thirty years. Next is the IT system level: ‘Legacy’ and ‘embedded’ date codes, both with many, many millions of occurrences. Full correction is impossible; even the ‘corrections’ are not assured. Only a minority of bad date codes will be dangerous, but how dangerous will they be? Up one level is that of the institutions. There has been a widespread failure of responsible parties to respond to clear and accepted warnings before it was very late, perhaps far too late in many cases. Why were the warnings ignored? This is a phenomenon at the cognitive, social and moral levels.

3.4. *Moral explanation*

On examination, we find that there has been a culture of ‘hi-tech’ sleaze, impossible for individuals to defeat. ‘Sleaze’ is the erosion of public morality for private gain. This is a universal tendency, culminating if unchecked in full-blown corruption. Its containment requires both formal mechanisms and also individual and group morale.

Corruption leads to the degradation of technology and of the economy as well as of society and morals. Although there is still much IT work of the very highest

quality, there has been an infection of IT by attitudes that are expected of local builders rather than of cutting edge technologies. At best: quote for the job and then see. At worst: protection rackets. Personal computing, dominated by ‘bloatware’, is now in a corrupted state similar to that of the US automobiles before Ralph Nader. Computer engineers find it increasingly difficult to defy the system.

What are the obvious manifestations of sleaze? For example, there has been no effective ISO Quality Assurance programme in this quality-critical industry; the British Standard for dates is ignored. In spite of constant negotiations on other technical standards among leading firms, there are no industry regulations, agreements or sanctions on Y2K. Non-compliant software was being shipped even in 1998.

Sleaze can be explained by both external and internal factors. On the external side, the recent growth of IT has occurred during a period of ‘regulation with a light touch’ in the US and UK. There are analogues between Y2K and BSE\CJD, in the ‘Milo Minderbinder’ society of the Reagan–Thatcher tradition. But the profit motive itself does not always cause sleaze to occur to this destructive degree, nor is sleaze or corruption unique to profit-driven economies. There are other dimensions of the explanation. Even when IT experts warned top management (both public and private) of impending problems, they were ignored.

For an internal explanation, we have history: the IT industry has suffered from extreme hypertrophy. There has never been a period of stabilisation, either in size or technical aspects. This hypertrophy, combined with the absence of barriers to entry (such as large capital or certified skills), inhibits the establishment of effective institutions for the setting of standards for entry, of criteria for quality of work, and of ethical codes. And although the idealistic pioneers are still around, they have lost influence both to the masses of new recruits with no heroic memories, and to the large corporations concerned only with short term profit.

3.5. *Conceptual explanation: ‘mathematical hubris’*

The origins of mathematical hubris lie in the prophetic visions of Descartes, Hobbes Bentham, and Taylor: there are no limits to the power of reductionist, mathematical thought, for controlling nature and society. In this paradigm, those who teach and preach on technical subjects have no interest in any of: reflection, history, context, uncertainty or errors. ‘Murphy’s Law’ is seen just as a joke circulating among those who merely keep the system running. Mathematical hubris has created the popular image of computers and IT as ‘Turing machines’: simple, rapid and faultless calculation. The propagandists ignore: architecture, error management, vulnerability to attack and interactions with other systems. Large-scale system failures (e.g. Stock Exchange ‘Taurus’, UK Passport Office, UK Air Traffic Control), are then inevitable.

A striking example of mathematical hubris is a formula that won the Nobel Prize for Economics one year and nearly destabilised the world financial system the next. This was ‘Long Term Capital Management’ (=short term capital speculation); was it the ‘Titanic’ of the global technocratic system?

4. Social explanation: technocracy

Technocracy is the expression of mathematical hubris in a vision and practice of society. It is the natural ideology of a society run by science-based experts (on behalf of others). It imagines people as reduced to simpler elements, which may be job descriptions (Taylorism), or behavioural models (psychology), or genetic makeup (eugenics, ancient and modern). It claims Science as its basis and justification. IT-based techno-social systems are its characteristic and most powerful realisation. Subjects based on technocracy include mainstream economics, probabilistic risk assessment, 'management science', and much computer modelling in environmental and social science. It is to be noted that the empirical content in most cases varies from modest to nil.

Technocracy lives in a deductive model of reality, conceived as composed of atomic individuals with linear scales of motivation. It cannot imagine either altruism or malevolence among individuals, nor vulnerability or malfunction among organisations. It relies on a faith in quantitative indicators of qualitative attributes. Under its rule, which is both fantasised and tyrannical, morale is destroyed, sleaze is fostered, and hypercomplexity results.

Structural explanation: hypercomplexity, as a result of technocracy, based on mathematical hubris and fostering high-tech sleaze, enabled the Y2K syndrome to mature.

To understand hypercomplexity, we ask, why do personal computers crash? Software is not a logical deductive system, rather it is a structure of commands that are mutually implicated in complicated ways. It is hand crafted, a line at a time, and checked frequently for 'bugs' (inconsistent or incoherent commands or connections). Software cannot ever be guaranteed bug-free; and when it is used, it always degrades. Either it depends on other software that has changed, or its basic information (on disk) erodes. A crash occurs when the 'systems harmony' of the various software elements is so badly disrupted that commands cannot be carried out, and the system is paralysed.

On a personal computer, crashes can usually be remedied by reinstalling either the separate software packages, or the computer's own operating software. But on large IT systems, where software has been used, modified and repaired over a long period of time, bugs and crashes are not easily remedied. The system gets patched more and more to keep it running, and there is less and less understanding by anyone of how it is actually working. Its architecture becomes ramshackle. This is a common condition not only for aging IT systems, but also in badly designed new ones. The IT system cannot be considered as the hard/software only, but essentially includes those people who maintain and operate it.

The IT system thus becomes a 'complex' system (not merely complicated), in that there is no unique correct perspective on its operation, accomplished by following clear and distinct rules. Rather, skill, judgement and commitment are necessary for effective work in maintaining and even in operating it. (Pirsig argued that this property holds even for simple artefacts, such as the motorcycle [12]). The social subsystem of operators and maintenance staff is complementary to the subsystem of

hard/software with which they interact. Sometimes this becomes quite intimate: “Its like with our older mainframes having to have system engineers sleeping on cots in the back room to baby sit all the time...”.

The systems provide us with a vivid symptom of hypercomplexity: crashes. If we think of a complex technological system as comprising (for example) devices, theories, rules and operatives, then a hypercomplex system is one where, because of defects in the various subsystems and their integration, it is subject to an unacceptable level of errors and crashes. The IT systems subject to the Y2K syndrome are hypercomplex in this sense. Now we can shift the perspective somewhat, and see those hypercomplex IT systems as embedded in larger social systems which use them as tools. Those larger systems can also be hypercomplex, perhaps because of their dependence on the defective IT systems, or perhaps because of analogous defects in their self-images or social structures.

Under technocracy, institutions run under a false image of their nature, being wilfully ignorant of informality, judgment and error. The informal methods necessary for keeping them running then tend to become either subversive or sleazy. With defective, indeed counter-productive systems of rules and insufficiently motivated staff, technocratic institutions are then prone to hypercomplexity. This can manifest ordinarily as inefficiency or corruption; and, under stress, as disintegration or collapse. The whole institution then takes on the properties of an IT system that is prone to crash. These phenomena have previously been studied in connection with industrial hazards.

Examples of hypercomplexity are: organisations that run ‘like business school exercise’ (as the US Army in Vietnam); ‘centrally planned economies’ in their later stages; and now the international financial system. In respect of the war we are currently losing against man-made strains of virulent pathogens, our health system (based on the technocratic vision of ‘stamping out disease’ and corrupted by uncontrolled over-prescribing) may be considered as hypercomplex.

4.1. Significance of Y2K

The failure of the IT social system to respond to the impending Y2K crisis can be seen as a case of hypercomplexity on a grand scale. In its origins it relates to IT, but in its effects it may expose widespread hypercomplexity in our total social system. Three centuries of scientific optimism—can it be maintained after the panic, confusion and moral dislocation of the millennium debacle? Will things really return to normal? Is hypercomplex technology the ‘characteristic contradiction’ of the reductionist world view of modern technocratic European civilisation? (The other is the destruction of our natural habitat). But with hypercomplexity, first manifesting in Y2K, the whole man made socio-technical system could start to shake itself to pieces. With this contradiction, civilisation has gone beyond the traditional cycles, where elementary vices were sufficient to cause decline.

Out of Y2K could come a positive development in human understanding. With the discrediting of the ruling assumption that all change is ‘progress’, and with the recognition that a technology can destroy itself as well as the world, we will have

the foundations in common-sense for a critical perspective on technology and science that will be complementary to that which has already emerged on issues of the environment.

5. Consciousness

The most problematic of the fault-lines in our culture, in the long run, is that of consciousness. There is no doubt that a vast and accelerating shift of consciousness is now taking place. While it is very difficult to imagine imminent political and social changes coming as a result, we should not forget that much of what has made modern Europe unique in world history is its peculiar truncated consciousness. Variouslly described as ‘atomism’, ‘secularism’, or ‘science’, it marks European culture as different from all others. As that special quality diminishes, and perhaps new hybrid forms of consciousness may arise. Without subscribing to all the visions of ‘alternative’ or ‘new age’ thinkers, we must recognise that they are now on the agenda of change in ways that would have seemed unimaginable only a generation ago.

Although few are aware of it now, our conceptions of the world and how to know it are conditioned by centuries of struggle. This was well described as ‘the Warfare of Science with Theology in Christendom’, the title of a classic study just a century ago. For ‘theology’ we could also read ‘metaphysics, dogma and superstition’. In the eighteenth century, the ideological shock-troops of secularisation appropriated the term ‘enlightenment’ for themselves, leaving the mystics in the dark. ‘Enthusiasm’ (literally, having God within) had already become a term of abuse because of the excesses of religious sectarians during the Reformation; when that danger had passed, the term could be used safely to describe the harmless passions of later epochs. Now all our cathedrals, Catholic as well as Protestant, are a neutral grey inside; their original total multimedia experience of light, colour, sound and smell have passed into oblivion.

In all ‘advanced’ nations, the religious believers are now in a sort of cultural ghetto, rendered largely invisible by the non-believing majority and its cultural apparatus. Their special folkways and commitments are but rarely displayed in the mass media; and when they do appear, as often as not the picture is derogatory. Of course, the picture is varied; in some countries there is still an established Church; while in America, God is invoked regularly and the various places of worship are full every sabbath. But even there, in spite of all the regularly recurring threats from the radical Christian Right, the modern liberal consensus on personal morality (an ethic based on pleasure rather than guilt) is dominant in the polity.

When religion, that is some sort of belief in realities beyond the tangible, does obtrude in political and social life, all too often it is easily represented as, a form of pathology. We all recall the Westernised Hindu cults of the sixties, many of them ending in scandal and disaster. The Christian sectarians, from Jim Jones to the ‘branch Davidians’ of Waco, are as bizarre as they are menacing. And ‘fundamentalism’, whether Christian, Muslim or Jewish, is accepted on all sides as an ugly thing.

It is all too easy to maintain the assumption that good sense and good morality are antithetical to such deformities of belief; and that the secularised Western world is and should be the exemplar of a civilised consciousness.

It may come as a surprise that the disenchanting and dehumanised world of European culture is actually an exceptional case among all great civilisations, past and present. In recent decades the world-views of South and East Asia have become popular, even chic; who does not know of Karma and Feng Shui? And for those who have come to appreciate 'native' peoples, there is a sense of awe at the dimensions of their experience, to which we are, as it were, colour-blind. We are really a cultural island, a rather small one in location and historical time, in our insistence that in the real world there is nothing here but us atoms.

But at the end of the millennium, it is all changing. We are now coming into a position to appreciate that modern European culture has been built on what might be called The Great Denial. In all other cultures, and even in the Platonic and Stoic traditions in Europe, there had been an acceptance of a continuity of degrees of being, and a diffusion of consciousness. It was not merely that man stood midway between apes and angels; but also that angels were as real as men and apes. But starting a good half-millennium ago, the old realities began to erode; angels, hell, and eventually even witches, became implausible to educated common sense. Along with them gradually died the ancient sciences of a conscious cosmos, including astrology, alchemy and all the elaborated interpretations of portentous things and events. Even the Bible, once the source of strange revelations and visions, was interpreted by the Reformers as a plain history for plain men.

Then, quite suddenly in the seventeenth century a few men of genius announced that the world was not what everyone had thought it to be. Devoid of spirit or even purpose, it now consisted only of matter and motion. This new metaphysics, so clearly, even brutally, enunciated by Descartes and Hobbes, was tied to a new way of doing science; but it was a presupposition of method rather than a result of research.

Earlier great scientists, such as Gilbert, Harvey and Kepler, had all operated in world that was significantly enriched in one way or another. Afterwards, down through the generations, this 'new philosophy' advanced, gaining social acceptance and then scientific strength and technological power. A century ago, it seemed supreme; and then came a couple of world wars, The Bomb, looming ecological disaster, and—in the first generation of mass affluent youth—the consciousness revolution.

There had always been a dialogue between 'hard' and 'soft' world-views, however antagonistic, covert, and suppressed by publicists and historians it may have been. It was most visible in Germany, where the 'romantic' style could never be driven entirely underground. All through the nineteenth century Goethe was both an embarrassment and a challenge to scientists; in his science he was both wrong in detail and wrong headed in principle, yet he was there as the greatest culture hero of the people. And in the field of medicine, where the scientific world-view came into direct contact with the lived experience of people, the various therapies that derived from the ancient philosophies could not be discredited rationally until the present century.

Yet, in dialectical fashion, the very successes of the scientific, secular world-view,

hegemonic over all others, led to a re-invasion from 'The East', which now has assumed quite serious proportions. We can see its roots in the triumph of scientific technology, which finally made it possible to imagine a productive system based on 'the human use of human beings'. The mid-century, post-war generation of youth, notably but not exclusively American, could take for granted an easy, casual hedonism. Moreover, for the first time in history, a privileged class did not feel the need to actively dehumanise or demonise some large section of humanity in order to justify or protect their status and comforts. So there was a generalised official benevolence, as expressed in Roosevelt's 'Four Freedoms' and the Broadway musical 'South Pacific'.

In such a wash of easygoing goodwill, even children could at last be accorded human status. This was the generation of 'Dr Spock', who supplanted not only the traditional ideology that preached The Child as Sinful, but also the modern scientific child psychology which analysed The Child as Machine. When that first post-war generation came to maturity, they had neither carrot nor club to keep them on safe paths; the categories 'adolescent' and then 'teenager' became commercial, social, and existential realities.

There had already, perhaps always, been a counter-culture which celebrated the body and its pleasures. But as a social institution it had depended in many ways on the sex industry. Given all the destructive contradictions of that institution, it had been marginalised and stigmatised. But by the earlier twentieth century it had been emerging into the mainstream, through the medium of music of African origins, which over the decades steadily infected ever wider cultural strata. It could be that the explosion of consciousness of the '60s could never have happened except in a society already committed to a hedonistic ethic, for which it had been softened up by popular music.

The confused and destructive aspects of the '60s drug culture, even its interpenetration with meretricious official commerce (to say nothing of the criminal world of suppliers), are all familiar. But what revolution was not a confused mess to a similar degree? What was established in that chaotic decade was as momentous, in its way as in earlier periods of concentrated cultural change. Suddenly 'consciousness', a direct experience of realities beyond the ordinary senses, became real. Among masses of respectably born young people there arose the conviction that they were now outside a 'straight' world that was dedicated both to concealing important realities, and to punishing those who would reveal them.

Again, it is not important that when those who had ripped open the doors of perception turned to the East, what they brought back was a poor parody of the original. How could it have been otherwise? And even when the original movement collapsed in confusion, the memory of something literally extra-ordinary persisted. In the complicated currents of thought over the last thirty years, two major themes have grown steadily: 'the environment' and 'alternatives'. These have interacted with other currents. The most notable is feminism, born of the rebellion against age-old sexual subjugations, and closely linked to the revolutionary discoveries that female sexuality could be safe, guilt-free and fun. There is also the active, sometimes activist sympathy with animals, and the conviction (against the whole weight of tradition of

reductionist science) that they are sentient beings. It has influenced research agendas and even lifestyles; and as it extends to new modes of communication with non-humans, touches on consciousness itself. Finally, there is the drugs culture, far removed from its naive hippie origins, but still presenting a profound generation gap between those who openly use drugs and those who officially denounce them.

Each of these major currents is profoundly subversive of the inherited order, conceptual and political. To this day, 'the environment' is beyond the comprehension of the major folk-science of the modern world order, mainstream economics. Its conceptual framework excludes any values that cannot be reduced to instant cash transactions. Also, 'the environment' now becomes an inclusive term, comprising social and spiritual values as well, and so functions as a rallying point for all those who oppose the globalised market system. After the collapse of state socialism, there is no visible prospect of an alternative scheme of organisation of society to challenge the capitalist. But under the banner of 'the environment' local campaigns are fought which can wound individual firms and also damage whole industries, such as nuclear power and now GM foods.

The subversive challenge of 'alternatives' is even greater. For here we have Science itself held up to critical scrutiny, from another vantage point. It is only isolated speculative thinkers who go head-on against physics and chemistry. But where Science meets the people, as in medicine, the battle is now effectively over. The Great Denial of seventeenth-century philosophy could be effective for all those centuries, so long as the opposition was effectively backward-looking or reactionary, and so could be marginalised and kept inferior, socially and culturally. But now that people from the most highly cultured and sophisticated strata embrace or at least apply elements of enriched world-pictures, simple dismissal or denunciation of the heterodox is no longer effective. Partly establishing itself in the mass market by sneaking in through the back door of beauty therapy, alternative medicine has recruited a vast number of adherents. It may be all the more powerful in that few customers of (say) aromatherapy know or care that they are committing a revolutionary act against the traditional denial of enhanced realities.

We should notice that the issue here is not just about what is in people's minds, as if it were all a matter of drug-induced moods or visions. Reality has become problematic too, for the first time in centuries. Are the 'chi' currents of acupuncture real, or are the needlings just a delusory placebo? And if acupuncture, why not Feng Shui; and then why not personal auras, Healing, crystals and the lot? It is difficult to imagine a Western equivalent of the Falun Gong movement; the Natural Law Party seems an unlikely candidate for destabilising the elected government in Britain. But it is early days yet. Certainly, for the immediate future, we can look forward to a loss of hegemonic official control over popular thought in Science. In that sense, the cultural scene will be more democratic, or perhaps anarchic, or both.

I cannot predict just what will be the fuller consequences of the collapse of the hegemony of Science. In the UK right now, we see one immediate effect: having been convinced of the corruption of official science by the BSE affair, the mass of people see no reason why they should allow official science to judge whether GM foods are safe for them. In a more general way, so much of the legitimacy of the

modern state depends on science (having rejected birth and wealth), that if that prop is taken away, all it has left is the promise of social justice. This could be a vulnerable support indeed.

It would of course be the most pathetic of fallacies to believe that a ‘softer’ cosmos automatically brings a ‘softer’ social and personal existence. The manipulation and control of just this sort of ‘consciousness’ was, after all, the business of churches and priests down through the history of civilisation. Their methods were frequently, indeed customarily, among the most brutal. But now civilisation could be returning to an enriched consciousness at a higher level, having absorbed the humane values of modern affluent society. To be sure there will be quacks, cranks and frauds aplenty as the traditional ideological quality-control of science and its derivative practices is eroded; and the manifold imperfections of the previous regime will not excuse all the wrong things that will happen. But babies are always thrown out with bathwaters as civilisations progress. The task is to discern the currents, and to make the transitions as smooth as possible.

6. Conclusion

Of the fault-lines I have reviewed, the first three are negative: meretricity, runaway technology, and hypercomplexity. Only the fourth is, in part at least, positive: a change in consciousness. Looking at this list, I am reminded of Europe in, say, the fifteenth and sixteenth centuries. Then there was a cultural scene where the Church was in full decay, and where the social order and religious sensibility had not recovered from the Black Death and its associated upheavals. New forms of experience had been tried, first in the Renaissance (in the sphere of high culture) and in the Reformation (in popular religion). The discovery and conquest of other continents functioned as a sort of runaway technology, bringing great new visions, but also new diseases and new sources of instability.

Going forward into the seventeenth century, Europe experienced the long and exhausting series of wars of religion, culminating in the Thirty Years’ War which was not about anything in particular. And just at that time of maximum confusion, disillusion, and competition among ‘new philosophies’, there was announced that most stark and uncompromising of world-views. That is the one that caught on, and the rest is history—our history. To be sure, the groundwork had been prepared, in the centuries-long process of decline of the spiritual element on ordinary experience. And it was some centuries into the future before the victory of this new common-sense was complete, even in Europe. But by the beginning of this century, it could seem that in most places Science had swept all before it; and in the others, the struggle, though sharp, could end in victory only for the progressive side.

Now, in spite of the myriad advances of Science, we are caught in doubt and confusion again. Are we in a position analogous to the time of Dante, of Luther, or of Descartes? Only the future will tell.

References

- [1] Orwell G. 1984. New York: New American Library, 1983.
- [2] Bradbury R. *Fahrenheit 451*. New York: Ballantine Books, 1953.
- [3] Ravetz JR. *Scientific knowledge and its social problems*. New Brunswick, NJ: Transaction Publishers, 1996.
- [4] See the interesting column by Ziauddin Sardar, 'living on our luck'. *New Statesman* 20 November 1998:39.
- [5] Funtowicz SO, Ravetz JR. The good, the true and the post-modern. *Futures* 1992;24(10):963–74.
- [6] Funtowicz SO, Ravetz JR. Science for the post-normal age. *Futures* 1993;25(7):735–55.
- [7] Funtowicz SO, Ravetz JR. *Uncertainty and quality in science for policy*. Dordrecht: Kluwer, 1990.
- [8] Ravetz JR, editor. *Post normal science [Special Issue]*. *Futures* 1999;31(7):641–757.
- [9] See the series of columns on GM foods by Ziauddin Sardar in *New Statesman*: 'Loss of innocence' 26 February 1999:47–8; 'Science: HM Govt or GM Govt?' 2 April 1999:37–8; and 'Science: after the facts', 7 June 1999:45–6.
- [10] Carson R. *Silent spring*. London: Penguin, 1965.
- [11] de Voltaire FMA. *Candide ou l'Optimisme (1759)*. Paris: G. Cres and Cie, 1921.
- [12] Pirsig RM. *Zen and the art of the motorcycle: an inquiry into values*. New York: Morrow, 1974.