COMUNICATIONS/MANUFACTURING

The struggle to find a solution to the "energy crisis" has taken on new dimensions with the emergence of alternative energy sources. Solar power, wind power, and geothermal energy are gaining popularity, but the real challenge lies in the development of efficient energy storage systems. The quest for a viable solution is driving innovation in battery technology, which could revolutionize the way we use energy. This article explores the latest developments in battery technology and their implications for the future of energy sustainability.
often bizarre forms of Web language are bringing to the English language. Crystal calls this "computer mediated communication", and her survey shows the readiness with which people are adapting grammar, semantics and spelling to new situations.

R. Rubey, M. Gálloszentmárai combine media and psychology skills to explore human "TV dependence." Similar principles apply to video games and computers despite the interactivity. Scientific American, Feb, 02.

Army Biometrics: Identifying and Addressing Sociocultural Concerns, J. D. Woodward Jr et al, RAND, 01. Biometrics are automated methods of identifying a living person in real time based on physical characteristics or personal traits. This technology assessment is an important security tool.

Economist Technology Quarterly, June 22, 02, pp21-23 examines issues of network security, highlighted by the havoc caused by worms such as Code Red (see Scientific American, Oct, 01) Such intrusions are inevitable but new methods use the principles of the immune system.

Malaysia, the global giant of disk drive producers, faces major challenges as disks shrink, their price declines and profitability erodes. Restructuring the S.E. Asian electronics industries into service oriented economies places enormous pressures on the worldforce and businesses, though the region retains its high quality infrastructures. Far Eastern Economic Review, May 2, 02, pp 36-39.

Listings

eGes: eBusiness for Government, D. Holmes, Nicholas Bresalier Pub, 01. "In time the Internet will affect the public service much more profoundly than the private sector'. Implementation and implications are explored for the ordinary consumer.

The Approaching Age of Virtual Nations, M. Dillard, J. Hennard, The Futurist, July-August, 02. Reliable communications access and a significant cause spawn new forms of association. Add a catalytic leader and the virtual nation is set aflame to take action for change.

From Anarchy to Power: The Net Comes of Age, W. M. Grossman, NY Univ Press, 01. An expert observer reflects on how the Web is changing the world in unexpected ways. Provides some useful predictions, anticipations and puncturing of hype.

ECONOMICS/BUSINESS

On Economies ... Knowledge Society

A wide range of research by international experts inform studies of various aspects of this theme, International Social Science Journal, No 171, March, 02. They cover the new content, new regulations and per-
spectives for policy and research, including those from developing countries. Notable contributions: A. Arora et al on Markets for Technology in the Knowledge Economy, drawing on research into markets for intermediate technologies and implications for business and public policy; A. Hirschel et al on their research into design management of collective learning cycles which create new concepts and products; and A. Lam on alternative societal models of learning and innovation in the Knowledge Economy.

...Economic Growth
Macroeconomic historian A. Maddison, The World Economy: a Millennial Perspective offers a well-documented sweep through long-run trends with a major focus on Western development over the last millennium. Some surprising insights emerge. The most consistent economic performer since 1600 is The Netherlands. Growth in the developing countries over the past quarter century has been much more than for the previous quarter, except for a number of resurgent Asian nations, and Botswana. Capital flight by corrupt African elites contributes to its dismal economic performance. Labour productivity in some European nations (France, Belgium, Norway, and the Netherlands) approached that of USA by 1968, and during the second half of this century overall Western European growth outpaced that of the US.

...Intangibles
Uneek Wealth: Report of the Brookings Task Force on Intangibles, M. M. Blair, S. M. Wallman, Brookings, 01. There is a large and growing gap between the significance of intangible assets in economic growth, and the ability to clearly identify, quantify and account for them. Recommendations for the US government included. See also Intangibles: Management, Measurement and Reporting, Brookings, 01, on their nature and impact.

...Ecological
Important recent developments in the theory, and practical applications of ecological economics and sustainable development from masters in the field, Economics of Nature and the Nature of Economics, Eds C. J. Cleveland, D. I. Stern, R. Costanza, Edward Elgar (pub), 01. Included are studies on tradable national carbon quotas, alternatives to GDP and green national accounting.

On Poverty
US development economist W. Easterly, Elusive Quest for Growth: Economists’ Adventures and Misadventures in the Tropics, MIT, 01, worked with the World Bank in the optimistic period for continued growth by the developing countries of the late 1980s. The subsequent decades of failure are a mystery but it is realised that poverty is very complex. In some countries where structural adjustment programmes were properly implemented, growth did occur, and when it does this helps everybody including the poor. The data does not support assumptions that education, or population control or debt relief are essentials. See also interview, Challenge, Jan-Feb, 02.

Former World Bank chief economist J. Stiglitz, Globalisation and its Discontents, W.W. Norton, 02, subjects the global economic foibles of the 1990s to withering scrutiny, with particular focus on the US Treasury and IMF, for their role in structural adjustment policies, and the Russian and East Asian crises.

C. K. Prahalad, A. Hammond, Harvard Business Review, Sept, 02, consider that a key to the overcoming global poverty is for multinationals to enter developing markets, investing in local business aimed at the bottom of the pyramid. This untapped market is vast if buying power is aggregated, there is scope for innovation, and good returns have been shown by companies doing this.

Developing Value, the Business Case for Sustainability in Emerging Markets, International Finance Corporation (World Bank) Sustainability Ethics, 02, presents a documented case for good corporate citizenship. Higher social, environmental, and governance standards and operations are essential for multinationals investing in these markets. Benefits to the local economy are accompanied by lower costs, reduction in risk and higher employee skills. These countries do want to have the high standards of the developed world. Financial Times, June 28, 02 p8.

Eds N. Birdsell et al examine the convolutions of the population growth-economic growth debate of the past half century, Population Matters: Demographic Growth and Poverty in the Developing World, Oxford Univ Press, 01. Currently the debate has returned to the position, but now based on evidence, that the poor countries who do succeed in breaking out of the poverty trap are those that have reliably made the demographic transition to lower fertility and mortality rates. Simple correlations are misleading, subtle factors are influential. Primary factors are education for girls, empowerment for women, market based reforms and effective packages of primary health care.

Brookings Institute Fellow C. Graham researched the mobility of the poor in a number of countries, showing how generations move into or out of poverty in a globalising society. Family background, education and income all matter. These can be aggravated by rigid social structures, racial and gender-based discrimination, unequal access to other crucial services such as health, unequal access to political rights. Incentives for workers to invest in their children’s education is doubly rewarding. Globalisation can offer new opportunities to the poor by
breaking traditional monopolies and subsidies, but there are new vulnerabilities, especially when the education qualification standards are raised. Journal of Human Development (UN), Vol 3/1/02.

The Australian Population Debate

Business is fiercely determined to increase migration levels, demanding that a bipartisan population growth policy with set targets be forged to ensure long-term strategy. A population policy encompasses more than immigration, extending to all aspects: social, cultural, economic, regional, etc. Business Review Weekly, May 9/15, 02, pp 64-66. An official Australian programme is actively encouraging business to be proactive in diversity management in the hugely multi-cultural national workforce. Diversity encompasses ethnicity, age, gender and attitude, and where this is developed, employee motivation and productivity suffers. Business Review Weekly, July, 25/31, 02, pp 64-66. Australians lack ways to talk about race and racism issues according to researchers. It is an offensive term to Australians, whose self-image hold to the fair deal and equality, and is therefore avoided. During training in diversity management, where people explore other cultures, they find more about themselves and can give clearer signals to other cultures. Business Review Weekly, April 11/17, pp 70-73.

Listings

The WTO Post-Doha Agenda, M. Khor, Third World Resurgence, No 141/42/02, discusses the pressing concerns of developing countries which were not met in this recent Ministerial Conference, which added more to the burdens they already carry in negotiating the framework of work programme.

The Company of the Future: How the Communications Revolution is Changing Management, F. Cairncross, Harvard Business School Press, 02. To survive the profound changes which will occur, managers need to steer by ten essential rules for survival. Updated from The Economist's Editor's 01 edition.

Global E-Commerce Strategies for Small Business, E. da Costa, MIT, 01. By US definition these have fewer than 500 employees. They are growing numerically and in importance. E-commerce gives them better opportunities and this study shows how.

When Systems Fail, K. H. Roberts, R. G. Bea, Organizational Dynamics, Vol 29/01, draws on the social science literature to explore why managerial failures contribute to disasters more often than do systems design errors.


HEALTH/MEDICINE

Improving Global Health

A recent WHO Commission of Macroeconomics and Health Report offers major recommendations which could really make a difference to the health of the global poor. These are-quadruple donations to developing countries' public health, double the R&D and private funds on diseases especially affecting the poor, raise the percentage of GNP developing nations spend on public health and do this for two decades.(see www.who.int) Expertise must be co-ordinated internationally and research data captured across national boundaries. Nature, 3 Jan, 02, p 1. A special section in Science, 15 March, 02, provides expert views on Unmet Needs in Public Health including an analysis of this Report, by P. Jia et al. Annually it would cost US$40-52 billion until 2015 in 83 low-income nations. It is feasible and would save millions of deaths annually. Still lacking is public recognition worldwide that present inequities in public health between developed and developing nations are intolerable.

M. Gandy, A. Zurnia, Social Science and Medicine, Vol 55, 02, consider that historical studies of major global diseases provide useful frameworks for understanding their contemporary dynamics. This is illustrated by multi-drug resistant TB(MDR-TB). It can best be understood and controlled by advances in both biomedical research and socio-economic and political factors, including changing patterns of health care provision. A coherent, persuasive policy agenda needs to be constructed by scholars, health professionals and health care advocates to link such diseases to social injustice and to galvanise political action.

A specific study on Tanzania in the context of the Commission Report (above), The Economist, 17 Aug, 02, pp 20-22, illustrates how a small health budget can be effectively used if targeted carefully. Research to develop a burden of disease profile in various areas revealed where a tiny increase of money could be most useful.

Other Scourges

P. W. Singer considers that AIDS is now a major international security topic because of its longer-term impact on national stability and armed conflict, with soldiers being at great risk. Old modes of military thinking and aid programmes need to be reviewed, Survival, Vol 44/1, 02. See also Report On AIDS and Violent Conflict in Africa, US Institute of Peace, 15 October, 01, which has nine recommendations covering increased AIDS programme funding, continued development aid, increased donor focus on civil society capacity building, involvement of women, harmonisation of international AIDS prevention, education of peacekeepers, addressing the needs of AIDS orphans, more effort by political leaders especially
African, and further attention to S. Asia and Eurasia.


Cure and prevention of malaria have been boosted with the genomic analysis of both a malaria parasite and a mosquito. French research groups have developed a new, easily prepared and inexpensive compound which kills the malaria parasite in the human bloodstream. A promising UK malaria vaccine is being trialed in the Gambia. _Science_, 15 Feb, 02, pp 1207-1208, _The Economist_, 24 August, 02, p 59.

Emerging Threat of Diabetes

Over the past decade, this, especially the Type 2 form, has become one of the major and potentially lethal diseases of the Western world, though all regions are affected. Projections for 2010 are much worse. Changes in the human environment, lifestyles and behaviour are aggravating genetic susceptibilities. _Nature_, 13 Dec 01. Insight section, presents an overview with six specialist studies on research into the functioning of the disease, and best ways to prevent it. Type 2 diabetes will require a much more integrated, international approach to slow the epidemic, since it is the symptom of a larger global problem. For development of the epidemic in Asia, see _Far Eastern Economic Review_, 10 Jan 02, pp 37-39. For the impact of even modest increases in wealth in poor countries, accompanied by urbanisation, and sedentary lifestyle, see _The Economist_, 23 Feb 02, pp 85-86.

Diabetes describes the potentially deadly linkage of obesity to diabetes, especially Type 2. Over the past two decades obesity levels in children have mounted, initially in Western countries and then in the richer classes of developing nations. But all socioeconomic levels can be affected, since limited diet and exercise opportunities render the urban poor vulnerable. Longer term obesity results in much earlier onset of cardiovascular disease and death. Causes are complex, but the major contributors are reduced levels of physical activity, and high calorie food intake, aggravated by TV. Weight gain is very difficult to lose long term. Programmes for families, or in schools have had limited success, surgical and drug interventions have high risks. _The Lancet_, 10 August, 02, pp 473-477.

Syndrome x describes the dangerous effect of over-stimulation of the liver, nullifying the power of insulin to control liver secretion of fats into the bloodstream. Cardiovascular and diabetic problems eventuate, according to recent research, which blames our snacking habits and high fructose diets. _New Scientist_, 1 Sept, 01, pp 26-29.

_Feasting China’s Little Emperors: Food, Children and Social Change_, Ed. Jun Jung. Cambridge Univ. Press, 00 is focused mostly on the better-fed urban children, where obesity levels are rising, and also covers the dynamics of family, food and markets.

All in the Brain

N. C. Andreasen, _Brave New Brain: Conquering Mental Illness in the Era of the Genome_, Oxford Univ. Press, 01. A new era of combating mental illness opens as the brain is being mapped. Mental illness is so costly that it will need much greater priority with an aging population. New treatments for depression, Alzheimer's, schizophrenia are possible.

Psychiatrist, M. H. Teicher discusses research into the effects of early childhood abuse, physical and emotional, on the neurological system. Such experience sets up stress responses which permanently damage key developments in the young brain controlling emotional responses. Such childhood abuse, in war, or in the home, has irreparable impacts. _Scientific American_, March 02.

New Therapies...or Old

Monoclonal antibodies have fulfilled the promise of the 1980s as they come to market. Each type is a clone of a particular molecule in the immune system for a specific target. Mass production of these is cheap, with further advances if they can be produced from GM animals or plants. _Scientific American_, Oct 01.

R. J. Carlson, G. Stenling, explore _The Terrible Gift: the Brave New World of Genetic Medicine_, Public Affairs, 02. Medically it promises marvellous developments for human health and quality of life. In terms of efficient and fair delivery of these to all in need the outlook is unpromising. The turning point should come between 2010-2015. Between a laissez-faire, market, or a state controlled system or a mix.

_Chinese Medicine in Contemporary China: Plurality and Synthesis_, V. G. Scheid, Duke Univ. Press, 02. China is synthesising the modern Western model with traditional Chinese medicine, utilising the advantages of each. An experienced analysis. _Time (NZ) Aug 26, pp 34-41 illustrates how sweet wormwood, or artemisia annua, is one of the major finds in this trove of Chinese traditional herbal cures which western medicine is beginning to understand. Researchers and traditional Maori healers are...
exploring the secrets of traditional, indigenous, medicinal flora, NZ Institute of Food & Crop Research Newsletter, no36, 01. But fake drugs, often with fatal additional ingredients are rising to 5-15% of global pharmaceutical sales, with much of the production in China. *Far Eastern Economic Review*, Feb 21, 02, p34-37.

Listing

An assessment of best practice programmes in OECD countries, noting the importance of a clear overall vision for road safety.

FOOD/FIBRES/FORESTS

Sustainable Agriculture

*Geography*, Vol 87/3, 02 is a special Sustainable Development issue, in which UK Professor L. Bowler examines the unsustainability of modern farming, with its strong incorporation of modernised practices into an industrialised food supply system with strong state protection. Three alternative models are not widely available. These are: production of environmental goods, integrated farming systems, and alternative agricultures. Environmental goods contain three subsystems: externalisation of inputs, regulation of agricultural externalities, and agri-environmental measures, often requiring state subsidy. Integrated systems of crop, livestock and pest management may be embedded into existing farming practice and offer a more pragmatic way forward.

Alternative systems cover a number of farming philosophies: ecological, biodynamic, human, low external input, permaculture, regenerative etc, with holistic emphasis on the farm and localised production. Organic farming has advantages and some disadvantages but the production volume is not sufficient for an urban-industrial population. None of the three sustainable farming models has been widely promoted, as the supportive infrastructure is limited to a mix of voluntarism, development of knowledge communities through education and training, and state regulation for quality control. A new social contract between farmers, food/processors/retailers, consumers and the state is needed.

*Insight section*, Nature 8 August, 02 explores aspects of Foods for the Future, focusing on traditional sustainability in the face of accelerating food demands. A rich assortment of expert studies on sustainability and intensive production, enhanced crops to feed the poor, risks with new agricultural practices, sustainability of global fisheries, the wine industry, and evolution and plant-animal domestication.

A recent international study reports that modern agriculture, if modified, can improve the rather than degrade biodiversity and that biodiversity preservation should be integrated into all landscapes. Details of eco-agricultural practices worldwide are examined. *Workload*, Sept-Oct 01, p 89. NZ farming needs to raise levels of no-tillage, a practice which is being rapidly taken up overseas, since it raises yields and the environment. Fuel costs are reduced, and Roundup herbicide reduces the need to spray resident weeds, formerly killed by ploughing in, which also contributed to erosion. *Countrywide*, S. Island ed, Jan, 02, p 24.

GM - Rice, and Litigation

Rice yields are fast approaching their theoretical limit for efficient photosynthesis. To feed future populations without massive input of nitrogen fertilisers, this efficiency must be raised, a daunting task which genetic engineering may eventually achieve. *Nature*, 11 April, 02, p 576-578. *Science*, 5 April, 02, published two sequences of rice genomes, to be soon combined into a complete rice genome sequence which will become the gold standard for all future investigations of genetic variation in crops.

India and Brazil are two landmarks standouts in the global advance of biotechnology adoption. Finally India has approved introduction of BT cotton modified to resist the bollworm. Brazil is waiting on a judicial decision about waiving an injunction on the pro-biotech government permission to grow GM soya bean. Brazil is a major supplier of GM-free soya beans. Success with biotechnology in such a market as India may not be as overwhelming. Pesticide resistance may eventually be countered by new strains of the pest, while property rights regimes will be bypassed by the mass of poverty-stricken, illiterate farmers. *Financial Times*, 27 March, 02, p12.

Monsanto won its case against the Canadian farmer who was found to have apparently wind-blown GM canola on his property. The legal focus is shifting as in Saskatchewan organics producers are pursuing a class action against manufacturers of GM canola as an environmental pollutant, because of the unwanted proliferation of GM crops. Argentinian farmers want sue their government for permitting widespread use such crops. *Biotechnology and Development Monitor*, Dec 01, p25.

D. G. Victor, C. P. Range, *Foreign Affairs*, May-June, 02, consider that the US government, rather than markets, must overcome the present polarized impasse over GM in farming. Three essentials in the strategy: maintain incentives for private investment in GM, especially through trade negotiations; support greater investment in agricultural research to benefit the world’s poor, and reform the rules governing intellectual property. Failure in adequate controls will harm GM everywhere, and poor countries with inadequate systems are the chief hazards.

A balanced assessment of all sides in the GM
debate, from D. Charles, Lords of the Harvest: Biotech, Big Money and the Future of Food, Pervos Publishing, 01, who sees a "hall-of-mirrors quality to the passionate arguments."

Food Bits

US political science academic G. Kent, UN Chronicle, No 1, 02, comments that while the right to adequate food is enshrined in international covenants, the responsibility is left to national governments. Since these are often under severe pressure from the free trade advocates to open up their food markets and concentrate on exports, the poor suffer, for markets benefit those who can pay. The international community must assume responsibility for ensuring the food rights of the poor, by fair trade schemes, by compensatory market mechanisms, or by support for food self-sufficiency programmes in poor countries.

US manufacturers are developing foods especially created for women, according to P. Hollingsworth, Food Technology, Jan 02. Three converging trends contribute widespread information on ingredients for women’s health needs, government approval of nutrition claims, and willingness of food manufacturers to address differentiated markets. Breakfast cereals, snack bars and beverages dominate.

Naturally Dangerous: Surprising Facts About Food, Health and the Environment, J. P. Collman, University Science Books, 01 tackles the "natural is safe syndrome" with lively vignettes on food, herbal medicines, environmental pollution, electromagnetic radiation, etc.

The Wood and the Trees

The further development of plantation forests of redesigned, superproductive trees, with little resemblance to the present, is highly controversial and may take decades to achieve. Trees are much more difficult than many plants to bioengineer, and the results take much longer to evaluate. The payoffs, ecologically and economically, may be huge but so are the risks. Science, 1 March, 02, pp 1625-1629. An ILO report Globalisation and Sustainability: Forestry and Wood Industries on the Move, 01, says failure to meet globalisation challenges and sustain these industries could cost 5% of their global workforce. Active government leadership in regulation and continued promotion of sustainable development is needed, which will also protect the environment and foster social justice.

D. Kaimowitz, Center for International Forestry Research (CIFOR) is promoting a major, research-based rethink among global economic and governance institutions on the value of forests in biodiversity, in poverty reduction, as well as health and climate issues and conflict reduction. Forest communities are keys to effective long-term management. New Scientist, 15 June 02, pp 44-47.

Futures Thinking

The Future of the Human Species

F. de Waal, The Ape and the Sushi Master: Cultural Reflections of a Primatologist, Basic Books, 01, takes a worldwide tour through animal behaviour to illuminate how humans and other animals are similar but different. Western dualism is uncomfortable with too close an understanding, which may mean an identity crisis in Western, though not in Eastern thinking.

Humans themselves may be at the point of creating a new Homo species. The past evolutions each took two hundred thousand years, and homo sapiens arrived one hundred and thirty thousand years ago. G. Stock, Redesigning Humans: Our Inevitable Genetic Future, Hougham Muffin, 02, takes both a medical and a biological view of possibilities. Rather than cyborgs (bionic people with silicon implants in brain and body), he foresees "cyborgs", functional cyborgs with extracorporeal electromechanical devices to enhance existing organs. The biological possibilities of human genetic engineering, cloning and genetic diagnosis before implantation will inevitably be developed through public pressure. F. Fukuyama, Our Posthuman Future: Consequences of the Biotechnology Revolution, Farrar, Straus, Giroux, 02, is more concerned with the social implications of human biological experimentation. There is something uniquely different in being human; in a moral sense and dignity which is fundamental to human rights, values (including capitalism). Many human qualities may now be understood in animals but still humans have a factor X, dignity, to be preserved from biotechnological intrusion. K. Malik comments on Fukuyama, New Statesman, 20 May 02, pp 48-49, that human uniqueness lies in our ability to act as conscious agents. We are both objects and subjects of nature and our moral values arise from being conscious agents, which allows us to not only follow nature but to amend it. The Economist, 25 May, 02, p 73-75, examines advances in brain science, with possibilities of human enhancement. Barring modification to impaired neurological conditions may be welcome, but free will is becoming a more debatable possibility, if mental decisions are merely the consequence of electromechanical interactions in the brain. Neurotechnology is already affecting human moral development, and could reduce the number of ways it is acceptable to be a person. Nature, 28 Feb, 02, p 363. Research biologists R. J. Atken, J A. M. Groves comment on the desperate plight of the human spermatozoos, as species fecundity declines. Environmental impacts and technological interventions


are both reducing the semen quality. Two main causes of germ-cell dysfunction are identified: genetic deletions on the male sex-determining Y chromosome and oxidative stress.

Club of Budapest member, E. Laszlo considers human evolution into the Third Millennium, Futures, September, 01. The dominant, extensive mode of the human species since the Neolithic period has been conquest, colonisation and consumption, which is now reaching a crisis in sustainability. A more desirable mode is intensive, with emphasis on connection, communication, consciousness. This exists now, but needs further development and application.

Listing
Predicting the Unpredictable, E. Bonabeau, Harvard Business Review, March 02. Ways by which the hitherto mysterious behaviour of people in crowds, in markets and organisations can be analysed and predicted.

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Contents abstracted by Future Survey, Future News and New Zealand Futures Trust
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