FIRST WE HAVE TO IMAGINE A BETTER FUTURE, THEN WE CAN BUILD TOWARDS IT

Apocalypse?

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AUSTRALIA'S COMMISSION FOR THE FUTURE

Essay Series **Number 1**

NO!

Youth and the Challenge to Change

BRINGING YOUTH, SCIENCE AND SOCIETY TOGETHER IN THE NEW MILLENIUM

by Richard Eckersley
author of *Casualties of Change*

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July, 1992

Australia's Commission for the Future

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Foreword

THE RANGE OF VARIABLES AFFECTING THE FUTURE and their possible interactions are more startling and endless than could be dreamed of by the most fertile of science fiction minds.

The most common method of forecasting the future through the extrapolation of past trends is not only unimaginative, but also a fruitless exercise.

This does not mean we are helpless in the face of the future. On the contrary, as the dominant species on the planet, the shape of the future is very much in our hands. And before we can build towards a preferred future, first we have to be able to imagine it.

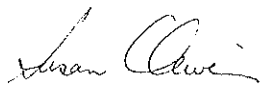
Authors of essays in the ***Apocalypse? NO!*** series will be asked to both identify and critically analyse a key trend, and then in the second half of their essay provide a positive, preferred method of shaping that trend so as we achieve the best possible outcomes for future generations.

It is too easy to take current trends, preach doom and gloom, offering only a bleak vision of the future. The more creative challenge which the Commission is committed to confronting is how do we strategically plan on a long term basis for a better future.

The ***Apocalypse? NO!*** series provides a public forum for beginning this process. The series will consist of regular essays, between 10,000 and 15,000 words long, published by Australia's Commission for the Future, examining key trends with the potential to influence the future in the long term. We are not looking just beyond our nose, but at what might affect the next generation in some 25 years time.

The essays will be commissioned from leading thinkers in every field of endeavour in an attempt to build an integrated picture of a future which would be worth striving for.

The series will recognise that while technological advances play a major part in determining future changes, this is not a neutral process driven by scientific progress or an abstract concern with efficiency. The series will strategically analyse the underlying social, cultural, educational, economic and environmental relations which provide the context within which change takes place.



Susan Oliver, Managing Director
Australia's Commission for the Future

Summary

GRAVE SOCIAL AND CULTURAL PROBLEMS CONFRONT Australia and other technologically advanced industrial societies, problems manifest most vividly in the rising levels of youth suicide, drug abuse and crime.

It is not necessary to project apocalyptic images of the 'end of the world' to understand that profound changes to our way of life are required. It should be enough to know that unless we act, we will condemn our children, and future generations of Australians, to a life of increasing hardship and suffering. Richard Eckersley describes our current treatment of children as 'cultural abuse' of an entire generation.

Bringing about the necessary shift in cultural values towards a more humane, sustainable and economically viable society poses a tremendous challenge to Australia and other democratic societies.

Circumstance will eventually force radical changes upon modern society; economic developments, deteriorating social conditions and environmental problems are already exerting this pressure. Those societies that are the fastest, most positive and most visionary in their response will be those that gain the greatest advantage and suffer the least cost.

Richard Eckersley argues that the way forward lies in bringing science into the mainstream of public debate, so as its handmaiden technology better serves the twin goals of searching for human purpose and planetary sustainability.

Governments could kick start the process of bringing about such a cultural shift through commencing large-scale environmental restoration programs, targeted particularly at employing the young. This would provide an essential step towards banishing the spectre of a deepening pool of young, long term unemployed, as well as giving youth a sense of worth, belonging and purpose.

About the author

RICHARD ECKERSLEY IS A SCIENCE WRITER, SOCIAL analyst and policy consultant. He is the author of two other major reports for Australia's Commission for the Future, *Australian attitudes to science and technology and the future* (1987) and *Casualties of Change: the predicament of youth in Australia* (1988). He has also written for CSIRO a report on environmental restoration, *Regreening Australia: the environmental, economic and social benefits of reforestation* (1989).

He was with CSIRO until 1990, first as head of its media liaison group and then as principal issue analyst in the office of the chief executive. He has also worked as a science writer for Australia's Commission for the Future and for The Sydney Morning Herald.

This paper develops the theme explored in Richard Eckersley's report, *Casualties of Change: the predicament of youth in Australia*, published by the Commission for the Future in 1988. The report, which has been widely reported, cited and acclaimed, described the worsening social and psychological problems experienced by young Australians, and argued that these problems have their roots in the fundamental changes taking place in western industrial society.

The material in this paper is drawn mainly from several recent addresses by Richard Eckersley, principally:

Casualties of change to agents of change? The challenge for youth in the 1990s. Keynote public address to the biennial national conference of the Australian Association for Adolescent Health, Perth, 29 November 1990.

The social limits to 'progress': can we cope with a world of accelerating change and increasing uncertainty? Guest lecture at the University of Western Australia Summer School, Perth, 24 January 1991.

'Casualties of change' revisited. Address to the Youth Affairs Congress, The place of young people in reconstructed Australia, Melbourne, 12 July 1991.

Science, God and trees: science and culture in a time of revolution. The Alcoa lecture in science, WA Science Summer School, Murdoch University, Perth, 21 January 1992.

"The finger twitches, and – blam! – the life across a distance – poof! – disintegrates: an existence powdered. The finger did it on a whim. The desacralization of life, a society of emotional disconnection: killing is a kind of dream-sequence video. Conscience is disconnected from trigger finger. Child is disconnected from future. Bullet is disconnected from gun muzzle and, once fired, can never be recalled."

Lance Morrow
Childhood's End
(about rising teenage homicide in the US)
***Time*, 9 March 1992**

Introduction

IN THE MID-1970s, I SPENT TWO YEARS TRAVELLING overseas – through Africa, Western and Eastern Europe and Asia. What began as a bit of break and an adventure, became, as is often the case, a much more important experience.

By far the most difficult cultural adjustment I had to make during my travels was on my return to Australia. Other westerners who have lived in other, non-western cultures have told me they felt the same way.

My first reaction on flying into Sydney from Bangkok was one of wonder at the orderliness and cleanliness, the abundantly stocked shops, the clear-eyed children, so healthy and free of the cares of living. Later, however, this celebration of the material richness of life in Australia gave way to a growing apprehension about its emotional harshness and spiritual desiccation. By 'spiritual', I don't necessarily mean believing in God (I am not myself a practising member of any religion), but having a deep sense of relatedness to the world around us.

There is nothing original about these perceptions, and it is easy to dismiss them as typical of the 'hippie' culture of the times. But I was never a hippie; for me they were a deeply personal and intuitive response to the culture of modern western industrial society. I became acutely aware of the cultural myths that define and support our society. For most of us in the west, the poverty of Africa and Asia is synonymous with misery and squalor; yet it is not. We see their people as crippled by ignorance, cowed by superstition, and oppressed by the harshness of their raw environment; we don't see the extent to which we are crippled by our rationalism, cowed by our lack of superstition (spiritual beliefs) and oppressed by our artificial environment.

I expressed these thoughts in a submission to the Federal Government's Committee of Inquiry into Technological Change in Australia in the late 1970s. Over the years the clarity of those impressions was lost. You get on with life; you adapt and adjust pretty well, although you are never quite sure at what cost. Dostoyevsky wrote that the best definition of humans was that we were creatures who would adapt to anything. When I reread that submission several years ago, I felt embarrassed by the vehemence of my criticisms.

Nevertheless, I feel that in many ways those 'gut reactions' of a young man returning home after two years on the road were confirmed by the conclusions of my report for Commission for the Future, *Casualties of Change: the predicament of youth in Australia*, an analysis of the worsening plight of young people, expressed in rising suicide rates, drug abuse and crime, and also more widely in their social conservatism, political apathy and materialism.

Casualties of Change argues that a range of economic, social and technological changes have combined and interacted to create a society that has become increasingly hostile to our well-being, and especially that of young people because of their social and psychological vulnerability.

The health and well-being of young people is a critical measure of a society for two reasons: in moral terms, how well a society cares for its weak and vulnerable is a measure of how civilised it is; in more pragmatic terms, a society that fails to cherish its youth, fails. It's as simple as that.

The resolution of this situation requires much more than fine tuning the status quo. It cannot be achieved by governments, and the manipulation of policy, in the absence of broader, fundamental changes – in our values and in our way of life.

In this essay, I want to deal mainly with the broad cultural consequences of the changes sweeping our society, and the role of science in driving those changes and so shaping modern western culture. I want also to examine the potential of science to transform our culture to encourage the development of a more sustainable and humane society.

The influence of culture is subtle yet powerful, and grossly under-estimated in public debate.

Our culture – how we see ourselves and our place in the world, what gives meaning and purpose to our lives, what we value and believe – is far more important in defining our society and determining its destiny than the economic indices with which we are so pre-occupied, and by which we measure our situation. Unless we understand and address these cultural issues, western societies, including Australia, will not deal effectively with the economic, environmental and social problems they face.

Deep down, most Australians sense how wrong things are going for us and, to a greater or lesser extent, most other nations. The surveys that I will be discussing later show this. But we are reluctant to admit these fears, because to do that will mean questioning the whole basis of our way of life.

Even the majority of Australians who are reasonably content in their domestic and working lives are reluctant to look beyond this personal domain to contemplate where we are going as a society. Many of us fill our lives with distractions – often obsessively and desperately – to avoid the big issues.

Yet it is crucial that we drag these deep anxieties out of the closet and confront them.

Before continuing, I should make several important qualifying comments. I am not arguing that we should not be introducing, or improving, specific programs in areas such as suicide, drug abuse or delinquency. However, I am suggesting that there comes a time when we must look beyond patching a seriously

flawed system, and regard such programs as, at best, short-term measures to contain, and hopefully improve, the current situation while long-term changes are set in train.

Nor am I arguing that all the changes that have taken place over the past few decades are bad, even where those changes may be contributing to the problems. For example, it is possible one of the reasons why young men, of all the groups in our society, seem to be suffering most is that they feel most threatened by the improving status and independence of women today. Also, some people might feel much more comfortable with the rigid conformity of the past. And compared to yesterday's parochialism, today's more global outlook can be overwhelming. But these possibilities don't justify a return to those ways, and the changes in these areas have been both inevitable and necessary.

Finally, in relation to the culture of modern youth, I want to emphasise that I am describing the characteristics and qualities of a generation, not every individual member of it; nor in criticising some of those features am I levelling blame. Rather I see youth as the miners' canaries of our society, acutely vulnerable to the peculiar hazards of our times.

The crisis in western society

Western civilisation in the 1990s is in social and cultural turmoil. The flaws in western societies are insidious in their effect, compared to those of what was the eastern bloc of nations, but the effect will be as profound.

The turmoil may not be apparent in our daily lives. Most of us continue to extract a fair measure of satisfaction from our lives; humans are remarkably adaptable. What I am talking about are the powerful undercurrents of our culture, whose full costs will not become apparent for years, even decades, to come.

The young suffer most in such circumstances. They face the difficult metamorphosis from child into adult, deciding who they are and what they believe, and accepting responsibility for their own lives. It is a transition best made in an environment that offers stability, security and some measure of certainty.

Their vulnerability is strikingly apparent in the trends over the past few decades. Here are some examples:

SUICIDE: Youth suicide rates have risen in many western industrial societies, notably among males. Among Australian males aged 15 to 24, the suicide rate has more than trebled since the 1950s and is now amongst the highest in the world. In 1950, the suicide rate for males aged 15 to 19 was 5 per 100,000 in this age group; for males aged 20 to 24, it was 9. In 1990, the figures were 18 and 36 respectively. In 1990, the suicide rate for males 20 to 24 was the highest of all age

groups, in sharp contrast to earlier decades when suicide rates among older men were much higher than those for young men. (There has been little change in suicide rates for young women in Australia, but among older women they have fallen markedly).

The rate of attempted suicide is up to 100 times that of successful suicide. The extent to which youth suicide has become part of our common experience is shown by a 1989 Saulwick Poll, which found that 21 per cent of Australians (and 40 per cent of young people) personally knew of teenagers who had attempted or committed suicide.

DRUG ABUSE: After increasing in the 1960s and 1970s, total drug use, both legal and illegal, appears to be declining as casual or social use of drugs becomes less fashionable. But serious drug abuse remains a major, and perhaps worsening, problem. Alcohol and tobacco pose the greatest drug threat to young Australians, especially through alcohol's link to road accidents, the biggest killer of young people.

'Binge drinking' among the young, even those in their pre-teens, has become a major problem in recent years. A recent South Australian study found 30 per cent of 15 year-olds (38 per cent of boys, 24 per cent females) reported a 'binge' drinking pattern (that is, they drank five or more drinks in a row in the fortnight before the study). Another survey, conducted in Western Australia, found that men aged 18 to 24 spent on average almost $66 a week on alcohol, and women in this age group an average of $31.

At the beginning of the 1960s, the United States was the only country with a significant illegal drug problem, and international authorities believed they had the matter under control. Instead, the Parliamentary Joint Committee on the National Crime Authority notes in its 1989 report, *Drugs, crime and society*, we have entered an era in which the consumption of illicit drugs "has increased beyond the most alarmist predictions".

Authorities and experts worldwide agree that the war against drugs is being lost, despite the expenditure of billions of dollars on law enforcement and education programs. Global production of opium is estimated to have doubled over the second half of the 1980s. International trade in these drugs has become a $300 billion industry. Drug use has now become epidemic in many parts of the world, especially among the young. In recent years, according to a World Health Organisation report, the average age of users has declined, and multiple drug use has become more common.

CRIME: Crime is mainly an activity of the young, especially young men. Crime rates have risen sharply in most, if not all, western societies since World War II, after a long decline from the high levels of the early 1800s.

In Australia between 1973-74 and 1990-91, the rate of reported serious assault has risen more than five-fold, reported rape has increased fourfold and reported robbery (theft with violence or the threat of violence) has

trebled. All are still rising. The incidence of non-violent crimes has also doubled or more. Only the murder rate has not changed significantly over this recent period.

A 1990 international crime survey strengthens the view that Australia is a relatively high-risk country as far as crime goes. Australia ranked third highest of the 14 countries surveyed in terms of overall victimisation – that is, the proportion of those surveyed who had been a victim of various crimes – behind only the United States and Canada. Australia ranked first for assaults involving force and for less serious types of sexual incidents; second for assaults involving threat; third for sexual assault; and equal sixth for robbery.

The trends in violent crime rates may exaggerate the degree to which there has been a 'real' increase in violent crime because of changes in recording and reporting crimes. How much of the recent rise in violent crimes (other than murder) is real, and how much a statistical artefact, we simply do not know.

Nevertheless, the consistency of historical trends across a wide range of different cities and nations in the western world suggests, in the words of an American authority, that "the trends reflect, in a somewhat distorted way, real and profound changes in aggregate social behaviour".

One dimension of the social reality reflected by these statistics was vividly described by Graham Goodman in *The Bulletin* early last year. After going to the theatre in the city, he and his wife decided to walk back to his office near Darling Harbour, where they had left the car, to enjoy the city sights of Sydney:

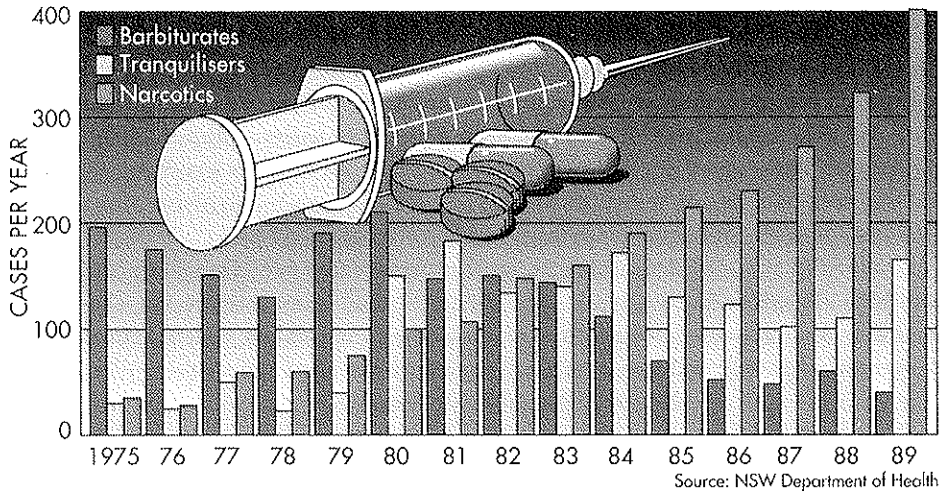
"We didn't. It was as if William Hogarth's Gin Lane stretched for blocks. The streets were littered with drunks, some vomiting where they stood. The footpaths outside the hotels were strewn with broken glass. People argued with and hurled abuse at one another. Others with vacant eyes stood mumbling soundlessly to themselves, arms whirling like aimless windmills. Through the streets surged packs of feral teenagers with brutish faces and foul, mindless mouths."

Behind the problems of youth suicide, alcohol and drug abuse and delinquency exists a constellation of psychological traits: alienation, anomie, frustration, confusion, hopelessness, impotence, loneliness. At the core of it all is a crippling lack of self-esteem.

Public discussion about these problems focuses on factors such as family conflict and breakdown, education pressures, unemployment, poverty and homelessness. Parents, in particular, often get blamed for the worsening plight of young people. I felt when researching *Casualties of Change*, and feel more strongly now, that the problem goes far deeper than this, important though these factors are.

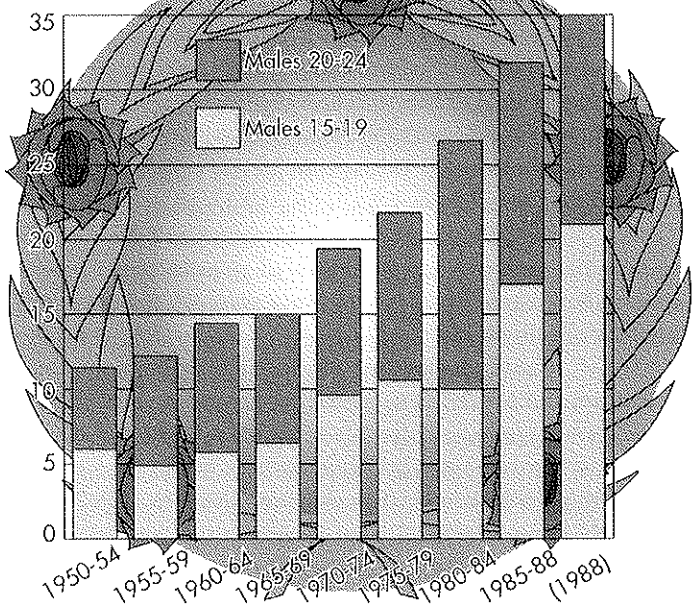
To understand what is happening to us, as a society, we must go beyond these issues to the social and cultural framework within which we live our lives. If the health of children is a measure of the health of the family, then it is also

MAJOR DRUG TYPES DETECTED IN POST MORTEM CASES – NSW



Source: NSW Department of Health

SUICIDE TRENDS AMONG YOUNG MALES
Number of suicides per 100,000 of population in each age group



the case that the health of the family is a measure of the health of the society. While for many, the family is a haven, a sanctuary, from the problems and pressures of the outside world, for others it is the bear pit where all their bitterness, frustration and anger are unleashed on hapless spouses and children.

Also, it is hard to argue these days that whatever the trends, the suicidal, the insane, the drug-addicted and the criminal represent only a small group of social misfits, and that the rest of society is humming along nicely. There is a growing variety of evidence that these problems represent only the most dramatic evidence of our predicament, the tip of an iceberg of social and cultural decline, even disintegration. For example, a research paper published this year in the journal, *Science*, argues that the status of American children has declined over the past three decades on almost every score except infant mortality: children today are fatter, more suicidal, more homicidal, and score lower on education tests than the children of the 1960s.

The crisis we face is also becoming increasingly apparent from studies of mental illness, personal behaviour and public attitudes.

MENTAL ILLNESS: Implicit in the rise in youth suicide is a rise in depression, because of the link between the two. Mental illness among people under 18 is reported to be one of the fastest growing health problems in Australia and elsewhere.

There is now a substantial body of research suggesting that in western societies major depressive illness, once regarded as a malady of the middle-aged and elderly, has become more common among teenagers and young adults, with the increase most marked among those born since World War II. More recently, there appears to have been an increase in rates of depression in all age groups.

Also, while depression has historically been two to three times more common among women than men, this difference may now be narrowing because of the increasing rate of depression among young men. According to Gerald Klerman, professor of psychiatry at Cornell University, these trends cannot be fully attributed to artefacts of reporting, recall, mortality or diagnosis.

These conclusions have been recently supported by an American study, The Epidemiological Catchment Area study, whose main findings were reported in *The Medical Journal of Australia* in February this year. The study, the largest undertaken in psychiatric epidemiology, began in the late 1970s and covered about 20,000 subjects. Recent, smaller studies in other countries including New Zealand and Canada have produced comparable results.

The ECA study found that one in three American adults (30 per cent of women and 36 per cent of men) had experienced one or more of 30 major psychiatric disorders at some time in their lives, with one in five having an 'active' condition when interviewed. Most illnesses began in adolescence and early adulthood, with prevalence decreasing with age. Surprisingly, older people did not have higher lifetime rates of illness than younger ones, and they had rates of active disorders as low

as, or lower than younger people , leading to the conclusion that psychiatric disorders may be on the increase, particularly alcohol abuse, antisocial personality and depression.

MASS OBSESSIONS: According to Naomi Wolf, the author of *The beauty myth*, 50 per cent of American girls aged between 10 and 13 have an eating disorder. A recent Sydney study of female high school students, with an average age of 13, found almost half were dieting in an attempt to lose weight, although less than one in five was actually overweight. Similarly, a Canberra study found about 20 per cent of 70 girls aged 13 and 14 believed they had an eating problem. More than two-thirds wanted to lose weight, although only one girl was overweight and 20 were underweight.

Boys appear also to be succumbing to obsessions about their looks. A recent Australian Customs Service report has revealed an extensive blackmarket for steroids in gyms and high schools. Apparently the drugs are being used for cosmetic, not competitive, purposes.

PUBLIC ATTITUDES: The United States, the pace-setter of the modern industrial world, shows many signs of a society falling apart. Recent reports and surveys reveal a nation that is confused, divided and scared. America is suffering its worst crisis of confidence in 30 years, and is coming 'unglued' culturally – the once successful ethnic melting pot that the US represented now coagulating into a lumpy mix of minorities and other groups who share few if any common values and beliefs. Most Americans no longer know right from wrong, and most believe there are no national heroes.

Although the symptoms may not be as severe, Australians are suffering a similar malaise. Recent surveys reveal a people who, beneath a professed personal optimism, nonchalance and hedonism, are fearful, pessimistic, bewildered, cynical and insecure; a people who feel destabilised and powerless in the face of accelerating cultural, economic and technological change; a people who are deeply alienated from the country's major institutions, especially government. We want a different lifestyle, are poised to make the change, but don't expect it will happen.

In *The beauty myth*, Naomi Wolf says of women: "Many, though publicly confident, are secretly feeling vulnerable, exhausted, overwhelmed and besieged". "Exactly," a female reviewer comments. And I would add that as many men probably feel the same way.

A 1988 survey by the Commission for the Future on attitudes to change and the future shows most Australians feel that, in many respects, life has become worse over the past 20 years. More expect the quality of life in Australia to be worse early next century than believe it will be better. More than half have an essentially pessimistic view of the future of the world.

A 1989 report by the Clemenger group of companies, *The silent majority II – the everyday problems of the average Australian*, replicates a 1977 study that sought to uncover the real concerns of the silent majority of Australians.

The study found Australians were gravely concerned about the safety and future of their children, and were worried about much more serious social issues than they were in 1977, when their concerns were more focused on mundane irritations.

The growing pessimism of Australians has been best charted by Hugh Mackay and his associates in the Mackay Reports. In a 1990 report, *The Australian Dream*, Mackay says Australians today are speaking more negatively about their country than at any time in the 12-year history of the report:

"Australians see Australia as a nation in trouble. The trouble is primarily economic, but a general spirit of pessimism also embraces social, political and cultural aspects of the Australian way of life. The mood is down. The outlook appears bleak. There is a growing feeling that Australia has now entered a difficult period in its economic and social history when it must begin paying for the excesses of the 1970s and 80s.

... For today's Australians, one of the most depressing aspects about life in Australia is the sense that there is no national goal; no sense of direction; no sense of purpose. Lacking such vision, Australians feel that they are at serious risk of losing control of Australia's future."

Another survey, *She won't be right – Australians' attitudes towards the family and the future*, published last year by advertising agency, Mattingly and Partners, and market research company, Brian Sweeney and Associates, yielded similar findings. Their report argues that the 1990s represent a fundamental watershed for our society:

"For most people, their vision of the year 2000 is a bleak and gloomy one characterised by high-rise, treeless concrete, smoke and haze, pollution, sadness and danger. This is in stark contrast with how they would like it to be – trees, families, animals, smiling faces, outdoors, freedom, sunshine, safety. The economic and environmental factors bringing about this gap between desire and expectation is producing a major emotional stress within our society."

Surveys of the outlook of children and adolescents reveal similar anxieties.

A 1989 study by Mackay, *Young Australians*, reinforces other studies, discussed in my earlier reports for the Commission for the Future, about the general pessimism about the life of today's youth, although they remain personally optimistic that they will be able to get what they want. "Shadows of doubt and disappointment are falling across young people's view of Australia," Mackay notes. The reasons include: violence; the fact that "everything seems to be getting harder"; pollution; "pathetic" political leadership; the road toll; racial tension; crime and corruption; increasing inequality; lingering discrimination against women; and a vague sense of impending disaster.

Reviewing the Next Wave Festival, Melbourne's biennial youth arts festival, in *The Bulletin* in June, Fiona Scott-Norman notes that youth

theatre, being responsive and immediate, acts as "a societal alarum". When the festival's theatre offerings are viewed in this context, she says, "the outlook for our society is pretty damn bleak":

"Whether the authors have chosen to explore the past, present or future, the message is the same – deprivation, violence, depression. Some hope and humour go into each Next Wave production but even the most positive of messages is intercut with fatalism. We get no sense of youth celebration, only a grim determination to survive."

In 1990, *The Sydney Morning Herald* conducted a survey in which about 120, 11-year-old Sydney school children were asked to write down their perceptions of Australia's future and how their country would fare in the new millennium. The idea was to publish a cheerful view of Australia's future; the *Herald* chose bright, normal healthy youngsters, young enough to be untarnished by cynicism. This is what the *Herald* said of the results:

"Yes, we expected a little economic pessimism, some gloom about the environment and job prospects and perhaps even a continuing fear of nuclear war. But nothing prepared us for the depth of the children's fear of the future, their despair about the state of our planet and their bleak predictions for their own nation, Australia".

The consequences of cultural failure

What does such a world view among children and adolescents mean?

I was surprised when researching *Casualties of Change* that some of the experts I consulted seemed to attach little importance to these concerns of young people. It was their personal experiences and circumstances that mattered, they said. My own suspicion is that this absence of hope, this lack of faith, is critical to understanding the problems of youth and the future of western society.

In any other culture, at any other time, children this age would be being told stories that would help them to construct a world view, a cultural context, to define who they are and what they believe – a context that would give them a positive, confident, optimistic outlook on life, or at least the fortitude to endure what life held in store for them.

Our children are not hearing these stories. I believe we are witnessing the cultural abuse of an entire generation of young Australians. More than that, we are inflicting it.

I suspect we greatly under-estimate the effect this broad failure of culture has on our lives, and our capacity to tackle the problems we face.

The pressures and stresses we feel are often difficult to define, the sources of our discontent and anxiety hard to pinpoint. As I suggested in

Casualties of Change, the real significance of the visions many people, and notably children, have of a future world devastated by nuclear war, ravaged by environmental despoliation, and dominated and dehumanised by technology, may not be that people really fear this is what the future holds – although the risks are real enough – but that they symbolise people's sense of impotence and unease about life today. By projecting our concerns into the future, we can describe them in more concrete terms, and thus express an anxiety that may be ill-defined, but is nonetheless personal and deeply felt.

We can perhaps draw an analogy between people's response to the risks and threats of modern life and their response to those posed by toxic disasters. Researchers who have studied the impact of 'toxic poison' tragedies like Three Mile Island and Love Canal have noted that those affected often do not respond in the same way as people involved in other disasters such as fires and floods, which have a distinct beginning and end: the danger arrives, and passes; people suffer, and recover.

With toxic disasters, the situation is different. Because of their insidious nature, they can leave their victims with a profound and prolonged dread, a dread that can be reinforced by the many media reports about the hazards we face in our daily lives: pollution, contamination, accidents, chemical leaks. Writing in *The Harvard Business Review* in 1990, Kai Erikson, professor of sociology at Yale University, says that toxic catastrophes can have a devastating impact on the people who consider themselves victims: "They feel adrift, devalued, demeaned, robbed of a measure of their humanity. Consequently, they often come to see life with an almost corrosive scepticism."

Thus I believe we must take seriously – but not necessarily literally – survey findings about people's discontent about life today and their fears for the future . Last year, Britain's *Daily Telegraph* was outraged by the findings of a survey it had commissioned on how people value science and technology in their daily lives. What most offended the newspaper – and a leading scientist whose opinion it sought – was the response to the question: "Science has brought us vast benefits, ranging from longer life to communications and labour-saving devices. But would you give up all this to live in a truly natural world that is free from radiation and pollution?"

Forty one per cent of those surveyed said, yes, they definitely or probably would, while a further 23 per cent were unsure. The point about this, which the *Telegraph* did not appreciate, is not that people really want to abandon all science and technology and go back to a pre-industrial age, but that they are yearning for a less frantic, simpler lifestyle that offers them more certainty, confidence and control over their lives.

In his book, *Western civilisation in biological perspective*, Stephen Boyden, a professorial fellow in human ecology at the Australian National University, lists the 'psycho-social' conditions of life that are conducive to good health, based on an assessment of what was provided by the hunter-gatherer society in which humans have spent most of their evolutionary history. He suggests that these conditions

provide clues to the nature of the biologically determined, or universal, health needs of the human species. They include an environment and lifestyle that provide a sense of personal involvement, purpose, belonging, responsibility, interest, excitement, challenge, satisfaction, comradeship and love, enjoyment, confidence and security.

For more and more people, modern life no longer offers these qualities.

When a society fails to imbue people's lives with a sense of worth and meaning, then they must attempt to find these qualities as individuals. It is a task that many find extremely difficult, even impossible. People want to know what is expected of them; they need to have something to believe in.

This absence of belief in much beyond ourselves, and the consequent lack of faith in ourselves, are undermining our resilience, our capacity to cope with the more personal difficulties and hardships of everyday life.

Robbed of a broader meaning to our lives, we appear to have entered an era of mass obsession, usually with ourselves: our appearance, our health and fitness, our work, our sex lives, our children's performance, our personal development.

The consequences of this loss of belief are more serious, I believe, for the young than for grown-ups. Adults are to some extent 'cemented' into their lives by jobs and families; their values and beliefs are set. For youth, this is not the case – or should not be. They should be exploring, reaching out, finding out – determining their identities and values, finding their way in life. This makes them particularly vulnerable to the uncertain culture of our times.

As I observed in *Casualties of Change*, we can see clearly the consequences for indigenous people, such as the Aborigines, when their culture is undermined by sustained contact with industrial society: the social apathy, the high incidence of suicide, crime, and drug abuse. We are seeing all these things increase among our youth. Others – the majority – seem to be coping well and to be happy enough, but often suggest a cynicism, wariness and hesitancy, and a form of social detachment, that reveal their uncertainty and confusion.

The findings of the Mackay study, *Young Australians*, cast interesting light on young people's cultural response to the ephemerality of today's world. The study found:

• Young Australians are 'fast trackers'. Something new is always happening, and they are accustomed to rapid change.

• There is a strong sense of urgency about the need to have fun, and have it now. 'Fun' is the ultimate antidote to pessimism, anxiety, pressure, boredom.

• Their appetite for newness appears to be insatiable. Faced with an ever-changing, ever-new range of choices, they are constantly looking for 'the latest'. Their span of commitment is very short, and they have few enduring heroes, fashions or favourites. "The real story of contemporary teenage fashion is that there is no story."

• They are a materialistic and indulged generation, and material possessions have come to symbolise not only status but security and 'being loved'. The right brand names, expensive ones, are important.

• They express a very strong need for a sense of security and belonging, with peer groups playing a very important role in this regard.

But perhaps the most disturbing finding of the study concerns young people's moral sense. Mackay found that they believed that moral values were in decline, and often found it hard to identify an accepted moral framework within the community – unless they were religious. Moral responsibility to the 'the group' is much stronger than to 'the community', Mackay says:

"Thus the ethical sense is rooted in a social sense, but that social sense is very limited, very transient, and very fragile. Lacking a broader sense of 'the community', many young people have difficulty in establishing an ethical framework which has any application beyond the boundaries of their own immediate circle of friends."

The picture that emerges from the Mackay study is of a youth culture that may be meeting the needs of its members in terms of providing them with meaning and an identity, but only just. It is of a culture that is barely holding together, certainly not enduring – a mass-media culture marked by frenetic fashions and polarisation between self-destructive recklessness and abandon, and a more insidiously debilitating cautiousness, social withdrawal and self-centredness.

In July 1990, *Time* magazine ran a major article on what it described as a new generation of young American adults grappling with its values. According to *Time*, a prime characteristic of today's young adults is their desire to avoid risk, pain and rapid change. They feel paralysed by the social problems they see as their inheritance: racial strife, homelessness, AIDS, fractured families and federal deficits:

"They have trouble making decisions. They would rather hike in the Himalayas than climb a corporate ladder. They have few heroes, no anthems, no style to call their own. They crave entertainment, but their attention span is as short as one zap of a TV dial. They hate yuppies, hippies and druggies. They postpone marriage because they dread divorce. They sneer at Range Rovers, Rolexes and red suspenders. What they hold dear is family life, local activism, US national parks, penny loafers and mountain bikes. They possess only a hazy sense of their own identity but a monumental preoccupation with all the problems the preceding US generation will leave for them to fix."

It may be, then, the greatest wrong we are doing to our children is not the broken families or the scarcity of jobs (damaging though these are), but the creation of a culture that gives them nothing greater than themselves to believe in – no god, no king, no country – and no cause for hope or optimism. It is a culture whose main effect appears to be demoralisation. Of course, for those young people without loving families and jobs, this demoralisation is all the greater, not least because of the importance of both to the process of cultural induction.

There are some promising signs, especially in *Time*'s description of the American scene: the shift in values away from materialism and selfishness, the search for a new moral framework. But a fundamental doubt remains: can young people muster the energy, will and commitment to effect the degree of change that is required?

The role of science

Critical to the development of our situation has, I believe, been the role played by science.

Science is crucial to our economic and industrial development, which is increasingly driven by innovation. It will be central to resolving the many serious environmental problems we face through the invention of cleaner and more efficient technologies and improved resource management strategies. It has an important role to play if we are to understand and better address the grave social difficulties confronting us.

Public debate and discussion about science concentrates almost exclusively on these issues. They are not, however, the aspect of the relationship between science and society that I want to focus on.

I am using the word 'science' in the broadest sense to include both the natural and social sciences and their application in new technologies. Most modern technologies have their origins in scientific research, and most scientific research these days is undertaken with the intention that its results will be used in one way or another, that is turned into technology.

One of the most fascinating predictions of the impact of science on our lives that I have come across dates back to earlier this century, when scientific optimism was probably at its zenith. The eminent English geneticist, J.B.S. Haldane, argued that if science were allowed to take matters in hand, there would be no limits to human progress. Men, he predicted, "will be able to think like Newton, to write like Racine, to paint like the van Eyks, to compose like Bach. They will be as incapable of hatred as St Francis". Diseases will be banished and man's life will probably be measured in thousands of years, "and every moment of his life will be lived with the passion of a lover or discoverer".

Haldane was regarded as a great science communicator. His views are fascinating not just for their unbounded, and in retrospect naive, enthusiasm for what science could achieve, but they highlight one of the most significant changes science has wrought: the transformation in how we think about ourselves and the world.

To what extent can we link this transformation to the modern predicament and so attribute our situation to science, with its objective, rational, analytical, quantitative, reductionist, mechanistic view of the world?

Poets and philosophers have warned against its evils for centuries. As the poet and painter, William Blake, pleaded: "May God keep us from single vision and Newton's sleep".

In his book, *The re-enchantment of the world*, Morris Berman, an American historian of science and social critic, says he began his study of the problems that characterise life in western industrial nations believing that their roots were social and economic – as most commentators still do – but became convinced that he had overlooked a whole dimension.

"I began to feel... that something was wrong with our entire world view. Western life seems to be drifting toward increasing entropy, economic and technological chaos, ecological disaster, and ultimately, psychic dismemberment and disintegration..."

Berman's conviction is that the fundamental issues facing any civilisation or any individual are issues of meaning:

"And historically, our loss of meaning in an ultimate philosophical or religious sense – the split between fact and value which characterises the modern age – is rooted in the Scientific Revolution of the 16th and 17th centuries."

I have some sympathy for this view, stemming from my experiences of cultures not dominated, or even greatly influenced, by science. However, I'm not convinced that we have to unravel all the cultural knitting we've done right back to the 16th Century, or that life was so wonderful before then, whatever enchantment science has since robbed us of.

The evidence does suggest that the sort of society we have become since World War II is beginning to fall apart under the pressures of the changes sweeping the world. Not all of this can be attributed to science, or not directly. Since the war, the industrial world has been characterised by a tremendous surge in economic, cultural, social and technological activity. But I believe that it is science, especially through technology, that has been the driving force behind the transformation of the world in the post-War decades.

It has been the pace and nature of these changes that appear to have torn us from our past, and from the cultural heritage that provided the moral framework to our lives. Science undermined our faith in 'god, king and country' in replacing it with faith in progress, the belief that the life of each individual would always continue to get better: wealthier, healthier, safer, more comfortable, more exciting.

Now progress has faltered, with economic, social and environmental problems piling up around us; expectations remain unmet. We are failing even by the standard measure of progress: for the first time in many generations, today's young adults cannot assume their standard of living will be higher than their parents'.

Australia's vulnerability

The pressures Australia faces are common to the whole of the modern world – pressures of increasing urbanisation, industrialisation, centralisation, mechanisation, individualisation; of growing populations, increasing global economic competition and accelerating change; of a strengthening material and economic domination of our lives and a weakening spiritual and moral influence; of the development and employment of ever more powerful and complex technologies that diminish the individual's place in society and sense of control over his or her own destiny.

While Australia possesses various advantages that might be expected to moderate the social impact of these pressures – climate, space, environment, natural resources, a small well-educated population etc – we have other qualities that may well make us more vulnerable. We are a young, heterogeneous people who lack a long and shared cultural heritage and a strong sense of national identity, and hence something to anchor us in these turbulent times. Older cultures offer a sense of permanence and continuity that can be very reassuring.

Historically, we have chosen to remain dependent on a colonial parent, – first England, then the United States (perhaps next Japan?) – rather than forge our own identity and destiny. Australians were a much more confident and proud nation when we saw ourselves as a young, vigorous outpost of the great British Empire. Today, we don't know who we are, or where we belong.

But we were children then; we are now growing up, still searching for our own identity. Social researchers have noted the adolescent nature of our national character, with, in the words of Hugh Mackay, "its confusions and self-contradictions: insecurity, lack of self-respect and self-discipline, apathy, outspokenness, innocence, vulnerability... Australians' chests may swell with pride, but this pride is very easily deflated," he says.

Thus Australia may be culturally less equipped than many other countries to cope with the rougher, tougher world of the 1980s and 1990s. The growing economic, social and environmental pressures are demoralising and dividing us, eroding our already fragile self-confidence and sense of identity, purpose and direction. As a result, we are losing faith in our leadership, in ourselves and in the future.

On the other hand, if we take up the challenge, we could come out of this difficult period with an exciting, new sense of national purpose and identity, one well suited to the world's shifting cultural, social and economic patterns.

We must choose between a nation in transition, or a nation in inexorable decline – between making Australia a more dynamic, independent, fair and far-sighted society, or allowing it to degenerate into one that is strife-torn, impoverished, fearful and subservient. Despite taking some significant steps in the 1980s, we have yet to face up to this choice. The longer we delay, the harder the right choice will become.

The roots of decay

The growing crisis facing western societies is, then, deeply rooted in the culture of modern western societies: in the moral priority we give to the individual over the community, to rights over responsibilities, the present over the future (and the past), the ephemeral over the enduring, the material over the spiritual.

Our cultural flaws and confusion both reflect and reinforce our economic, social and environmental problems. They also undermine our ability to resolve them effectively. Unless we forge a new culture, then it is unlikely we will overcome these problems because we will lack the will, the moral courage, to confront them.

If those who see science as intrinsically hostile to human psychic well-being are right, then we could be in for – to use a phrase of our times – the mother of upheavals as western civilisation falls apart.

But I believe that the problem rests more with our immaturity in using a cultural tool as powerful as science, and I am hopeful that with growing experience and wisdom, together with advances in science itself, we can create a more benign and complete culture, and so a more equitable and harmonious society.

Perhaps the best example of our misuse of science – aside from the nuclear arms race -is the mass media. The media, the product of tremendous advances in information and communications technology, have become the most powerful determinants of our culture, yet as a society we make little attempt to control or use the media in our best long-term interests. Indeed the style of public culture dictated by the popular media virtually guarantees we will fail to address effectively the many serious problems we have:

- They divide us rather than unite us, fashioning public debate into a battle waged between extremes – a delineation of conflict rather than a search for consensus;
- They create public images of issues that bear little resemblance to the private reality of those issues;
- Their fleeting interest in issues discourages community commitment;
- They heighten our anxieties and intimidate us by depicting the world outside our personal experience as one of turmoil, exploitation and violence;
- They fuel our discontent by promoting a superficial, materialistic self-centred and self-indulgent lifestyle, and selling a way of life that is beyond the reach of many.

Aldous Huxley once said that if he were to rewrite *Brave new world* – with its vision of a scientifically controlled society in which babies grew in bottles and free will was abolished by methodical conditioning and regular doses of

chemically-induced happiness to make servitude tolerable – he would include a sane alternative, a society in which:

"science and technology would be used as though, like the Sabbath, they had been made for man, not (as at present and still more so in the Brave New World) as though man were to be adapted and enslaved to them."

Surveys suggest Australians recognise the cultural source of our situation, but find changing their ways too hard. The 1988 Commission for the Future survey on change and the future included an open question that asked: "What do Australians need to do, either as individuals or as a nation, to manage change better and improve future prospects?"

By far the most common response, given by 42 per cent of respondents, related to the need to change our personal values and behaviour. The sort of things people mentioned were the need to work harder, work together, work for the good of the country, be less greedy, less selfish, raise moral standards. This category was followed by the need for better government, mentioned by 29 per cent, which covered both the desire for stronger leadership and the need for greater participation in the political process. After these came improving the economy (22 per cent), better education (19 per cent) and protecting the environment (13 per cent).

The Mackay Report, *The Australian dream*, found that when talking about the nation, people rarely dreamed of wealth:

"Much more often, they dream of people being more responsible, more self-disciplined, more caring and tolerant; they dream of 'better education', less crime and violence, and a safer, cleaner society; they dream of 'capturing some of our basic values'."

But Mackay notes that Australians' private and personal dreams often contradict their own proposals for solving the country's problems:

"...people will commonly state that 'we should all be tightening our belts' while, at the same time, expressing a personal wish to have a more comfortable (or even extravagant) life-style.

"...Personal dreams do still often involve materialistic means of life-enhancement – in spite of a significant shift away from 'wealth' dreams towards 'value' dreams. Reality is certainly becoming harsher, and dreams are harder to dream, but the romantic/excessive/ extravagant/luxurious dreams of material wealth are still lurking – not far below the surface."

I want to look at two examples of how scientific knowledge might provide the impetus towards change that we need. One is through strengthening the compatibility between the scientific and spiritual view of the world, although the reality and significance of this is still unclear. The second, more developed, is our increased scientific understanding of our impact on our environment and the importance of this to our own well-being.

Science and religion

Talking to cosmologists these days about the origins of the universe seems inevitably to lead to questions about God. I recall interviewing a leading Italian astrophysicist, Remo Ruffini, more than a decade ago and asking him whether there was a place for God in the cosmic system he had just described with eloquence and enthusiasm. He replied that it was not a trivial question:

"I think everyone of us develops a kind of religiosity in the sense that working with nature, and the understanding of nature and seeing the extreme beauty and simplicity which can come out of great complexity, we develop an enormous sense of respect for nature.

We have been educated in the traditional sense to distinguish between people, animals, trees and inorganic material in a kind of scale. What we discover more and more is a great unity in nature, an underlying self-consistency which spans all nature and that in a certain sense is religion, but I would not like to go further than that."

One scientist who is prepared to go further than that today is Paul Davies, professor of mathematical physics at Adelaide University, and author of internationally popular books such as *God and the new physics*, *The cosmic blueprint* and, published this year, *The mind of God*. He suggests there might be a purpose behind the mathematical beauty of the universe and our capacity to discern that beauty.

Davies was quoted in *The Sydney Morning Herald* last December as saying:

"My line is that I can't accept that the world's elaborate organisations and principles are simply a brute fact. I think there are deeper levels of meaning involved, and it is convenient for people, to think of those levels as 'God'... I have a belief in an abstract, timeless God. I think there must be something behind it all, and that human beings are part of that meaning, not a cosmic extra. As a physicist I believe that science is a surer path to God than religion..."

In a recent interview published in the Commission for the Future's magazine, *21.C*, Davies acknowledges that science has had a tendency to marginalise, even trivialise, human beings , but argues that in recent years more and more scientists are rediscovering that "our existence in the universe is actually tied in with basic processes in a very fundamental way."

Some of Davies' comments seem to imply a divine status for humans – that of all creatures, only we have the capability to appreciate the beauty of God's works, as it were. But Davies says he does not mean humans have been pre-ordained and written into the laws of nature:

"I mean that the general tendency for the universe to evolve or progress from its initial state of almost total featurelessness to an ever richer variety of complex organised systems is written into the laws of nature, and that the emergence of

consciousness as a phenomenon is inevitable given the nature of these laws. That is, that this general progression towards greater complexity leading on to consciousness is something which is very deep-seated in the nature of things... So I do believe that our existence, and in particular the existence of consciousness and intelligence...and mind is not just some quirky little by-product."

Later in the *21.C* interview he says:

"I'm not saying that the world has been deliberately designed so that we can decode it, or that we've been deliberately designed as decoders, or anything quite so contrived. All I'm saying is that I think that there's a link between the existence of mind in the universe and the particular form of the underlying laws. So if there is a purpose behind the universe then we're part of that purpose in a rather intimate way."

Behind Davies' views is an emerging scientific picture of a world strikingly different from Newton's mechanical one. Thus quantum entities such as light and electrons can exhibit the properties of waves or particles, even, it seems, both waves and particles, depending on how we design our experiments to measure them.

John Gribbin, a British science writer and co-author with Davies of *The matter myth: towards 21st century science*, says that while Newtonian clockwork may be out, we do not yet have anything to replace it:

"In the new physics, the whole of space and the whole of time interact, in a mysterious and ill-understood way, to produce the behaviour of entities such as electrons, atoms... people and planets 'here and now'. We live not in a cosmic clockwork, but a cosmic network, a network of forces and fields, of non-local quantum connections and non-linear material processes."

A professor of nuclear physics once put it to me this way: the mechanistic picture held by scientists in the 19th century and still held by many people today is not correct. Materialism – which asserts the primacy of matter – is out as a philosophy. According to quantum mechanics, the observer is essential; without the observer, there can be no universe. All events are consciousness.

The views of Davies and others represent a dramatic shift from those expressed in the 1970s by the likes of French Nobel Prize-winner, Jacque Monod. Monod published in 1972 a book, *Chance and necessity*, that argued that the whole of life could be understood in terms of physics and chemistry, and that the significance of this – and this is where his position differed from Davies' – was that we and the world around us resulted from the chance collision of atoms and molecules.

These produced the first life on earth, which evolved through the action of natural selection on random mutations in living organisms. Throughout geological history, nothing has been working but hazard and natural selection, hence the title of his book. Asked by an interviewer, whether this meant the universe had no discernible purpose, Monod replied: "It means that it can have no purpose at all, discernible or otherwise." Once you had understood the mechanisms of life, and

particularly of evolution, he said, there was no room left for a Meaning of Life, passionately though many people wanted one. The living world was "the product of a gigantic lottery that draws numbers out at random. From these, natural selection blindly chooses the winners."

Apart from the developments in cosmology, the British scientist, James Lovelock's Gaia hypothesis, of the Earth as a single huge organism that regulates its environment to suit life through various feedback mechanisms involving both living and non-living components, always struck me as having wonderful religious potential (the name comes from the Greek Earth goddess). And as it happened, many deep green environmentalists have embraced Gaia with almost religious fervour.

But if cosmology is moving closer to the notion of purpose, then Gaia has moved away from it to become more respectable – and useful – to mainstream science. Gaia's self-regulation is automatic, not intentional. Lovelock told the first establishment-sponsored conference on Gaia in San Diego in 1988 that his and his collaborator's thoughts had evolved over the last 20 years: "In the early stages one tended to speak poetically. I hope that we are now speaking more scientifically."

Lovelock says in a recent book, *The ages of Gaia*, that when he wrote his first book on Gaia he had no inkling that it would be taken as a religious book. But he is pleased to see a spiritual link there:

"Art and science seem interconnected with each other and with religion, and to be mutually enlarging. That Gaia can be both spiritual and scientific is, for me, deeply satisfying. From letters and conversations I have learnt that a feeling for the organism, the Earth, has survived and that many feel a need to include those old faiths in their system of belief, both for themselves and because they feel that Earth of which they are a part is under threat. In no way do I see Gaia as a sentient being, a surrogate God. To me Gaia is alive and part of the ineffable Universe and I am part of her."

From all this I am left with the impression that if we do find purpose – or 'God' – in the world described by science, it is because we choose to interpret the world that way, not because science has revealed meaning to be there. I am quite happy about this. It demonstrates a more flexible approach to how we use science (as distinct from how we do science) to ensure that we use it to suit our nature, rather than allowing it to dominate and oppress us.

I'm not sure that defining 'life, the universe and everything' in mathematical equations – even just one equation – will ever establish purpose or meaning, or 'prove the existence of God'. Nor will it necessarily return a spiritual dimension to our lives. But advances in scientific understanding may lead to a greater tolerance of such beliefs, and so encourage their renaissance in our culture. It might also allow us to create new concepts for expressing religious or spiritual beliefs, different from, say, the traditional notion of a supreme being 'out there' watching

over us, and judging us – metaphysical metaphors more appropriate to our times and our understanding of the world.

Even now, however, science and spirituality are not mutually exclusive. I think it is less science and the scientific view of the world that cripple us spiritually than it is the busyness and artificiality of our modern lives, the all pervasive manifestations of rationality – an environment that we have created through science.

The views expressed by Davies and Lovelock are at the edge of or outside mainstream scientific research. A recent newspaper magazine article included both among a group referred to as feral scientists: once domesticated researchers who have gone wild; scientists who are not afraid to use words like purpose and meaning in talking about the world. They seek a new paradigm for science, one that is holistic and flexible, freed of the constraints they believe are imposed by the reductionism and rigid disciplinary boundaries that dominate mainstream research.

It is important to note, however, that science is now less reductionist than many of its critics claim. Fields such as climatology and ecology are becoming increasingly holistic, helped by the tremendous advances in computing, which allow scientists to create sophisticated models of natural systems and the interactions between the components of those systems. In many areas of research, especially applied research, the need for a multi- or trans-disciplinary approach is also becoming obvious to even the most conservative researcher. However, this does not mean abandoning rigorous, highly specialised knowledge and skills, which will remain essential to scientific advances.

It is still too early to assess the real cultural significance of the perspective offered by scientists like Davies and Lovelock. But it is by no means only the 'feral' scientists who are contributing to a transformation in the way we think about ourselves and the world we inhabit. This is clear from looking at the relationship between science – mainstream science – and environmentalism.

Science and environmentalism

The environmental movement owes much of its prominence and power to the belief that it has been largely responsible for the 'greening' of public opinion and politics in recent years. It is quite remarkable how little this belief is questioned.

In 1990, CSIRO commissioned a survey in which people were asked what group they thought had contributed most to increasing public awareness of the environment. Not surprisingly, 77 per cent of them chose environmentalists, with 17 per cent nominating scientists.

While there is now growing recognition of the role of science in understanding and trying to resolve environmental problems, the media consistently attributes the new environmental consciousness almost solely to environmental activists – even pieces critical of them concede this point. "Now," one article begins, "thanks to the early efforts of those brave bulldozer and battleship blocking pioneers, middle Australia is getting the message...". Another article on farming that I read recently states: "Credit must be given to the largely urban middle-class greenies for exposing the destruction of the natural environment by farmers through short-sighted, often exploitative farming practises."

Yet this view is quite simply wrong. Contrast it with the finding of a 1989 Melbourne survey of consumer views on the environment, which says:

"For many, 'the greenies' – who were once viewed as a bunch of radical, political nuts who stood in front of bulldozers – are now gaining credibility. Many found it ironic that those bunch of 'ratbags' were, in fact, right all along."

I am not arguing that is an accurate reflection of the environmental movement and its activities (it is an example of the difficulties the media create). But it is, or was, the image that many people held. Australians are a conservative society, and have become more conservative over the past decade. The survey suggests that the radical image of the conservation movement had put 'middle' Australians off, and that for many the conversion to environmentalism occurred despite the movement, not because of it. In other words, something brought it wide public acceptability, even respectability. That 'something' was science.

There has been a qualitative shift in recent years in the environment as an issue, one that has transformed it from a collection of discrete local issues into a major national and international issue, one that has challenged the economy's domination of the political agenda. It is in achieving this transformation that I believe the part of the environmental movement has been exaggerated, although this is not to deny that environmental groups have played an important part, especially in providing a political focus for environmental concerns.

If we study the shifts in public sentiments about the environment in recent years, it is clear the critical factor has been our improved understanding of problems like greenhouse effect and ozone depletion, which, without research, very sophisticated research, would have remained invisible to us until it was too late to do anything about them. During the mid-1980s, atmospheric scientists undertook major reviews of the greenhouse effect, and at an international meeting in 1985 issued a statement reflecting the consensus that rising levels of greenhouse gases were likely to cause significant climatic changes over the next few decades. In the same year, scientists discovered the hole in the ozone layer over the Antarctic. These issues added a global, even apocalyptic, dimension to environmental problems that captured public attention.

Closely following this development, and strongly reinforcing its impact, were a spate of 'freak' weather patterns in many parts of the globe, including droughts, heat-waves, floods and storms, and a series of pollution 'horror' stories such as the Exxon Valdez oil spill in Alaska, the deaths of thousands of seals in the North Sea, and the worsening beach pollution in Sydney and elsewhere.

Other factors behind the environment's rise include, paradoxically enough, a long global economic boom; when economies go into recession so do people's environmental sympathies, as their concerns focus on unemployment and other more immediate social hardships. Another possible factor is the cold war thaw, with the perceived lesser risk of nuclear war; as a result, the environment has become a new focus of people's anxieties and disenchantment with modern life.

So the critical factor in our environmental re-awakening, I suggest, has been our improved understanding of the seriousness of the damage being done to the environment – understanding that has come largely from mainstream scientific research undertaken in universities and government research laboratories.

Furthermore, the role of science has not been limited to providing the knowledge for others to use. Scientists have also done most to publicise the greenhouse effect, ozone depletion and other problems such as the biodiversity crisis and land degradation. In Australia, CSIRO atmospheric scientists made a conscious decision in 1986 to begin drawing attention to the likelihood of climate change, and invited the Commission for the Future to join them in the task. Together, they played the biggest part in making people aware of the issue.

Environmentalists now recognise the extent to which they are reliant on scientific information. Some acknowledge the central role scientists have played. The former director of Friends of the Earth, Jonathan Porritt, wrote recently that:

"The scientists are now with us rather than against us. On occasions... they actually seem to be out in front of the activists of the environment movement... Hard scientific evidence counts for a lot in a hard materialistic world."

That mainstream science, rather than environmental activism, has been the main factor behind the profound greening of social and political values demonstrates both how powerful knowledge can be in forcing cultural change and the potential of social institutions as agents of reform – if they accept the challenge.

This is a crucial educational point. Given the level of disillusionment and cynicism that exists, it is vital that we convince people, especially the young, that you do not have to be powerful and famous to change things. Nor can you only do it, or even do it most effectively, by working outside the major institutions of our society – for example, by joining an environmental organisation. Knowledge, more than activism or pronouncements by 'media personalities', will lead to sustained and fundamental change.

That is the nature of the change we need, for we have a long way to go.

Making the cover of *Time* or *Newsweek* is widely regarded as a major milestone in winning public recognition – for an issue or an individual. *Newsweek*, in a cover story headed *The ravaged environment*, warned of the peril to humanity posed by the poisoning of the natural environment with "noxious doses of chemicals, garbage, fumes, noise, sewage, heat, ugliness and urban overcrowding". The general public, the article states, "has been seized with such anger and alarm as to goad political leaders into proclaiming conservation of the environment the chief task of this decade".

The head of General Motors is quoted as committing his company "to eliminating the automobile as a factor in the nation's air-pollution problem", if necessary by abandoning the gasoline engine itself. The President of the United States declares that this must be the decade "when America pays its debt to the past by reclaiming the purity of its air, its water and our living environment. It is literally now or never."

It ought to be encouraging – except for the date of the magazine: January 26, 1970.

So what has happened in the 20 years since then? There have been some real gains, but they tend to be localised. In developed countries like Australia, there is now a much larger area of natural environment protected in national parks; the air quality of major cities has improved, at least according to some pollution indicators (but not all); some badly polluted rivers have come back to life and are now cleaner than they have been for decades.

But even from the perspective of the environmental threat as it was perceived in 1970, the gains have been limited. Professor Barry Commoner, an influential figure in 1970s environmentalism in the US, has questioned whether the environment movement's goal can be reached by "the present spotty, gradual, and now diminishing course of environmental improvement."

But the most striking aspect of *Newsweek*'s story is all the environmental problems it does not mention, but which now make up such a large part of our environmental consciousness: acid rain, the extinction of plants and animals, the loss of natural resources including soil and forests, the depletion of the ozone layer. *Newsweek* does mention the greenhouse effect, describing it as one of the "fanciful notions" of global disaster that scientists play with in "their more apocalyptic moments".

So despite the value changes that have occurred in recent years, and which have been reflected in political thinking, it is important not to exaggerate the extent of the change in relation to what is required. Nevertheless, I believe the sounder scientific basis for our environmental concerns should ensure the achievements of the 1990s are more substantial than those of the 1970s – if we act on that knowledge.

The way ahead: radical change

Protecting the environment is not necessarily incompatible with economic growth and development. In fact development will be essential to generate the wealth and technologies necessary to meet environmental objectives.

Economic growth need not be the same thing as growth in our material standard of living. While it is true that past economic growth, and employment growth, has been fuelled by consumerism, there is no reason why this must remain so.

The problem is not so much wealth generation as how we generate it, and how we spend it. We do need to stop promising ourselves an everlasting orgy of consumption, and, instead, invest and earn wealth with the aim of improving our quality of life, a measure far less reliant on material goods than many believe. And we do need to put as much thought and effort into the conservation and distribution of wealth as we do into its creation.

These days economic growth depends more on the growth in knowledge, on innovation, than on the consumption of resources. It should be possible, if we are wise, to develop an economic system based on the frugal and efficient use of non-renewable resources, the substitution of plentiful resources for those that are scarce, and the sustainable use of renewable resources, with the growth component based essentially on the growth in knowledge, which really is a limitless resource.

To achieve this shift will require radical changes in our pattern of expenditure – a massive shift from personal material consumption to private and public investment in bringing about a far-reaching physical and social reconstruction to create a society that is more economically competitive, more environmentally benign and more socially equitable.

In the present political and economic climate of tax cuts and reduced public spending, this prescription will strike many as far-fetched and improbable. Yet it does not really entail personal sacrifice. What it involves is a lowering of individual standards of living, which cannot in any case be sustained, to achieve a higher, sustainable, quality of life.

It comes back to a question of choice, and of values – a question of culture. What we need is profound and lasting change, not the sort of inter-decadal or inter-generational cultural 'blips' in what, fundamentally, has been an unwavering pursuit of material 'progress'.

Now, as never before, we have to set broad long term goals for our society – not just economic or social or environmental objectives, but goals that define, in broad terms, the totality of how we want to live – and manage change towards those ends.

Science has an absolutely crucial role to play in this process. It will be the main source of the new knowledge and technologies we need to attain the goal. It also provides the long-term perspective that is essential for the task. In a sense science allows us to see, and shape, the future.

Scientists gave us the first phase of modern environmentalism in the 1960s, with their warnings about pollution and population growth. As I have argued, they have done most to draw our attention to the greenhouse effect, the depletion of the ozone layer, the staggering rate of destruction of tropical forests, the degrading of our land, the accelerating pace of species extinction. To take a topical example, the toxic algal blooms in the Darling River and other waterways: scientists warned decades ago of the risk of these blooms if we continued to abuse our rivers and lakes.

Today, it is the scientists who are warning of the limits to Australia's carrying capacity for humans, and urging the development of a population policy that recognises this limit. It is they who have been calling attention to the deterioration in our urban infrastructure, and the inability of old systems like sewerage to cope with the demand now placed on them, and urging their replacement with more efficient modern technologies. (Our sewers use 5,000 litres of freshwater, one of our most precious resources, to carry away one litre of waste. What a waste!)

Changing science

I have argued that science offers a way forward out of the crisis it has largely been responsible for creating. How then can science contribute even more to the cultural shifts necessary to restore our faith in ourselves and our hope for the future?

Science in affecting change must itself be changed. I believe science must become intellectually more humble, culturally better integrated and politically more influential. Science must become more tolerant of other forms of reality, other ways of seeing the world. It must become less remote from public culture, with a steadier and readier flow of influence between the two – in both directions. And it must exert more pressure on political processes to extend the timeframes of policy making.

Hopefully, in changing science, we can also change its image among youth. Given the role science has played in changing the way we see ourselves and the world, the results of a survey of student attitudes to science, commissioned by the Department of Industry, Technology and Commerce, are disturbing. The survey showed that students saw scientists as nerds and losers; lonely, foolish and naive; uncommunicative and socially unaccepted; wasting their lives on hopeless causes while everybody else was looking after number one. Science had little relevance to their personal lives, and a career in science was seen as high risk and unrewarding, a hard path involving a long-term commitment to something that would rarely if ever pay off.

The survey suggests not only that science has an image problem – it seems a curiously archaic image – but that we've got a problem with the attitudes and values of students today. Their comments about science and scientists clear reflect the mass media culture of today's young people. It is tempting to criticise, to say, "what wimps, what cynics, what timid conformists". But that would be unfair, even if it is true; they are, after all, the product of a culture that is not of their making.

If we are to resolve the problems confronting us, it is imperative that we change that culture. We need to persuade young people that if something is not hard and sometimes painful, it is not worth doing; if it does not demand commitment, it is not worth doing; if it does not entail some risk, it is not worth doing; if it is only done for financial reward or social status, it is not worth doing.

Public perceptions of science are dominated by the image of the research scientist, but this is only part of the totality of science. I think more emphasis needs to be placed in formal education and public communication on understanding, interpreting, integrating and using science. This is not to argue that we abandon rigorous, specialist courses, but that we supplement them. It won't help, for example, if everyone abandons physics, chemistry and biology to take up environmental studies. But scientists, students and public alike should be made more aware of the context of science in modern society.

This process should extend beyond the teaching of science subjects, to including a science component in other subjects such as history and economics. I suspect the history of science has more to tell us about the world today than the history of wars and empires, kings and emperors. Australian economics remains dismally ignorant of the role of innovation in economic growth.

We need the knowledge generators – the research scientists – but we also need the teachers, translators, interpreters, integrators and implementers of knowledge. There should be no hierarchy of status among these roles. Each can be as intellectually challenging and creative as the other. I never accepted I was a second-class citizen in CSIRO despite its research orientation, and I only rarely felt I was perceived in this way by the research staff.

Changes are occurring; it is a process with which I have been closely involved for most of my career. CSIRO, for example, has changed enormously over the past decade from being a remote, aloof, very research-oriented organisation to one that is much more involved and inter-active, publicly, politically and commercially. (That change in culture, I might add, was as much internally inspired as it was externally imposed – contrary to public perceptions.) My point is that these changes must be taken further. *New Scientist*, in an editorial, notes that the outcomes of the Earth Summit in Brazil in June inspire both hope and despair: hope because of the new money committed to desperately needed research; despair because "the cogs of science and politics, while moving closer, have yet to synchronise".

As I discussed earlier, there is growing pressure both within the scientific community and from outside for these changes. For example, *New Scientist* reported last November that at a conference organised by the International Council of Scientific Unions to prepare a research agenda for the Earth Summit, the president of the European Science Foundation, Umberto Colombo, called for scientists to throw off the blinkers of their specialisations and become 'Renaissance men'. He equated scientific specialism with the factory production line and urged a 'pluri-disciplinary' approach to the problems of the world, combining the natural and social sciences, including economics.

Stephen Boyden, a professorial fellow in the Centre for Resource and Environmental Studies at the ANU, recently emphasised the need for a better understanding of the interplay between cultural and natural processes, the lack of which he described as "a grievous deficiency in our contemporary culture". To rectify this, he urges the teaching of a new type of integrative course.

"The call here is not simply for the integration of different disciplines or paradigms, nor for interdisciplinarity per se, worthy as such notions may be. It is rather for increased learning about the dynamic interactions between cultural, human and biophysical variables and about the principles that govern these interactions and their outcomes."

While we are looking for broadly based change, driven from many sources, Government programs could also help to achieve the sort of cultural transition we need by both reflecting and reinforcing the necessary shift in values.

One example

In 1989, I wrote for CSIRO a report which drew on a wide range of scientific expertise, mainly from within CSIRO, to advocate a program that would integrate and reconcile economic, social and environmental objectives. Called *Regreening Australia: the environmental, economic and social benefits of reforestation*, the report argued the case for a massive long-term national environmental restoration program, based around, but not restricted to, large-scale reforestation and revegetation. The benefits would include helping to:

- Halt and reverse land degradation, our most serious environmental problem; slow and adapt to the greenhouse effect; preserve our unique animals and plants.
- Make farming sustainable; increase timber resources; promote tourism by enhancing the unique beauty of the Australian landscape; stimulate the growth of an export industry based on environmental management skills and technologies.

• Create many socially useful and personally worthwhile jobs, as well as opportunities for training and affordable housing, especially for the more mobile young.

But apart from these tangible benefits, there could well be important cultural benefits that make the program relevant to the theme of this paper. It would give more Australians experience of what is the most distinctive part of our folklore: 'the bush'. The program could also promote a greater sense of national confidence and purpose, and a greater sense of belonging to our land and responsibility for its care. In this sense you could argue that there is even a spiritual dimension to the program.

The proposal is very much in the nature of 'grand schemes', which are currently very unfashionable. However, it overcomes some of the legitimate criticisms of grand schemes: while grand in concept it would be small in execution (managed locally and tailored to local needs); and unlike programs such as the Snowy Mountains and Ord River schemes, it would involve the conservation and rehabilitation of the natural environment, not its radical alteration.

Events since 1989 have strengthened the case for such a scheme. These include the deepening rural crisis and rising unemployment, and the strengthening scientific rationale for revegetation and reforestation, both on economic and environmental grounds. For example, CSIRO researchers have estimated that we have cleared 15-18 billion trees from the Murray Darling Basin, a region that provides 30-40 per cent of Australia's agricultural production, and that at least several billion trees will have to be put back to control the basin's worsening salinity and erosion problems.

The proposal has been very well received in many quarters. Material from it was reproduced in the Federal Government's 1989 Prime Ministerial statement on the environment, *Our country, our future*, and it was, I understand, a significant influence behind the establishment of the One Billion Trees Program announced in the statement. In a report on land degradation policies issued later that year, a parliamentary committee recommended that the program be implemented.

But perhaps most gratifying was the comment by a journalist researching a magazine piece on trees and the environment that the report had convinced a lot of people, including him, to take the idea of such a massive reforestation program seriously. Public and political interest in the issue of environmental restoration and its link to job creation continues to increase, and I remain hopeful that it will be adopted on a scale closer to that which I envisaged, and which is necessary to match the magnitude of the problems.

The proposal could be targeted particularly at the young. A growing number of Australians are calling for the introduction of a non-military 'national service' for young people to address environmental and community needs. The Australian Trust for Conservation Volunteers' has suggested we introduce a 'Year 13' to

encourage young people to take a year off after finishing school to work, for pay, on conservation or similar activities and projects. Not only would it benefit their personal development by broadening their experience and giving them time to think about what they wanted to do with their lives (that is what I did, working as a professional fisherman for a year after leaving school and before going on to university), it would take much of the pressure off the higher education and TAFE systems and the teenage job market, where the unemployment rate now stands at over 30 per cent.

There is growing evidence that unemployment will remain high for years, even with economic recovery. Recent studies have drawn attention to the pattern of each recession 'ratcheting up' the long-term unemployment rate. A survey of some of Australia's largest industrial companies supports this, saying job numbers in the companies are unlikely to return to pre-recession levels as the economy picks up because of their determination to pursue further productivity gains.

These trends suggest programs such as 'Regreening Australia' are no longer optional, but essential. They would provide an important step towards the eventual goal of a guaranteed minimum income for everyone – in return for doing socially useful 'work' (which would include, for example, raising children). We must recognise that 'working' means much more than being able to afford food, shelter, a few consumer goodies and the odd night out. It is a means of participating in society, of having a sense of worth and belonging; to be 'out of work' is to be culturally excluded and socially alienated.

A liberal or conservative approach?

The nature of our problems highlights the inadequacy of the main socio-political ideologies in dealing with the current situation. To my mind, the solutions do not fit readily into right-conservative or left-liberal prescriptions – and debates between these two perspectives too easily become sterile.

For example, central to many of the problems we have been discussing, as I said, is the question of self-esteem. The Californian Government saw self-esteem as so central to America's social problems, it set up a task force to report on how it could be increased. But not everyone agrees; the conservative British weekly, *The Economist*, argued in an editorial that the problem with America's underclass was not a lack of self-esteem, but of self-discipline. That's fine; but how do you have self-discipline without first having self-esteem?

My own personal response to the crisis we are experiencing combines both 'conservative' and 'liberal' elements. Thus, I agree with the usually

'conservative' emphasis on the family, and on enhancing the stability and security it should offer children; I accept the primary importance of personal moral values in addressing our problems.

I agree with the 'conservative' view that we need to put more emphasis on individual responsibilities, not just individual rights, and that as much as possible, individuals should take responsibility for their own lives. It is becoming increasingly clear that societies cannot function well if some people can get a free ride – that is they are supported and looked after, and nothing asked of them in return. Nor, usually, can those individuals lead satisfying, fulfilled lives.

However, I cannot accept the 'conservative' emphasis on 'law and order' in considering social problems, or its belief that the best, even only, way to address these issues is through the unfettered operation of market forces to forge an efficient, competitive economy. I am 'liberal' in that I believe that if people are to be expected to take responsibility for their own lives, there is an obligation on society to ensure they are equipped with the capability to take that responsibility, and they have the opportunity to exercise that capability.

Clearly, we now have a society where many people have neither the capability nor the opportunity to take charge of their own lives.

Conclusion

I have argued that western civilisation is slipping into a deepening social and cultural crisis characterised by: increasing youth suicide, drug abuse and crime; widespread mental illness and mass personal obsessions; and growing community disillusionment and anxiety about western industrial society's direction. Resolving this crisis will require fundamental changes to our values and behaviour, spanning every aspect of life from our spirituality to the role of the media and political philosophy.

I have also argued that while science has been the main factor behind our current predicament, it could, if used more wisely, provide the impetus for the cultural transformation necessary to secure our future, and especially that of future generations.

In discussing some of the grave social and cultural problems confronting Australia and other technologically-advanced industrial societies, I don't want to project apocalyptic images of the 'end of the world'. There have been other times in human history of great cultural and social confusion. The Renaissance was apparently a period of madness as well as brilliance as people struggled to come to grips with radical changes in the meaning of life. The Industrial Revolution, with its

destruction of traditional lifestyles and jobs, was accompanied by soaring drunkenness, child abuse and crime – the conditions that led to Australia's colonisation.

Nevertheless, the threat we now face is greater than in the past because of the global dimensions of the cultural crisis in the west and its concurrence with other great problems: the political upheavals in Eastern Europe and the former Soviet Union; the soaring world population and the pressure this is putting on resources; and worsening environmental degradation.

But it is not necessary to invoke images of catastrophe to argue that profound changes to our way of life are required. It should be enough to know that unless we act, we will condemn our children, and future generations of Australians, to a life of increasing hardship and suffering.

Circumstances will eventually force radical changes upon modern society; economic developments, deteriorating social conditions and environmental problems are already exerting this pressure. But those societies that are the fastest, most positive and most visionary in their response will be those that gain the greatest advantage and suffer the least cost.

Our lifetime will present western civilisation with its greatest test. The events of the past two years in Eastern Europe and what was the Soviet Union have shown how quickly and dramatically things can change when the institutions of a society, especially government, prove unable to make the reforms needed to solve its problems and which are demanded by its people. The pressures there may have been different, and their political system less flexible and responsive. But the parliamentary and government processes of western democracies are also clearly showing signs of strain. They have never before faced such a test as now.

We will be operating over the decades ahead with a fine margin between order and chaos. I believe that there is scope within that margin for idealism and hope; but there is none for cynicism and apathy.

Bringing about the necessary change in direction poses a tremendous challenge to Australia and other democratic societies. But it is a challenge that we must accept. It is a challenge that will make the 1990s and early 21st Century amongst the most crucial and exciting in human history.

IN THIS FIRST ESSAY IN THE ***APOCALYPSE? NO!*** SERIES, AUTHOR, Richard Eckersley, describes our current treatment of youth as the 'cultural abuse' of an entire generation. His clarion call for a deep, cultural shift towards a more humane, sustainable and economically viable society poses a tremendous challenge to all Australians.

In previous research carried out for Australia's Commission for the Future, science writer and social analyst, Richard Eckersley, focussed in *Casualties of change: the predicament of youth in Australia* on the social and psychological problems faced by young people in Australia. Since then, Eckersley has refined his work to examine the spiritual and cultural malaise which, he believes, is the underlying cause behind such problems as the high suicide rates, drug overdoses and crimes of violence among young people. He canvasses the controversial theme that the shallow, materialist nature of western civilisation lies at the very heart of much of the bleak despair of today's youth for their future.

"It is not necessary to project apocalyptic images of the 'end of the world' to understand that profound changes to our way of life are required," Eckersley writes. "It should be enough to know that unless we act, we will condemn our children, and future generations of Australians, to a life of increasing hardship and suffering."

Published by Australia's Commission for the Future, the ***APOCALYPSE? NO!*** essay series will provide a public forum for taking a long, hard look at key trends with the potential to influence the next generation in some 25 years time. Leading thinkers in every field of endeavour from education to the environment are being commissioned to provide positive visions of a future which would be worth striving for.

As the dominant species on the planet, the shape of the future is very much in our hands. And before we can build towards a preferred future, first we have to be able to imagine it.

It seems fitting to start the series with an essay on the challenges facing youth, and how they might be overcome.