

Ecopolis

Paul F Downton

Ecopolis

Architecture and Cities for a Changing
Climate



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ISBN 978-1-4020-8495-9

ISBN 978-1-4020-8496-6 (eBook)

DOI 10.1007/978-1-4020-8496-6

Library of Congress Control Number: 2008932626

© 2009

Co-published by Springer Science+Business Media B.V., Dordrecht, The Netherlands and
CSIRO PUBLISHING, Collingwood, Australia

Published by Springer as Volume 1 of the Future City Series

Sold and distributed:

In the Americas, Europe and Rest of the World excluding Australia and New Zealand by
Springer Science+Business Media B.V., with ISBN 978-1-4020-8495-9
springer.com

In Australia and New Zealand by **CSIRO PUBLISHING**, with ISBN 978-0-643-09578-6
www.publish.csiro.au

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*For Chérie
and our grandchildren:
Caleb, Jasmine, Kai, Jet and Cayden*

*and to the memory of
Jessica Bullen and
Nina Creedman*

Charter of Calcutta

*We are at a turning point in history.
Our planetary environment is severely damaged.
Desertification is spreading, the globe is warming.
Entire ecosystems are under threat.
And the City is at the centre of the storm of destruction.*

*But that is the key!
We must cease seeing the City as a problem.
We must see the City as the solution.
For the City is our home.
It is what we make it to be.
It is where we live.*

*If we fail to seize the Future,
We will be consumed by the Past.
The Future begins NOW!*

*Let the Charter of Calcutta be simple and clear,
To be heard by all,
And filled with hope and vision -*

The City Can Save the World!

'Proposed by Paul F. Downton (Australia), endorsed by a panel consisting of Dr. Wale Odeleye (Nigeria), Prof. Christine Boyer (USA), Mr. Dean Ackemecht (Switzerland) and Prof. Santosh Ghosh (India) and adopted in the Concluding Session of the International Conference and Exhibition on Architecture of Cities held in Calcutta on the 20th. November, 1990 and organised by the Indian Institute of Architects, West Bengal Chapter.'

Summary

'Ecopolis' is about a new kind of city. It is about the purpose of cities, their critical role as agents of change and their essential function as vehicles of survival during this time of massive ecological disruption. This book presents a vision of cities as vital places, and the making of shelter as a crucial part of what it means to be human. It promotes grass roots action, inspirational leadership and the creation of catalysts for cultural change. In this book, the author describes a framework for making human settlement that integrates the knowledge and skills held throughout society, not only in the formal educational milieu and in the professions, but also in the wider community.

The book is a potential core text for urban ecology. It identifies and examines the work of theorists, practitioners, places and philosophies that have particular relevance for this rapidly evolving discipline. The presumption is made that anyone reading this book will already be familiar with the usual catechisms of sustainability regarding energy, water and resource conservation.

Most books in the rapidly growing library on sustainability and urbanism provide planning prescriptions or descriptions of some aspects of sustainability, or both. This book is more concerned about ways of thinking.

One of the author's key goals is to promote an understanding of cities as essential tools for the survival of advanced civilisation. Using insights from cybernetics and the life sciences, city-making is defined in terms of living systems, as an extension of the physiology of human beings.

Building on themes and arguments from his doctoral thesis, the author introduces his concept of urban/cultural fractals as key drivers for achieving a sustainable future in the face of rapid climate change.

As well as defining the purpose of cities – something lacking from textbooks about the subject – the author presents a set of propositions about the necessary conditions for creating Ecopolis. Setting the creation of human settlement in an ecological context he demonstrates, with the support of case studies, that practical approaches to urbanism can be grounded in principles of direct democracy and cooperative community processes that are ecologically responsive and socially liberating.

At the heart of this work lies an abiding concern with implementation. The author is both an advocate and activist: he is architect and urban designer of award-winning

inner-city ecopolitan development projects described in the case studies where empirical research into 'what was planned' and 'what happened' have contributed to the construction of the Ecopolis theory.

The author proposes a set of design and planning tools for achieving Sustainable Human Ecological Development (SHED) that focus on social process, culture and scenario planning. By seeking out linkages rather than barriers, commonality rather than difference, integration rather than separation and mutual aid rather than competition, SHED spans the totality of decisions and choices made to provide and maintain conditions for human habitation within a planetary biosphere undergoing accelerated climate change.

Despite the scale of the challenges presented by global warming, unfettered industrialism, rampant urbanisation and continuing population growth, the book is optimistic. Ecopolis promises a future in which allied understandings of buildings, cities and living systems are placed in a framework that facilitates creation of urban systems consciously integrated into the processes of the biosphere in order to optimise the functioning of the biosphere for human purposes – and contributes to our conscious evolution as a planetary species.

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Foreword

If there is one thing that the reader takes away from this book, it is the recognition of the importance of the role of our cities, and the hope that they hold, for our sustainable future. For it is right here in our cities that we must start looking for solutions to our global environmental problems, and it is here where these issues will be found and solved.

Cities, as Paul Downton sees them, are integral to what we are as humans – rather than merely separate constructs that we build and occupy. It is here that the fundamental basis of our civilisations began. And it is these cities that we must now change and reinvent, with ourselves as Paul says, ‘urban evolutionaries’.

The book takes us through the wide range of issues that confront us, and which we must now resolve if our cities are to survive. Paul’s ideas are illustrated and tested by his own endeavours to build a microcosm of his Ecopolis vision, in his Christie Walk project in Adelaide, Australia. What his case studies demonstrate is that all the essential pieces of this new eco-urban jigsaw, already exist.

His city vision is for an Ecopolis – consisting of key ideas about how ecology, biology, design, development, economics and society are brought together. His chapter on city ecology, provides a lucid explanation of cities as living entities that must physically connect and integrate biologically with our built environments. This is a vision that we both share, and is close to what we do as ecodesigners, architects and planners – to seamlessly and benignly biointegrate our designed systems with the natural environment.

This book is an essential and challenging read, which draws together the ecological, social, economic and aesthetic dimensions of architecture and city planning into a whole.

Ken Yeang (Dr.)
Llewellyn Davies Yeang
London 2008

Introduction: The City Is My University

Many of the radicals of 30 years ago, burning with fervor for fundamental change, have since withdrawn into the university system they once denounced, the parliamentary positions they formerly disdained, and the business enterprises they furiously attacked.

(Bookchin 1995 p.229)

vivendo discimus (By living we learn)¹

Preamble

Are we living on a dying planet?

It's hard to feel that anything much is wrong, although there are innumerable things that aren't quite 'right'. Species have been dying and the atmosphere has been changing whilst several human generations have procreated with unprecedented success. There is starvation, disease and suffering but the number of healthy, happy, educated people on the planet is greater than the entire global population of just 100 years ago. It's hard to believe that we can be running out of anything when the tide of people, cars, and dazzling consumer goods is constantly rising. With so many good things happening in the world, how can we hope to know if or when we have reached some critical tipping point of no return? What would it feel like to be living on a dying planet? I think it would feel just like this; and many years ago in order to find a way to navigate the miasma of materialism and avoid foundering on the shoals of despair, I started looking for a way to think about ecology and cities that could accommodate the full spectrum of what it means to create and maintain human settlement within the only functional biosphere we know of.

The permanent threat of nuclear annihilation, the fact of continual media bombardment, and the promise of personal liberation has meant that the expected shape of civilisation for post-war babies has never matched that of their fore-parents. Nurtured on the certain belief that our species has the power to destroy the world, we might be forgiven the conceit of believing that we could somehow make it better. As Stewart Brand wrote in the first Whole Earth Catalog of 1968, 'We are as gods and might as well get good at it'.

Despite and because of the growing sense that an ecological catastrophe is stealthily approaching, during the last decade or so there has been rapidly increasing

¹Patrick Geddes' motto (see Chapter 4).

interest in the idea of ‘green’, ‘sustainable’, ‘compact’, ‘environmental’ and ‘ecological’ cities. Evolving in this cultural milieu, this personal exploration of a theory of Ecopolis has been influenced by various and particular writers and theorists – whom I have tried to acknowledge through the book – but it has also been a product of life experience.

Its genesis can be traced back to two concurrent preoccupations. One is a fascination with regional identity and individual expression in architecture that began around 1967 in the Wells Blue School library with my discovery of Frank Lloyd Wright’s philosophy of organic architecture. The other is my abiding concern about the state of the environment which developed at about the same time and led to me becoming a founding member of an environmental organisation called ‘Abacus’ at the age of 17, in Wells, Somerset.

The radical politics of the time was informed by reaction against the Vietnam War, the ubiquitous threat of instant annihilation from global nuclear war, and the so-called ‘Oil Crisis’. My awareness of the political dimension of architecture evolved through exposure to the politically charged environment of Wales while in Cardiff where I undertook undergraduate degrees at the Welsh School of Architecture², wrote ‘The Politics of Aesthetics’ (Downton 1976), got involved in student politics, and invited a group called Street Farm to present their experiments in autonomous, anarchist housing to the students of architecture. Regional awareness has always been very strong in the islands of Britain, and for me it was reinforced by the years spent in Wales. The difference in the form of urban settlement in the regions of industrial South Wales and rural South-west England is very marked, despite the short distance between them.

I was fortunate to be a student of architecture in a school that took social, political and environmental issues seriously and encouraged my fascination with climate. I tried to design environmentally appropriate buildings and at the same time became active in community organisations fighting against the forces which threatened to turn the old residential areas of cities like Caerdydd (Cardiff) and Abertawe (Swansea) into ghettos of high-rise office blocks. It was then that I began working on projects in which one can find the beginnings of this book; in particular my final year joint project with David Pickles (see Section 6.8) which proposed the redevelopment of a factory site in the medieval town of Beverley in Yorkshire using local materials, traditional architectural and urban form and construction, with the re-establishment of local craft and building skills as part of the development process. This project was later exhibited and published (Downton and Pickles 1976). Other early forays into investigating strategies for ecological building included a long essay on ‘Climate, Construction, Consciousness & the Cultural Imperative’ (!) and an unpublished paper on ‘Zero Energy Building’ (circa 1977) which set out a methodology for creating resource and location-limited architecture for long-term ecological sustainability.

In September 1982, just when the Palestinian camps of Sabra and Shatilla in Beirut were being pounded into rubble and the infamous massacres of civilians

² B.Sc. (Architectural Studies) and B. Arch.

took place, I arrived in Jordan to teach architecture at Yarmouk University. The two years spent with my family in that country taught me much about both the ephemeral and eternal nature of building and buildings. Ephemeral, because things get blown up; eternal, because ancient classical architecture still stands there in biblical landscapes.

In Jordan I began to sense more deeply the ebb and flow of history and its relationship to the physical dependency of architecture on a resource base determined by culture, economics and politics – all consequent upon human decisions. Perception of these relationships was sharpened by observing the manipulation of people, politics and resources, as the Israeli state created ‘facts on the ground’ and used architecture as a weapon of war on the West Bank, where both sides are ‘right’, and wrong.

As I learned more about Islam and the history of the three great monotheistic religions of the region (Judaism, Christianity and Islam), it seemed to me that the natural climate took a central role in shaping human affairs and in the development of culture and politics. I had always seen that architecture was clearly linked to climate – a building envelope, after all, is essentially a climatic modifier – but now I realised that the cultural driver of architecture was also conditioned by the climate.

Regionalism

Arriving in South Australia in July 1984 I was struck by the absence of climatic response in the architecture. This again underlined the power of the cultural imperative in making buildings by demonstrating how it could override other considerations. When it came to formalising an initial research topic for pursuing a higher degree, all the above experiences were subsumed in my proposed topic of architectural regionalism. My initial aim to generate a theory of architectural regionalism turned into work on ideas about urban ecology, tested in practice and informed by the idea of ‘dwelling’ as a cultural, social and technological response to the fact of being alive in a living universe.

All this has been given impetus by the discovery of so much congruence and converging energy amidst the diversity of information and ideas that coalesce around ecological cities. My hope is that this book will contribute towards, and amplify, the synergies and synthesis that come from the bringing together of academic research, visionary dreamings and political activism so that ecological cities do not remain a chimera, nor end up on the scrapheap of capitalist assimilation.

For good or for ill, a city amplifies the activities of the human organism. If those activities undermine the basis for the continued existence of that organism they are inherently dysfunctional; if they sustain or recreate the conditions for its continued existence they are ecologically viable. This book seeks an understanding of what is viable and how to design human settlement to create and sustain that viability.

The global ecological crisis is a crisis of civilisation. Over its 10,000 year history, city making and its coevolved cousin agriculture, has changed the face of the planet. Since industrialisation the pace has quickened, partly due to an exponentially increasing population and partly because of the rapacious nature of industrialism. Cities may have started as human scale creations but their impact on the environment was limited only by the available technology and a pre-fossil fuel energy base. Once cheap energy started to fuel the engine of civilisation, cities grew fast and furious and the phenomenon of urbanisation measured development against the scale of mega-machines rather than people. My Ecopolis concept of development is a response to this history. It is an attempt to return to the human scale in city making, to return to the idea of city as community, and to make the city the centre of restorative activity rather than destruction, in dynamic balance within itself and with the nature of the land that supports it.

The concept of 'ecological corridors' was inspired by knowledge of revegetation programs being undertaken by Trees For Life in South Australia when my partner, Chérie Hoyle, was working as their office manager in 1988–1990. The story of *The Man Who Planted Trees* and the campaigns of Richard St. Barbe Baker did much to inform the idea that revegetation could restore ecosystem function with multiple, synergistic benefits, and from my initially vicarious experience of Trees For Life I learned that the community is a powerful workforce, able to undertake ecological projects despite limited financial resources. The linkage between county and city folk was fundamental to the Tree For Life program and inspired confidence in the idea that the two were not only functionally interrelated, but that the two communities could be brought together through shared purpose focussed on ecological restoration. Trees For Life continues to provide a powerful demonstration of the strength of communities in the service of nature.

Much of my information and inspiration has come from outside the academic environment. Taking cues from Patrick Geddes and Lewis Mumford, men who made enormous strides towards understanding what was required for the design of ecologically integrated urban systems (Kitchen 1975, Miller 1989) and in whose footsteps I am happy to try and tread, I regard the city itself as my university.

Words

This book is about identifying things that work through the analysis of case studies, relating them to extant theories, supplementing with additional material as appropriate, and integrating the whole if possible. Any appearance of linearity in its structure is a consequence of the need to organise material in a literary format and is not necessarily implicit in the theory.

As a child of the fifties and victim and perpetrator of the radicalism of the 1960s and 70s, I learned that language is powerful, and that it could be damaging, undermining the capacity for clear thinking with its capacity for conveying two or more meanings by surreptitious means. Since at least 1975 I have consciously sought to

avoid the thoughtless use of the male pronoun and irrelevant inflections of gender. When quoting a text that has failed to do the same, though it may strike some readers as tedious, I have used the traditional method of calling attention to textual oddities (sic) because the job of creating gender-neutral language is far from done.

I have tried to avoid obfuscation, believing it to be a kind of obscurantism that is the refuge of intellectual scoundrels.

Weaving

The thesis in this book can be seen as the picking up of several threads of thought in an interweaving of ideas and experiences drawn from various realms. The warp of social and cultural ideas and activities are given shape, pattern and form by the weft of construction, manufacture and design. This book then, is a piece of fabric created by the weft of creative consciousness crossing the warp of society. It is a tapestry, a coat of many colours, a carpet or a wall hanging³. In any case, it represents an effort to find viable patterns in the making of human settlement that can be comfortably fitted on the body of Gaea.⁴

THE WARP ('the threads stretched lengthwise in a loom to be crossed by the weft.'⁵)

- Strands of Environmentalism and the Life Sciences
- Strands of Social Justice and Community Politics
- Strands of Libertarianism and Iconoclasm

And from the built environment:

THE WEFT ('the threads woven across a warp to make fabric.')

- Strands of Green Urbanism
- Strands of Green Architecture
- Strands of Green Design

The warp is made of the longer threads. The length of those threads can be taken as representative of time for cultural and social changes happen slowest. The weft of making and doing are the shorter, busier threads representing the quicker changes associated with self-conscious creative endeavour.

The weaving can also be seen in terms of the warp of biophysical reality supporting the weft of human society – an intersection of 'natural' and human envi-

³ Van der Ryn and Cowan employ the imagery and metaphor of weaving in a similar fashion in their introductory chapter to 'Ecological Design'. Another instance, perhaps, of the unconscious convergence of ideas that seems to accompany the way of thinking precipitated by ecological philosophising.

⁴ Spelt 'Gaea' as it is the more correct spelling than the commonly used 'Gaia'. Kirkpatrick Sale uses Gaea.

⁵ Unless otherwise stated, the word definitions employed in this dissertation are taken from The Australian Concise Oxford Dictionary, Second Edition 1992.

ronments. These thematic metaphors are combined in the Ecopolis Development Principles, a set of precepts that, in one form or another, have informed the developing theory and practice of Ecopolis since 1991.

Building the SHED

To describe the synthesis of Ecopolis theory I have used the organisational device of 'The SHED' (Chapter 11), in which a series of steps take us from one kind of shed, a watershed, to another, the shed as a building. Using 'shed' as label and metaphor in this way, there is a return to the theme of weaving: the shed is also the opening between the warp threads in a loom through which the shuttle carries the weft.

Spirituality is not one of the great strands of the warp or the weft. But neither is it neglected, because to do so would be to neglect the most powerful manifestation of human mindfulness through the millennia. Rather, spirituality is dealt with as an emergent property of civilisation, and it is up to the individual reader whether they wish to see its patterns as intrinsic to the tapestry of human affairs, as evidence for the beauty of a divine purpose, or merely an interesting, colourful addition to the body politic.

There are two major agenda in the discourse that follows. One is the reason for the book, which is to begin the construction of a credible and usable theory for the design, development and maintenance of ecological cities – this is strongly represented in the 'weft' of the writing. The other is to describe a field of action in which the struggle for social justice can be sustained in the face of globalising forces that are eroding the power of the state whilst reducing the role of citizens to that of mere consumers. I believe that the Ecopolis proposition regarding 'ecological culture' is inherently radical in its scope and content. The idea that effective long-term environmental responsibility can only be guaranteed by the creation of an ecological culture is explicit and fundamental to the Ecopolis idea – it is the 'warp' that, hopefully, is made visible in the fabric of this book. Such a culture can only come about as the result of systemic social change. The quality of that change depends on informed individuals being able to act effectively and to do that they need an appropriate power base, or field of action. The theme underlying the development of this theory is that if we can fully understand the historical and potential role of the city as the place where we make and shape economic, social, cultural (including spiritual) and *ecological* reality, we will have the basis on which to engage in the evolution of an ecological culture.

Rhetoric to Reality

It has been 18 years since I stood on a platform in Berkeley, California in the opening plenary session of the First International Ecological City Conference and said, 'An ecocity has never yet existed. Before it can be made it needs people to make an

ecological culture. We are those people. We must build now as we need to live, and live to build the ecological future, for what we build now is the future, and every moment counts.’ (Canfield (ed) 1990 p.19). Earlier, in a keynote presentation, I made the claim that ‘...every single attempt at anything which works towards achieving an ecological city is worth trying. There is no single solution, because it is about a way of life, and it is a situation in which everyone can make a difference.’ (Canfield (ed) 1990 p.12)

I have been responsible for a good deal more rhetoric in the meantime, but have also tried to find ways to live up to those exhortations by working with some truly marvelous people on the task of making Ecopolis a reality. It has been an exhausting but rewarding time during which I have been continually conscious of the need to record our collective experiences in these experiments with ecocity-making. I am convinced that for the collective success of ‘every single attempt at anything’ there needs to be some coherent theoretical framework, for even the most radical models of social change need structure. This is analogous to the role of the city itself, which is to provide a well structured framework within which individuals become citizens in order to fulfil their greatest potential whilst simultaneously supporting, and being supported by all the other individuals that make up its citizenry.

In a similar way, this book seeks to provide a framework within which many individual ideas become part of an overarching theoretical approach that enables each of those concepts to develop whilst supporting, and being supported by all the others. The intention of this approach is to acknowledge that the necessary tools already exist for reshaping our global urban civilisation for an ecologically viable future, and that the key is to use those tools appropriately.

This book has not been not inspired by previous academic examples, however illustrious and apt. It was inspired by the radical visions of architects, scientists, designers and dreamers who have dared to insist that it really is possible to make ecological cities. Implementation and advocacy are major themes here, driven by a deep personal concern about how we live and conviction about the way we might live (to paraphrase William Morris). I have made a determined attempt to maintain sufficient distance from the issues to aspire to a degree of *relative* objectivity, but I have inevitably written as an architect and advocate.

You may be correct if you suspect that this book has been constructed in a similar manner to the way its author designs buildings. There are those things to which there is an aesthetic attraction; there is an underlying belief system that is brought to bear in the process and outcomes of analysis; there are things known through experience and training about how different elements should be put together; and there is a sense of obligation, or duty, to the people who will use and have some kind of relationship with the whole assemblage.

Looking back, I realise that I’ve always somehow wanted to integrate buildings with nature. When I got my first strong impulse to build at the age of twelve I wanted to make a tree house at the bottom of the garden and when my father wouldn’t let me (it wasn’t our tree, but I didn’t really understand that at the time) I insisted on building anyway and enlisted the help of my sister Sue and cousin Alison to make

an underground house in the garden instead. I don't think my father appreciated the loss of part of his vegetable patch, but the little underground shelter worked quite well and quickly grew a roof that made it indistinguishable from the rest of the garden, which was exactly what I had hoped would happen. So my very first building was an earth-sheltered, green roofed, cooperative, non-sexist exercise in construction that fitted its environment so well it was invisible! I like to think that has been my subconscious touchstone ever since.

Here Today

Civilisations come and go, they live and, though we don't like to think about it too much, they die. That we are now living in a time of changing climate seems beyond reasonable dispute, what is in question is whether it is a period of slow, or rapid change. There are gradualist and catastrophist schools of thinking about the rate of change. Until the industrial era, the rate of change of the built environment was relatively slow, since the industrial era it has been astonishingly fast (later in this book I spend some time looking at Stewart Brand's very useful insights into rates of change). We have got used to the idea that our buildings, towns and cities could adapt gradually to any changes demanded of them. Much of that adaptation has been in response to human demands, often because of increasing knowledge about better ways to construct human habitat – one thinks of the changes precipitated by better understanding of sanitation, like undergrounding sewers, or the need to conserve energy, resulting in building codes that required better thermal performance. If we look deeper into the history of city-making we can find catastrophic change, represented by abandoned settlements, like those of the Anasazi Indians in the south-west of North America, but our model for change is based on a gradual revision and replacement of buildings and infrastructure to suit new conditions. This book challenges the presumption of that model and argues the case for rapid and extensive changes in both the process and product of making and re-making human settlement, and in so doing, considers the purpose of cities and the driving force of human culture that they represent.

Cities are simultaneously the most vulnerable and powerful of human institutions. This book is dedicated to their sustenance and evolution as the agents of change for creating a world in which humans have learned to live at peace with themselves and as ecocity pioneer Richard Register would say (in an etymologically disputable manner), 'in balance with nature'. This is still a work-in-progress. The level of coherence required for a fully-fledged, integrated, *usable* theory for the design, development and maintenance of ecological cities is only hinted at here. A free flow of information through mechanisms like the internet has barely begun and is subject to interference. The required interdependency between academic and professional disciplines exists only in embryo. Nevertheless, we do have all the tools and knowledge we need to make a determined beginning and it is to this end that this work is dedicated.

Gro Brundtland's now classic definition of sustainable development says that it 'meets the needs of the present without compromising the ability of future generations to meet their own needs.' Ecopolis is about much more than pragmatic responses to resource shortages, the careful management of energy, and achieving sustainability, although it includes these things. Ecopolis is about the future, and the future is already here. Climate change is already a reality – I'm finishing this manuscript just as Adelaide comes to the end of a heatwave of 15 consecutive days over 35°C which, an atmospheric scientist has just informed us, is a once in a 3,000 year event.⁶

Too often, the future is seen as another place, separated from the present by some kind of gulf or chasm that we have to miraculously cross. In truth, the future is embedded in the now. Everything we do now is part of shaping it. Most of the buildings and people who will be in the future of, say, 2050, are already with us. Gro Brundtland's future generations are already amongst us, we are already answerable to them, and we cannot afford to compromise any of their abilities.

Paul F Downton

Adelaide, March 2008

⁶ "Adelaide's 15-day heatwave was a once in 3000 year event, an atmospheric scientist says. Adelaide has sweltered through 15 consecutive days above 35 degrees – the longest heatwave recorded in any Australian capital city. The heatwave ended today, with a milder 29 degrees maximum forecast. Atmospheric scientist Warwick Grace said the 15-day heatwave had a .03 per cent of occurring. "The odds are about the same as tossing 12 coins and getting all heads or all tails," Dr Grace said today." (Indaily, the on-line service of The Independent Weekly, 18 March 2008).