The biggest grump of all

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Eighty years ago the world seemed almost limitless and few of us had any clear realisation of serious damage to our natural systems. For a youngster born at that time much of nature – the Amazon Basin, the Indonesian Archipelago, the tropical Pacific Islands, the Arctic and the Antarctic and the vast open ocean – seemed wonderful dream places of exploration for a budding naturalist. One's view of the natural world was of something clean and fresh.

At the age of 21 having completed a masters degree in marine ecology I went to England just after World War II. Optimism abounded among my young scientist friends, and we listened in awe at the London Challenger Society to lectures on their science by greats like C. M. Yonge, the slightly zany but brilliant Alistair Hardy, and groundbreaking European scientists like Nico Tinbergen and others.

My first job was at Durham University demonstrating, lecturing and undertaking research on those dour grey North Sea fishes (described as "the hake, the cod, and all that lot").

But I was after something different, and was angling for a tropical job in the Colonial Service to satisfy my huge interest in the extraordinary richness of coral reefs and the ecology of coral reef fishes. I finally landed a Colonial Office Scholarship which after a year led to a job at their fisheries research laboratory in Zanzibar where the great British Empire was struggling with its Colonial past and trying to pass the baton to the inhabitants with a semblance of dignity.

Living on what was basically a raised coral reef, working on coral reef fishes, and diving on spectacular coral reefs for recreation at the week ends, was a biological feast for Suzette and myself, who I had married just 6 months earlier. We found coral reefs and their diverse fauna little damaged, basically because local fishing and no refrigeration meant fishing pressure was light and explosives were not used. The scientific world knew next to nothing about coral reefs, and there were exciting discoveries to be made. The results of the British Great Barrier Reef Expedition were published, and we hoped some day to visit the greatest barrier reef of them all. As an extra marine excitement in nearby Madagascar the second speciment of the living Coelacanth *Latimeria chalumnae* had just been found.

Why I give you this background is to try and explain the unbounded optimism that young scientists like myself had at the time. I found in my 20s that scientific jobs were many and they were not hard to get. You could turn down good jobs if they did not quite suit your personal scientific odyssey and with perseverance you could go where you wanted. To stay working on coral reefs I even, though with some trepidation, turned down a job at that great and venerated sheltered workshop for scientists, the British Museum of Natural History.

This almost golden period has allowed many of the grumpy old scientists that are here in this audience today, to have lived rich, secure lives of scientific exploration and travel.

In the 60 years since my time in England the setting has fundamentally changed. Over these years we have steadily seen increasing environmental damage and now most of us have deep concerns for the Earth and the human future.

It is not only we old grumps who are concerned. It is difficult to be optimistic about the environment for the thoughtful whether old or young, and in this financial climate perhaps especially for the young starting on their scientific careers.

Wise old Aldo Leopold was warning us of the breakdown of ecological systems in his *Sand County Almanac*, finished in the year of his death - 1948, and published a year later. In 1953 his son Luna published the *Round River Parable*, from Aldo Leopold's journals, written around campfires over some decades. From this Parable comes the famous quote: "One of the penalties of an ecological education is that one lives alone in a world of wounds…" A quote from which Paul and Anne Ehrlich derived the title of their 1997 publication *A world of wounds: ecologists and the human dilemma*.

Sadly one no longer needs to be an ecologist to see environmental wounds. But the awareness has grown slowly.

One of our first major alerts was in 1962 by the publication of Rachel Carson's *Silent Spring*, and her deep concern about the pesticides we were using.

Only a few years later came Paul Ehrlich's *Population Bomb*, highlighting the huge problems that would be caused by the world's rapidly increasing population and added to by greed and affluence.

And in 1972 the Club of Rome's *Limits to Growth* was published showing that there were problems ahead and continual growth was pure fantasy.

Now of course there has been a flood of books that have warned about changes that are occurring and of a difficult or disastrous future (many by Paul and Anne Ehrlich, by Jared Diamond, Herman Daley, and others), and literally tens of thousands of individual scientific papers showing the impacts of human pressures on various aspects of our natural systems.

These describe the destruction of forests, loss of biological diversity, soil loss, salinisation and desertification, water overuse, overfishing, and then of course the final insult, a close to 40% increase of CO_2 in our precious atmospheric blanket and resultant global warming, ocean acidification, and sea level rise.

Pp 24-25 in *Grumpy Scientists: the Ecological Conscience of a Nation*, edited by Daniel Lunney, Pat Hutchings and Harry F. Recher. Royal Zoological Society of New South Wales, Mosman, NSW, Australia. 2013.

So we have been warned. The best science we have – the work of our best scientists, tell us of fundamental change looming. In fact, we are being warned publicly virtually on a daily basis by various reports in press, television, radio, and film.

It is my conjecture that this must have a serious effect on the youth of today. The natural world cannot seem open-ended to an intelligent young person. It is not as full of opportunity as it was to the generation that was growing up with me 60 years ago. Optimism about the continuance of this rich and glorious world we were born into is more difficult to sustain. I hope I am wrong, and the young are still able to sustain optimism about our ability to see problems ahead and change course.

For if we are to change, it is essential that we have driving and optimistic youngsters.

But let us get back to more factual stuff.

Humans have often made terrible self-defeating mistakes. Civilizations both large and small have risen, lasted for a time, and then collapsed.

Jared Diamond lists five main causes of the collapse of civilizations, but in many cases environmental breakdown has been a primary cause, usually self-inflicted.

Paul and Anne Ehrlich's book *One with Nineveh* documents the change from the rich and thriving city state in Mesopotamia to a now barren landscape. They list as the prime reason a decline in their natural resources. Deforestation in the upland areas of their water supply, unsustainable irrigation, siltation of canals, and salinisation of soil are likely reasons that so weakened the dominant city of Nineveh that it succumbed to invaders.

The Harappan of the Indus valley is perhaps the largest of these earlier civilizations. Archaeologists have found remnants of over a thousand cities and settlements, which had an estimated 5 million people and lasted for 6,000 years. This massive civilization also collapsed seemingly for environmental reasons – a gradual shift of the monsoons, perhaps not human induced in this case.

There are many more. Easter Island which destroyed its forest cover (the dominant tree is now extinct) and had a massive reduction in its population; the Mayan civilization of Central America, culturally rich in writing, art and astronomy, collapsed with internal struggles and lost 90% of its population. Jared Diamond cites environmental degradation resulting in food shortage in this case.

But now for my grump.

It is not a novel grump – others have said it quite clearly – but, it is, to me the biggest grump of all – subsuming many other grumps. **A great trump of a grump in fact**.

It is that we now know more about our impacts, and can better predict the result of our actions, than any of the previous human civilizations before their environmental catastrophes….

But that in spite of this clear knowledge we are not changing our actions.

We have a massive increase in time sequence data showing the results of our actions over the past hundred and fifty years since the industrial revolution,

We have excellent modelling that gives us a pretty clear idea of the scale and timing of coming problems. And each year these predictions are becoming more accurate

So we have a pretty fair idea of what we are facing and its timing – **And still we will not act seriously to stop it.**

Of course the problems of a change are difficult in the extreme.

* They will involve urgently slowing population growth and eventually reducing our numbers.
* Shifting our energy sources and usage.
* Reducing inequality and sharing our resources more intelligently - sharing resources such as food.

All these are self-evident facts essential to sustain our world and ourselves.

To resolve these is extraordinarily difficult – of course it is. But gearing up for war has always been terribly difficult too. But we have done it and urgently shifted labour, capital, resources, and priorities.

But we are not doing so for this war against collapse.

In my darker moments I wonder if the civilization we have created and become used to, with its world structure of hierarchy, privilege, and entitlement, its ridiculously complex financial systems, and its unsustainable belief in growth forever, will prevent us from engaging in this war.

But not engaging in this war and instead running towards the cliff edge looking backwards is not an option that we – *Homo sapiens* (the clever species) – can take. Perhaps we can hoodwink ourselves for a while, pretend that it is all too difficult, and so go on with business as normal. But I believe one or two environmental disasters will change that.

Fear of change and its difficulty has stultified both the public and politicians – but fear can work both ways – disasters and visible changes for the worse may yet provide the stronger fear to finally stimulate our world community.

What can old grumps like myself do? My own personal solution is clear.

We are continually being better informed as data are received and our methodology improves. Constant communication by scientists (including retired old grumpy ones) to the public and to the political front can be done by all of us. So I must try to keep up with scientific information, and help to communicate it honestly, and not to lose optimism and hope.

And to young scientists entering the work force today I would say:

> Firstly, be optimistic.
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> This is not the end of the world, and much will be saved. Help us get the environmental message across and work to shift course from those cliff edges.
>
> And secondly, be fearless.
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> Brave people who can face the future with clarity and honesty are essential in this war against collapse.

It is tempting also to say *mea culpa* – for my generation has seriously screwed up. But as this does not help, I won't say it.