*The worst speculative Sceptic ever I knew,*
*was a much better Man than the best*
*superstitious Devotee & Bigot.*
***David Hume***

**Eve's Bite gets bitten**

**Homeopathy: the ultimate dilution**

**Anti-oxidants**

**Bernard Howard: 1920-2008**

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content



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### Contributions

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Letters for the Forum may be edited as space requires - up to 250 words is preferred. Please indicate the publication and date of all clippings for the Newsfront.

Material supplied by email or IBM-compatible disk is appreciated.



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editorial

# IDers have designs on NZ schools

WHILE the recent national curriculum review confirmed evolution's place as the central organising theory of modern biology, creationists continue to try and chip away at the edges. Most recently, Focus on the Family, an American-based Christian group, has distributed 400 resource kits to secondary schools throughout New Zealand, containing copies of Guillermo Gonzalez's Intelligent Design (ID) DVD, The Privileged Planet, and an accompanying booklet. The covering letter requests they be made available to science teachers and school libraries.

Creationists claim Gonzalez has been victimised for his beliefs after being denied tenure at Iowa State University, due to his poor record in publication and in attracting funding and graduate students. He is a senior fellow of the Discovery Institute (an ID lobby group), and The Privileged Planet is very much the thin edge of the institute's Wedge strategy (**www.antievolution.org/features/wedge.pdf**), strongly implying the existence of a designer, but never actually mentioning him/it.

The Dominion Post picked up on the issue (28 June) and it aired on National Radio's Nine to Noon programme on 1 July. Both items featured Focus on the Family's New Zealand executive director Tim Sisarich and Waikato University biology lecturer Alison Campbell (who will be speaking at the Skeptics' Conference in September – see insert).

Creationists in this country number in the hundreds of thousands, and they are well organised. The comments appended to the article on the Dominion Post and Stuff websites (the articles are identical; the comments are different) show that even though they're a small minority, they are very vocal. The influence of Creation Ministries International is apparent, with several commenters parroting material from their recent newsletters.

Tim Sisarich said in the Dominion Post that science takes a theory and tries to establish it as the truth, and that was all this initiative was trying to do. This is dead wrong. Science takes theories and tries to *dis*prove them. Those that survive this rigorous process continue to be accepted on a provisional basis, always recognising that fresh information may lead to them being modified or abandoned. Creationism was once scientific orthodoxy. It has lost that status because it could not survive in the face of the overwhelming evidence amassed against it, and because better explanations of the data have been developed. Although, as Dr Campbell pointed out, the material Focus on the Family has provided may have value in a comparative religion or philosophy course, there is no place for it in a science class.

# Eve bites off too much

**Warwick Don**

*Ian Wishart is one of New Zealand's more prominent creationists. In a recent book he takes on evolutionary biology, a task for which he seems ill-equipped.*

IN HIS latest book, Eve's Bite (2007), Investigate magazine managing editor Ian Wishart has a chapter titled The Beagle Boys (sub-titled Darwinism's last stand). In it he again attacks the well established edifice of organic evolution. He heads the chapter with a quote from Ann Coulter's Godless: The Church of Liberalism, which is worthwhile reproducing here in full because it clearly reflects the key elements of Wishart's (false) assessment of the scientific status of evolution:

> Liberal's creation myth is Charles Darwin's theory of evolution, which is about one notch above Scientology in scientific rigor. It's a make-believe story, based on a theory that is a tautology, with no proof in the scientist's laboratory or the fossil record – and that's after 150 years of very determined looking. We wouldn't still be talking about it but for the fact that liberals think evolution disproves God.

Are Ann Coulter and Ian Wishart right? Is evolution a myth based on a tautology (the theory of natural selection)? Does evolution lack proof in the laboratory or in the fossil record? Does it disprove God?

The theory of natural selection (defined as "survival of the fittest"), claim anti-evolutionists, is a tautology because it is merely saying those who are fittest are the ones that survive. However, this is not how most biologists now view the term 'fittest'. In brief, the fittest organisms are the ones possessing *heritable* features that enable them to leave the most offspring in a particular environment, physical and biological. In other words, there are criteria of fitness that are independent of survival.

ArthurWeasley

**Creationists often claim transitional fossils don't exist. Yet an increasing number of such forms continue to be found. The transition from fish to amphibians, via forms such as *Tiktaalik* (above) is particularly well documented.**

Much of the confusion perpetrated by anti-evolutionists emanates from a too-simplistic notion of natural selection. "Survival of the fittest" is best regarded as a shorthand for a complex process. (Incidentally, it is Herbert Spencer's phrase, not Darwin's, although Darwin did eventually incorporate it into later editions of the Origin.) In fact, the theory of natural selection is far from being tautologous. For example, it can lead to testable hypotheses (predictions) relating to particular traits. As one evolutionist, Jason Rosenhouse, has observed, "there is nothing tautological about saying…that moths possessing dark coloration will be less visible than light colored moths to predatory birds when resting on dark-colored trees." If the theory of natural selection is a mere tautology, supplementary testable hypotheses such as this one would be non-existent. Most importantly, regardless of *how* evolution has occurred, the evidence for it is overwhelming.

Evidence for the process, derived from laboratory observations and experiments, emanates from several fields of research, such as comparative anatomy (from an examination of fossil and extant organisms), embryology, molecular biology and genetics.

As for the fossil record, it is a treasure trove of evidence that evolution has occurred. Not only does it reveal morphological and other details of numerous creatures from the past, it also shows an overall pattern of similarity pointing to the reality

of descent with modification. In addition, numerous transitional forms have been discovered (see below).

**Naturalism**

Does evolution disprove God? It is important to realise, in the current context, that biologists in doing science are practising *methodological naturalism*, so that supernatural explanations, because they are empirically non-testable, can have no role to play in science; they are scientifically worthless. Therefore the accusation by anti-evolutionists that evolutionists are deliberately atheistic (that in promoting evolution they are intentionally promoting atheism) is unwarranted. In fact, not all evolutionists are atheists.

It comes as no surprise, given her take on evolution, that Coulter, a lawyer and a conservative columnist, has drawn on what she calls "the generous tutoring" of intelligent design (ID) luminaries, Michael Behe, David Berlinski and William Dembski. If she genuinely wishes to learn something about evolution, the last people she should seek help from are ID proponents. In quoting Coulter, Wishart has set the tone and the level of argument of his chapter attacking evolution.

Wishart has adopted a familiar strategy used by anti-evolutionists in general – quoting eminent scientists purporting to be demonstrating that evolution itself is in crisis. It's not, of course, but let's see how he tries to convince his readers that it is, and that intelligent design is the only logical successor to an apparently discredited scientific theory.

But first, a point of clarification. It is necessary to distinguish between Darwin's theory of descent with modification, establishing the reality of the process, and his theory of natural selection. The distinction is important because, almost invariably, scientists are quoted by anti-evolutionists questioning aspects of theories relating to the mechanism(s) of evolution. But it suits Wishart (and others) to convey the impression that evolution itself is in serious doubt in scientific circles (hence his subheading: "Darwinism's last stand").

**Wishart has adopted a familiar strategy used by anti-evolutionists in general – quoting eminent scientists purporting to be demonstrating that evolution itself is in crisis.**

A passage by Niles Eldridge (American Museum of Natural History), a prominent opponent of ID creationism, extracted from his 1995 book, Reinventing Darwin (p. 95), according to Wishart, is supposed to demonstrate "the lack of fossil support" for evolution. It reads in part as follows:

> No wonder paleontologists shied away from evolution for so long. It never seems to happen. Assiduous collecting yields…the very slight accumulation of change – over millions of years, at a rate too slow to really account for all the prodigious change that has occurred in evolutionary history. When we do see the introduction of evolutionary novelty, it usually shows up with a bang, and often with no firm evidence that the organisms did not evolve elsewhere! Yet that's how the fossil record has struck many a forlorn paleontologist looking to learn something about evolution.

On the face of it, pretty damning comment surely? To understand what really concerns Eldridge we need to consider the above passage in context. It appears in a chapter devoted to a discussion of the Eldridge/Gould concept of punctuated equilibria which, as Eldridge himself describes it, "is a melding, in essence, of the pattern of stasis [as revealed in the fossil record] with the recognition that most evolutionary change seems bound up with the origin of new species – the process of speciation." By 'stasis' is meant the tendency for species not to change very much, often over millions of years. Long periods of stasis (or stability) are *punctuated* by shorter periods of comparatively rapid change, the process of speciation. Because of its somewhat short duration (geologically speaking) in *small* populations on the outskirts of an ancestral species' range, the chance of recording a speciation 'event' in the record of the rocks is substantially reduced.

Two points to note here. Eldridge is not denying the reality of evolutionary change – that new species and groups arise over time through the influence, essentially, of natural selection. What Eldridge and Gould have brought to the attention of fellow evolutionists is that it is possible

to reconcile what palaeontologists have observed in the fossil record, in Eldridge's words "its gappiness, and uncertainties about where its fossilized animals and plants might have come from", with how species originate over time. This reconciliatory theory brings into question the view of gradual (imperceptible) change over eons of time in the production of new species. Most importantly, the theory of punctuated equilibria is very much concerned with rates of change, the tempo of evolution.

To repeat, what it does not bring into question is the reality of evolution itself. This is not the place, nor is it necessary, to discuss the merits or otherwise of punctuated equilibria theory or of phyletic gradualism. What the theory has done (going back to Eldredge's statement quoted above) is show that palaeontologists do have a role to play in the elucidation of the mechanisms and patterns of evolutionary change. And we should not overlook the role long played by palaeontologists in the discovery and painstaking excavation and preparation of numerous fossils that have provided such a rich lode of evidence for the 'fact' of evolution.

**Transitional fossils**

Which brings us to Wishart's take on the subject of transitional fossils as evidence for evolution. There aren't any, he contends, among the 250,000 fossil species now identified and catalogued: "Nowhere, are there fossils that show a weasel-cat, or a deer-giraffe, or any other of the alleged half-breed species said to have existed. In fact, a search of the literature on giraffe evolution has failed to find a single example of a short-necked giraffe at all. The long ones just suddenly appeared."

Let's briefly examine each of these examples. First the 'weasel-cat'. Weasels and cats belong to different families within the mammalian Order Carnivora (Mustelidae and Felidae respectively). Should we expect these two families to be linked by a transitional 'weasel-cat'? Well, no. The fossil and morphological evidence together point to *separate* ancestral groups among the earlier carnivores. What about a deer-giraffe link? Such a link between the Cervidae and Giraffidae is conceivable, but the inter-relationships of these two families are not firmly established. The apparent absence of such a link in the fossil record does not, of course, rule out a possible future discovery.

Is Wishart correct? Is there no example of a short-necked giraffe fossil? Here Wishart really comes to grief. He couldn't have searched very far. Here is what Prothero (New Scientist, 1 March 2008) has to say: "Most fossil giraffes looked more like the short-necked okapi, a shy white-and-brown-striped denizen of the African rain forests, and the only other living giraffid." More recently, a fossil giraffe has been described from the late Miocene and early Pliocene. "Its neck is a perfect intermediate between the short-neck ancestors and their long-neck descendants."

Wishart somewhat sarcastically refers to "half-breeds". However, "half-breed" is best regarded as an offensive term pertaining to a person whose parents are of different 'races'. The term has nothing whatever to do with transitional or intermediate forms. In fact, the fossil record contains numerous examples of transitional forms, between species and between higher groups.

Before we leave the subject of transitional fossils, a brief word about whale evolution. Wishart continues to ignore the impressive fossil evidence – a series of forms beginning with a semi-aquatic predator (*Pakicetus*), probably derived from the hippo-pig lineage of artiodactyls, and ending with modern whales.

**The Cambrian Explosion**

He again raises what is colloquially called the Cambrian explosion. The Cambrian period saw the first appearance in the fossil record of many of the major phyla of multi-cellular animals. Naturally, creationists like to take 'explosion' literally, depicting this period as a time of sudden or instant creation, and hence supporting the creationist scenario. (The fact that many groups preceded them, and many have arisen subsequently, seems not to concern them!) It was nothing of the sort. In brief, new groups appeared in the Cambrian over tens of millions of years. One of the chief reasons for the variety of new fossils during this period is clearly the arrival of hard-shelled invertebrates conducive to fossilisation.

There are many more examples of misconceptions and distortions about evolution in Wishart's chapter, too numerous to expose here. The key message to take away from this critique: if you decide to read Ian Wishart

or Ann Coulter on evolution, or any other ID proponent on the same subject, keep a salt cellar handy!

For previous critiques of Ian Wishart on evolution, see NZ Skeptic, winter 2002; summer 2003.

Recommended additional reading: Donald R. Prothero (2007). Evolution. What the Fossils Say and Why It Matters. Columbia University Press, New York.

Warwick Don, before retirement, was senior lecturer in Zoology, University of Otago.



# The Pitfalls of Homeopathy or, The Royal Assent to the Ultimate Dilution

***Martin Wallace*** *particularly likes two of the five definitions of 'pitfall' in the OED:*

- *A trap or crafty device to catch by surprise the unsuspecting or unwary*
- *Any hidden or unperceived danger or error into which a person is liable to fall unawares.*

IN THE northern summer of 1965 I was living in London with my wife and three-year-old daughter, Elizabeth. I had sat and passed the MRCP (London) exam, got myself on to the British Medical Register, and applied for a position at the Hammersmith Hospital as a registrar in renal medicine, and been appointed. We had a month to face, however, with no income. I phoned the BMA locum finding service. To my surprise, the 'finder' suggested I take a locum medical registrar position at the Royal London Homeopathic Hospital. I protested I would surely be in danger of being struck off the Register I had recently got on to!

"Oh no, Dr Wallace," said the finder. "There is no risk of that. The Queen and her family go there!" After interviews with two physicians, I was appointed.

Both physicians said I could practise orthodox medicine, whilst they did the homeopathic prescribing. When the patient got better, we could both claim the credit! One patient told me he had a malignant bone marrow condition. I was rather rattled by all this, and impolitely asked him what homeopathic remedy did he take for that? "Oh no," he said. "I don't take any of that. I go up to the Hammersmith for radioactive phosphorus."

My practice there was never interfered with, but I saw episodes of the most extraordinary neglect while tincture of arnica was relied upon to treat bleeding ulcers, heart attacks and so on. There were totally unproved treatments of the most bizarre kinds.

### Research

I found I had a lot of time on my hands. The man whose position I was filling had left his desk open. I read The Carpetbaggers, which I found there. I also found an empty pill bottle labelled 'Hashish'. Down the corridor was a door labelled 'Research'. I opened it and it swung inwards with the creak of little use. Inside were many shelves of bound copies of 19th century journals, such as The Proceedings of the Philadelphian Hahnemann Society. They were collections of papers describing in the most detailed and personal way the experiences of individuals who had taken a particular substance. If for example, the subject had a bowel motion within some hours of ingestion, the substance was to be used for constipation. If however the subject did not have a bowel motion, then clearly the substance would be a treatment for diarrhoea. This process was called 'proving'. In either case, before use the substance was to be diluted in solution many times and at each dilution step, the container was to be banged on the table a specific number of times. These processes were

called 'potentization' and were governed by something called 'Hahnemann's Law of Succussion'. As I read this material, the 20th century traffic roared past in Great Ormond Street, and a framed autographed photograph of the Prince of Wales trembled slightly on the wall. When I retired, and was able to resume my education, I found out more.

**History of homeopathy**

Christian Friedrich Samuel Hahnemann (1755–1843) was born in Meissen, and gained an MD from Erlangen in 1779.

A physician and apothecary, he forsook medical practice and in 1789 he published his beliefs in 'Hufeland's Journal'. He stated that he had discovered the 'law of similars' for the treatment of illness, which stated that 'like cures like'. That is, that diseases are cured by substances which cause the same symptoms.

He went on to write two books, the Organon and the Treatise on Chronic Diseases. He wrote that the dilution of a medicine strengthened its potency, with ever increasing effect with ever increasing dilutions.

He also promulgated an extraordinary theory that most chronic diseases were a response to a scabies infection, 'psora'. He listed a very large number of conditions, including epilepsy, rickets, cancer, dropsy, suppuration of the lungs and paralysis. It is of note that today's homeopathists do not push this piece of fantasy.

Hahnemann wrote this: "A long experience and multiple observations upon the sick have led me within the last few years to prefer giving only two shakes to the medicinal liquid, where I formally used to use ten." (The mutable law of succussion!)

These doctrines were taken to the US, where they gained ready acceptance and rapidly spread. By 1833 the Philadelphian Hahnemann Society was formed, and it was their proceedings that I had perused at the London hospital. Why this flowering of illogicality took place in the US is perhaps related to the similar success of Mormonism at the same time. An American friend suggested to me that a deep desire for religious tolerance was behind both.

However, rational and detailed rebuttal of the homeopathy doctrines was made by Oliver Wendell Holmes in 1842, and in 1871 he said this to a final year medical class:

> "Some of you will probably be more or less troubled by that parody of mediaeval theology, which finds its dogma in the doctrine of homeopathy, its miracle of transubstantiation in the mystery of its dilutions, its church in the people who have mistaken their century, and its priests in those who have mistaken their calling".

In Britain, homeopathy had its greatest success when in 1852, during a cholera epidemic, only 16 percent of patients admitted to the first London Homeopathic Hospital in Golden Square died, compared with 53 percent admitted to the Middlesex Hospital, just down the road. Clearly the prognosis was much better if one did nothing, rather than employing the blood-letting and purging practised by the orthodox!

The British Hahnemann Society was founded in 1968 .

**The royal family and homeopathy**

"All the European monarchs were intimately related and interbred, and all very taken with homeopathy," wrote Peter Morrell, author of British Homeopathy During Two Centuries. Morrell suggests that that these people took it up because it seemed to work, it became fashionable, it was nebulous and divine, and it became traditional. Sir John Weir, a homeopath, treated Edward VII, George V, George VI, and Elizabeth II. Queen Victoria did not believe.

The Prince of Wales is an ardent supporter of homeopathy, and letters from his household, expressing his disapproval of critics of the cult, surface on the desks of the logical. His Foundation for Integrated Health recently received $NZ 2.18 million of tax-payers' money for voluntary self-regulation of alternative health practitioners, yet the Foundation dos not require evidence for clinical efficacy.

In 1949 the London Homeopathic Hospital became the Royal London Homeopathic Hospital.

**Current status of homeopathy**

Despite the support of the Prince of Wales, and the support of the British government for 'alternative' treatments, the RLHH and other state-funded homeopathic hospitals have fallen on bad times. Recent careful meta-analyses of many publications of trials of homeopathy have shown no advantage over

placebo effects, and community health trusts have withdrawn funding. The Guardian in the first week of February, this year, reported that more than 20 percent of UK hospitals had withdrawn funding.

The Swiss government withdrew funding for homeopathic remedies in 2005 following the publication of one of the meta-analyses carried out by Swiss investigators, and a team from Bristol University. This does not stop a homeopath in the Hamilton This Week free paper claiming on 13 March 2008, that in Switzerland "homeopathy is rebateable by most insurance providers". This is offered as support for the system, as is the support of the royal family. She also claims to be "NZQA approved".

The NZ School of Classical Homeopathy was founded in Auckland in 1984. It claims that homeopathy is a medical science, "as much as paediatrics and neurology".

The principal of the BOP College of Homeopathy in Rotorua, claimed in the Hamilton Press of 6 February 2008, that the efficacy of homeopathic treatments has been shown in clinical trials. When I (politely) asked her for the references she referred me to two papers published in 1986 and in 1991. The major paper, a review of 107 controlled trials concluded that "At the moment the evidence of clinical trials is positive but not sufficient to draw definitive conclusions". The principal did not direct me to the more recent work, including a paper published in September 2007 in the British Journal of Pharmacology, which showed that a mixture of four homeopathic medications (arnica, bryony, hypericum and ruta graveolens) was no better than placebo in lessening the need for morphine after knee ligament repair surgery. The course at this college has been approved by the NZQA to level seven. What does this mean? The approval is of the surroundings and the way in which homeopathy is taught. Not the substance of *what* is taught. The difference is often not made clear.

In Tawa, Wellington, there is a Museum of Homeopathy, the private collection of Julian Winston, an immigrant homeopath from Philadelphia.

**Why does homeopathy survive?**

In his 1982 book, The Social Transformation of American Medicine, Paul Starr wrote: "Popular culture develops partly by a process of 'cultural sedimentation'. Like a residue of the past the theories and remedies of learned traditions filter down to the lower classes where they remain, even after the learned have abandoned them."

Prof David Colquhoun has written of the Age of Endarkenment. He characterises this 'Age' by a lack of scientific literacy, an avoidance of the difficult subjects, a resurgence in magical thinking and superstition. It has seen an elevation to university level of courses in homeopathy. At least five institutes of technology raised to the level of universities by governmental decree in the UK have introduced degree courses in homeopathy. The obvious reason for this is to increase student numbers, and thus funding. The sacrifice of hard evidence to financial pressure has been seen here in New Zealand. When a senior lecturer

"Well, yeah, you might be nuts. Just how long have you been hearing these voices..?"

in History and American studies at Waikato University taught the facts about the origins of the Mormon church, he was accused of improper academic behaviour, "since the Book of Mormon may be right". He was asked to face a room full of believers who I assume were by implication threatening to take their custom elsewhere. Postmodernism brings financial gain.

When my wife, Janelle, and I wrote and distributed a leaflet warning our patients at the hospital about the potential harm of unproven remedies to people with kidney failure, and included information on "how to identify quacks", a vigorous complaint to the CEO from a member of the public who saw herself so identified, was handed to the public relations officer for action. The complaint then went to the ethics committee for consideration. We never received an answer or opinion. It wasn't the truth of what we had written, it was the potential harm to the hospital and its income.

The popularity of unproven remedies is a manifestation of a society in which wishful thinking matters more than truth. Truth and falsehood have become a matter of choice.

In the UK and NZ, labelling law does not **r**equire proof of efficacy for traditional remedies. Journalists feel there is a need for 'even-handedness', even when the evidence shows there is no middle path. As Richard Dawkins has said, "Either it is true that a medicine works or it isn't. It cannot be false in an ordinary sense, but true in an alternative sense."

**Homeopathy can cause harm**

In 2007 the Society of Homeopathy (UK) were advising that their medications could cure Aids, prevent and cure malaria, and do away with the need for immunisation. They even went so far as to maintain they could send the necessary forces by radio, encrypted in music. This nonsense is particularly damaging in Africa, where homeopathy has the support of many people.

The Faculty of Homeopathy (UK), made up of medically qualified practitioners does not support the Society, but does, for example, maintain that salt (NaCl) cures eczema.

All unproven remedies carry the implicit risk of patients failing to seek orthodox help while waiting for effects to occur from the medication they believe in.

In the same century as Hahnemann was writing his first papers, David Hume wrote An Enquiry Concerning Human Understanding". In his conclusion he wrote:

> "When we run our libraries persuaded of these principles, what havoc must we make! If we take in our hand any volume of divinity, of school metaphysics, for example, let us ask: Does it contain any abstract reasoning concerning quality or numbers? Does it contain any experimental reasoning concerning matters of fact or existence? If NO to both, commit this to the flames, for it can contain nothing but sophistry and illusion."

**Martin Wallace is a retired physician with special training in kidney disease and its management, and a degree in pharmacology in addition to the MB., ChB. Since retirement he has had time to resume his education in other fields.**



## Creationist video 'commended'

***Mike Palin** queries the judging criteria in a recent high school science video competition.*

A blatant anti-evolution DVD has been "commended" by the Royal Society of New Zealand (**www.rsnz.org/events/bigsci/2008/competitionresults.php**). The video is hosted on HotScience (**www.hotscience.co.nz/video_detail.php?videoid=184**). It presents "five assumptions" of evolution, each of which are portrayed as lacking any supporting scientific evidence. Four of these are prominent in creationist literature and websites. The fifth deals with irreducible complexity, a term coined by proponents of Intelligent Design (ID). The video includes a short discussion of the failure of evolution to explain giraffe development that appears to have been taken directly from the book Of Pandas and People. This book was the subject of a federal court case in the US involving an ultimately unsuccessful attempt by the school board of Dover, Pennsylvania to introduce ID into the biology curriculum.

The five-minute video was submitted by a team of three students from Te Kauwhata College as part of the Freemasons BIG Science Adventures DVD competition held in May. The competition is for year 11-13 students and is administered by the

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*Compiled by David Riddell*

# The murder that never was

CHARLENE Makaza went into hospital with an acute Aids-related condition in the first week of 2007. By the time the 10-year-old Zimbabwean girl died 18 hours later, doctors had decided she'd been murdered (Sunday Star Times, 25 May).

It took until 21 May 2008 for her uncle, George Gwaze, to be acquitted of the non-existent crime.

Charlene, who was cared for by her uncle and his wife after her parents had died of Aids, was frequently unwell. On the morning of 7 January she was found in her bed, having difficulty breathing, deeply unconscious and awash in white, chalky diarrhoea. Her aunt, Sifiso Gwaze, changed her into clean clothes and rushed her to an emergency clinic, but those clothes became soaked as well. By the time Charlene got to the clinic, she had a temperature topping 40 º C, a pulse over 180, and no recordable blood pressure. This resulted in her brain being starved of oxygen, a condition later attributed to suffocation.

Things started to go wrong for George Gwaze when Charlene's care was handed over to a new shift. Those on duty later lost sight of her first symptoms. When a rectal probe was inserted to take a more accurate temperature, medical staff discovered damage to Charlene's rectal tissue related to her condition, but which were interpreted as signs of forced penetration.

GP and forensic physician (and Skeptic) Felicity Goodyear-Smith, the medical adviser for the defence, said that once the possibility of sexual abuse had been raised, other possible explanations were never considered.

"Once you get a particular line of thought, like this is sexual abuse, it colours thinking," she said. "And these were very senior people saying it was abuse. If it *is* sexual abuse that doesn't matter, but suddenly the possibility that it might not be isn't on the table any more..."

Police recovered Charlene's underwear, on which they detected traces of Gwaze's sperm. Though this seemed damning, it became clear in the trial that modern DNA tests are so sensitive that enough sperm can be transmitted between items of clothing in the laundry to produce a positive test.

Had Gwaze been convicted, said defence counsel DNA adviser Arie Geursen, it would have been "a terrible travesty of justice. It would have been science and medicine gone astray".

### 'Arkeologist' calls for kiwi help

On Auckland's North Shore, two Mairangi Bay men who last year were involved in the hunt for Lord Lucan have now set their sights on Noah's Ark (North Shore Times, 3 April).

Rod McCourt and Dave Ashworth run a business called Global Intelligence Solutions, which analyses satellite and aerial images and CCTV footage for law enforcement agencies and the military. In January they were approached by American professor and Ark-hunter Porcher Taylor, who has been excited by satellite images of a 300 x 52-metre ice shelf about 4000 metres up Mt Ararat, in eastern Turkey. The dimensions of the shelf fit those of the biblical ship, Porcher says. Interest in the feature, known to 'arkeologists' as the Ararat Anomaly (has a nice scientific ring to it, that) dates from 1949, when a US Air Force plane on patrol near the border of the former Soviet Union "inadvertently recorded" the images of the mountain top.

Dave Ashwood says aerial images taken in the 1950s were inconclusive but hopes modern technology will shed light on the so-called anomaly. They will receive new satellite images for analysis later this year. "Generally in nature things aren't so symmetrical, so it's unusual," he says. "In 50 years of study no one has turned around and said it's definitely not the ark."

Last August the two used facial mapping to disprove allegations that 62-year-old Marton resident Roger Woodgate was long-lost murder suspect Lord Lucan.

At least Lord Lucan did once exist...

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- The placebo effect is a well-known medical phenomenon which accounts for the apparent effectiveness of many 'alternative' remedies. But what is the physiological basis for this effect?

- Is it time for philosophers to move over and, as they did with natural science, hand the task of establishing moral principles to others who may be able to produce a more satisfactory (if not necessarily palatable) solution?

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**RIGHT AWAY!**

### Workers safe from dioxin

A study of more than 1700 workers at the former Dow herbicide factory in New Plymouth has concluded their life expectancy was the same as that of the general population (NZ Herald, 17 April).

The Otago University study, headed by David McBride, included blood tests on 346 people, which found that workers potentially exposed to the dioxin TCDD had higher levels of it in their blood – averaging 10 parts per trillion (ppt), but up to 100 ppt. The NZ-wide average in a 1997 study was 4ppt.

The study also found that while exposed workers' death rates from cancer and heart disease appeared higher, the rise was not statistically significant. Death rates from lung cancer, prostate cancer and diabetes were lower than expected.

Dr McBride said the findings were good news for Dow workers and the people of New Plymouth. One of the study group's scientific advisers, Professor Emeritus Sir John Scott, of Auckland University, said the large size and high local participation rate helped make the study a "definitive assessment" of dioxin exposure in the city.

The US Centres for Disease Control say an increased incidence of cancer in workers exposed to dioxin might be linked with blood levels of between 495 and 31,800 ppt.

Some former workers and local residents remain unconvinced, however. Neil Herdson, a former Dow factory worker, argued the study was unreliable because it only reported on death rates, and not full medical histories. Another local campaigner, Andrew Gibbs, observed that blood dioxin levels declined over time, and some workers may have initially had levels higher than the 495ppt minimum risk level set down by the USCDC.

### Water's health benefits all wet

Many widely-held beliefs about the health benefits of water are not backed by scientific evidence, say two Pennsylvania University researchers (Globe and Mail, April 4).

Although some claim drinking lots of water can help clear toxins from the body, reduce the frequency of migraines, ward off weight gain and even keep skin looking youthful, Stanley Goldfarb and Dan Negoianu were unable to substantiate the claims after scouring the medical literature.

"There is really no basis to even invoke the possibility that extra water consumption aids toxin removal or improves skin tone," Dr Goldfarb said.

One study found that drinking water before eating can make you feel full during the meal, but not after it. But it didn't establish whether drinking large amounts over the course of the day would decrease the number of ingested calories. As for the old story about drinking eight glasses of water a day, the pair couldn't even be sure of the original source of this unfounded advice, which has already been debunked in earlier studies, they said.

### Violent video game myths debunked

Video games are not as bad as they're painted, according to a recently released book, reviewed in The Press (17 June).

Grand Theft Childhood: The surprising truth about violent video games, is the work of Lawrence Kumer and Cheryl Olson, co-founders and directors of the Centre for Mental Health and Media at Massachusetts General Hospital in Boston. They report that video games are a normal part of teenage life, and teenage boys who play violent video games tend not to be socially isolated.

Kumer and Olson say what they found "surprised, encouraged and sometimes disturbed them", but the book debunks a lot of popular misconceptions surrounding video games. They say they came across a lot of "muddle-headed thinking, misuse of scientific data and political posturing on the part of people from all points of view".

For boys at least, it seems playing video games is a marker for social acceptance by their peers. Girls also enjoyed M-rated games.

The pair say that for most kids and parents, the bottom line can be summed up in a single word: relax.

"While concerns about the effects of violent video games are understandable, they're basically no different from the unfounded concerns previous generations had about the new media of their day. Remember, we're a remarkably resilient species."

# Anti-oxidants: the key to nutritional success?

**Alan Hart**

*Extravagant claims are often made for the health-giving effects of anti-oxidants in the foods we eat. But sorting out the truth from the hype is not at all easy.*

IN THE window of a health-food shop, I saw an advertisement extolling the merits of Goji berries. The advertisement said that an 'ORAC test' had shown that Goji berries have a lot of anti-oxidants in them. 'ORAC test' has a scientific ring about it – Goji berries must be good!

Anti-oxidants have attracted a reputation as beneficial ingredients of foods, nutritional supplements and cosmetics. So I thought I would try to describe what anti-oxidants are, and explain what the ORAC test is and its limitations. I'll also give some examples of anti-oxidants in fruits and vegetables, and make some comments as to whether it's worthwhile taking supplements containing these anti-oxidants in an attempt to get more of them inside you than is usual from a healthy diet.

What are anti-oxidants? Let's start with oxidation and move onto food. Oxidation is a process in which electrons are removed from atoms and molecules. Oxygen is the classic oxidising agent. Digestion of food and extraction of energy from it is essentially an oxidative process. It occurs over many steps but one of the final outcomes is the transfer of electrons to oxygen (which is why our existence is dependent on a supply of this gas*). When the electrons are passed to oxygen, water is formed but oxygen 'radicals' are also formed as a side effect. Radicals are atoms or molecules which have one or more unpaired electrons. By virtue of the unpaired electrons, radicals (sometimes referred to as 'free radicals') are extremely reactive. The oxygen radicals are no exception and if not mopped up will cause all sorts of havoc by reacting with molecules that they shouldn't react with. In short, oxygen radicals are toxic.

An example of an oxygen radical generated in our bodies is the 'superoxide radical': $O_2^{\bullet -}$, two oxygen atoms linked together to form a molecule that has an unpaired electron (the dot) and a negative charge (the dash). It's been estimated that an adult weighing 70 kg makes about 1.7 kg of superoxide radicals a year. This is equivalent to about one percent of total oxygen consumption.

Molecules that can neutralise free radicals are called anti-oxidants. Anti-oxidants do not react only with oxygen radicals. Other 'reactive species' capable of causing oxidative damage and that react with anti-oxidants may contain, for example, nitrogen and sulphur. Barry Halliwell and John Gutteridge give a more formal definition of an anti-oxidant in Free Radicals and Biology in Medicine (2007), which is: "any substance that delays, prevents or removes oxidative damage to target molecules".

Reactive species in addition to oxygen radicals also end up in our bodies. Cigarette smoke, for example, contains free radicals. Given the toxicity of oxygen radicals and other reactive species, it's not suprising that anti-oxidants are considered a good thing, and that it's thought a good idea to make sure we have as much of them inside our bodies as possible. Fortunately, our bodies have a number of built-in anti-oxidant systems to protect us against oxygen radicals formed as we breathe, and other reactive species. I am not going to deal with these systems but will confine my attention to dietary sources of anti-oxidants as it is these which are usually discussed in dietary advice and turn up in nutritional supplements. These anti-oxidants are, by and large, derived from plants.

* An excellent and readable account of the role of oxygen in our world, including a discussion of oxygen radicals and anti-oxidants, is Nick Lane, 2002: Oxygen, The molecule that made the world, Oxford University Press.

**Measuring Anti-oxidants**

The ORAC test is one of the principal assays used to estimate the anti-oxidant content of such materials. (If all this seems a bit dry, bear with me because the nature of assays for anti-oxidants is central to claims that supplements, foods, etc, contain a lot of them.)

When an analyst is faced with developing a chemical assay to find out how much of something is in a sample of fruit or vegetable, one approach is to find some reagents which when added to the sample react with the substance(s) in question and in so doing exhibit a measurable change in some property of the mixture, eg an increase in colour intensity. Hopefully the technique is sufficiently sensitive (will measure quantities that are of interest to the analyst), selective (ideally the reagents react only with the substance(s) in question) and quantitative (the properties of the mixture change in a regular way as the amount of substance changes). Many assays are quite selective; others only give an indication of the amount of a class of compound. The ORAC test is of this latter type.

There are dozens of molecules that can be classed as anti-oxidants and it would be a lengthy and expensive task to identify the compounds in a sample every time an estimate of the overall level of anti-oxidant activity was required. Tests like the ORAC assay are used to estimate overall activity in a sample, the amount of activity being expressed as 'equivalent to' an amount of a 'standard' anti-oxidant compound.

ORAC stands for Oxygen Radical Absorbance Capacity. The basic premise behind this assay is that the ability of a sample to neutralise free radicals indicates the presence of anti-oxidants. When exposed to light, a substance called fluorescein emits light of a longer wavelength than that shining on it; this 'fluorescence' can be measured using a fluorimeter. Fluorescein also has the useful property that its fluorescence is diminished in the presence of free radicals. We would have the basis of an assay if we mixed our sample with fluorescein and a source of free radicals and saw that the decrease in fluorescence was less than in the absence of the sample because of the protective effect of anti-oxidants. This wouldn't get us very far as about all we could do would be to say that one sample had more or less anti-oxidant activity than another. The assay could be made more quantitative if we were able to compare estimates of activity from various samples with those obtained using a known standard anti-oxidant. A commonly used one is Trolox, a synthetic analogue of vitamin E.

**Goji berries (*Lycium barbarum*) have a long history in traditional Chinese medicine, but have only recently become popular in western countries.**

So in the complete assay we would measure the fluorescence coming from a series of solutions containing increasing amounts of Trolox but constant amounts of fluorescein and free radicals. If we run everything correctly there will be a regular and positive relationship between the fluorescence emitted and the amount of Trolox present. We would also measure the fluorescence coming from solutions containing the free radicals and our extract of Goji berries (no Trolox), and calculate that a measured amount of Goji berries contained an anti-oxidant activity equivalent to that provided by a known amount of Trolox. Another way of looking at this is that we have estimated so many grams of berries as having the same ability as a certain amount of Trolox to protect fluorescein from oxidation by the free radicals.

Remember that the ORAC test only gives a measure of the ability of our extract to protect fluorescein from the action of free radicals in vitro (in vitro – in the test tube; in vivo – in the living body). It says *nothing* about the anti-oxidant activity of the extract once it has been ingested (in vivo). A high ORAC value

simply tells us that the extract contains molecules that *might* have some anti-oxidant activity in vivo.

The principal value of an assay of this type lies in the ability to compare different samples of plants, foods etc according to a single property. The table below contains some ORAC values for anti-oxidant levels in some fruits and vegetables. These values have been taken from a larger set published by the United States Department of Agriculture (USDA, 2007).

The units of measurement are μmol Trolox Equivalents per 100 g fresh weight (FW) of fruit or vegetable. Fresh weight is the weight of the leaf, fruit etc as it is harvested with no adhering dirt, fully hydrated but with no surface drops of water. A mole (abbreviated as mol) is a measure of the amount of Trolox and 1 μmol of Trolox has a mass of 0.00025 g. So, if a vegetable has an ORAC value of 1000 TE per 100 g FW, then 100 g FW of the vegetable has the same ability, *in the test-tube*, to neutralise free radicals as 1000 μmol or 0.25 g of Trolox.

Some ORAC values:

| | μmol TE / 100 g FW |
|---|---|
| Turmeric | 119346 |
| Curry powder | 6665 |
| Blueberries | 6552 |
| Apples, Granny Smith, raw with skin | 3898 |
| without skin | 2573 |
| Cashew nuts, raw | 1948 |
| Avocadoes, Hass | 1933 |
| Onions, raw | 1034 |
| Green peppers, raw | 923 |
| Bananas, raw | 879 |
| Carrots, raw | 666 |
| Cabbage, raw | 508 |
| Tomatoes, raw | 367 |

...and Goji berries? It's not easy to find a reputable ORAC value but it does seem to be considerably higher than most other plants tested.

**Examples of anti-oxidants**

What are these anti-oxidants of plant origin? Here are a few examples, with some comments as to whether they exert a beneficial effect in vivo.

**Vitamin C** or ascorbic acid: This is an essential nutrient, famous for its role in the prevention of scurvy. It is an anti-oxidant in vitro but it is uncertain as to whether it has any major effects as an anti-oxidant in vivo. Sufficient vitamin C to maintain health can be obtained from a diet including fruits and vegetables. With such a diet, there is no evidence of beneficial effects of supplementary doses.

(Scurvy is a deficiency disease of connective tissue. The role of vitamin C here is not that of an anti-oxidant but to ensure that enzymes involved in the synthesis of connective tissue function effectively.)

**Vitamin E:** Vitamin E was first defined as a fat-soluble 'factor' necessary for reproduction in rats. It is not a single compound, a number of substances having vitamin E activity. The principal 'natural' form is α-tocopherol. Mixtures of tocopherols are found, for example, in soybean, corn, walnut and rapeseed oils. The evidence for anti-oxidant effects in well-nourished humans is limited.

**Carotenoids:** These are orange and yellow pigments found in plants, most typically in carrots. β-carotene is a common carotenoid. There is only weak evidence that they have an anti-oxidant role in vivo. (They do have an important role in the diet for other reasons, principally as a precursor for vitamin A.)

**Polyphenols:** Polyphenols are compounds that have groups of six carbon atoms linked together in rings. The rings have hydroxyl groups (-OH) attached to them. Polyphenols of plant origin are excellent anti-oxidants in vitro, but it does not follow that they have the same effect in vivo. This group contains the compounds found in blueberries and blackcurrants and some have become

quite well known through discussion of their potential anti-oxidant properties, eg resveratrol from red wine, quercetin in teas and onions, and curcumin from turmeric.

### Epidemiology

There is evidence from epidemiological studies of correlations between anti-oxidant levels in the body and good health, and between good health and diets rich in fruit and vegetables. Correlations however do not prove causation and it remains uncertain whether the correlations observed are due to compounds exerting anti-oxidant effects in vivo. A further problem in interpreting epidemiological studies is that it is difficult to be accurate about the relationship between dietary intake and incidence of disease, particularly when studies seek to understand data gathered across different countries.

### Intervention studies

Intervention studies (where one group of subjects is provided with a supplement, and their health and physiological status is compared to a matched group receiving a placebo) might help us decide whether supplements are worth taking, but it has proved difficult to obtain evidence of a cause and effect relationship in these. Halliwell & Gutteridge (2007) describe the literature on intervention studies seeking to demonstrate a link between diet and supplementary anti-oxidants as a "morass of confusing data".

Some clarity on the effects of supplements of some anti-oxidants (β-carotene, vitamins A, C, E) and selenium has been given by a recent Cochrane review (Bjelakovic et al., 2008). This review considered 67 trials, involving 232,550 people, of the effects of taking supplements of these anti-oxidants. The principal conclusion from consideration of all this data was that overall, there is no evidence for an effect of these supplements on mortality in healthy people or those with various diseases. When the effects of different supplements were looked at separately, there was an increased risk (which only just reached statistical significance) of mortality associated with supplements of vitamins A, E and beta-carotene. There were no significant effects on mortality from vitamin C or selenium supplementation. (Selenium is an essential nutrient and is a component of several enzymes, some of which are thought to have anti-oxidant functions.)

### Conclusion

What to do? If we take the epidemiological evidence as our guide, eating lots of fruit and vegetables is sensible advice. They have established beneficial effects, such as being enjoyable to eat, providing fibre and helping to maintain adequate levels of vitamins and minerals. The anti-oxidants they contain might exert a direct beneficial effect in vivo. At this point in our knowledge of dietary anti-oxidants and their effects in vivo, there seems little, if any, point in spending money on supplements of anti-oxidants.

**Alan Hart spent over 30 years doing biology research. The last 15 were spent developing assays of various kinds. He has an interest in the meaning and practice of biological measurement.**



From page 9

RSNZ The theme of Darwin and evolution was chosen this year to mark the 150th anniversary of the Wallace-Darwin paper on natural selection read to the Linnaean Society in London in 1858. DVDs were to be made by the students with a teacher acting as a guide and facilitator, but not directly involved in the production. Principals were to approve each entry. A short list of entries was considered by a panel of judges chaired by Prof Lloyd Davis of the Centre for Science Communication at the University of Otago.

When contacted, Prof Davis said in an email, " I chaired the final judging panel tasked with selecting the top two films from those short-listed. That is, I played no part in determining which films made the short list. We duly selected the two best films in our opinion and the film to which you refer did not make the top two." He added, "As someone who has taken a strong stance against Intelligent Design in a recent book, I can say that I don't think it is worth getting too precious about the film. You have to understand that from the point of view of the competition, there was much more being judged than the quality of their arguments (which I agree were flawed) – from a filmmaking perspective, like other entries we saw, they did some things well and some things poorly."

A matter of style over substance?

**Mike Palin is an Otago University geologist.**


# Drink your way to good health

**John Welch**

DON'T scoff. A magazine as authoritative as Woman's Day reports a case where a woman treated her breast cancer by drinking her own urine. Following a mammogram and ultrasound examination the patient reports: "I was introduced to a surgeon who said I needed to have both my breasts removed right away." This is complete nonsense as no surgeon would ever perform a bilateral mastectomy without a tissue sample confirming the diagnosis. It is quite clear that she never had cancer at all, but a condition colloquially known as lumpy breasts or benign fibrocystic breast disease.

Such people are a godsend for cancer quacks. There's nothing easier than curing somebody who was never ill in the first place. In fact, that's the whole basis of 'alternative medicine'.

I googled the subject of urine drinking and there are a surprising number of articles on the subject. My favourite was a reference to the Koryak tribe of Siberia who used to get stoned by consuming the fly agaric toadstool, *Amanita muscaria*. The hallucinogens are excreted in the urine and as the account goes: "those who cannot afford the fairly high price (of the fungi) drink the urine of those who have eaten it, whereupon they become intoxicated." (Wasson, quoted in Murder, Magic and Medicine, by John Mann)

### Hyperbaric Oxygen-I don't think so!

A local clinic offers "Hyperbaric Oxygen Therapy" at a cost of $60-$110. The pamphlet says:

> "A cleanse with intraceuticals products first followed by a deep exfoliation. Oxygen Therapy applied with serums suitable to skin condition – a relaxing soothing treatment incorporating lymphathic (sic) drainage for a complete rejuvenation/brightening or reduction of fine lines. Also treats acne, rosacea, eczema and open pores-super hydrates. Complimentary home care product if a course of six treatments (weekly) booked."

This clearly constitutes false advertising as well as an affront to grammar and spelling. Hyperbaric oxygen means oxygen under pressure and this requires either a pressurised mask or a chamber which can be pressurised. I have contacted the Commerce Commission over this false claim and I will keep you posted.

### Cancer Diversions

A friend has been unlucky enough to develop bowel cancer last year and then go down with breast cancer this year. She has faced up to all of this with equanimity. Another acquaintance of mine, a doctor, has been diagnosed with a form of cancer which is likely to be terminal. This person is now on a vegetarian diet with no alcohol and is described by friends as "doing very well."

It's hard to imagine the fear and horror of being diagnosed with cancer. It leads to all sorts of irrational thinking, even by doctors. If I ever got cancer I would take up smoking again, use hard drugs, drink as much as I liked and indulge myself in dangerous sports. Go out with a bang, not a whimper! Such a strategy could well see cancer cells shrinking against an onslaught of nasty substances.

"Magical" thinking about cancer extends to psychological issues. An Australian study comprehensively debunked the idea that mental attitude has anything to do with beating cancer. For example, women who were preoccupied about their cancer were more likely to get a relapse. The researchers found

that such women had the worst tumors – they were anxious and preoccupied for a reason! This sort of analysis is at the heart of skepticism – looking at the facts and coming up with the most likely explanation – not some horribly deprivational diet that denies people meat, wine and what little enjoyment of life they have left.

The chief executive of the Cancer Council Australia, Professor Ian Olver said that he had been involved with a smaller study with lung cancer and had reached a similar conclusion.

Marlborough Express 4 June

**Bogus Body Enhancer**

Winston and Sylvia Gallot were ordered to pay $632,500 and $130,000 costs after being convicted of breaching the Fair Trading Act. Their weight loss product, Body Enhancer, was described by the judge as being ineffective. The High Court dismissed the quacks' appeal but reduced the fines to $394,500.

Never mind, the couple must be laughing all the way to the bank as it was estimated that about $5 million of the product had been sold. If you google the offending product there is a wealth of material to review. I particularly enjoyed the Judge's descriptions as follows:

> "Mr Gallot was described as a man of considerable intelligence, style and charm, but he was exposed as 'calculatedly dishonest' and blamed everyone but himself."

Judge Moore referred to a "succession of blatant untruths" by Mrs Gallot in trying to launch Body Enhancer in Britain.'

Marlborough Express 30 May

**Another useless product**

The Commerce Commission successfully prosecuted another useless product which claimed to "melt away fat and cellulite." A judge said anyone who purchased Celluslim wasted their money.

The company had claimed that the product "had been scientifically tested by a fictitious doctor at the fictitious Saint Alto Research Centre in Switzerland." When their useless product ran out they merely substituted honey, garlic and apple cider vinegar pills.

Marlborough Express 30 May

**Amalgam again**

A local dentist missed out on a health contract because of his opposition to dental amalgam. The amalgam debate has raged for decades and has parallels with the pure water crackpots who oppose fluoridation. Amalgam is a stable compound that is not ideal but it is the most cost effective agent at present. When something better comes along it will be superseded. I have a mouth full of amalgam fillings – a legacy of growing up without fluoridation. My mother gave fluoride tablets to the remaining four siblings who all have perfect teeth. People who elect to have their amalgam fillings removed expose themselves to a great deal of mercury which is released during destruction of their fillings. Those of us who sensibly live with our existing amalgam fillings can rest assured that our major mercury exposure comes from fish and chips.

Marlborough Express 25 March

**Body Talk**

I will have to rethink my theory that "wacky ideas are promoted by people who are bald and have beards". After rubbishing body talk in an earlier column I was stunned to see that this ludicrous nonsense has arrived in Blenheim. Get this – straight from the reporter:

> "I lie down on the consultation table and she holds my hand loosely over my stomach. A series of yes or no questions are asked and she lifts my hand in a circular motion each time, sensing resistance or acceptance of the question. It's when she picks up on a positive response; she places my hand over my sternum and then taps me several times on the head, then taps me on my heart zone."

The reporter accidentally stumbles across the mechanism when reporting: "It bears a resemblance to the 'laying on of hands' popular among some born again Christian groups."

This whole mélange of hocus pocus is of course a placebo. It is staggering that such nonsense can gain credence and it beggars belief that a newspaper should even bother reporting it. How ridiculous does something have to be before an editor would reject it?

Saturday Express 24 May

# The passing of a Skeptic

## Bernard Hugh Howard, born Manchester, March 25, 1920; died Christchurch, April 16, 2008.

The Skeptics have lost one of their founding members, with the death of Bernard Howard in Christchurch, aged 88. Active to the end, he collapsed suddenly while walking to the bus stop. As a regular attendant at Skeptics conferences, Darwin Day dinners and other events, and a frequent contributor to the NZ Skeptic, he will be sorely missed. As Denis Dutton said in the Christchurch Press, "Bernard had a probing mind and knew how to ask the right questions, especially the embarrassing ones. I have never encountered a man with such a rapier-sharp, yet gently delivered, wit. He is irreplaceable."

According to his own account, Bernard was late joining the Christchurch meeting which founded the NZ Skeptics. The first words spoken to him were: "We have decided to form a committee, but don't have a treasurer yet. Are you interested?" Bernard, who readily admitted to not being able to refuse anything Denis Dutton asked him to do, was immediately appointed. The society's first postal address was Bernard's personal box number at Lincoln College. When Bernard first applied for a box in 1964, he was told the only available box was Number 13. "I wonder why?" asked Bernard.

Born in Manchester in 1920, he met his wife-to-be, Molly Rackett, when they were students at high school. Their courting included frequent hikes in the Pennine hills. They married in 1942. By then Bernard had graduated BSc from Manchester University. While there, he had mixed with free-thinkers, rationalists and socialists. These influences stayed with him, though he preferred to think of himself as a humanist, his son Brian says.

Bernard's parents and sister were religious, but he "quietly made up his own mind that there was no after-life and no God". There was "no dramatic rebellion" against his family's beliefs and practices.

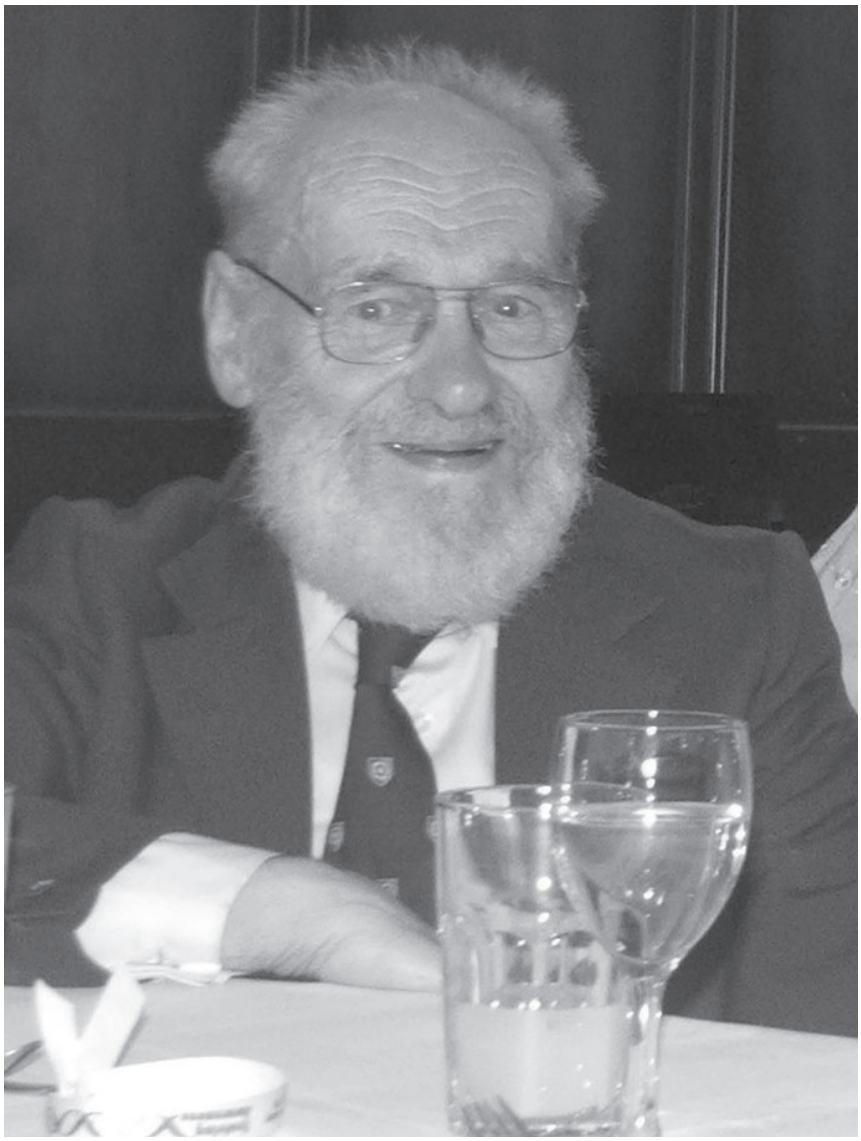
During World War 2 he was manpowered to research work with the Ministry of Food in London. He later completed studies for his doctorate in biochemistry at London University. He was on the staff of London's School of Hygiene and Tropical Medicine from 1947 to 1954, and then moved his family to Aberdeen, where he was a senior fellow at the Rowett Research Institute. His work focused on digestion in ruminant animals.

The institute granted him leave in 1961 for a year-long secondment to the chemistry division of New Zealand's Department of Scientific and Industrial Research, at Palmerston North. He brought his family to New Zealand and returned with them to Scotland in 1962. While in New Zealand, he heard of an opening at Lincoln as professor to establish a department of Biochemistry. He applied for and gained the position.

So the Howards moved back to New Zealand in 1964, although the eldest son remained in Scotland and the second son completed his schooling there before joining them. They lived in a staff house at Lincoln until shifting into their own home, at Cashmere, in 1968. The Lincoln history says Bernard's work on micro-organisms was "internationally known". Brian remembers his parents' home as one of books, classical music and news broadcasts, which his father followed closely. His parents attended ballets, operas and plays. They tramped in the high country. They hosted visiting academics, including Richard Dawkins, and fellow scientists and skeptics. They enjoyed travel, often visiting family in Britain. Sabbaticals involved research work at American and European universities and institutes.

Bernard was Professor of Biochemistry at Lincoln University for 21 years from the department's foundation, and Dean of Chemistry in the early 1970s. The centennial history of Lincoln notes that staff was "predominantly conservative in out-

look" before the infusion of new blood in the 1960s. Bernard was one of several original thinkers whose "keen intellect and radical philosophy" benefited staff thinking. Brian Howard says Bernard was aware of his part in this but "was reluctant to blow his trumpet and never spoke of it". Brian says his father's rationalism and intellectualism attracted other original thinkers to his department.



**Bernard Howard at last year's conference in Christchurch.**

Bernard retired in 1985 and was honoured with the title Professor Emeritus. His successor, Professor Roy Bickerstaffe, says he was meticulous in guiding students and in everything he did. In 40 years as a member of the Royal Society and president of the Canterbury branch in the 1970s, Bernard seldom missed a meeting or a field trip. At 88 and with poor eyesight, he was still being driven to meetings until the week before he died. Fellow society member Dr Alistair Campbell says he had a sharp mind but was a quiet man. He would listen closely, allowing "very little to escape him", then make appropriate comments. He had strong loyalty to his department and was revered by staff and students.

The Christchurch Press noted that readers of their letters to the editor would be missing his wit and wisdom. "His interests ranged widely. His words scattered pomposity. His style brooked no humbug. Yet he was a quiet, gentle man. His great loves were classical music and the mountains. He was also a man of powerful intellect."

"Bernard was a true humanist," according to Denis Dutton. "I remember once discussing the Russian novelist Lermontov with him. He asked for the loan of A Hero of Our Time, and came back after reading it with the most insightful observations."

"We often saw him at performances in the Chamber Music series. His musical knowledge and perception were redoubtable. He also continued regularly to attend the Court Theatre."

Bernard had a wonderful sense of the absurd. His very last performance at the Darwin Day dinner in Christchurch took place only weeks before he died. It was a talk on Darwin's mother's hypochondria and the place of fashionable afflictions in that lady's pampered life. According to Dutton, "Bernard was hilarious. He had us in stitches."

Brian says his father was reluctant to go into a retirement home when Molly became ill, but, once there, he still led an active life. Bernard is survived by wife Molly, sons Brian, Kris and John and five grandchildren – as well as a great crowd of sad skeptics who were privileged to have known him.

**Based on an obituary in the Christchurch Press, 26 April.**

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