

NEW ZEALAND SKEPTIC

JUNE 1994—NUMBER 32

Bruce Ames: Environmental Prophet or Apostate?

Jay D. Mann

What is the link between chemicals and cancer?

Forty years ago, Bruce Ames was a young microbiologist working at NIH in the day and enjoying Scottish country dancing in the evening, when he had an inspiration: to use the rapid growth of bacteria as a method for determining whether a particular chemical was able to cause mutations. If the chemical was positive — i.e., was mutagenic — it might be considered as a possible cause of cancer. This method, soon called “the Ames test,” became widely used. It was cheap, fast, and sensitive. One of the first discoveries was that a dye commonly used in children’s pyjamas had mutagenic properties. Bruce Ames became a hero to the environmental movement when he led a successful campaign to ban such dyes.

Ames was more interested in reducing the death toll from cancer than he was in attacking new chemical technology. As

more results from the Ames test accumulated, he realised that many naturally occurring chemicals were also giving positive results. Even more disturbing, the number of chemicals that seemed to be positive in high-dose tests on mice and rats was, he felt, excessive. In an extensive series of important reviews, published in prestigious journals such as *Science* and *Proceedings of the National Academy of Sciences*, he has attempted a quantitative estimate of the difference in hu-

man cancer. Because his figures show manmade chemicals in food and the environment to be quite insignificant compared to natural or self-inflicted factors, the name of Bruce Ames is now anathema to the same environmental movement that once applauded him. Nevertheless many professional scientists believe that Ames’ position is basically correct. If the inventor of the Ames test now says that most methods for detecting carcinogenicity are invalid, it is certainly not a case of sour grapes. This article is an attempt to summarise his beliefs. Those who are sufficiently interested should read some of the papers listed in the bibliography.

(1) *What do we know about the incidence of cancer?*

First, cancer risk increases according to the $\Rightarrow p3$

CONTENTS

Bruce Ames: Environmental Prophet or Apostate?	Jay D. Mann	1
Editorial	Denis Dutton	2
Attack of the Killer Comet		7
Maori Science?	Mike Dickison	8
Newsfront		10
Hokum Locum	Dr John Welch	17
Christchurch Pesticide Scare	Bernard Howard	20
Forum		22
1994 Conference		23

Oh, What a Lovely World!

Late in his life, in answer to a question, Freud compared the human condition approximately to the contents of a baby's nappy. When I first heard this story, it seemed to mark a bitter old man. That was when I was in high school in the late 1950s. Higher education was spreading in the world's democracies. Ignorance and superstition, the plague of the human species since the caves, were on the way out. Reason, knowledge and tolerance would rule the future of the world. Or so it seemed. Does it look like that today, even to high school students? A few news items:

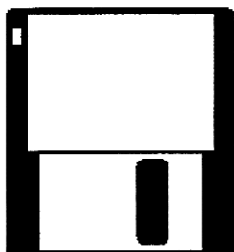
- ☐ A British insurance salesman is convicted of double murder on the testimony from one of his victims, who was contacted during deliberations by three jurors using a Ouija board. Because British law normally does not allow even appeal courts to question jury deliberations, the conviction may stand.
- ☐ Australian medical schools are being filled by significant intakes of Darwin-doubting fundamentalists, possibly 20%-25% of students. These wholesome young people will in the course of time advance, attaining places on the policy boards of hospitals, using their authority to determine health policies.
- ☐ In South Africa a woman was forced by a mob to douse her mother in petrol and set her alight, before she and the rest of her family were killed. Her crime: being a witch. There is a steep increase in killing of witches in South Africa.
- ☐ The Oz Skeptics awarded their annual Bent Spoon to the Australian Attorney General, who has made it possible for workers in his department to take sick leave with a note from an iridologist, naturopath, homeopath or other alternative practitioner.
- ☐ Freud's doctrine of repression is itself responsible for the smell of nappy-contents that surrounds "recovered memory" therapy, probably the most vicious pseudoscientific fad ever to be adopted by the

counselling industry. The fashion to blame all of life's disappointments on "repressed" episodes of incest has caused more human suffering than any single issue to confront the New Zealand Skeptics.

- ☐ Not that the therapists want to stop beating the drum of victimhood. When the BBC went across the Channel to give its extensive coverage to the D-Day commemorations, it made free counselling available to all its employees who might be upset by the experience. I'm not making this up. It's more than the survivors of Omaha Beach got, but we're so much more sensitive these days!

The meliorism of the 1950s has evaporated. Why? Some talk of abandonment of moral standards, others the rise of the nuclear threat — or the decline of the nuclear family, while others will blame it on the fall of religion — or of communism. My candidate is the degradation of education in its broadest sense — the failure of the modern democracies to give sufficient knowledge and critical, analytical abilities to young people at all levels. The dumbing down of public education, with its mantras in praise of self-esteem rather than hard-won knowledge, is bad enough. But even school is being replaced by television, with all its shallowness and sentimentality, as the major enculturating force. Ignorance, prejudice, and superstitions thrive in ways that would have amazed me thirty years ago.

The next time someone tells you how much better the world is becoming with instant global communications, innovative educational methodologies, and your therapy needs covered by ACC — think skeptically!



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5th power of age. That is, a 40-year-old is 100,000 times more likely to be cancerous than a 20-year-old. There are more cancer cases per 100,000 population simply because we are living longer and no longer dying of infectious diseases.

Second, the age-corrected mortality (death rate) from cancer has been declining since 1950 except in those over 84. Overall decline has been 13%. Naturally much of this decline is caused by improved detection and treatment. The only exceptions are lung and skin cancer, clearly caused by tobacco smoking and by increased exposure to sunlight. There are occasional claims that certain types of cancer are increasing slightly, but improved methods for detection are probably responsible.

Thirdly, some mostly unknown environmental factors have a major influence on the types of cancers that are likely. Japanese, for instance, have a high incidence of stomach cancer, yet Americans and Japanese-Americans have a low incidence. On the other hand, American men have much more likelihood of prostate cancer than do Japanese.

(2) What are the major known causal factors in cancer?

The single most important factor is smoking. This accounts for one-third of all US cancer deaths, not to mention one-fourth of heart disease. Each year, smoking causes 400,000 premature deaths in the US and 3 million deaths around the world.

Chronic infections contribute to about one-third of cancer on a world-wide basis. As mentioned below, any factor that causes body cells to divide increases the likelihood of cancer. Hepatitis B and C infect 500 million people, mainly in Asia and Africa. This liver infection is a major cause of "hepatocellular carcinoma." Two different Schistosomiasis worms infect Chinese colons and Egyptian bladders, being associated with increased cancer risk in those two organs. Liver flukes cause chronic inflammation of the biliary tract, hence risk of cholangiocarcinoma. A bacterium, *Helicobacter pylori*, is adapted to living in the human stomach and is now believed to be a major cause of stomach cancer, ulcers and gastritis. (So much for the classical

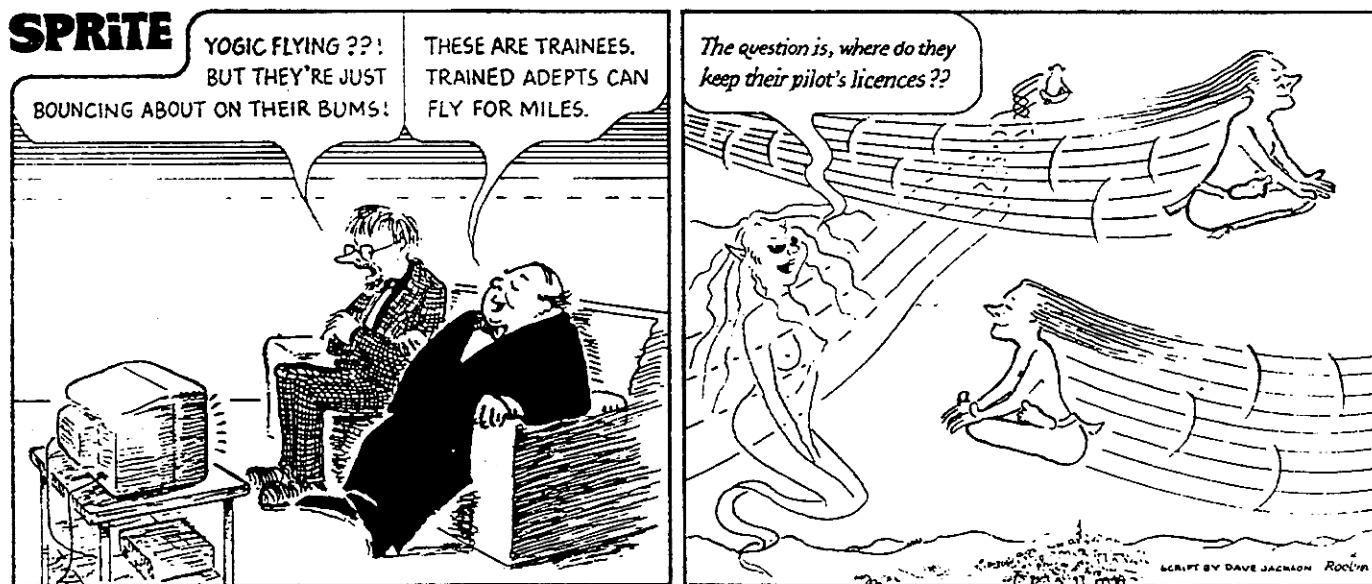
psychogenic explanation for ulcers!)

Overall about 70% of cancers might be caused by environmental factors, but pinpointing the exact causes is very difficult. There remains some 30% that cannot be ascribed to any factor other than age and bad luck.

(3) How does cancer develop?

The first requirement is that a dividing cell suffer some sort of damage to its DNA. (DNA is the basic material of our genes.) DNA damage occurs all the time, but our bodies have excellent repair mechanisms to detect and destroy damaged DNA. Based on the amount of DNA breakdown products in the urine, Ames and co-workers estimate about 10,000 "hits" on DNA every single day in an adult. These repair mechanisms are not 100% perfect, and some damaged DNA does escape.

DNA damage is mostly caused by oxidants. The oxidants in turn arise from both internal and external sources. Internal oxidants come from mitochondria, peroxisomes, cytochrome P450 enzymes, and phagocytic destruction of infected cells. The production of oxidants when in-



Donald Rooum, *Skeptic* (UK)

fects cells are destroyed may be a factor in the connection between chronic infection and cancer. External sources of oxidants include the nitrogen oxides of tobacco smoke, iron and copper salts, and natural plant phenolics like chlorogenic and caffeic acid.

If oxidants are bad, then antioxidants should be good. They are: antioxidants protect against disease. Natural antioxidants include ascorbic acid (vitamin C) and tocopherol (vitamin E). Synthetic antioxidants are also good. One worker estimated about 5% reduction in cancer because of approved antioxidants added to our food.

The health benefits of antioxidants, provided mostly by fruits and vegetables, are statistically highly significant. The quarter of the US population with the lowest intake of fruits and vegetables has double the cancer rate of the quarter with the highest intake. This applied to "epithelial" cancers (lung, mouth, larynx, oesophagus, stomach, pancreas, cervix, bladder, and colorectal) plus ovarian cancer. Breast and prostate cancer, on the other hand, is less affected by fruit and vegetable diets. (Although there is at least a statistical link between fat/calorie intake and breast cancer.)

Persons taking daily tocopherol or ascorbate had one-third the risk of developing cataracts. In contrast, smoking and radiation (both well known oxidative stresses) are strong risk factors for cataracts. Smoking seems to destroy ascorbate: smokers need to take double or triple amounts of ascorbic acid to achieve the same blood levels as non-smokers. Incidentally, smoking by the father

seems to affect sperm production and health; smoking fathers increase the risk of birth defects and childhood cancer in their offspring.

Excess food, at least in rats, is "the most striking rodent carcinogen ever discovered." Even a 20% increase in calories over the optimal results in shorter life, with more endocrine and mammary tumours.

**...we eat about 10,000
times more natural
pesticides than synthetic
pesticides.**

Excessive cell proliferation (cell division) is a very important factor in cancer production. This has been mentioned above in relation to chronic infection. Major dietary factors, such as salty pickles in the Japanese diet, have been hypothesised to be involved in the high rates of stomach cancer in this population. Even table salt, at high enough concentrations, can cause stomach cancer.

That cell proliferation predisposes to cancer is a major source of false positives in chemical screening as normally carried out. Test chemicals are repeatedly applied to animals at the "MTD" (maximum tolerated dosage). This is like chronic wounding, "which is known to be both a promoter of carcinogenesis in animals and a risk factor for cancer in humans". Many chemicals that purportedly have caused cancer at high dose (MTD) levels, may therefore not be true carcinogens. The infamous saccharine tests are a case in point: only female mice dosed with nearly toxic levels of saccharine showed an increase in bladder tumours.

For these chemicals that "cause cancer" at high doses only by tissue irritation, a tenfold reduction of dose in a rat or mouse experiment would show much more than a tenfold reduction in risk. This seems to have been confirmed. One analysis of 52 tests showed that two-thirds of the purportedly positive results for carcinogenicity would not have been found if the dosage had been cut even by one-half! (I suspect that commercial cancer-screening laboratories get new contracts in direct relationship to how many "successes" they have had previously.)

(4) *How do synthetic and natural chemicals line up as causes of cancer?*

The conventional cancer-screening techniques are, as stated above, too sensitive. There are not merely a few chemicals that show up as carcinogenic. Instead, nearly one-half of all chemicals tested seem to be positive in these tests. The ratio is the same for both natural and manmade chemicals, even though very few natural chemicals have been tested. Thus we cannot generalise that natural chemicals are inherently safer or riskier than synthetic chemicals. We must look instead at the quantities of chemicals ingested.

Plants contain surprisingly large quantities of natural pesticides. One of Ames' greatest achievements, in my opinion, has been to compile convincing evidence about how many natural chemicals have pesticidal functions. (In my youth, the question of the function of different "secondary" plant products was much debated. Some thought that products like alkaloids and lectins were mere accidents of metabolism, a plant

process gone wild. I personally thought that the main role of these chemicals was to provide research material for young biochemists.) Ames pointed out that up to 5% of the fresh weight of vegetables can be natural pesticides.

The list is very long, and a sample limited just to non-toxic plants would include: the sharp flavours of mustard and other

cabbage-family crops; piperine (10% of weight of black pepper); light-sensitising psoralens in parsnip and celery; chlorogenic and caffeic acid in coffee beans; nerve-poisoning alkaloids in potatoes, tomatoes and eggplants. The cat-attracting chemicals in catnip are actually very good insect repellents. The vast majority of plants are inedible by us. Even so we are at

risk of poisoning if cattle or sheep graze on them. Abraham Lincoln's mother died when she drank milk of cows that had grazed on snakeroot. A California infant was born deformed when fed milk from a goat that had been eating lupin. The concept that "natural is harmless" is simply false.

Ames has published numerous estimates of the amounts of

Material	Carcinogen, dose to 70 kg person	Rodent Potency	Risk (HERP%)
Tap Water	Chloroform, 85 ug	90	0.001*
Contaminated Well water	Trichloroethylene, 2800 ug	940	0.004*
Home air	Formaldehyde, 598 ug	1.5-44	0.6
PCB's, daily	PCB's 0.2 ug (US average)	1.7-9.6	0.0002*
DDT/DDE, daily	DDE, 2.2 ug (US average)	13	0.0003*
Bacon, cooked	Nitrosamines, 0.4 ug	0.2	0.003-.006
Peanut butter	Aflatoxin, 64 ng/sandwich	0.003	0.03
Brown mustard	Allyl isothiocyanate, 5 mg	96	0.07
Mushroom, 1 raw	Hydrazines	20-300	0.1
Beer, 350 ml	Ethyl alcohol, 18 ml	9110	2.8*
Wine, 250 ml	Ethyl alcohol, 30 ml	9110	4.7*
Comfrey-pepsin tablets, 9/day	Comfrey root	626	6.2
Diet Cola, 350 ml	Saccharin, 95 mg	2143	0.06*
Phenacetin pill	Phenacetin, 300 mg	1246-2137	0.3**
Phenobarbital, 1 sleeping pill	Phenobarbital, 60 mg	5.5	16***
Formaldehyde, industrial	Formaldehyde, 6.1 mg	1.5-44	5.8
EDB, industrial exposure	Ethylene dibromide, 150 mg	1.5-5.1	140

Table 1: Calculated risk factors for common chemicals.

* Material not believed to be gene-damaging; that is, acting as a carcinogen only by irritation or damage at high concentrations.

** Some evidence for increased kidney (renal) cancer after long-term use.

*** Apparently no cancer risk to people taking it for decades.

natural pesticides that we eat every day. He calculates that we eat about 10,000 times more natural pesticides than synthetic pesticides. More usefully, he and his coworkers have attempted to estimate the relationship between the amounts of different chemicals we are exposed to, and their potency as carcinogens. After all, it is the dosage that makes the poison, to coin a phrase. Some of his calculations are shown in Table 1, rewritten from Ames et al., 1987. The last column (HERP%) is a relative risk. A 5% HERP doesn't mean a 5% risk of cancer!

How then do these theoretical risks relate to the "real world"? A few links can be found. There have been perhaps dozens of cases of liver damage from comfrey-pepsin tablets, although this has been as "hepato-occlusive disease" rather than cancer. These comfrey-pepsin tablets have a risk factor (HERP%) of about six.

Although alcohol is a low-potency carcinogen, large quantities are consumed by some people. Alcoholics have significantly increased risk of cancer in the mouth and throat. Thus HERP's around five seem to be genuine risks. On the other hand, the HERP value of 16 for one phenobarbital sleeping pill is apparently not connected with any risk of cancer. (Note that phenobarbital is one of the numerous so-called carcinogens that shows up as positive only at tissue-irritating concentrations.)

One interesting point is that TCDD (the dreaded "dioxin" of milk cartons and teabags) is known to cause most of its effects by reacting with an animal component called "Ah receptor." There are chemicals in

broccoli, mainly indole-carbinol, that also react with the Ah receptor. Both chemicals can protect against cancer if administered before challenge with a carcinogen. Both chemicals can promote cancer if administered after the carcinogen has already acted.

Taking potency into account, a 100 g portion of broccoli has 20,000 times more effect on the Ah receptor than a legally allowable TCDD intake of six femtograms/kg/day. (Perhaps it is not surprising, then, that experiments in which rats given a carcinogen were protected by including broccoli or cabbage in their diet. There is evidence that humans too are protected by these vegetables: People who are high-crucifer eaters are significantly less likely to wind up in cancer wards.)

(5) *How pesticide regulations and chemical scares diminish public health.*

Diet is one of the key routes to better health. Only 9% of the US population eats sufficient fruit and vegetables, higher consumption of these would decrease cancer as well as other diseases. There is plenty of margin to increase fruit and vegetable eating.

To discourage consumption of vegetables and fruits is to diminish public health. Excessively strict limits on harmless levels of synthetic pesticides act to increase vegetable and fruit prices, by reducing production and by increasing cost of production. Thus these regulatory restrictions may well be harming health rather than helping it.

Similar comments could be made about the attacks on Alar a few years ago, when apples

disappeared from the lunchboxes of many children.

This then is one reason why Bruce Ames is hated by many "environmentalist" groups. He has shown that they are, in all likelihood, damaging public health under the guise of protecting it against non-existent or unimportant risks.

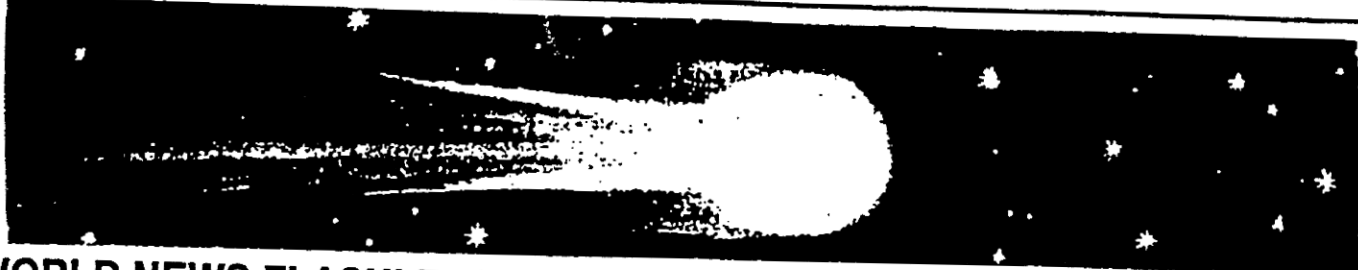
Acknowledgement:

This review was inspired by an article by Dr Arthur B Robinson in *Access to Energy*, April 1994.

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Dr Jay Mann is a plant biochemist and keen tramper whose physique demonstrates a life-long interest in food.



WORLD NEWS FLASH! FROM ASTRONOMER SOFIA RICHMOND

AN S O S ! TO POPE JOHN PAUL 11
ARCHBISHOP GEORGE CAREY
TO THE CHIEF RABBI
JEWISH BOARD OF DEPUTIES
PRIME MINISTER JOHN MAJOR
PRESIDENT BILL CLINTON
CHANCELLOR HELMUT KOHL
PRESIDENT MITTERAND
PRESIDENT YELTSIN

TO H.M. THE QUEEN
TO PRINCE CHARLES
TO NATIONAL & INTERNATIONAL
NEWSPAPERS
TO BBC TV NEWS
TO ITN NEWS EDITORS
TO CHANNEL 4 TV NEWS
TO CARLTON TV

POLISH ASTRONOMER SOFIA (RELIGIOUS NAME SISTER MARIE GABRIEL) PRINTED A COSMIC FORECAST SEVEN YEARS AGO ON THE 4TH JULY 1986 IN ALL THE NORTHWEST LONDON PRESS NEWSPAPERS THAT A HUGE COSMIC EVENT IS DUE SOON NAMELY THE GREAT COSMIC EXPLOSION OF A GIANT COMET IN OUR SOLAR SYSTEM. NOW SEVEN YEARS AFTER HER INITIAL PREDICTIONS IN THE PRESS 1986 THE AMAZINGLY ACCURATE FORECASTS OF SISTER MARIE GABRIEL ARE ABOUT TO COME TRUE SOON ANYTIME WITHIN TWELVE MONTHS. SHE PREDICTS THAT

**A GIGANTIC COMET IS ABOUT TO COLLIDE
WITH THE PLANET JUPITER BY 16TH JULY 1994
CAUSING THE BIGGEST COSMIC EXPLOSION IN
THE HISTORY OF MANKIND!!!**

**AS A WARNING ULTIMATUM FROM ALMIGHTY GOD
TO ALL GOVERNMENTS**

THAT THEY MUST OBEY HIS MESSAGE AT TOP SPEED OR FACE GLOBAL EXTINCTION BY AN ASTEROID READ THE PROPHET ISAIAH CHAPTER 24
GOD COMMANDS ALL NATIONS TO TEACH SCHOOL CHILDREN MORAL LAWS AND THE TEN COMMANDMENTS.
1. DRASTICALLY REDUCE THE CRIME RATE BY COPYING BIBLE'S SUCCESSFUL SYSTEM OF LAW AND ORDER
2. DESTROY ALL PORNOGRAPHIC MATERIAL SUCH AS INDECENT BOOKS MAGAZINES FILMS AND VIDEOS WHICH INCITE OFFENCES AGAINST WOMEN AND CHILDREN EVERY DAY
3. BAN ALL CRIME, INDECENCY AND VIOLENCE FROM TELEVISION BECAUSE TV VIOLENCE INCITES VIOLENT CRIME DAILY
4. GOD COMMANDS NHS HOSPITALS TO STOP KILLING OLD PEOPLE WITH MORPHINE OVERDOSES & STARVATION (KNOWN AS WITHDRAWING OF FEEDING). OLD PEOPLE ARE BEING KILLED OFF BY THE NHS TO REDUCE NUMBERS IN NHS WARDS.
5. ALCOHOLIC DRINKS TO BE REPLACED BY NON-ALCOHOLIC BEERS AND WINES
6. WOMEN MUST OBEY STRICT MODESTY LAWS IN PUBLIC TO REDUCE SEX CRIMES.
7. ALL CRUELTY TO BIRDS AND ANIMALS MUST BE STOPPED WITH SEVERE DETERRENTS. ITALY & SPAIN MUST STOP SHOOTING MIGRATING BIRDS. ALL ANIMAL LABORATORY EXPERIMENTS MUST BE BANNED.
8. ALL WARS IN AFRICA, YUGOSLAVIA AND OTHER NATIONS MUST STOP IMMEDIATELY, IF NOT NATIONS FACE GLOBAL EXTINCTION BY A GIANT ASTEROID. THE WARNING EXPLOSION OF THE COMET WILL HERALD A ROYAL COUP D'ETAT & A ROYAL REVOLUTION IN ENGLAND.
GOD HAS COMMANDED SISTER MARIE GABRIEL TO BE HIS MESSENGER AND AMBASSADOR.

LIST OF PUBLIC SAFETY PRECAUTIONS FOR JULY 1994

SOFIA PRINTED THIS ANNOUNCEMENT IN NEWSPAPERS ON 19 JULY 1993, SCIENTISTS ARE NOW CONFIRMING HER STORY IN JANUARY 1994. BBC TV HORIZON PROGRAMME INTERVIEWED HER IN THE HILTON HOTEL, PARK LANE, LONDON, ON 25 OCTOBER 93. DURING THE INTERVIEW SHE TOLD BBC TV THAT IT WOULD BE WISE IF THE PUBLIC WERE INFORMED OF THE FOLLOWING **LIST OF SAFETY PRECAUTIONS**, BECAUSE THE COMET/JUPITER COLLISION WILL CAUSE AN IMMENSE FLASH IN OUR SOLAR SYSTEM.

1. ADULTS AND CHILDREN SHOULD WEAR DARK GLASSES FOR SAFETY BETWEEN 15-20 JULY (**BETTER TO BE SAFE THAN SORRY**).
 2. IT WOULD BE WISER TO CLOSE DOWN NUCLEAR POWER STATIONS BY 1 JULY FOR SAFETY IN CASE JUPITER BLAST AFFECTS STAFF AT THE CONTROLS
 3. ALL AIRCRAFT SHOULD BE GROUNDED IN CASE THE JUPITER BLAST AFFECTS PLANES IN FLIGHT. HM THE QUEEN SHOULD AVOID ALL FLIGHTS BETWEEN 15-25 JULY 1994 FOR SAFETY.
 4. EMERGENCY SERVICES SHOULD BE ON STAND-BY JUST IN CASE SOME PEOPLE FAINT FROM SHOCK.
 5. IT WOULD BE ADVISABLE TO STAY IN COLD CELLARS OR BASEMENTS TO AVOID ANY HEATWAVE.
 6. KEEP CURTAINS DRAWN AND TURN ON AIR CONDITIONING, BUY FOOD FOR 5 DAYS AND KEEP PETS INDOORS.
 7. FARMERS SHOULD PROTECT LIVESTOCK BY KEEPING ANIMALS IN COOL SHEDS AND BARNES.
 8. DON'T DRIVE CARS, LORRIES, BUSES OR TRAINS IN CASE COMET/JUPITER BLAST AFFECTS TRAFFIC.
- IT IS BETTER TO MAKE A MISTAKE ON THE SIDE OF MAXIMUM CAUTION WHEN FACING THE BIG UNKNOWN.** AFTER THE COMET HITS JUPITER THE PLANET COULD LOOK LIKE A SECOND SUN IN THE HEAVENS. ON 12 FEB 91 HALLEY'S COMET ERUPTED AND BROKE INTO PIECES WHICH ARE NOW HEADING FOR JUPITER.
(SOFIA RICHMOND HELPED TO PUT OUT THE BUSH FIRE AROUND SYDNEY AFTER AUSTRALIAN CHANNEL 7 NEWS CAME ON THE 14TH JANUARY '94 AND FILMED HER METHOD OF BRINGING DOWN HEAVY RAINS IN 48 HOURS. THE RAINS POURED DOWN NEXT DAY.
3 YEARS AGO IN JUNE 1991 SISTER MARIE SENT A PROPHETIC REGISTERED LETTER TO THE QUEEN INFORMING HER OF THE IMPENDING COSMIC EXPLOSION. PALACE SENT A REPLY. BY 1ST JULY ASTRONOMERS WILL CONFIRM THAT SOFIA RICHMOND WAS CORRECT IN IDENTIFYING THIS COMET AS HALLEY'S COMET
BENEFACTORS ARE URGENTLY NEEDED TO PRINT THIS ANNOUNCEMENT ABROAD. PRESS MEDIA AND VIP TEL 061 450 2748 FAX 061 206 2774 FAX 061 452 2873 SCIENTIFIC FORECASTS SOCIETY TEL 061 452 5632

Maori Science?

Can traditional Maori knowledge be considered scientific?

Mike Dickison

The idea of a separate indigenous science, practised by Maori before European settlement and passed on to their descendants, is an appealing one. The phrase "Maori science" has cropped up in school curriculum reform and in Museum of New Zealand planning documents. Courses on it have been taught at university level. The Department of Conservation has decided it is "highly relevant to future policies for science and research". But does "Maori science" even exist?

At first, this seems a silly question. After all, we know that Maori possessed a huge body of knowledge about their environment, passed on orally for generations, even if today much of it has been lost. The knowledge of how to make bird snares, process karaka berries to destroy their toxins, and differentiate dozens of different varieties of harakeke surely qualify as science.

But science is more than a body of in-depth knowledge about the world. Other bodies of knowledge include history, literary theory, gardening, auto mechanics and rugby. If knowing a lot about flax is enough to make you a scientist, then so is knowing a lot about rugby. Although scientists tend to know a lot about their area of study, as astronomer Carl Sagan has said, "science is a way of thinking much more than it is a body of knowledge".

Defining Science

The aim of science is to understand how the world really works. Not just collecting facts about the world, but questioning the mechanisms behind those facts. Knowing how to prepare karaka berries is knowledge; trying to find out why and how they are poisonous, and how your preparation is removing the poison, is science. A perfect scientist (most are mere human beings) is continually questioning, never accepting hearsay or declaring an area

closed to inquiry. This aim of science, and all the methods that flow from it, is responsible for the extraordinary understanding of the natural world we have today.

Dr Ian Hawthorn of Waikato University defines science as "objective rational co-operative knowledge acquisition". That is, it deals with the real or empirical world as opposed with subjective opinion or personal belief. It believes that the world can be understood rationally, without recourse to the supernatural, and it operates through the sharing of knowledge by scientists.

Under this definition of science, how does Maori knowledge measure up? The answer, it seems, is not very well.

Kaumtua Morris Grey has pointed out that there was no demarcation between religion and knowledge in Maori culture. Religion's goal is not to understand the natural world, but to help people to live in it. It operates on faith and authority. However good the knowledge database possessed by Maori, questioning ("Why don't kakapo fly? Why is the sky blue? What is a rainbow?") would quickly bring you up against religious and supernatural explanations, which by their nature are not open to questioning.

Maori culture was not alone in this, of course. On the contrary, every society in the world until very recently operated much the same way. Society then was what we today would call authoritarian, where the authority of your elders and gods was not up for challenge. In Maori society, knowledge was not freely available, but imparted to those who were deemed worthy in a controlled environment. Knowledge was power, and had to be restricted. It was legitimised by the authority of your teacher.

A society in which science can develop needs to have people with sufficient technology and leisure time to do research. It also has to have a good communications network, and ways of

reliably storing, disseminating and duplicating information. This state was nearly reached in several ancient societies, but the right conditions were only achieved a few hundred years ago in Europe, and it is only an accident of history that science began there and not in China or South America. Maori society had neither the communications network nor the social structure for collaborative research to go on between different iwi.

So Maori knowledge acquisition was neither objective (relying as it did on religious faith), rational (it mixed supernatural with mundane explanations), nor co-operative (it relied on authority rather than challenge and consensus).

Matauranga

It seems then that "Maori science" doesn't qualify as science. What should it be called then? Botanist Murray Parson has suggested the useful word *matauranga*, one Maori term for knowledge, and one which makes no assumptions about how scientific that knowledge is.

The phrase "Maori science" is problematic in a second sense. Most scientists would agree that the universality of science is one of its strongest features. Science is only accidentally European and, more importantly, can be practised by any culture. So the terms "Pakeha science" or "Western science" do not make sense — either a practice is science or it is not, regardless of the practitioner's culture.

Maori knowledge or *matauranga* seems to have concentrated more on getting along in the world than understanding what makes it tick; it has more to do with technology than science. The words science and technology are often used together or interchangeably, but biologist Lewis Wolpert has argued that until quite recently the two areas had very little to do with each other — the technology our ancestors

used for hunting, farming and building houses was uninformed by science until the 19th century. So *matauranga* may not be science, but that is only one of the problems that would assail anyone that tried to defend it as a research method or a curriculum subject.

Demeaning Traditional Knowledge

Calling *matauranga* a science demeans it. Maori knowledge — a mixture of religion, mythology and observed facts — is sometimes inconsistent and often resorts to an appeal to authority to justify a statement. It has different aims and standards to science. Moreover, to contrast it with “Pakeha” science, which is wider in scope and both more detailed and more accurate in almost every case, will teach Maori children that they are heir to a “science” that is less comprehensive and often simply wrong. Scientific standards are the wrong ones to use when examining *matauranga*.

Consider the story quoted by early anthropologist Elsdon Best about the pukeko arriving in New Zealand on the Aotea or Horouta canoes. This is a good example of the sort of knowledge claim that might be put forward in a Maori science class. It is also empirically testable. Ornithologists will point out that although pukeko are indeed found though most of the Pacific, New Zealand pukeko belong to the Australian subspecies, not the Pacific. This is consistent with other facts, such as the ancestors of takahe being pukeko which settled here long before humans, and the number of other bird species that have arrived here from across the Tasman. It is not, however, consistent with *matauranga*.

Such contradictions and anomalies are not rare. If *matauranga* were to qualify as science, it would have to play by the rules of the game and discard its mythological and religious elements. To many, and I am sure to most Maori, this seems a ludicrous solution, one which would rob *matauranga* of its coherency and richness.

There is another problem with the concept of Maori science. Although some of its promoters have the laudable aim of making science more accessible to Maori children, setting up an opposition between Maori and

Pakeha science will have a different effect. The message conveyed will be that “real” science, with its wide-ranging and powerful explanations, is owned by Pakeha, and that Maori own only a lesser version.

As artist Cliff Whiting has pointed out, this ignores the fact that any race and culture can practice science. Members of historically excluded groups, such as Maori and women, should be encouraged to participate in science, not taught that it is the tool of the dominant culture and that to study it is to sell out.

Why Indigenous Science?

Given that there are so many problems with the notion of indigenous science, why is it being promoted at all?

The seminal publication in this area is a paper by Liz McKinley, Pauline Waiti and Beverley Bell, published in 1992 in the *International Journal of Science Education*. It advocates studying the culture of Maori students to encourage their achievement in science. The proponents are not cynical and malicious, as the creationist movement in the US has been in its struggle to introduce religion into science classes. They genuinely believe that Maori knowledge is science and should be taught. The problem here is that criticising their solution could be misinterpreted as criticising the very real problem of poor Maori participation in science.

About half the paper offers constructive suggestions for making science relevant to Maori. Again and again, however, the authors slide from this point to actively defending a separate indigenous science. Their use of the term “Maori science” seems to be an attempt to legitimise *matauranga* in Pakeha eyes, by borrowing the cloak of science to confer some mana. As Mere Roberts, a zoologist studying kiore, has pointed out, this is a little like the situation of some decades ago, where some Maori discarded their language and culture by “trying to be Pakeha”. Why should Maori have to “legitimise” their *matauranga* by trying to turn it into science?

Maori science is not being talked about only in academic journals. In 1992, the Department of Conservation,

in response to the debate generated over the poisoning of kiore, the Polynesian rat, gave a bicultural presentation. Roberts talked about kiore from a scientific point of view, Bradford Haami from that of *matauranga* (which DoC called tikanga Maori, or Maori custom/protocol). The message was that each of these “techniques” of data-gathering are of equal value when doing research, and that this approach was highly relevant to future policies for science and research.

In 1993, McKinley and Waiti are on contract to the Ministry of Education to translate the NZ Curriculum Science Statement into Maori. An interesting point made in their paper is that some scientific concepts will not be crossing the language barrier; the concepts taught in Maori may not be the same as those taught in English. Their example is that in Maori “wind” would be termed “Tawhirimatea” for the name of the Maori god of wind. They defend the inclusion of religion in a science course by pointing out that concepts of energy taught by a physics and a chemistry teacher also differ, which hardly seems a reasonable analogy even if it is true.

The idea of Maori science seems to make sense at first hearing, partly because of a vernacular but inaccurate definition of science as “a body of knowledge”, and partly because it appeals to the fairness of teachers, who genuinely want different perspectives and to tell both sides of the story. The latter appeal is misleading, and echoes creationist requests for equal time for their story. Presenting two alternative viewpoints is only appropriate if the viewpoints are genuine alternatives; that is, if they are seeking to do the same thing in different ways. Science and *matauranga* do not seek to do the same thing.

The transitions going on in New Zealand society at the moment mean that discussions of cultural beliefs can become emotionally polarised, with misquotation and misunderstanding running riot. Posturing, name-calling or Maori/Pakeha-“bashing” will not help answer these issues. It is vital that critical and constructive argument can occur instead.

Mike Dickison is a research associate in the Philosophy of Biology at Victoria University.

Chch trial raises questions about validity of 'recovered memories'

Hb. 21 Nov 1994

About 9pm on a wet night in March the jurors returned to the courtroom looking haggard and defeated. For the previous nine hours they had debated whether they could rely on allegations of sexual abuse made by two women against their 44-year-old father.

Allegations of rape, sodomy, and sexual violation within a family are not in themselves extraordinary. Sadly, undeniable cases of such abuse are all too frequent.

The unusual feature of this case was that the daughters, now 19 and 21, had no knowledge of the acts they alleged until about three or four years ago when, they said, "memories" of the abuse surfaced. For probably the first time in New Zealand history a jury was required to assess the reliability of so-called recovered memories. It was always going to be a difficult task.

The field is extremely contentious. Briefly, so far as sexual abuse is concerned, the "recovered memory" theory says that a person subject to such abuse suffers an experience so traumatic that it is not recorded in conscious memory. The memory is not "recovered" until years later, often under counselling or therapy.

The therapeutic profession is itself split on the assertion that the mind can block out traumatic events (such as sexual abuse) and recover them at a later stage. In the United States, psychiatry is hotly divided about the very existence of the phenomenon. Supporters argue strongly that it is real and common; critics, including some of America's most eminent psychiatrists, denounce it as a sham and a disgrace to the profession.

Proponents of "recovered memory" say the memories are the genuine recollections of people who tell their stories reluctantly. Detractors argue that the memories are stimulated by suggestive questioning from therapists acting on the pre-conception that sexual abuse lies behind most mental disturbances.

In the United States deep misgivings have set in. Persons with "recovered memories" have retracted them, convictions based on them have been overturned, and therapists and counsellors who are alleged to have induced the "memories" have been sued for malpractice.

In the Christchurch case little of this debate reached the jurors. The reliability of the sisters' evidence was an issue entirely for them, they were told. They returned not guilty verdicts on three of the charges and were unable to agree on the remaining five charges. The charges have now been dropped because of the unwillingness of the complainants to give evidence again.

The sisters alleged that their father had sexually abused them over more than 15 years. They said they had no memory of this, however, until the

New Zealand's first trial featuring testimony based on so-called "recovered memories" was recently held in the High Court in Christchurch. Confidence in the reliability of such memories received a further knock, as High Court reporter MARTIN VAN BEYNEN reports.

elder of them went for counselling after a minor bicycle accident. The younger sister began her "flashbacks" after attending a counselling session with the older woman and their mother in an effort "to improve family communication".

Some expert evidence was provided at the trial by Christchurch psychiatrist Dr Karen Zelas, who believes that the concept of recovered memory is valid. She said the mind could block out traumatic events through defence mechanisms known as denial and dissociation. She gave the example of a 50-year-old client who had been locked in the same room as his father when his father shot himself. All her client could remember was banging on the window in an effort to get help, she said.

The likelihood of two people from the same family reacting to abuse by resorting to the defence mechanisms she had outlined was not put to her.

The two sisters' evidence referred to much more extensive memories than those of Dr Zelas's client. After initial "flashbacks" they had told of detailed and graphic images of being abused from an early age, in the case of one them, when she was a baby.

Their memories had consisted of flashbacks and "somasensory" experiences where they had relived the feelings and emotions — sobbing, revulsion, rage — experienced at the time of the alleged abuse.

As time and counselling went on the clarity of the "memories" had sharpened. The older sister said her most vivid memories were recalled during moments of intimacy with her boyfriend more than a year after the initial flashback.

In effect the sisters had recovered a whole new past. Memories of a generous father who took them on outings and who took a concerned part in their upbringing had to co-exist with feelings and images of dread, fear, threats, and gross abuse.

Now all their father's behaviour was suspect. Outings and holidays were his way of buying their affection and his explanation about their rabbit going missing was a device to show how easily they could share the same fate.

One surprising element of the sisters' evidence was their recollection of events in their past which had occurred without the trauma regarded as the pre-requisite for the blocking mechanism to operate. They also told the court they had recovered the way their minds operated to block out the

abuse. The younger sister, for instance, could remember the "curtain coming down. I would disassociate myself and travel somewhere in my mind".

The nature of the alleged recovered memories also appeared to cloud recollection which had never been lost or blocked. Asked to describe their feelings at their father's wedding in June 1990 they said that "part of them" had been happy to attend because their father would now not need them for sexual activity and they could now have normal lives. The defence was then able to point out that neither of the young women had recovered any memory of abuse until at least a month after the wedding.

The jury no doubt found this all rather perplexing. They would have to concede there were inconsistencies in the complainants' evidence but were they sufficient to undermine the allegations? Could these apparently genuine, intelligent, and articulate young women have become deluded to the extent they were prepared to give evidence against their father?

Into the equation would have gone the fact the young women had been taken seriously by the police and the Crown prosecutor. Accident Compensation had paid out \$10,000 to each of the complainants and subsidised their counselling over two years. The women's counsellors had obviously believed the claims as evidenced by their readiness to support the women at an arranged meeting to confront their father.

(He denied the allegations and told the women to go to the police.)

The jury would have wondered from where the things the women said they had recalled could have come if the events had not occurred.

The defence tried to provide some answers but did not bring expert testimony to show how genuine but wrong beliefs could come about. The defence were able to point to cards, songs, and other bits of family history which showed the women had been very fond of their father before his second marriage, which appeared to result in some bitterness in the family.

Defence questions elicited the fact that the complainants and their mother were heavily involved in the counselling culture. The older sister had been having counselling for various problems including solvent abuse since she was aged 14. The younger sister expressed her ambition of being a counsellor for teenagers who were "constantly depressed like herself".

The issue of the influence of counsellors was not a major one at the trial although neither complainant had recalled anything before going into counselling. The sisters said none of their counselling had been suggestive or interventionist. They had been encouraged to talk about the memories but were not probed, they said.

The defence were also able to show that the concept of recovered memories had been in the family since the mid-80s and the complainant's mother had been involved in re-birthing, hypnosis, astrology, psycho-drama, and gave workshops in astro-drama (acting out "astrological energies").

None of these interests in the family environment were shown to have affected the women's allegations, however.

A worrying aspect of the trial for both the prosecution and the defence was the similarity between the complainants' allegations. As the younger woman had begun to "recover memories" a year or so after the older sister the implication was that her allegations had been influenced by the earlier disclosures. Neither of the complainants was completely truthful about how much they had known about each other's stories before the trial.

The risk of contamination resulted in a very strong warning to the jury from both the judge, Justice Tipping, and Crown counsel, Mr Brent Stanaway.

In the end the jury rejected three of the four charges based on the younger woman's evidence. The hung verdict on the other five charges shows some jurors — it is impossible to say how many — were convinced the older sister had recovered reliable and accurate memories.

The case demonstrates the difficulties juries will face in this field. Twelve laypeople are, unfairly it might be thought, thrown into an area where the experts have yet to reach consensus.

The case discussed will be one of the easier ones. It was a clear-cut case of allegations being made after counselling and there was plenty of ammunition for jurors who wanted to acquit.

The next case could be much more finely balanced.

And what of the accused? The costs of defending the allegations may well have bankrupted him.

If in fact the memories are erroneous he did nothing to bring the charges on his own head. He could pursue a claim under the Costs and Criminal Cases Act but realistically cannot expect to recoup more than a fraction of the amount he has spent.

What could compensate him and his new family for the upheaval and torment of being falsely accused?

13 March '94

Child abuse slur still haunts former Kiwi minister

LONDON (by Nick Brown of NZPA) — The Rev Morris McKenzie is trying to lead a quiet life in retirement these days, but the nightmare that shattered his life three years ago won't go away.

The former New Zealand lawyer, whose midlife career change saw him serving God in Scotland, on February 27 1991 had police pounding his front door at dawn seeking evidence that he was conducting satanic rituals of child abuse on the island of South Ronaldsay in the Orkney group.

In similar raids the same morning, nine children from four families on the island were taken away by police and social workers.

A judicial inquiry in October, 1992, criticised the authorities for acting too precipitately and with closed minds. Lord Clyde, who chaired the inquiry, said Mr McKenzie and the parents of the families "should be presumed innocent".

The inquiry's narrow terms of reference stopped it short of attributing blame for the heart-wrenching events on South Ronaldsay.

But media investigators, a Scottish sheriff (judge) and children's court official all pointed to accusations of child abuse being coached out of children by social workers acting on American-originated theories that ritual abuse of children is widespread and undetected.

The four families are now suing the Orkney Islands council for a million pounds (\$NZ2.6 million) compensation, claiming its social workers were negligent in removing their children for five weeks.

But Mr McKenzie, 66, having suffered a horrendous slur on his character, is left without legal redress or even any apology from the council or the government's Scottish Office.

SECRET ADDRESS

Having retired late last year after 15 years as Church of Scotland minister on South Ronaldsay, he now lives at a secret address on the Scottish mainland. NZPA contacted him through an intermediary and he emphasised how he now just wanted some "peace and quiet".

He is still aggrieved at being denied the right to clear his name, but thinks he has exhausted all avenues.

"I was defamed horribly in the Clyde inquiry and my name was mentioned many times with statements that were completely and utterly false," he said.

"The Scottish Secretary, in a letter to an MP, virtually admitted that, but said the Clyde report is privileged, so you can't sue. That situation, I think, is quite wrong."

Although social workers named Mr McKenzie — alleging he was a masked and hooded figure who pulled children into a ring with a crook to perform sexual acts during satanic orgies — he had no opportunity to address the inquiry because of its terms of reference.

He said Lord Clyde's comment that he and the parents involved should be presumed innocent was "just a vague and general statement" which meant nothing.

"I have asked many times for a full inquiry but (Scottish Secretary) Ian Lang just refuses point blank. He makes no apology for any injustice and he has no justification whatsoever," Mr McKenzie said.

Last year the Church of Scotland's general assembly had unanimously denounced his "denial of rights" and he took some comfort from that.

'DISINFORMATION'

But he said social workers had spread a programme of disinformation against him, including a defamatory suggestion that he had left New Zealand because of sexual impropriety.

Mr McKenzie had been a solicitor for the Ministry of Works in Dunedin, Wellington and Auckland. When he had the "calling", like his father who had been a church minister in New Zealand, he decided to go to one of Scotland's several theological colleges in 1974.

Both he and his wife Jan have family roots in Scotland and his abiding interest in medieval archeology has kept them there in retirement.

Poor health — he suffers from angina — has prevented him from returning to South Ronaldsay during the past cold winter.

But he said former parishioners had stayed with his family at their new home and he had corresponded with families still battling the authorities from the island.

Mr McKenzie shares the outrage of many islanders that social workers have prevented six children returning to their mother and that social workers are believed to be pushing through the adoption of the two youngest children by their foster parents.

It was in this family of 15 children that allegations of sex abuse first arose on South Ronaldsay. Their father was jailed for seven years in 1986 for a series of offences against them.

INTO CARE

Eight children were then taken into care when an older sister made unproven allegations of inter-sibling abuse. Two boys have been returned to their mother, but six remain with their foster parents including the two youngest girls, aged seven and 10, for whom adoption is pending.

Mr McKenzie believes the best place for the children is with their mother.

"The youngest child was only four when she was taken away three years ago and her mother hasn't had any access to her for 18 months," he said.

"The social workers are pushing ahead, regardless of what people think. They feel if they back down, it will break down their whole bureaucratic structure."

The care shown for this family by Mr McKenzie and neighbouring families eventually trapped them in a whirlpool of rumour and fantasy — which social workers took as fact after hours of questioning children.

"We had these so-called therapists putting my name to the children about 28 times. They were determined to get me — I don't know why," Mr McKenzie said.

Satanic abuse 'experts' attacked

By ALAN SAMSON

THE Social Welfare Department, police and courts are heeding a small number of misinformed "experts" in dealing with ritual and satanic abuse allegations, according to a senior Wellington academic.

Victoria University sociology professor Mike Hill made his comments after a British Government report earlier this month found no evidence of abuse directed to a magical or religious objective.

The report, for British

Health Minister Virginia Bottomley, was written by Jean La Fontaine after allegations, subsequently disproved, of ritual child abuse in the Orkney islands involving a New Zealand Presbyterian minister.

After studying all cases of organised and ritual abuse of children reported between January 1988 and December 1991 — 211 in total — Professor La

Fontaine made a damning assessment of British procedures.

She found instances of younger children being influenced in their disclosures by mothers and interviewers.

She concludes that an evangelical Christian campaign against new religious movements has been a powerful influence encouraging the identification of satanic abuse.

"Equally important in spreading the idea of satanic abuse in Britain are the profes-

sional 'specialists', American and British. Their claims or qualifications are rarely checked."

Professor Hill said the situation was worse in New Zealand because of its small size.

The origins of ritual and satanic scares had been traced to America and Britain.

The worry in New Zealand was that the "experts" were few and the same people kept reappearing in that guise in the large-scale abuse cases.

Scepticism urged in a mystical age

H
Press March 1 '94

The world might be no less gullible than it was a century ago, says Clyde Herreid, a visiting American scientist. He talks to CHRISTOPHER MOORE.

You have been told that your neighbour has been abducted by aliens from another galaxy while successfully performing psychic surgery in a commune of Sufi crystallogists near Greymouth. You have also been informed that the world will end precisely at 3pm next Tuesday.

It must be true because it has been featured on "Holmes" and the front page of your local newspaper. Here in this rational, scientific age where everything from the economy to your sex life is seemingly governed by science, you are suddenly confronted by the unbelievable. There are more things in the news media than dreamt of in your philosophy.

Relax. Take a dose of sceptical inquiry. Become like Rudyard Kipling's Elephant Child and adopt a mood of "satiating curiosity". The shadows of quackery, deception, and deceit can be purged with a healthy dose of scepticism according to American scientist and educationist Clyde Herreid.

He believes that the many rather than the few should be educated in the use of science as a tool to examine any unusual claim.

"Extraordinary claims should be met by extraordinary evidence," he suggests.

It comes as no surprise to learn that Clyde Herreid is a confirmed sceptic. However, when confronted with the results of a recent poll which revealed that 85 per cent of the American public believed in extra-sensory perception, the occult, and the paranormal, even Herreid's enthusiasm wilts imperceptibly. The same poll revealed that 50 per cent of Americans hold doubts about the theory of evolution.

Sceptics, it seems, have a long road to travel, but Clyde Herreid, visiting New Zealand from his work as a biologist at the State University of New York at Buffalo,

believes that rational scientific investigation can only educate and improve.

"While the scientist asks for evidence, the average citizen has no way of evaluating many of these claims. We live in a scientific and technological age where everything from the economy to our sex lives is driven by science. In the face of that, the world has created a New Age mysticism, where the occult has a much higher profile internationally.

"It's hard to evaluate whether the world is any more gullible than it was 100 years ago. Certainly we are educating more people, but the communication technology means that the publicity given to many of claims is quicker and more extensive."

He cites a rising number of cases in the United States, where individual claims have been lodged with the courts seeking compensation for alleged injury caused by commercial products.

"When a case comes to trial, there is usually no substantial evidence to support it. Nevertheless, juries continue to award damages to the plaintiff. It is part of a Deep Pocket Syndrome, one which reflects the dearth of concern about critical thinking, analysis, and scepticism towards these claims."

Clyde Herreid lays the bulk of blame for this situation at the feet of universities, where individual departments have become driven and obsessed by their work while professing no interest in any other areas of research.

"We focus all our attention on these individuals. We still have not figured out good ways of communicating science in an exciting fashion or devising methods of developing critical thinking among the public.

"I am concerned to see us changing the curriculum in ways which will engage the average person in developing a healthy

Clyde Herreid: "extraordinary

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PHOTO: RICHARD COSGROVE

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deception — professional magicians — should also be involved.

"The first question which has to be asked is whether the incident happened or whether it happened in the way described. On closer examination most of these alleged events soon emerge as false. The media has a special obligation. It often encounters these claims first and it needs to raise doubts in the public mind about their validity.

"The media's obligation is to be sceptical at all times. Should it publish or broadcast these claims at all? If it is decided to report a claim, the obligation is to be sceptical and find expert opinion to examine it.

"This should involve serious scepticism, not merely token examination."

Many claims should be simply treated as novelties and not given credence by flying in the face of expert opinion.

"Do this and you do your readers a disservice. It makes people doubt the

value of the other reporting," he says.

Clyde Herreid concedes that it may be too much to expect people to live in an entirely rational world. After all, humanity had survived billions of years of evolution by trusting in their senses. When something moved, we believed it moved and paid it close attention to avoid being eaten.

This survival technique was a two-edged sword, which also meant that attention could be distracted and the mind easily deceived. It remains a genetic trait which possibly allows deception to remain alive and well in the technological age.

"Everybody can be fooled. Nothing wrong in that. Enjoy it. We love fantasy and stories, and imagination is important for our creativity, but so is a sense of inquiry and scepticism. There is always someone out there looking to make money from human gullibility," says Clyde Herreid.

'Scaremongering' angers dentists

Denham 7 June 1994

DENTISTS are angry that a Tauranga chelation therapist is "scaremongering" by claiming that amalgam tooth fillings cause mercury poisoning, despite a ruling there is no proof the two are linked.

In two landmark decisions last week the Accident Compensation Appeal Authority rejected two claims of mercury poisoning caused by amalgam tooth fillings.

However, the authority, Judge Brian Blackwood, ordered the Accident Rehabilitation and Compensation Insurance Corporation to pay more than \$9000 toward costs of the appellants, Alison Watts and Gwenneth Hudson, both of Mt Maunganui.

Tauranga chelation therapist Mike Godfrey, who supported the cases and has treated the women for what he claims is mercury poisoning, said amalgam fillings should be banned.

"Don't have any more and definitely don't let your children have them," Dr Godfrey said yesterday.

But Dental Association executive director Laurie Croxson said the court ruling did not surprise dentists as there was no scientific or medical evidence that fillings containing mercury caused poisoning.

Amalgam fillings were one of a range used by dentists but were the cheapest and most "user-friendly". There was no reason to ban them.

Fish had more mercury than fillings so "you're more likely to be poisoned from eating snapper than getting your teeth filled", Mr Croxson said. Dentists were angry that "people like Dr Godfrey" caused unnecessary fear.

Judge Blackwood labelled the

By SARAH CATHERALL

claims as "Dr Godfrey versus the Establishment", a view he said was backed up by indirect testimony that Dr Godfrey "wanted to use the ACC claim to establish himself as an expert in mercury poisoning".

He said though mercury had been banned in some countries, there was no evidence to support the diagnosis of mercury poisoning from dental amalgam fillings. The medical conditions the women suffered were intermittent and different from symptoms of mercury poisoning.

Dr Godfrey said he was trying to get the cases defined as dental misadventure and had the women's interests at heart.

Dr Godfrey said Mrs Watts used to grind her teeth away and had 109 amalgam fillings in nine years.

She was diagnosed with multiple sclerosis 25 years ago and was on crutches for most of her adult life. Since he "diagnosed" her with mercury poisoning and treated her, pumping a solution into her body to get rid of toxins, she had been "walking on high heels".

"When someone's exposed to that much amalgam, it's got to have a toxic effect," Dr Godfrey said.

Mr Croxson said dentists offered patients the choice of fillings. However, amalgam fillings were most commonly used as they were half the price of plastic fillings and more durable.

"If amalgams are rejected tomorrow, what will be available for those people who can't afford to get their teeth filled?" he said.

Satanic abuse does not exist — report

by Rosie Waterhouse

SATANIC abuse does not exist, a British Government inquiry has concluded. A three-year investigation funded by the Department of Health has found no evidence to substantiate any of the 84 cases in which it was alleged that children were sexually abused during satanic, black magic rites.

The official report, which was commissioned in 1991 after children had been snatched from their homes in dawn raids by social workers and police in Rochdale and on the Orkney islands, is due for publication next month.

It blames the evangelical Christian movement and self-proclaimed "experts" for spreading the satanic-abuse scare. And it suggests that social workers and others believed in it because involvement with the Devil explained why parents could harm their own children, reviving "an age-old myth" of cults controlled by unknown, powerful, and dangerous strangers.

Providing the first official definition of satanic abuse, the report explains: "Rites that allegedly include the torture and sexual abuse of children and adults, forced abortion and human sacrifice, cannibalism and bestiality may be labelled satanic or satanist."

"Their defining characteristic is that the sexual and physical abuse of children is part of rites directed to a magical or religious objective. There is no evidence that these have taken place in any of the 84 cases studied."

The report stresses there is a distinction between satanic and so-called "ritual" abuse. Three substantial cases of ritual abuse were found.

"In these cases the ritual was secondary to the sexual abuse, which clearly formed the primary objective of the perpetrators. The rituals performed in these cases did not resemble those that figured in the allegations of the other 81 cases."

The research was conducted by Jean La Fontaine, emeritus professor of social anthropology at the London School of Economics, an expert on child abuse and on cults.

Professor La Fontaine had access to the files of every police force and social services department that investigated allegations of satanic or ritual abuse in Britain since 1988. Allegations were investigated by police forces from Kent to Strathclyde, including Nottinghamshire, Derbyshire and Merseyside, but no evidence was found to corroborate the claims. Similar stories of satanic abuse first surfaced in the United States and have since spread to other countries including the Netherlands, Norway, and Australia but no evidence has been found.

The report attempts to explain how the stories began. "The alleged disclosures of satanic abuse by younger children were influenced by adults. A small minority involved children pressured or coached by their mothers."

"The interviews during this period (1988 to 1991) were frequently poorly conducted. Too-frequent interviewing, leading questions, contamination, pressure and inducements to agree to suggestions, may have resulted from the anxiety of the interviewers to find out what happened."

"As a result of the way in which it was collected, recorded and transmitted, the evidence said to represent children's disclosures was unreliable and misleading. What is defended as 'what children say' may be nothing of the sort."

The report also tries to explain how the satanic abuse scare spread. "The evangelical Christian campaign against new religious movements has been a powerful influence encouraging the identification of satanic abuse. Equally, if not more, important in spreading the idea of satanic abuse in Britain are the 'specialists', American and British. They may have few or even no qualifications as professionals but attribute their expertise to 'experience of cases'. Their claims or qualifications are rarely checked."

In some of the cases investigated the children really had been sexually abused but treating them as victims of satanic abuse caused further problems.

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Seance jury probed

June 1994

LONDON, June 20. — Britain's Appeal Court was asked today to review a murder trial because three jurors allegedly used a Ouija board to contact one of the victims before finding a man guilty.

Lawyers for Stephen Young told the court they had received anonymous information from another juror about a seance in the hotel the jury occupied the night before they found Young guilty of shooting newlweds Harry and Nicola Fuller.

They said, the three jurors "contacted" the dead Mr Fuller, who named Young, 35, as the killer. The 12-person jury went on to convict Young.

Young's lawyers argued that if

they could prove the seance took place, it would show that the jurors did not reach their verdict solely on the basis of evidence in court.

Young should therefore be given leave to appeal against his conviction and sentence of life imprisonment.

The court, asked today to decide on the narrow issue of whether it is entitled to inquire into the allegations about the seance, reserved judgment to a later date.

Lawyers for the British Crown opposed the application, arguing that to reopen the case would flout a British law which prevents courts from inquiring into a jury's deliberations. — Reuter

□ **Creche crime.** Last Friday a Wellington man was sent to jail for crimes against children in his care at a creche. But what happens when the accusations are wrongly made? Post reporter Suzanne Green writes.

A N AUCKLAND woman is trying to come to terms with the horror of being falsely accused of physically abusing creche children.

Last month, after a two-week trial, she was acquitted on eight charges of wilfully ill-treating eight children between March 1992 and March 1993. The Auckland District Court jury took 3½ hours to reach its verdicts.

Her name and that of the creche was suppressed.

In a telephone interview with The Post

Living with the horror of false child abuse accusations

the 33-year-old mother of two spoke of a year of sheer hell.

She said she and her husband had shares in the creche which was run by herself and another woman, also a partner in the business. After about a year she and her husband were unhappy with some aspects of the business and sold up.

"Two weeks after I left I heard the first rumours there was an investigation about me over child abuse."

"My initial reaction was, 'It couldn't be happening. What on earth could they accuse me of'."

In the weeks and months that followed social welfare and finally the police were

brought in. She said she was only questioned by social welfare once and that related to an allegation of force-feeding a child. She offered them a list of creche staff and parents she said could prove she had not done this but they dismissed it as a character witness list.

In August last year she went with her children to Hamilton for a two-day visit to her parents. It was her birthday.

She had only just arrived when the police came and arrested her. She ended up in Hamilton District Court bewildered, confused.

"Here was an ordinary kindly teacher being treated like an utter criminal."

She said there were no initial parent complaints. And at her trial no children gave evidence against her.

Of the court proceedings she said she received no official support and financially it was devastating.

"You are presumed guilty until you are proven innocent. It's meant to be the other way round, but it's not."

Her defence cost thousands of dollars. She and her husband paid right up until the time of trial and "when we were utterly desperate we got legal aid."

The jury had taken the unusual step of signing a letter recommending she be awarded costs.

It seemed innocent people had to fight the system while those making the accusations had all the time in the world to sit down and get their stories straight, she said.

As well there was no access to counselling as there was for victims.

"We're really broke and can't afford to pay for counselling," she said.

"People have turned around to us and said, 'You must be on a real high.'"

But it was nothing like that.

"It's such a long, battle, so hard. Such an ordeal," Mrs X said.

For her it is the end of a career in childcare, something she had trained three years for and had put her heart into.


"Now I'm so professionally damaged I would find it almost impossible to set up a business in child care. I probably won't ever go back to child care."

It was going to be a long time before she would be able to put the nightmare behind her.

"I can't put it to rest yet. I have to put it out of my system — the horror of it, the injustice of it."

"It's going to take quite a while." □

THAT'S RIGHT, MARK. IN RECENT YEARS, MY PATIENTS HAVE MADE TREMENDOUS PROGRESS BY RECALLING REPRESSED CHILDHOOD TRAUMA THROUGH HYPNOSIS!



AND YOU'LL HAVE A CHANCE TO
HEAR DAN IN ACTION WHEN HE
PUTS YOURS TRULY UNDER-RIGHT
HERE ON LIVE RADIO! THAT
AND MORE WHEN WE RETURN!

SO, DAN—HOW'S THE FAMILY?

NOT SO GOOD. I HAD TO SUE MOM.

NOT SO
GOOD. I
HAD TO
SUE MOM.

OKAY, CAMPERS,
HERE WE GO! OUR
OL' FRIEND DR. DAN
ASHER IS ABOUT TO
PUT YOURS TRULY
UNDER! TAKE IT,
DAN!

OKAY, CAMPERS,
HERE WE GO! OUR
OL' FRIEND DR. DAN
ASHER IS ABOUT TO
PUT YOURS TRULY
UNDER! TAKE IT,
DAN!

THANKS, MARK!
WHAT I'LL BE
DOING IS HYPNO-
TIZING YOU IN
ORDER TO RECOVER
LONG-REPPRESSED
MEMORIES...

THANKS, MARK!
WHAT I'LL BE
DOING IS HYPNO-
TIZING YOU IN
ORDER TO RECOVER
LONG-REPPRESSED
MEMORIES...

I MUST CAUTION
YOU, IT COULD GET UGLY.
WE'LL BE ACCESSING ALL
SORTS OF EXPERIENCES
AND IMAGES YOU'VE
LONG FORGOTTEN,
OKAY?

I MUST CAUTION
YOU, IT COULD GET UGLY.
WE'LL BE ACCESSING ALL
SORTS OF EXPERIENCES
AND IMAGES YOU'VE
LONG FORGOTTEN,
OKAY?

FINE. HEY,
COULD YOU
FIND MY KEYS?
I CAN'T REMEM-
BER WHERE I
PUT THEM.

I'LL SEE
WHAT I
CAN DO.

FINE. HEY,
COULD YOU
FIND MY KEYS?
I CAN'T REMEM-
BER WHERE I
PUT THEM.

I'LL SEE,
WHAT I
CAN DO

**ON-AIR REPRESSED-MEMORY-
HYPNOSIS THERAPY...**

YOU FEEL RELAXED...
YOU FEEL COMPLETELY
RELAXED NOW!
DON'T YOU, MARK?

4-20

**ON-AIR REPRESSED-MEMORY-
HYPNOSIS THERAPY...**

*YOU FEEL RELAXED...
YOU FEEL COMPLETELY
RELAXED NOW,
DON'T YOU, MARK?*

YES.
YES, I
DO.

WHERE
ARE YOU
NOW, MARK?
CAN YOU
TELL ME?

YES,
YES, I
DO.

WHERE
ARE YOU
NOW, MARK?
CAN YOU
TELL ME?

I'M... I'M
STANDING
OUTSIDE...
ON A
DESOLATE
COUNTRY
ROAD...

YOU SEE
SOMETHING,
DON'T YOU?
IT'S AN
ALIEN, RIGHT?

68 Prud'homme

I'M... I'M
STANDING
OUTSIDE...
ON A
DESOLATE
COUNTRY
ROAD...

YOU SEE
SOMETHING,
DON'T YOU?
IT'S AN
ALIEN, RIGHT?

UM... I DON'T THINK SO...

THEN IT'S YOUR MOTHER! SHE'S HOLDING A KNIFE, ISN'T SHE?

UM... I
DON'T
THINK
SO...

THEN IT'S
YOUR MOTHER!
SHE'S HOLD-
ING A KNIFE,
ISN'T SHE?

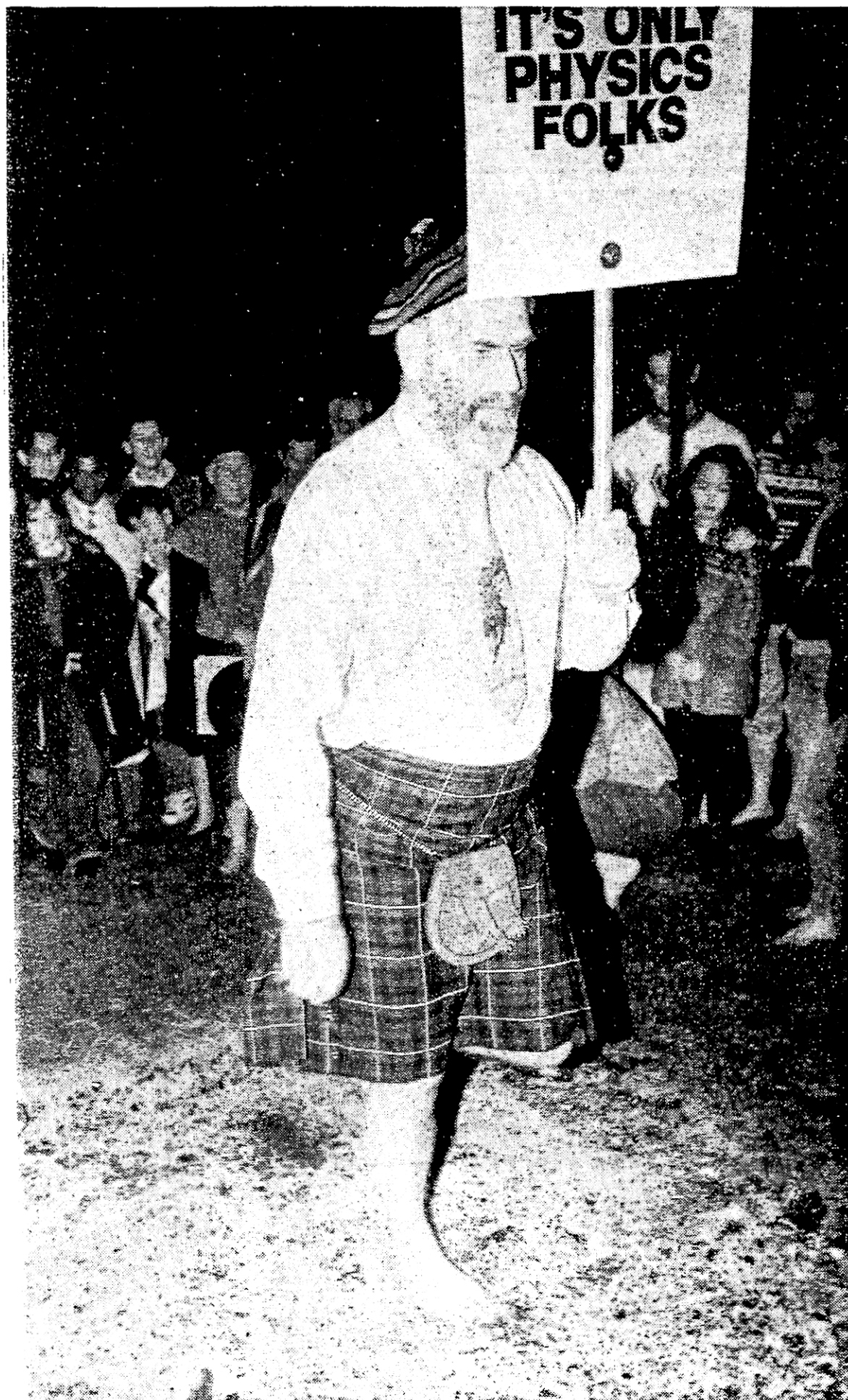
157 + 12 = 169

"To my utter dismay, there were no statistically significant changes in any of the answers to any of the questions — the same proportion of the students still believed in Adam and Eve," Professor Short said.

He is unsure why one-fifth of his students held firmly to creationist beliefs, but suggests that those with no training in biology are more likely to shun Darwin and evolutionary theory. Sixty-four per cent of those surveyed had not studied biology at school. Physics, not biology, is a prerequisite for medicine at Monash.

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None of the students presented a counter-evolutionary argument in their essays. But when the questionnaire was issued again at the end of the course, the results had not changed.



PICTURE: CRAIG SIMCOX

Dr Campbell walks across the embers at the Auckland University Tamaki campus last night.

Myth goes up in flames

By ANDREW LAXON

Dr John Campbell, physicist and part-time firewalker, has his own version of the laws of thermodynamics.

It translates as: Firewalking doesn't hurt — as long as you do not stop.

Last night the kilt-wearing University of Canterbury staff member put it to the test on a bed of red-hot charcoal embers at the Auckland University Tamaki campus.

About 40 physics staff and students watched and then followed him barefoot for four steps across the 1000 deg C surface.

All were unscathed, although some looked surprised as they started to feel the heat on the final step.

Dr Campbell said the firewalkers made it across safely because their feet did not touch the charcoal long enough to be burned.

"The heat is transferred through the carbon so slowly that it's okay to hang on to it for one second before the heat is transferred through the dead layer of skin on your feet."

Dr Campbell said he had walked over fires 14 times in demonstrations to debunk "the outrageous claim" that firewalking was a case of mind over matter.

Auckland University physics staff invited him to lecture students on the principles of thermodynamics yesterday afternoon.

Those at the lecture were invited to test the principles on the bonfire embers last night.

The university made all firewalkers sign a form absolving the university of any liability.

Hokum Locum

Dr John Welch

A Menu of Dietary Delusions

Neither *Nutrasweet* nor sugar-rich diets produce any change in children's behaviour. (*New England Journal of Medicine* 330:301-307, 1994)

The subjects were tested in a double-blind, placebo-controlled trial. The trial was reported in the local press and produced a predictably outraged response from local nutritional quacks who have carried on regardless. Their beliefs are based on faith and are therefore not amenable to reason. For another good New Zealand review see *NZ Medical Journal* 27/9/89 (Diet and Behaviour) and 23/8/89 (Children's diets: what do parents add and avoid?).

Evening primrose oil has been touted widely as a "natural" remedy for a host of conditions such as pre-menstrual tension and menopausal symptoms. The active ingredient is gamma-linolenic acid and it was tested in a randomised, double-blind, placebo-controlled trial of 56 menopausal women experiencing episodes of sweating or flushing. It was found to be no better than a placebo.

It is worth noting the value of such studies. Randomisation means that patients have an equal chance of receiving either the "test" substance (gamma-linolenic acid) or a placebo. This ensures that both wings of the trial are identical in terms of age, sex, number of smokers, etc. Double-blind means that neither the subjects nor the investigators know who was taking the "test" substance or placebo until the study has fin-

ished. It is no wonder that quacks decry such studies which remove bias, prevent cheating and usually show that quack remedies are useless. (*BMJ* 308: 501-503, 1994)

Smart Drinks

These are amino acids and other precursors of neurotransmitters which are being promoted among teenagers at music and cultural festivals. Smart drinks are claimed to "fire up the brain" and give the young executive an "edge." Could there be anything more loathsome than a hyperactive yuppie? I remember reading about the smart drinks phenomenon in the US and I am not surprised that they have arrived in New Zealand. There is no evidence that smart drinks have any ef-

fect on either memory or intelligence. (*NZ Doctor* 31/3/94)

Sick of Work?

All that is necessary in New Zealand to get a sickness benefit (\$22 per week more than the dole for those under 25 years of age) is to persuade a doctor to sign a prescribed form from the DSW.

Over the years I have seen many flagrant abuses of the SB. The best one was a young person who had been on a SB for over two years because of a perforated ear-drum. When I refused to sign the certificate she simply went to a more compliant doctor.

The court news regularly detail the activities of professional criminals and drug addicts who



"Jack, here, is the most fascinating man I've ever met—he's in alcohol-abuse counselling, he goes to a sexual-harassment support group, he's in a race-relations workshop, and he spends every weekend in prison."

are described as "sickness beneficiaries." My attempts to find out which doctors were signing these certificates were thwarted by DSW who cited "medical confidentiality." The great irony is that at the time they were expecting doctors to inform on beneficiaries who were fiddling the system but were not prepared to put their own administration under scrutiny.

A reporter in Germany was able to obtain 41 days sick leave from five different doctors even though he told them he was perfectly well but just wanted a few days away from the office. One visit lasted four minutes, involved no examination and was worth 12 days off! (*Dominion* 29/3/92, Worker highlights easy access to sick leave)

This sort of abuse arises from poor ethical standards, which also extend in Germany into drug licensing (see *Skeptic* 27).

Laying On of Hands

The introduction of ACC around 1972 saw a great increase in both the use of physiotherapy and private physiotherapy practices. In *Skeptic* 29 I commented briefly on the widespread use by physiotherapists of unproven treatment modalities such as ultrasound. Ultrasound treatments have been introduced on a basis of applied experience rather than from controlled scientific study. Dr Linda Maxwell writing in the *NZ Science Monthly*, March 1994, has studied cellular processes at injury sites and found that ultrasound may enhance inflammation and actually cause more injury.

Physiotherapy is also traditionally used to build up muscle strength in patients with rheumatoid arthritis. A controlled trial by

physiologists (*New Scientist* 16 Oct 1993 p17) found that this approach tended to worsen the flexion deformities seen in this condition. Work continues in the area of electrically stimulating the extensor muscles in an effort to counteract the tendency to flexion deformity.

Most injuries recover with time and I doubt whether the laying on of hands or the use of electrical gadgets by physiotherapists accelerates this process. Many of my patients become upset if they do not receive a referral for physiotherapy and few doctors will refuse in such circumstances.

It is no surprise that costs of the ACC scheme have continued to rise each year. The burden of proving that their treatments are worthwhile rests with the physiotherapy profession. ACC should not pay for any treatments unless they can be shown to be both cost effective and scientifically valid.

Alexander Technique

The "Alexander Technique" (AT) is an extreme example of the laying on of hands. To quote a recent magazine article, "...by extending the neck and opening the back, it literally makes you taller and releases the body's natural energy flow."

Note the typical vague language of quackery: what does "open the back" mean and just what is this "natural energy flow" that quacks keep going on about? The usual anecdotal reports are quoted by satisfied patients: "My singing has improved tremendously...I felt lighter, taller...I've learnt to relax by opening and lengthening the back muscles!"

The founder, Frederick Alexander, was born in Tasmania in 1869 and longed to be an actor but suffered a mysterious loss of voice. The rest is worth quoting: "Sitting alone for nine years in a room containing only mirrors and a chair, he studied his position in every detail. It took two years for Alexander to discover only the fact that when he talked he was moving his face and chin forward and contracting the vertebrae in his neck. The muscles of his neck were becoming very tight and causing obstruction in his voicebox."

I would have described his position as ridiculous and if he found the problem after two years what did he do for the other seven years? How does one "contract the vertebrae in the neck"?

Feeling a need to inform us further about AT the author followed up with three more anecdotal reports from satisfied customers who all described how they feel "happier, more positive, less stressed."

Quackery has many recurrent themes. The founder of AT suffered a profound illness which was clearly psychological (nine years in a room with mirrors!) and led to him feeling that he had discovered the meaning of life.

The laying on of hands is the basis for the clinical effects (essentially placebo) of most forms of physical therapy such as chiropractic, osteopathy and AT.

Massage and postural "adjustments" are pleasant procedures for patients and it is not surprising that they go away feeling empowered and improved. Unfortunately, many become dependent on therapy and I have met many people

who feel it essential to consult such therapists on a regular basis for years. This of course is encouraged by such quacks because it is great for business and they are able to take advantage of people who are incapable of taking responsibility for their own lives and health.

Ischaemic Heart Disease

Ischaemic heart disease (IHD) is a serious public health issue in New Zealand and is the leading cause of death for New Zealand adults. My own father died suddenly of a heart attack while on a golf course. He was 71 years old and had no known risk factors yet autopsy showed severe coronary artery disease.

The costs of treating IHD are considerable and surgical treatment is popular. Political pressure has seen the creation in New Zealand of an absurd number of cardiac surgical units compared to similar western countries. An American study (quoted in *Lancet* Vol 343 p412) of 1,252 patients showed no difference in employment status after one year between comparable patients who underwent either surgical treatment (angioplasty or bypass) or medical treatment (lifestyle modification, drug treatment).

Angioplasty involves passing a fine balloon catheter into an area of blockage and inflating it, while bypass surgery involves using lengths of vein to bypass the blocked area in the coronary artery. In a subset of 72 patients the median number of days from the start of treatment to return to work was 14 days for medical treatment, 18 days for angioplasty and 54 days for bypass surgery.

Clearly surgery is not always the best option and a lot more of our health resources could be better spent on prevention of

this condition by risk factor reduction.

Death or Compensation

A court in the UK awarded a Falklands War veteran \$220,000 for post-traumatic stress disorder acquired as a result of serving during that campaign.

This drew a sharp response from the defence editor of the *Daily Telegraph* (*Dominion* 10/3/94) who asks how this can be taken seriously at a time when thousands of veterans are converging on Normandy to commemorate the D-Day landings. The Falklands War veteran received his award for the stress of an action over two days! Many WWII vets saw active service for five years and returned to lead happy and successful lives.

Wars are horrible experiences from which soldiers can recover without the need or right to compensation. Post-traumatic stress disorder is simply a New Age euphemism for shell shock, and an insult to all servicemen who have done their duty and returned to civilian life. This absurd monetary award is an example of Welch's law (after Parkinson): "Whenever compensation is available conditions will emerge to take up the compensation available."

Deliver Us From Gynaecologists?

In *Skeptic* 29 I referred to abuses of gynaecology. In Florida, where 25% of deliveries are by caesarean section, the state legislature has forced doctors to change their practices, wanting the rate to be less than 20% by 1997. There is a higher rate of Caesarean delivery among patients with better health insurance and higher incomes, and the rate is lowest in

teaching hospitals. (*BMJ* Vol 308 p432)

Failing the Sex Test

This is the headline of an article which appeared in the *Dominion* 17/3/94, and concerns an Indian clan which murders unwanted female children. Because of the illegal dowry system, girl children are too expensive so are murdered by being either strangled or smothered soon after birth. The tribe cannot afford amniocentesis which is also abused in order to pre-determine sex so that female foetuses can be aborted.

It is important that such cultural practices are highlighted and discussed. It has been interesting to see how various other equally vicious cultural practices have fared following migration to western countries. Some doctors have been de-registered for performing female circumcision and I have even seen a reference in print defending this procedure!

The Indian authorities have taken little action over these murders since the status of women in India remains low. If there are problems over the dowry after marriage, it is a traditional practice to set fire to one's wife and make the murder look like a kitchen accident.

How far should we go in either acknowledging or accepting traditional cultural practices? Nurses in New Zealand are judged on their "cultural safety" regarding Maori traditions and customs, which fortunately do not honour such abuses as infanticide.

Squadron Leader Dr J.C. Welch is Base Medical Officer at RNZAF Woodbourne.

Christchurch Pesticide Scare

The media were quick to cry "Wolf" when concerns were raised about the fungicide Benlate.

Bernard Howard

On 9 December, 1993, the people of Canterbury read an alarming headline in the *Christchurch Press*: "Herbicide scare after babies born with defects." Three City Council staff "who worked with herbicides gave birth to babies with defects." In this first report neither the nature of the defects nor a specific herbicide were mentioned.

Several comments by Council officials and others, intended to soothe public fears, were quoted in the report — "coincidence," "a link between the defects and herbicides was unlikely," "the substances ... did not absorb well through the skin." An occupational health expert had been asked to investigate and report urgently; a fourth parks employee of the Council, who had worked in the same area as the other mothers, had given birth to a healthy baby.

During 1993 the office of the Parliamentary Commissioner for the Environment, Helen Hughes, had been investigating the use and disposal of dangerous chemicals in New Zealand, and the report arising from these enquiries was published only a few days after the story in the *Press*. The Commissioner was quoted as saying that the controls recommended by her office would have been even stronger had she known of the Christchurch birth defects.

Despite the encouraging noises emerging from the Civic Offices and other official buildings, public anxiety increased almost to the level of hysteria.

Within a week the substance under suspicion had been identi-

fied as benomyl (a fungicide, not a herbicide), made by Du Pont and sold under the name "Benlate." Sales plummeted, TV cameras were taken to garden centres to picture staff sweeping the stuff from the shelves, and only eight days after the first report, Du Pont's New Zealand Manager was buying whole pages of advertising space in the newspapers to rebut the accusations made against his company's product.

During the week journalists interviewed some of the people involved, and a few personal and medical details emerged. Two of the three babies were blind; the mother of one, born in 1990, was "in anguish" after slowly rebuilding her life; the parents of the other were in a more belligerent mood, threatening legal action against Du Pont. The Wellington bureaucracy was also quick to act; the Ministry for the Environment's representative on the Pesticides Board announced she would press the Board to de-register benomyl, and recommend the Department of Health should ban its use.

Further comments intended to lessen public anxiety came from the City Council, including the announcement that Benlate was being withdrawn from use in the Parks Department. Then, less than ten days after the first report, the matter sank from public view while New Zealanders attended to the serious business of the Christmas-New Year summer holiday period. Behind the scenes, however, Dr John Alchin, Occupa-

tional Physician, was very busy. Before the issue became public, the City Council had asked him to investigate the birth defects. His report, 74 pages long, was submitted on 15 April, 1994, and reported in the *Press* the following day. The sub-editor's summary of Alchin's summary read, "Report on birth defects finds no pesticide link."

Alchin's investigation had been very thorough. He had examined the hospital obstetric and paediatric records, the medical and ante-natal records of the family doctors, and the notes of the obstetricians and paediatricians concerned. He had interviewed the parents at length and scrutinised City Council procedures. He instituted wide searches of two computerised medical databases, and talked to several New Zealand experts in epidemiology, environmental health, medical genetics and toxicology.

Concerning the two babies who were born blind, he noted: (1) one was born in 1990, the other in 1993; (2) their blindness resulted from two quite distinct congenital defects; (3) birth defects are not uncommon, there is roughly a 1 in 1000 chance of any two babies being born with major anomalies; (4) the two mothers had had minimal exposure to pesticides during pregnancy; and (5) other studies show no linkage of human birth defects to pesticide exposure. In view of the emphasis given to Benlate in the media reports, it is odd to note that Alchin could not confirm that either mother had