

The Ecologist

Rethinking Basic Assumptions

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CANCER: Are the experts lying?



**"Was it a virus that killed him, a faulty gene ...
or perchance a surfeit of mushrooms and blue cheese?"**

*The Medical Industrial Complex • The Gospel According to Sir Richard Doll
Cancer: A Disease of Industrialization • The Clan of One-Breasted Women
"Objective" Science at Auction • Cancer and "Risk-free" Radiation
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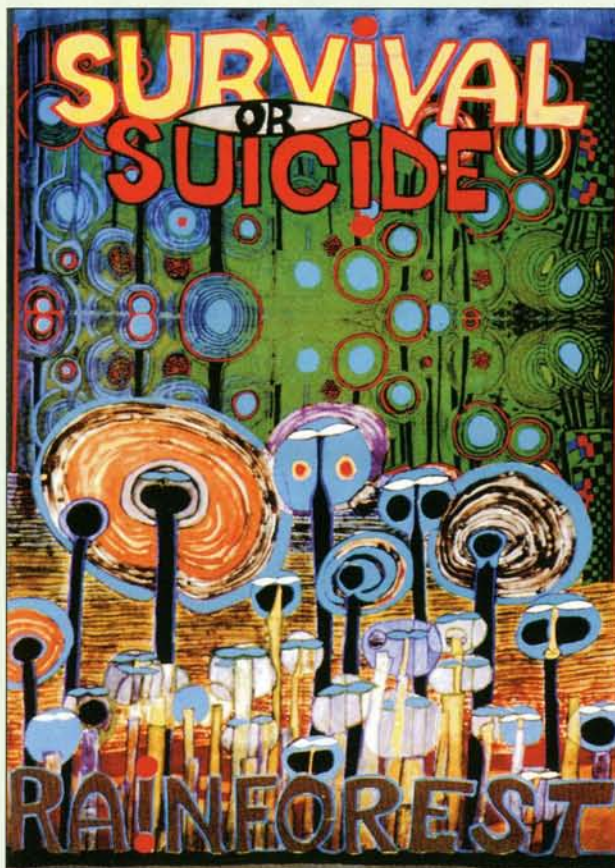
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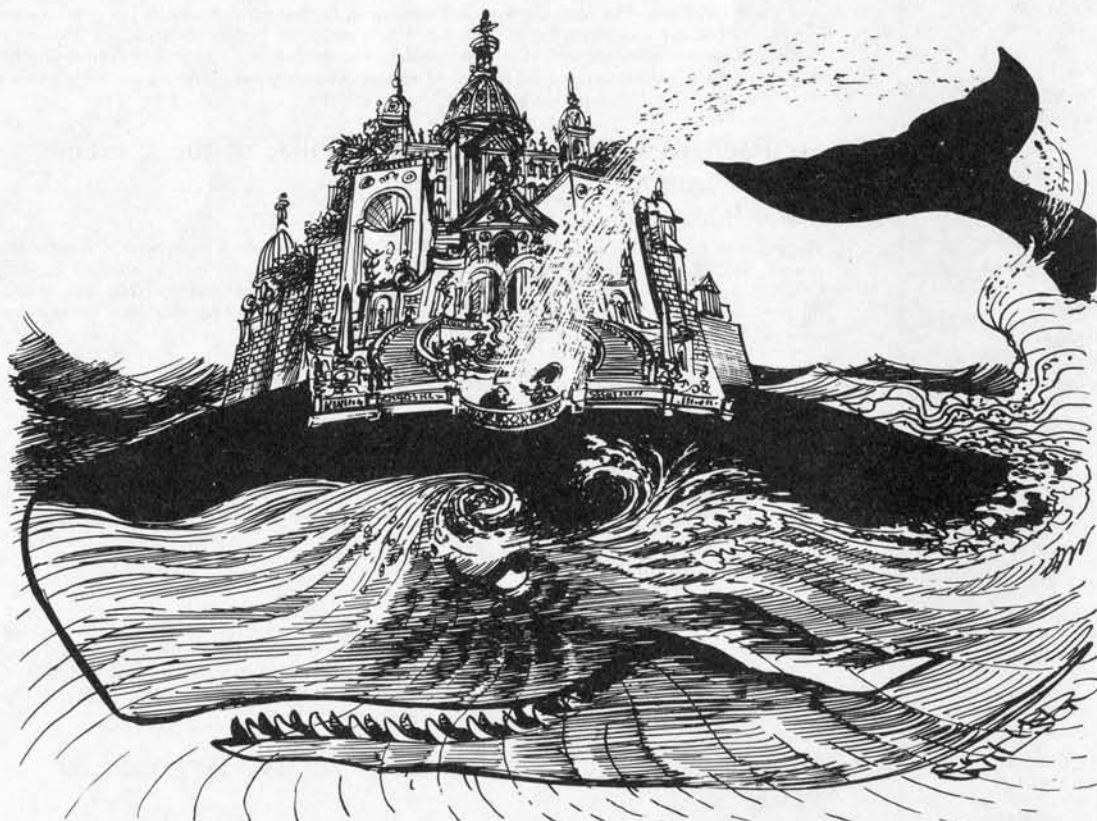
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*"...fear not, my liege, merely a sprinkling of rain,
your majesty's domain will never be flooded."*

Editorials

Are the Experts Lying?

I once spent the night at the flat of a friend of mine in Paris. He worked for a somewhat shady business efficiency firm and was preparing a report for a company that made aperitifs to explain why it was losing so much money. My friend was finding this very difficult and getting very little down on paper. I asked him what was wrong. "It's quite simple," he said. "The reason the company is going bust is that the managing director is hopeless, and his two sons and son-in-law who run the company with him are even more so. But I can't say that, can I, or I'll never be paid, so I have to invent other reasons for explaining the company's plight, and its not easy, I can tell you."

Much the same has been happening for years on the cancer front. Cancer is now a disease that afflicts one out of three people, and everybody knows in their hearts, on the basis of countless studies and from the experience of vulnerable groups, that the main causes are: exposure to carcinogenic (cancer-causing) chemicals and ionizing radiation – from medical X-rays, nuclear tests and radioactive emissions from nuclear installations. However, the 'Cancer Establishment', spearheaded by the National Cancer Institute in the USA and the Imperial Cancer Research Fund in the UK, will not admit it. Nor, of course, will the ever more powerful chemical, pharmaceutical and nuclear industries that fund nearly all the research on the causes of cancer and make quite sure that the present cancer epidemic is attributed to anything except exposure to chemicals and radioactivity. (see Peter Montague and Russell Mokhiber in this issue).

After my brother, Jimmy Goldsmith – to whom this issue of *The Ecologist* is dedicated – died last July, I argued in an article in *The Sunday Telegraph* that he was more likely than not to have been yet another victim of the chemical industry. Needless to say, I was immediately attacked by cancer establishment experts, who took it in turn to regurgitate the same old arguments that they feel best serve to obscure a reality that

to them is so totally unacceptable.

The first, put forward by Dr Roger Bate of the European Science and Environment Forum in Cambridge, is that the cancer rate is not increasing, except in the case of lung cancer, melanoma and non-Hodgkin's lymphoma – indeed that it has actually fallen by 15% since 1950.

How he and others like Sir Richard Doll can justify such a statement is difficult to understand as it is in conflict with the official figures published by the National Cancer Institute (NCI) itself. According to these the age-standardized cancer incidence for all sites for the white population of the USA between 1950 and 1988 has increased by no less than 43.5 per cent (see Epstein, table 1 in this issue) and between 1950 and 1994, by 54% – and hence by an average 1% per annum.

What is more, it has been increasing ever since the beginning of the industrial age, for previously cancer was very rare and, in some areas, apparently non-existent (see Zac Goldsmith in this issue). The same was true of the other "diseases of civilization" such as ischaemic heart disease, diabetes, peptic ulcer, appendicitis, varicose veins and tooth caries – diseases whose incidence, before the very recent chemicalization of the Third World, increased along with per capita Gross national product (GNP).¹

This is consistent with World Health Organization statistics, according to which the cancer rate in the years 1967-68 varied in different countries in accordance with their per capita GNP. Thus Mauritius, with a per capita GNP of \$140 a year at that time, had an annual cancer rate of 216 per million among men: in Sri Lanka, with a per capita GNP of \$225, it was 316 per million, and it was 1,115 per million in Portugal, with a per capita GNP of \$479, while in the USA, with its per capita GNP of \$3,960 at that time, the figure was 1,698.

The second argument put forward by the Cancer Establishment (in this case Dr John Emsley of The Imperial College of Science, Technology and Medicine) is

that "chemicals that are used in agriculture and food production have to pass stringent tests for safety". This, of course, could not be further from the truth. To begin with, only an insignificant fraction of the 70,000 or so chemicals that have been introduced into our environment, and of the 1,000 or so new ones introduced every year have been tested at all, and even then the tests could hardly be *less* "stringent". This is not surprising as the regulatory agencies in the UK and elsewhere are largely dominated by the industries they were set up to control (see North in this issue).

In any case, for many reasons the tests provide very little information on the carcinogenicity of the chemicals tested. The first is that they are carried out on chemicals, in isolation from each other, whereas in the real world we are exposed to a veritable cocktail of different chemicals (see Alison White in this issue), among which there are important synergistic effects. This is, of course, denied by Bate and by the regulatory agencies, even though a large number of these effects have been well documented.²

In fact, as pointed out by Massachusetts Institute of Technology's (M.I.T.) famous report 'Man's Impact on the Global Environment' 1971, "Synergistic effects among chemical pollutants are more often present than not",³ and the evidence suggests that different combinations of chemicals can be tens if not hundreds of times more carcinogenic than the same chemicals used in isolation from each other.

For instance, a small amount of DDT, greatly increases the liver damage produced by small amounts of carbon tetrachloride. The toxic effects of this solvent are also increased by a hundred times if one adds the common drug phenobarbital.

In addition chemicals undergo change over the years – among other things they decay and in some cases the decay product may be more harmful than the original material. Thus the pesticide heptachlor decays into heptachlor epoxide and then into heptachlor epox-



"Thank God I didn't ask for the mushrooms in a blue cheese sauce"

ide ketone, each of which is more carcinogenic than the preceding form – but very little work has been done to identify the possible decay product of many other potentially carcinogenic chemicals produced.

Another problem is that there tends to be a long delay between exposure to a carcinogen and the development of different types of cancer. It can be as much as forty years or even longer with specific cancers only manifesting themselves in the next generation as in the case of Diethylstilbestrol (DES); a hormone once prescribed to pregnant women, some of whose daughters developed, as a result, a rare form of vaginal cancer. Of course, it is only “economic” to carry out tests for a very much shorter period and even when higher doses are used, the results are unlikely to tell us what are likely to be the long-term effects.

The third argument is that much of our food contains very many more natural carcinogens than man-made ones (for instance, in mushrooms and blue cheese). This is the favourite argument of Professor Bruce Ames, at the University of California at Berkeley. It was also put forward by Dr Roger Bate and Dr Michael Ward of the School of Chemistry, University of Bristol, in their criticisms of my article. For this argument to have any bearing on the escalating cancer rate, however, it would have to be shown that the consumption of natural carcinogens has increased at much the same rate as has the use of artificial carcinogens, and that, of course, would be very difficult, as the production of synthetic organic chemicals – the most likely chemicals to be carcinogenic – has gone up by more than 500 times since 1950, which I suspect is more than has the consumption of mushrooms and blue cheese.

In any case Ames and Bate take no account of the critical theoretical considerations involved. As Barry Commoner, the famous American biologist and ecologist notes, living things make use of only a minute fraction of all possible organic compounds. This indicates that the multitude of chemical compounds that they carefully exclude are likely to be “incompatible with the successful operation of the exceedingly complex network of reactions” involved in life processes. As Commoner notes, “though the chlorine ion is common in living things, and organic compounds can easily be chlorinated artificially, chlorine derivatives are exceedingly rare in the natural world. The reason is that synthetic organo-chlorine compounds such

as polychlorinated bithenyls (PCBs) as well as DDT produce long-term damage such as cancer”.⁴

The fourth argument is that if there is more cancer around, it is simply that we live longer. Cancer is a disease of old age as Bate tells us, and clearly, if there are more old people around, there will be more cancer. This may once have been true but no longer. Cancer has become a major cause of death among children too. According to the official NCI figures, childhood cancers of all sites have increased by 21.3 per cent in US whites between 1950 and 1988, and cancer of the testes, a largely new disease mostly confined to young men in their twenties, has increased by a horrifying 96.1 per cent over the same period. In the last two decades moreover there has been a 38 per cent escalation in the incidence of childhood brain and nervous-system cancer, the incidence of cancer in all sites having increased among children by 1% per annum.

Epstein shows that in spite of the Cancer Establishment’s claims, and of the billions poured into cancer research, very little progress has been made. Conventional ‘scientific’ methods of treatment are rarely very effective except in the treatment of a few isolated forms of cancer such as certain types of leukaemia, and there are no longer any valid arguments against undertaking serious research into the alternative ‘non-scientific’ methods of treatment, many of which are very promising (see Mansfield and see Last). Nevertheless, most scientists agree that the accent should be on prevention rather than cure. However, for many of them, prevention merely means promoting lifestyle changes, in particular by adopting a diet rich in vegetables and fruit (whether or not these have been grown organically or with the use of carcinogenic chemicals). Prevention for Ross Hume Hall, Epstein and other serious scientists means more than this. Even if the fresh fruit and vegetables were organic, we would still be exposed to carcinogenic chemicals of all sorts that are present in the air we breathe, in the rain that falls on our crops and in the water that flows from our taps. In general, industry is experiencing an ever-growing problem of how to dispose of its wastes. The methods that are used, and that are increasingly being legalized by legislators throughout the world, are increasingly irresponsible. Thus as landfills fill up, the tendency is to incinerate wastes, including plastic wastes containing PVCs, a process that very often leads to the emission of highly carcinogenic dioxins. Chemical wastes are increas-

ingly used as fuel – and are often provided free to be burned in cement kilns, which also means dispersing these poisons over the land.⁵ Even radioactive waste, or rather the material in which the radioactive particles are contained, is incinerated as the latter cannot be destroyed by burning and is consequently dispersed over the countryside and of course over neighbouring towns and villages. Chemical wastes are incorporated in building materials, such as bricks and breeze-blocks, and – incredible as it may seem – added to sludge and even to the artificial fertilizer that is spread out over our agricultural land,⁶ (some Government scientists even having the gall to assure us that this actually improves the soil). Perhaps even more incredible is the new directive of the European Commission that legalizes the incorporation of radioactive waste in consumer products.⁷ Already British Nuclear Fuels are making available the radioactive remnants of a dismantled nuclear reactor for the manufacture of pots and pans. We shall thus be living in an increasingly chemicalized and radioactive environment in which the cancer rate can only escalate further until it eventually becomes generalized in the human population.

Prevention can really only mean the reversal of these trends, and a quick and effective reversal at that. Industrialists can no longer be allowed to poison our environment with their carcinogenic materials. They must simply stop producing them. A huge popular campaign is required to force them to do so. There is no socially and morally acceptable alternative.

Edward Goldsmith

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Cancer and "Risk-free" Radiation

There are two cancer charity shops in my small town in Wales. Wherever I go these days I see cancer charity shops. People stop me in the road to ask for donations and pin yellow paper flowers or pink ribbons on my coat. Everyone is wearing the same grim decoration. In the larger towns, the cancer charities set up chains of shops; one in each district. My friend, the sick joker, refers to this take-over of town centres, all the local shops having been driven out of business by out-of-town shopping, as the new growth industry.

What is happening? Whatever it is, the establishment is crossing its fingers and hoping it will go away. A recent article in the *British Medical Journal* by David Coggon and Hazel Inskip, entitled "Is there an Epidemic of Cancer?", concluded that the increase in the disease is merely a consequence of an ageing population. This is simply untrue.

The first nation to notice that something was wrong and to begin to panic was the United States. Thus, in 1980, the US National Academy of Sciences (NAS) commissioned the British star epidemiologists and environmental scare firemen Doll and Peto to ride to the rescue and investigate. Professor Sir Richard Doll FRS, professional epidemiological conservative and chief establishment player-down of environmental scare stories, concluded in his report, published as "The Causes of Cancer" in 1981, that there was no case to answer. Although it appeared that cancer was increasing in real terms, this was, he felt, due to errors in the US census figures for population, there being more old people around than the data recorded. Was anyone reassured?

Earlier this year, I was invited to address the World Conference on Breast Cancer in Kingston, Ontario. Hundreds



All over the world, the names Chernobyl, Harwell, Aldermaston, La Hague, Dounreay, Brookhaven, Hanford, Sellafield have become synonymous with mutation, cancer and leukemia.

of women who had been victims of the disease attended this enormous conference, set up by international women's groups, trusts and organizations as a huge vote of no confidence in the work of the major cancer research charities,

cer? What is the cause of the increases in most other cancer types, from childhood leukaemia to prostate cancer? Let us see if there are any clues.

Cancer is a genetic disease expressed at the cellular level. These are the words of Sir Walter Bodmer, Director of the Imperial Cancer Research Fund. One thing that all the intense research which has been carried out on the disease since the 1950s has now shown almost beyond all doubt is that the primary cause of cancer is genetic mutation in a single cell. The control system of cells, located on the chromosomes, written in the

Again, Professor Doll was asked by the Medical Research Council to comment. "No problem," he said, "the exposure is too low." Luckily for us all, President Kennedy listened to other advisers, and called a halt to the tests in 1963.

none of which attended. The big question asked by the conference was: "What is the cause of the recent, increasing and undeniable epidemic of breast cancer?" In parts of the United States, the disease affects one in nine women. In Wales the figure is one in twelve. The incidence rate has increased in young women as well as the old. Using a statistical technique to allow for changes in the age of the population, there has been a 50 per cent increase in the disease in England and Wales since the 1960s. So what is the cause of the epidemic of breast can-

language of the genes and in the script of DNA, can be altered by damage. Certain combinations of mutated or altered genes can result in the cell, and its descendants, no longer recognizing territorial constraints, and multiplying continuously and crazily. The chance of a cell acquiring the correct (or incorrect) set of cancer genes is an exercise in probability. Clearly the more genetic damage, the greater the chance of the critical set of mutations occurring. As we grow from birth to old age and death, our cells divide and divide again to pro-

Dr Chris Busby trained as a physical chemist and is an independent researcher on the effects of low-level radiation. His book *Wings of Death: Nuclear Pollution and Human Health* (1995) outlined evidence that radioactive pollution was the main cause of infant mortality in the sixties and contemporary increases in cancer and other illness, especially in areas of high rainfall.

duce two, then four, then eight and 16 and 32 and so forth; a power series of chromosome replications, each generation having copies of the previous mutations but acquiring new ones to add and pass on to the next generation. This is why cancer incidence is observed to increase with the age of the individual and also why there is a lag of 15 to 20 years between first exposure and onset of the disease. The mutations can be caused by chance, but are also caused by exposure to environmental substances called mutagens. Mutagens can be man-made chemicals, like coal or petroleum refining by-products, organic chemicals, pesticides, pharmaceuticals, agrochemicals, food additives and also some natural substances. Mutations are also caused by ionizing radiation – indeed, radiation is the largest single mutagen.

Professor Doll, who first discovered the link between cigarette-smoking and lung cancer, pointed out in his report to

the NAS that cancer was almost entirely environmental in origin, a position that had been adopted by the World Health Organization as early as 1964. So mutagens cause cancer: all carcinogens are also mutagens and most if not all mutagens are carcinogens. Since the lag between exposure to an environmental mutagen and the onset of cancer is about 15 to 20 years, the increase in trend in cancer incidence that began in the mid-seventies in most parts of the world where cancer registries keep data, signals the sudden appearance and increase on Earth of some new mutagen in the period 1955 to 1960. There is another clue. In the UK, the increases in cancer first began in areas of high rainfall like Wales, Scotland and the West Country. Cancer incidence has not increased in the same way in dry areas like East Anglia. For example, in 1987, the age-standardized rate for all cancers combined was 54 per cent higher in

Wales than in East Anglia. Wales had 72 per cent more leukaemia and 316 per cent more childhood cancer.

There is at least one good explanation for this. The cancers were caused by mutation produced by exposure to radiation from atmospheric nuclear bomb testing which occurred in the period 1955-1963. The bombs were exploded by the nuclear superpowers in Kazakhstan, Nevada and the South Pacific. The force of the explosions drove large quantities of radioactive material into the stratosphere, and this was circulated globally, falling to Earth everywhere, but particularly in high rainfall areas.

At the peak of the testing in 1961-63, concern began to be expressed by the doctors that strontium-90, building up in milk, might be affecting babies. There was some basis for their concern since infant mortality began to rise. Again, Professor Doll was asked by the



"Radiation you say? I've worked here for twenty years ... nothing wrong with me!"

No evidence of leukaemia-nuclear links?

The incidence of cases of leukaemia in children living within five kilometres of the Krummel and Goesthacht nuclear installations in the Federal State of Schleswig-Holstein in Germany is much higher than for Germany as a whole.

After eliminating other factors like X-rays, exposure to chemicals, previous family diseases and parental exposure to occupational or medical radiation, the scientists have concluded that this can only be explained in terms of geographical proximity. Soil samples taken near the Krummel

plant containing raised levels of strontium-90 and caesium-137 confirm this conclusion.

Two other factors seem to make the link between the nuclear plants and leukaemia undeniable. The leukaemia levels in adults living near the plants are also raised (by 56 per cent) and the first cases of leukaemia were diagnosed five years after Krummel had been commissioned. This five-year delay corresponds with the known latency period of radiation-induced leukaemia in children.

Despite all this the Government of Schleswig-Holstein denies that there is evidence of any connection and permits the plants to continue.

Environment and Health News, 1998.

Medical Research Council to comment. "No problem," he said, "the exposure is too low." Nevertheless, and luckily for us all, President Kennedy listened to other advisers, like Linus Pauling and Ernest Sternglass, and called a halt to the tests in 1963.

But despite Doll, the babies were certainly dying, and their mothers, making milk for them, were accumulating strontium-90 in breast tissue. It is this cohort of women, the nursing mothers exposed at the peak of testing, who received the largest dose from strontium-90 and who also have the largest increase in breast cancer. It was this discovery that I reported to the World Conference on Breast Cancer.

Clearly something is wrong. Clearly people are now dying from cancer because they have been contaminated, among other things, by radioactive substances, mutagens, produced by the nuclear and military project. All over the world, the names Chernobyl, Harwell, Aldermaston, La Hague, Dounreay, Brookhaven, Hanford, Sellafield have become synonymous with mutation, cancer and leukaemia. I met a man last week who had named his cat Sellafield, because the animal had an extra claw on one paw. As the low-level radiation link with cancer becomes more and more screamingly obvious, people like Doll are wheeled out to pour scorn on the hypothesis that we are the

victims of the greatest public health scandal of the century. But as Joseph Conrad once said, "Every sort of shouting is transitory, after which the grim silence of facts remain."

The guardians of the 'no risk' paradigm in this country are the National

I met a man last week who had named his cat Sellafield, because the animal had an extra claw on one paw.

Radiological Protection Board (NRPB), who operate from Harwell in Oxfordshire, or the "Dark Tower" to those of us who oppose the nuclear project. Until quite recently, and for the period during which Chernobyl occurred, their Chairman was Sir Richard Southwood. Southwood, another Oxford luminary like Doll, is the man who also chaired the Government's BSE commit-

tee which advised us that BSE could not cross the species barrier. The present director of the NRPB is also the chairman of the International Committee on Radiological Protection, and is therefore the top man in radiation risk in the world. But his committees are becoming increasingly isolated by the grim silence of facts. Studies by Alec Jeffreys's 'Genetic Fingerprint' team of DNA mutation in children from Chernobyl, published in *Nature* in 1996, show that the NRPB's understanding of low-level radiation risk for mutation is out by 10,000 times. And there is now an open split between the NRPB and the Medical Research Council whose team (also at Harwell) under Professor Dudley Goodhead is discovering alarming mutation damage to cells occurring at the smallest radiation doses imaginable.

Meanwhile, what of the cancer charities, whose shops are colonizing the towns and villages of England and Wales? Why are they not looking for the cause, rather than spending our money on new toxic treatments that blast cancer and sufferer alike? Might I suggest that they don't want to find the cause. There is no money in discovering the cause; it is bad for business. There is plenty in selling treatments to desperate people. Cancer research money has gone to coincide with whichever branch of technological business happens to be developing at the time. First it was radiotherapy, more of the same, then chemotherapy, and now gene therapy.

And finally, if it eventually turns out that all these people, old people, young people and children, suffered and died because environmental hazards were disparaged by experts like Sir Richard Doll in the face of overwhelming evidence to the contrary, will we be allowed to stand the experts in some Nuremberg-style dock, and investigate their guilt in crimes against humanity? I hope so.

Chris Busby

Action

In 1996, Dr Busby helped found The Low Level Radiation Campaign which is presently engaged in opposing the transposition of the Euratom Directive in the United Kingdom. Through his membership of the European Committee on Radiation Risk he is also engaged in a project to repeal the original Euratom Treaty of 1957, which called for the development of nuclear power throughout Europe. These campaigns are desperately short of person power and also funds. Anyone wishing to help in any way is invited to write to The Low Level Radiation Campaign, Ammondale, Spa Road, Llandrindod Wells, Powys, LD1 5FY or telephone 01597 824771.

"Objective" Science at Auction

The US chemical industry has "overpowered" federal and state efforts to protect the public health from chemical hazards, according to a scathing report issued by the Center for Public Integrity recently. The report, *Toxic Deception: How the Chemical Industry Manipulates Science, Bends the Law, and Endangers Your Health*, was authored by *Newsday* reporter Dan Fagin, *National Law Journal's* Marianne Lavelle and the Center for Public Integrity. It was published by Birch Lane Press.

The authors looked at four heavily regulated chemicals – alachlor, atrazine, formaldehyde and perchloroethylene. The report found that studies of these chemicals funded by the chemical industry tended to find the chemicals innocent, while studies financed by non-industry sources tended to consider the same four chemicals to be dangerous to human health.

The authors reviewed 161 studies of the chemicals on file at the National Library of Medicine and found that of 43 industry-funded studies, only six returned results unfavourable to the chemicals. But in the 118 studies conducted by non-industry researchers, 71 were unfavourable.

"Chemical companies employ nearly 90 per cent of the nation's 1,650 or so 'weed scientists', and the few independent researchers rely heavily on grants from pesticide makers," said Charles Lewis, executive director of the Center for Public Integrity. "The industry-sponsored studies are important because the federal government's approach is to consider the chemicals safe unless they are proven harmful."

The chemical companies are required by federal law to make any scientific findings available to the government if a chemical already on the market is found to pose a "substantial risk of injury to health or to the environment."

The report found that the industry frequently acted in "bad faith" in this regard. In 1991 and 1992, when the Environmental Protection Agency (EPA) offered amnesty from big-money fines to any manufacturer who turned in

*What do you mean, what is it?
E102, E223, E212, E320, E234,
Banana Trifle, What Else?!*

health studies that they should have provided under the law earlier, more than 10,000 studies suddenly appeared showing that their products already on the market pose a substantial risk (see Peter Montague in this issue).

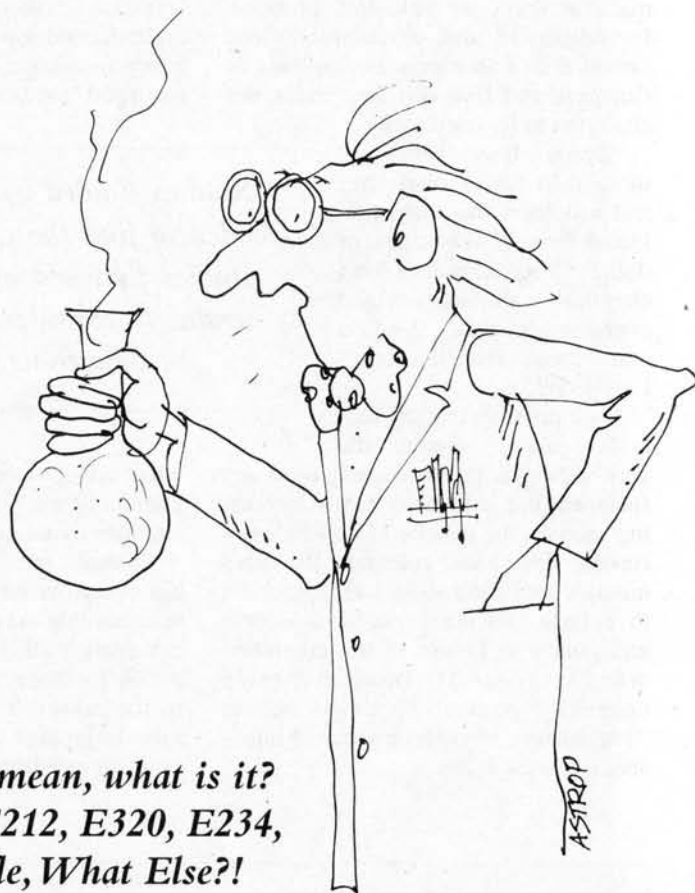
The report was highly critical of the EPA's efforts at policing private laboratories that conduct important safety tests. "The EPA has never inspected about 1,550 of the 2,000 labs doing the manufacturer-funded studies that the EPA uses to decide whether chemicals are safe," Lewis said. "The EPA, which doesn't do its own safety tests, has audited only about 3.5 per cent of the hundreds of thousands of studies that have been submitted to the agency."

The report was also highly critical of the revolving door between the EPA and the chemical industry. Of 344 lobbyists and lawyers identified as having worked from 1990 to 1995 for the chemical companies and trade associations, at least 135 came from federal departments or agencies or congressional offices, and a substantial number of top EPA officials who worked in toxics and

pesticides have ended up with chemical companies, their trade associations, or their lobbying firms.

"Too often, when important regulatory decisions are due, important officials have abandoned government, leaving their successors unprepared to make such decisions, adding to months and years of delay," Lewis said. "And there are many tales of former US officials helping the industry to thwart federal government oversight." At least 3,363 trips were taken between March 1993 and March 1995 by EPA officials that were paid for – to the tune of \$3 million – by corporations, universities, trade associations, labour unions, environmental organizations, and other private sponsors. Four of the corporations examined closely by the authors – Ciba-Geigy, Dow, Du Pont and Monsanto – hosted EPA employees on at least 25 trips to their corporate headquarters and other locales.

EPA Deputy Administrator Fred Hansen will be asking the Inspector General and EPA's ethics office to review the report, according to offi-



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cials, and "if any impropriety is found, it will be addressed with swift and appropriate action."

Members of Congress have also been courted by chemical companies. The manufacturers of alachlor, atrazine, formaldehyde and perchloroethylene provided 214 free trips to members of Congress and flew one key committee chairman to Rio de Janeiro.

"Some lawmakers got more than just a plane trip and a hotel – they also collected tens of thousands of dollars in speaking fees from chemical manufacturers and even more in political action committee contributions," Lewis said.

"Is it possible that the federal regulatory system, the way in which political campaigns are financed, the judicial system's increasing secrecy, the paucity of non-industry funding for cancer research, the news media's confusion about which scientist to believe, all skew public discourse and policy in favour of the continued manufacture of fundamentally unhealthy products?" Lewis asked. "The answer, after three years of intensive research, is yes."

"With millions, maybe even billions, of dollars to spend on lawyers, scientists, PR firms, campaign contributions, secrecy orders, and millions of pages and years of seemingly unlimited patience in litigation challenging the outmanned, under-funded government's every regulatory move, the chemical industry has managed to continue manufacturing

to politicians, scorched-earth courtroom strategies, and misleading multimillion dollar advertising and public relations campaigns."

Jeff Van, a spokesperson for the Chemical Manufacturers Association, said he couldn't respond to the specifics of the report. But he did say that chemical products are subjected to "a level of review and scrutiny that is unparalleled in modern society."

"Our products receive a great deal more scrutiny by government at all levels, by the media and by the public than anything the Center does or will ever do ..." Van said.

That's all very interesting, but since there are nearly 100,000 man-made chemicals

currently in use, and since according to Vyvyan Howard [*The Ecologist* Vol.27 No.5, page 193] "to test just the commonest 1,000 toxic chemicals in unique combinations of three would require at least 166 million different experiments (and this disregards the need to study varying doses)", perhaps we should wonder, who is *really* doing the scrutinizing?

Russell Mokhiber

Studies funded by the chemical industry tended to find the chemicals innocent, while studies financed by non-industry sources tended to consider the same chemicals to be dangerous to human health.

what are generally considered to be harmful agents – even when better, safer alternatives are available," Lewis said.

"Simply put, the chemical industry has overpowered the nation's system of safeguarding the public health. The federal agencies that are supposed to be the public's watchdogs have been defanged by the industry's pressure tactics, which include junkets and job offers to government regulators, major contributions

Unjustified Chemophobia?

The New England Journal of Medicine recently provided an editorial by Stephen H. Safe, a Texas researcher whose work is often funded by the Chemical Manufacturers Association, entitled "Xenoestrogens and Breast Cancer". (Xenoestrogens are industrial chemicals that interfere with normal sex hormones such as oestrogen.)

Dr Safe's editorial began, "Chemophobia, the unreasonable fear of chemicals, is a common public reaction to scientific or media reports suggesting that exposure to various environmental contaminants may pose a threat to health." Surely this is an odd message from a scientist. He is saying, if you fear chemicals because scientific reports indicate that they might harm your health, you are suffering from an irrational phobia. Perhaps Dr Safe did not write the editorial in his capacity as a scientist.

Dr Safe concludes his chemophobia editorial saying it is time we all stopped worrying about organochlorines and breast cancer. He writes, "The results of Hunter [published in an article in the same issue] along with those of other recent studies should reassure the public that weakly estrogenic organochlorine compounds such as PCBs, DDT and DDE are not a cause of breast cancer." Estrogenic organochlorine compounds such as DDT, DDE and PCBs are not a cause of breast cancer. Case closed.

If we still didn't get the point, Gina Kolata of the *New York Times* interviewed Dr Safe, giving him an opportunity to amplify his message. Dr Safe told Ms Kolata it is time to quit researching the relationship between organochlorine chemicals and breast cancer: "For advocates [of the idea

that the two are connected], it's never ending. But for other people, there may be times when we want to spend our money on other things," Dr Safe said. No more research needed. Case closed.

Three days later in the *Sunday Times*, Gina Kolata delivered the message to us once again, summarizing the Hunter study this way: "One more environmental scare bit the dust last week as scientists from the Harvard School of Public Health reported that their large and meticulous study found no evidence that exposure to the chemicals DDT and PCB's [sic] are linked to breast cancer." Another scare bit the dust. Case closed.

Including the recent Hunter study, there are now 11 published studies of organochlorine compounds (DDE, PCBs, methoxychlor, beta-hexachlorobenzene, and chlordane – the last three being pesticides) in relation to breast cancer. Four studies, including the largest two of the 11, have shown no relationship between DDE, PCBs and breast cancer. Six smaller studies have indicated a positive relationship, suggesting that some organochlorines may be implicated somehow in breast cancer. One additional study was equivocal, subject to differing interpretations.

Thus, out of 11 studies, four are negative and seven show elevated levels of organochlorines of one kind or another in tissues of women with breast cancer. One of those seven was not statistically significant. Is it really time to close the book on this inquiry?

Rachel's Environment & Health Weekly, No. 574

Is Regulation Possible?

We often hear that regulation of toxic chemicals in the US is the best in the world. That may be true, but it is also irrelevant. The question to ask about chemical regulation is, "Is it adequate to protect public health and the environment?" If it is adequate, then why would we care whether or not it is the best in the world? If it is adequate, then it is good enough. And if it is *inadequate* and the best in the world, that only tells us something dismal about ourselves and about the rest of the world.

The US regulatory system for toxic chemicals is now 21 years old. This seems long enough to reveal whether or not the system is adequate to protect public health and the environment.

The Toxic Substances Control Act (TSCA) was passed by Congress in 1976. It is a complicated law and many excellent books have been written to tell people how to comply with it.

The basic idea of the law is that government should decide which chemicals, among the 70,000 or so now in use, are dangerous, and secondly how to protect workers and the general public from the dangers (how to "manage the risks", to use today's buzzwords).

It may come as a surprise to some people, but even a huge bureaucracy like our federal government has a very limited capacity to conduct studies of chemical safety. For example, the National Toxicology Program (NTP) – a consortium of eight federal agencies – studies *only* the cancer effects of chemicals, and manages to test *only* a couple of dozen new chemicals in isolation each year. (Effects on the nervous system, the reproductive system, the immune system, the endocrine system, and major organs such as kidney, liver, heart and brain are simply not considered by the NTP). During a typical year, while the NTP is studying the cancer effects of one or two dozen chemicals, about 1,000 new chemicals



enter commercial markets. Our federal government is simply swamped by new chemicals and cannot keep up. Furthermore, it is highly unlikely that

combination with the 70,000 chemicals already in circulation.

Congress understood this situation in 1976 and wrote provisions into the TSCA to compensate for the government's intrinsic shortcomings. Under Section 8(e) of the TSCA, any chemical manufacturer, processor or distributor who becomes aware of "any information which indicates that their chemicals present a substantial risk of injury to human

After 14 years of relying on this system (of corporate self-regulation) to protect public health, EPA had to admit that it was not working.

this situation will change. No one believes that our government – or anyone else – will ever have the capacity to evaluate fully the dangers of 1,000 new chemicals each year, especially not in

health or the environment" must report the information to the US Environmental Protection Agency (EPA). To be reportable, such information does not need to establish

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conclusively that a substantial risk exists. Instead, information must be reported if it "reasonably supports the conclusion" that a chemical presents such a risk. The law says such information must be reported to EPA within 15 days and provides a penalty of \$6,000 for each day that the reporting is late.

A recent book on the TSCA describes the importance of Section 8(e): "In some respects, Section 8(e) is the most critical of the TSCA reporting requirements. EPA views its information-gathering under this section as an early-warning mechanism for keeping the Agency and citizens apprised of newly discovered chemical hazards."¹

For 14 years the EPA relied upon the TSCA 8(e) early-warning system. However, in 1990, after 14 years of relying on this system of corporate self-regulation to protect public health, the EPA had to admit that it was not working.

From 1986 to 1991, the EPA engaged in a four-year legal battle with Monsanto Corporation over Monsanto's pesticide Santogard PVI. In 1990, Monsanto agreed to pay a fine for failing to report scientific data that the company had acquired in 1981 showing that Santogard PVI causes tumours in rats. Because the law provides fines of \$6,000 per day for failure to report under Section 8(e), in 1990 Monsanto should have paid a fine of nine years times 365 days times \$6,000, equalling \$19.7 million. The EPA settled for \$198,000 which, to a company the size of Monsanto, is pocket change. (Even a fine of \$19.7 million would not have slowed Monsanto, which had 1996 sales of \$9.2 billion.)²

This event revealed the government's feebleness. It can't even collect fines from scofflaws, as provided by statute. This incident also gave the agency a hint that Section 8(e) wasn't producing the data needed to protect public health and safety.³ The EPA then sent a letter to all chemical manufacturers urging them to submit any data they had failed to report under Section 8(e). Six months later, the Chemical Manufacturers Association asked for a meeting with EPA officials and together they hammered out an "amnesty" programme whereby companies that had violated

8(e) reporting requirements year after year would send the EPA all the data they had withheld. In return, EPA would limit its fines to \$15,000 for any human study and \$6,000 for any animal study or other type of health study. In addition, any one corporation's total liability would be capped at \$1 million.

While this amnesty was in effect –

Under Section 8(e), Monsanto should have paid a fine of \$19.7 million. EPA settled for \$198,000, and revealed the government's feebleness.

during the period 1991-1994, more than 120 companies sent the EPA 11,000 studies or reports of adverse health effects from chemicals on the market that had never been reported in scientific literature. The Du Pont corporation alone submitted 1,380 studies; the Ciba-Geigy corporation submitted 580; Shell Oil corporation submitted 351; Hoechst

Clearly, any taxpayers hoping their government is going to protect them from toxic chemicals will be greatly disheartened by these revelations.

Celanese corporation submitted 200.

Some studies had been on company shelves since 1960 and had not been submitted when the TSCA was passed in 1976. Under the law, any such study submitted in 1991 should have drawn a fine of 15 years times 365 days times \$6,000, equalling \$32.9 million. Thus the "amnesty" saved these chemical corporations hundreds of millions of dollars if

Any large corporation can tie up the EPA in legal snarls for years or decades.

not billions (and impoverished the tax-paying public by an equal amount).⁴

Clearly, any taxpayers, or any members of the public hoping their government is going to protect them from toxic chemicals, will be greatly disheartened by these revelations. Anyone who examines this situation dispassionately can see that these corporations have been bamboozling the

government for years, thumbing their noses at the most important toxic-chemical-control law on the books, and dancing away from major liability. Meanwhile, the EPA is carrying their water for them. How many thousands of people have been poisoned because these corporations withheld crucial information from the EPA's "early-warning" system? After these corporate scofflaws and poisoners are caught red-handed, the government bends over backwards to minimize any pain they might feel from their crimes.

The EPA considers this programme a great success. The *National Law Journal* reports, "EPA views the programme as an important success, and it has already attempted to duplicate it."⁵ For example, to induce the natural gas industry to comply with another chemical-reporting law, the EPA has waived \$25,000-per-day fines and has agreed to cap liability at \$3,000 per chemical, while capping any single company's liability at \$90,000. Last year the EPA began applying this same principle to "enforcement" of the nation's Right to Know law. The EPA sent letters to thousands of food processors that have ignored the Right to Know law for years, waiving the \$25,000-per-day fines and capping each corporation's liability at \$2,000. This is called enforcement.³

How could the EPA consider such programmes a success? Because the EPA has realized that it is powerless against the chemical corporations, who have bigger staffs, *much* bigger budgets, and many, *many* more lawyers than the EPA will ever have.

The *National Law Journal* summarizes it this way:

"EPA policy makers have themselves concluded that they cannot count on the traditional techniques of deterrence to prevent crime on this beat. Not with thousands of factories, hundreds

of thousands of products and a complex set of laws – the meaning of which is subject to perpetual debate."⁶ What better summary of our situation could we ask for? Any large corporation can tie up the EPA in legal snarls for years or decades.

The idea of "regulating" corporate behaviour to prevent the poisoning of the environment is a joke. It never has worked, and it never will work. It cannot

work. The entire result of 21 years of steady effort under the TSCA has been to remove nine chemicals from the market. We could multiply the size of our federal government by ten (a truly frightening thought) and it would still be no match for the Fortune 500.

Yet these corporate behemoths have a gaping vulnerability. They are amazingly weak. If you stop to think about it, they are nothing more than the Wizard of Oz. Behind their enormous displays of green smoke and thunder, all of their power boils down to this: they were given a single piece of paper, as a matter of privilege (not a matter of right), by a state legislature. That paper could be withdrawn or modified at any time. Their power endures only so long as we, the people, fail to develop strategies focussed on this huge vulnerability.

Any time we decide that the situation

needs changing, we have the legal power under the Constitution to change it. Most of us sit idly by, watching the planet's ecosystems being shredded by unnecessary 'developments' and unneeded products, its species genetically engineered, poisoned and displaced, the vast majority of the world's peoples deraci-

We could multiply the size of our federal government by ten (a truly frightening thought) and it would still be no match for the Fortune 500.

nated, impoverished and enslaved. Most of us sit idly by, dreaming of new regulations to replace the old regulations that never worked and never *could* work. Instead, we should be thinking long and deeply about the corporate form. Thomas

Hobbes, the 17th-century British philosopher, called corporations "worms in the body politic". Obviously the body politic needs to develop a modern immune system to protect itself against these particular worms and any similar ones that might come along.

But this task will require us to remove our rose-coloured glasses and stop pretending that regulation can control the behaviour of these worms. Regulation is a ruse, a foil, a ploy invented and created by corporate brigands in the period 1885-1915. The environmental community needs to stop playing their game.

And, unpleasant as it may seem, we need to point our fingers and demand of those who *do* play such games: "Which side are you on?"

Peter Montague

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The Medical-Industrial Complex

by Ross Hume Hall

One reason we are making so little headway in our struggle with cancer, is that cancer treatment is big business. A firm alliance between the established cancer institutions and the chemical, pharmaceutical and nuclear industries has formed what the author terms the 'Medical Industrial Complex'; far bigger and more powerful than President Eisenhower's 'Military Industrial Complex'. Policies promoted by the establishment are unlikely therefore to represent anything other than the interests of that alliance.

Why should a group of Boston breast cancer survivors picket a national meeting on breast cancer sponsored by the American Cancer Society?¹ Surely the women would be delighted that several hundred cancer specialists were coming to Boston to present their latest findings about a disease that afflicts one woman out of eight (at some point in her life). They had read an advanced copy of the programme, however, in which the 67 speakers were to deal only with what the women disparage as slash, burn and poison – surgery, radiation and chemotherapy. Not one speaker was to offer any ideas on how to *prevent* breast cancer.

The pickets, members of the Women's Community Cancer Project,² were incensed that established cancer institutions were ignoring opportunities to prevent the disease, focussing instead on the holy grail of cure. The women recognize that improved treatment is imperative, but that to avoid the disease is clearly preferable, by any standards.

Each year in the United States, 184,000 women are newly diagnosed with breast cancer. If the breast cancer rate in the United States were similar to that in Asia, where women are five times less likely to contract breast cancer than they are in the US, Canada and Europe, there would be only about 35,000 new cases each year. That means some 150,000 women each year would not contract breast cancer. What's more, when women from Asia migrate to Western countries, their rate of breast cancer, within a generation, jumps to that of native-born women. The problem therefore is not a genetic one.

Albeit, lifestyles in Asia differ from lifestyles in the West, but specifics of why women in these countries have a low rate of breast cancer are open to study, and are at the very least 'interesting'. Nevertheless, neither the American Cancer Society, nor any other cancer institution, has shown the slightest interest in promoting such a study and translating the findings into the Western experience – for the benefit of every woman.

Breast cancer is just one example. The broader issue is who directs cancer policy? How and why are decisions made to deal with an epidemic, which in all its forms afflicts one person out of three at some point in his or her life? There has to be something wrong with a policy that doesn't look at cancer in its totality, a disease that for the most part should be preventable. Why should this be so?

The Medical-Industrial Complex

To understand the tight control over social policy for dealing with cancer, look to a coalition of shared interests, which for want of a formal name can be called the medical-industrial complex. This group of industries and medical institutions, including the American Cancer Society, conducts research, develops and markets drugs, medical equipment and supplies, and provides a variety of treatment facilities. The cancer part of the medical-industrial complex spells big money. Over the last 50 years cancer research budgets

have ballooned into the billions. Diagnostic facilities, instruments and drugs for cancer eat away a major part of each country's annual health-care outlay.

The term, medical-industrial complex, is not intended to be laudatory. In 1959, President Eisenhower, finishing his term of office, warned that a *military-industrial complex* distorted military and social policy by virtue of its bias towards production of military hardware. The defence needs of the country, said Eisenhower, are incidental to this goal.

No less, the medical-industrial complex distorts health policy to suit its own purposes. At its best, this complex provides better diagnosis, new treatments and first-rate health-care facilities. At its worst, the medical-industrial complex blocks an all-embracing programme for preventing cancer.

Is Cancer Preventable?

Before getting into how the medical-industrial complex structurally blocks a preventive approach, we should determine whether cancer really is preventable? The answer is based primarily on comparing cancer statistics between regions and countries. John Higginson, a cancer epidemiologist and director of the World Health Organization Center for Research on Cancer, Lyons, France, was one of the first scientists to draw

When women from Asia migrate to Western countries, their rate of breast cancer, within a generation, jumps to that of native-born women.

Ross Hume Hall is a former cancer researcher and chairperson, Department of Biochemistry, McMaster University Faculty of Health Services, Hamilton, Ontario. His most recent book is *Health and the Global Environment*, Polity Press, 1990.

conclusions from data, such as the low rate of breast cancer in Asia. As early as the 1950s, Higginson concluded that 80-90 per cent of *all* cancer is caused by environmental factors.³ Higginson defined *environment* as one's total life experience: your marital status, what you eat, where you live, where you work, the air you breathe, the food and water you take in. Higginson did not believe in single cause, but rather that a constellation of interacting factors leads to the disease. "Cancer is preventable", said Higginson, "if we identify and are able and willing to deal with these factors."

It's going on 50 years since Higginson's studies, yet in that time no systematic search for cancer-causing factors has been undertaken. The medical-industrial complex focusses almost exclusively on treating individuals and searching for a cure.

We find ourselves in a similar position in which to that of our nineteenth-century forebears. The major health issue then was infectious disease. They had no cure for typhoid or cholera, but instead launched vast public health programmes of clean water, uncontaminated food and better living conditions, which eliminated much of the disease then burdening nineteenth-century society. Such programmes proved that human suffering due to illness and premature death, not to mention the medical-care costs, can be reduced or eliminated by effective social policy.

As we move into the twenty-first century, a major health issue is cancer, for which there is no effective cure.

And so we have created conditions on which our great grandchildren will reflect, and wonder how we could have condemned one-third of the population to the disease – with current treatment a poor gamble – when for the last 50 years we've had good evidence that most cancer is avoidable. It defies common sense.

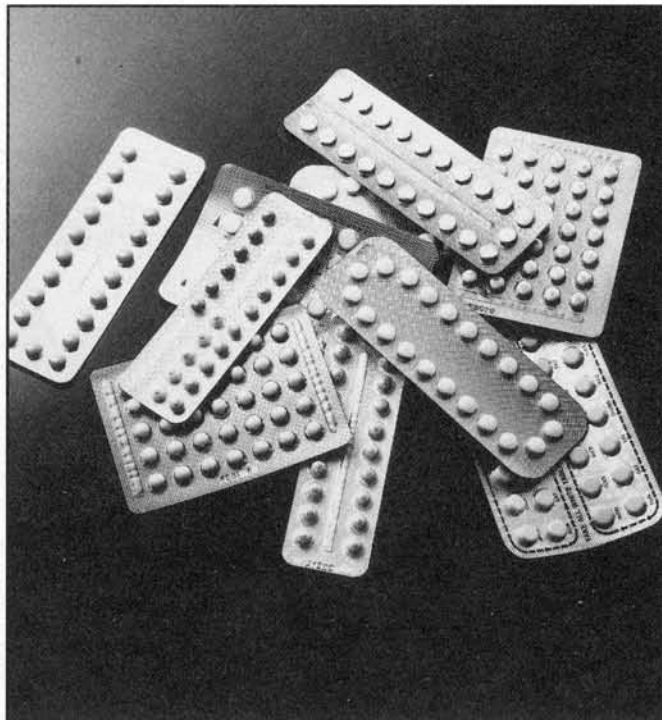
Then, common sense doesn't guide cancer policy. So we ask: how does absence of a preventive approach serve the interests of the medical-industrial complex?

The Medical Part of the Complex

In analysing this question, I have chosen to examine American institutions. The analysis applies equally well to other industrialized countries, all of whom have comparable institutions that march lock-step to the tune played by the medical-industrial complex. Two institutions, the American Cancer Society and the National Cancer Institute, dominate American cancer policy. Both institutions in their early history were guided by strong-willed individuals who believed that a cancer cure *could* be found, if enough effort was put into the search. They shunned prevention as a viable option.

Prior to the mid 1940s, the American Cancer Society (ACS) was a feeble organization run by a group of medical doctors. That changed when Mary Lasker, the wife of Albert Lasker, an advertising entrepreneur, took over. Albert, who ironically had made a fortune in the tobacco industry, set up the Albert and Mary Lasker Foundation in 1942 to support medical research. His wife, using the foundation as a base, took on cancer as her mission. She saw the disease was not merely a medical problem, but also a social issue.

She and a small group of business associates wrested control of the ACS from the doctors and within two years increased its take from the public 50-fold. Lasker and her colleagues set the



ACS on a course from which it never wavered, the search for improved treatment of patients and for the ultimate cure.

Lasker realized that for the ACS, a volunteer society, to succeed, the public had to support its goals. The society started a major campaign, as one critic complained, that inspired fear of death and incited public panic. The ACS has never stopped fanning public fears about cancer, and public donations keep rolling in. With vast public support, the ACS has become a dominant cancer-policy maker.

One reason for this dominance is its relationship with the National Cancer Institute (NCI), created by the United States federal government in 1937 as a unit of the National Institutes of Health, Bethesda, Maryland. The NCI's charge was to engage in research into

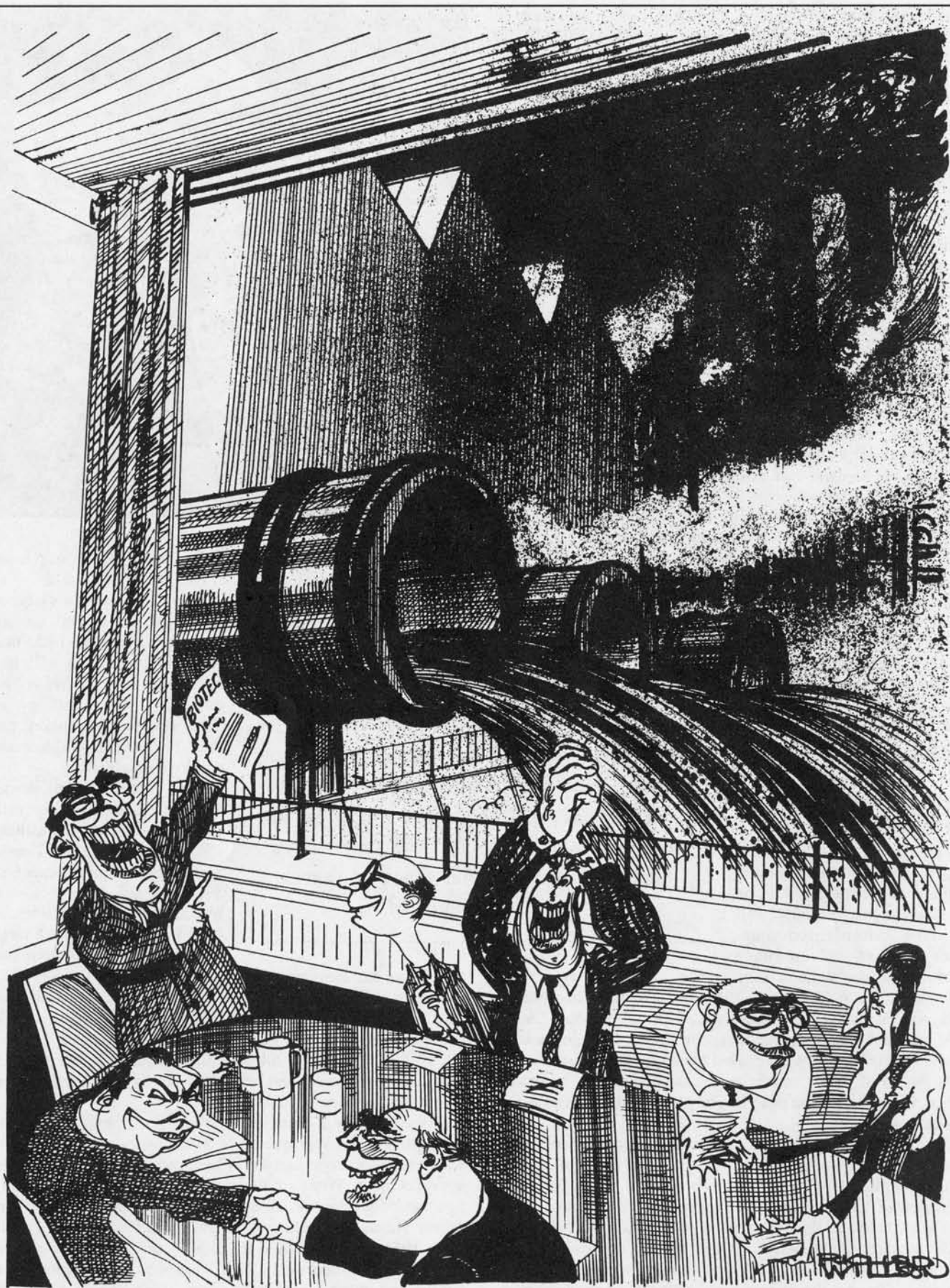
the causes and treatment of cancer. For the first decade of its existence, it lasted on minuscule funds. Its budget in 1945 was \$0.5 million. Moreover, The NCI's research attracted little interest in the scientific community. Cancer research slunk in the bottom reaches of the scientific pecking order. All that changed when Lasker and her colleagues turned their attention to Washington's deep pockets.

They skilfully lobbied the senators and congressmen who controlled health appropriations. They made certain the public was aware of congressmen who voted in favour of those appropriations. What politician would want to be seen voting against conquering a killer disease? Lasker had a strong ally in James Shannon, director of the National Institutes of Health from 1955-1968. Shannon used every dollar appropriated to his institutes, including the NCI, to expand their programmes. By the end of the Eisenhower years (1960), the NCI's annual budget was running at \$110 million.

The NCI's constituency extends beyond its own extensive laboratories and scientific staff; over half its budget is given out in the form of grants and contracts to scientists in universities

Our great grandchildren will look back at this period and wonder how we could condemn one third of the population to the disease, when for the last 50 years we've had good evidence that much of cancer could be eradicated.

Drawing by Richard Willson.



"They've found it – a gene for all cancers! What a useful little thing, the gene ... much more convincing than mushrooms and blue cheese."

and research institutes across the country. Top scientists, including Nobel prize winners, suddenly with an interest in newly accessible resources, no longer considered cancer research a pariah. Faculty salaries and laboratory support depend on the golden flow, and, without it, health-related departments of many United States universities would collapse.

The small but effective lobbying effort by Mary Lasker and her colleagues has mushroomed into a gigantic lobby of cancer institutes, universities and their alumni, devoted to improved treatment and search for a cure. The downside for the public is that this single-minded goal has created an army of cancer specialists, who lack the know-how and interest in investigating a preventive approach to cancer.

The Bandwagon Search for the Cure

Cancer defies easy description and scientists have no idea how – or even if – cancer can be cured. That being the case, you'd think this huge army of researchers would move on a broad front, exploring every lead. Not so. Lewis Thomas, once President of Memorial Sloan-Kettering Cancer Institute, New York, complained that the whole operation of cancer research had become too bureaucratic, too cumbersome and too goal-directed. The bureaucrats, he said, "fail to allow for the surprises which surely must lie ahead."⁴

Albert Tannenbaum, then president of the professional organization, the American Association for Cancer Research, as far back as 1957 assailed his fellow researchers for climbing on one bandwagon after another: transplantation therapy, immunology, carcinogenesis, enzyme activity, chemotherapy, new diagnostic tests. Tannenbaum, like Thomas, recognized the enormity of our ignorance about cancer, and the folly of ignoring any direction, any possibility.

So here we are in the late 1990s and cancer researchers still hop from one bandwagon to another. Today it's genes. Researchers have announced discovery of the colon cancer gene, the breast cancer gene, and many more. But what does the discovery of such genes do for the patient with colon or breast cancer? Claudio Stern, a biologist at Columbia University, New York, dampens any enthusiasm. Discovering a gene, he says, is like trying to learn a foreign language from a dictionary.⁵ You memorize words but know nothing of the context in which these words are used.

Look beneath the bandwagon and of course the driving force for discovering cancer genes becomes apparent. Not surprisingly, it's money. Take breast cancer genes. A 40-member team led by Mark Skolnik of the University of Utah Medical Center, Salt Lake City, in 1994 announced the discovery of a breast cancer gene called BRCA1.⁶ A defect in the gene can lead to breast cancer. Myriad Genetics Inc., a biotechnology company in Salt Lake City and part of Skolnik's team, rushed to patent the gene. The company plans to develop a lucrative diagnostic test capable of revealing the defective gene in the estimated 1 in 200 women who carry it.

The patent situation, however, grew murky with a report fifteen months later that another team led by Richard Wooster and Michael Stratton of the Institute of Cancer Research, Sutton, UK, had discovered a second breast cancer gene,

BRCA2.⁷ The small number of women who carry defects in this gene are also likely to contract breast cancer. CRC Technology, a company set up by the Cancer Research Campaign, which funded the British team, applied for a patent. The CRC Technology application was immediately contested by Myriad, who claimed that it had already discovered the second gene.

So while lawyers, court cases, and the lure of big bucks from diagnostic testing swirl around the breast cancer genes, what about women and their risk of breast cancer? The two genes are connected only with hereditary breast cancers – five to ten per cent of all cases. And what good does such a test do? If the test shows a woman carries a defective gene, there is a limit to what can be done.

In many ways this highly sophisticated research *does* increase our understanding of human biology. What is of concern however is the way the medical-industrial complex uses such research. They would have us believe that because of various findings, such as cancer genes, the cure lies just around the corner. The truth is however, it doesn't make much difference if a cure ever emerges. The search is a splendid money generator.

The Industrial Part of the Complex

Institutions and companies making medical equipment and drugs and providing services in the health-care field form one aspect of the medical-industrial complex. Their vested interest in sick people is obvious. Healthy people don't need their products or services. But talk of staying healthy – of preventing cancer – and other industries also become nervous. Because they feel threatened, even

industries without a direct role in medical care deflect cancer policy away from prevention. The chemical industry is an obvious example.

Ever since Rachel Carson in her 1962 book *Silent Spring* exposed chemicals dumped in the environment as factors in disease and death, the chemical industry has fought to maintain what it considers its rights. For centuries the industry dumped chemicals into the environment willy-nilly. Although it has cleaned up considerably (at least in the North) in the last 30 years, the industry still wants to exercise the freedom to decide what and how much to dump. As such it functions in two ways: by controlling how governments regulate chemicals and by mounting a disinformation campaign to allay the public's 'chemophobia'.

The chemical industry got its foot in the regulatory door in the early 1970s with the creation of the United States Environmental Protection Agency (EPA). The agency needed a scientific basis to regulate chemicals in the environment, and the industry lobbied to force them into adopting a science tailored to the needs, not of the environment and the public, but of the chemical industry.

The industry in the nineteenth century, concerned by increasing on-the-job illnesses, developed the means for measuring the danger of chemicals in the workplace, a science that came to be known as toxicology. As a tool, toxicology suits the conditions of the workplace. A factory is enclosed, relatively small and workers come into contact with a small

Bruce Ames argues that synthetic pesticides and other unnatural chemicals contaminating food and water are no worse a threat than the natural substances in plants. The chemical industry, delighted to cite an "independent" authority like Ames, broadcasts the message far and wide.

The Truth About Breast Cancer Awareness Month And ICI

More American women have died of breast cancer in the past two decades than all the Americans killed in World War I, World War II, the Korean War and the Vietnam War combined. The average woman killed by breast cancer loses 20 years off her life. Thus with approximately 46,000 American women killed each year by breast cancer, we are now losing nearly a million person-years of life each year from breast cancer. The costs of this epidemic are incalculably large.

About 180,000 new cases of breast cancer arise each year among US women. Furthermore, since 1940, the incidence (occurrence) of breast cancer has been creeping upward one per cent each year. This relentless increase cannot be explained by an ageing population or by better detection such as mammography screening. The one per cent annual increase is real. In 1940, a woman's chance of getting breast cancer was half what it is today.

Everyone now accepts that breast cancer has environmental and 'lifestyle' causes. Two basic facts make this conclusion inescapable. First, breast cancer incidence is five times as high in some countries as in others. Secondly, when women migrate from a country with low incidence of breast cancer to a country with high incidence, their daughters acquire the breast cancer risk prevailing in the high-incidence country. Clearly, something in the environment (air, water, soil, food, or electromagnetic spectrum [for example, X-rays]) is at work here.

For years, breast cancer research (centred at the National Cancer Institute [NCI] in Bethesda, Maryland) has focussed not on prevention but on therapy and treatment – earlier detection, better chemotherapy, better radiation, and better surgery. These approaches have allowed many women to survive the disease (most of them without their breasts) but they have done little or nothing to prevent the scourge.

This non-preventive approach has been promoted aggressively by "Breast Cancer Awareness Month", an annual campaign that surfaces every October, sponsored by 17 governmental, professional and medical organizations, including the National Cancer Institute.

Breast Cancer Awareness Month was initiated in 1985 by a British chemical conglomerate called Imperial Chemical Industries (ICI), now known as Zeneca Pharmaceuticals. Breast Cancer Awareness Month is "focussed on educating women about early detection of breast cancer." Breast Cancer Awareness Month has promoted the slogan, "Early Detection is Your Best Prevention," but this is nonsense – if your cancer can be detected it's too late to prevent it. Breast Cancer Awareness Month – with all the authority of those 17 sponsoring organizations – consistently diverts attention away from real prevention.

According to a recent investigative report on Breast Cancer Awareness Month (BCAM) by Monte Paulsen (Detroit Metro Times, May, 1993), "ICI has been the sole financial sponsor of BCAM since the event's inception. Altogether, the company has spent 'several million dollars on the project', according to a spokeswoman. In return, ICI has been allowed to approve – or veto – every poster, pamphlet and advertisement BCAM uses." Thus the lack of a prevention message from Breast Cancer Awareness Month has not been accidental, and the 17 sponsoring agencies have adopted and endorsed Imperial Chemical's programme and message.

Breast Cancer Awareness Month thus reveals an uncomfortably close connection between the chemical industry and the cancer research establishment in the US. Imperial Chemical – with revenues of \$14 billion – is among the world's largest manufacturers of pesticides, plastics, pharmaceuticals and paper. ICI is also a major polluter for example, one of its Canadian paint subsidiaries has been held responsible for 30 per cent of all the toxic chemicals dumped into the heavily-polluted St Lawrence River which separates the US from Canada.

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number of chemicals. Toxicology tests one chemical at a time because that is all a worker might contact.

This is the science, the industry imposed on the EPA, in effect, extending the workplace to the environment. However, that which may be a suitable science for assessing safety in an enclosed factory is hardly suitable for assessing safety in the open world.

John Doull, Professor of Toxicology, University of Kansas, and author of *the* authoritative text on the subject, admits toxicology is incapable of assessing mixtures.⁸ In the open world, each of us – babies, toddlers, young people, old people – carries hundreds, if not thousands, of different chemical residues from pesticides, industrial chemicals and food additives in our bodies. Toxicology is blind to the dangers of carrying this lifetime burden, a blindness which clearly works in favour of the chemical industry.

Why? The chemical industry has ensured that environmental laws are written in such a way that the burden rests on the EPA to prove whether or not each chemical, one by one in isolation, is harmful. So the EPA is stuck with trying to prove harm with a flawed test procedure. The result, not surprisingly, has been that pesticides and waste chemicals can legally enter the environment and human bodies even though better testing might show that the chemicals are ultimately fatal.

The incompetence of EPA testing goes even deeper. The EPA licenses pesticides and issues dumping permits based on a standard human male, weighing 150 pounds, in his mid-thirties, healthy and robust. Officials estimate how much of the pesticide or waste chemical our standard man can tolerate without suffering ill effects and then set the legal limit about ten times lower.

That factor of ten doesn't work in the real world.

Individuals vary greatly in their susceptibility to toxic chemicals, and the differences between men and women can be punishingly large. George Lucier, a toxicologist at the National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina, says the variation is not a factor of 10 but a factor of 1,000.⁹ Women thus can fall victim to legal limits of residues of pesticides and waste chemicals on their supermarket grapes or in their apple juice.

So even at their best, EPA regulations disregard the susceptibility to cancer of 50 per cent of the population.

Disinformation

The chemical industry exploits the weakness of toxicology in its disinformation campaign to convince the public that synthetic chemicals are not a cancer-causing threat. The industry, for instance, is fond of quoting Bruce Ames, a biochemist at the University of California, Berkeley. Ames, like Richard Doll in the UK, has made something of a career out of downplaying the cancer-causing nature of synthetic pesticides and industrial chemicals dumped in the environment. Ames claims that such chemicals are no more dangerous than natural toxicants found in plants. He points out that coffee contains 1,000 chemicals, of which 28 have been tested and 19 cause cancer in rodents.¹⁰ He takes the same tack with a variety of common foods, such as mushrooms, noting that they contain the chemical hydrazine, which causes cancer in rodents.

But there is a basic flaw in Ames' argument. In the case of mushrooms, for example, the hydrazine is taken out of con-

text. Hydrazine from a laboratory bottle is tested in rodents at high doses, totally unrealistic in human terms. In any case, the real question is not whether laboratory hydrazine causes cancer but whether mushrooms as eaten by humans cause cancer? Ames can't answer that question.

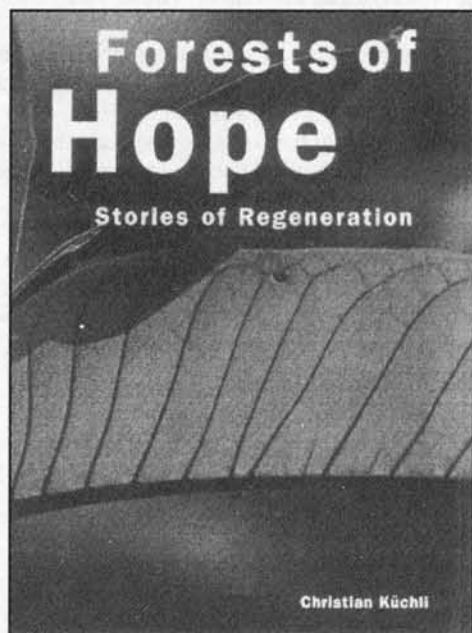
Hydrazine, although carcinogenic, belongs within the molecular context of the mushroom, just as the fire in your furnace belongs within the context of your home. Synthetic pesticides, in contrast, don't belong in the foods they contaminate. They are more like burning torches thrown randomly around your home.

What's more, if carcinogenic substances in plants are dangerous, how can it be that people who eat plenty of fresh fruits and vegetables have less cancer than those who eat few vegetables and fruit?

Nevertheless, Ames has used these flawed arguments to claim that synthetic pesticides and other unnatural chemicals contaminating food and water are no worse a threat than the natural substances in plants. The chemical industry, delighted to cite an 'independent' authority like Ames, broadcasts far and wide the message that synthetic chemicals are not a significant factor in the high rate of cancer. Such disinformation, if nothing else, confuses the issue in the mind of the public and politicians, weakening any resolve to eliminate chemical pollution.

The Weight of Evidence

Disinformation serves another purpose: namely that of throwing the blame for cancer on the individual. Ever since Doll and



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Peto in 1981 concluded that one-third of cancers could be attributed to dietary imbalance,¹¹ the NCI has mounted an intensive campaign to get people to eat more vegetables, five servings a day. The message says to one-third of patients with cancer: it's your fault, you didn't eat properly. But behind that message lies another: don't question commercial practice.

And yet, the NCI won't take the next and necessary step of questioning the way the vegetables arrive at the consumer's plate. There is a big difference between fresh and processed vegetables. Commercial processing, canning, freezing and packaging cause a drop in the inherent cancer-protecting value of the vegetable. And who is to judge, and by what means, the quality, safety and acclaimed 'superiority' of the genetically engineered vegetables now coming on the market?

The disinformation campaign is based, as I have mentioned, on toxicology and in addition on another and equally limited science, epidemiology. Epidemiology tries to link result with cause, and works well when dealing with a single link like smoking and lung cancer, but poorly when linking disease to the multi-chemical contamination all of us suffer. Yet when epidemiological studies show no link between an environmental contaminant and cancer, headlines shout: "no worries". The information given to the public doesn't mention the weakness of the scientific tool.

Using solely toxicology and epidemiology to investigate cancer-environmental links is like taking a dim lantern into a dark wood to look for criminals. You may find a criminal, but if you don't, you'd be foolish to claim the woods are criminal-free.

It's foolish for the EPA to limit itself to two weak sciences when other scientific fields illuminate in sharp relief the cancer links to environmental contaminants. Studies of wildlife, for instance, which are exposed to the same environmental contaminants to which humans are exposed, have produced strong evidence of chemical-cancer links. The weight of evidence from wildlife studies and from many other sciences builds a strong case that chemical contaminants in the environment contribute substantially to cancer and other human diseases. (See *Our Stolen Future* by Theo Colborn and collab-

orators for a summary of such evidence.)¹²

Yet in terms of public policy, the chemical industry lobbies politicians to ensure that government decision-makers exclude this weight of evidence. Studies revealing evidence of links between cancer and environmental contamination get tossed out. How can science serve the public interest when our most reliable evidence is disallowed?

Let's Get Serious About Prevention

Although we've known, at least since Higginson's work, that breast and other forms of cancer are mostly preventable, the medical-industrial complex has insisted that society puts all its eggs into one basket, the expensive search for a cure. John Bailar, a professor of epidemiology at the University of Chicago, points out, among a great many others, that, in spite

of the billions pouring into cancer research, the death rate from cancer is not dropping.¹³ In fact, between 1973 and 1990, a period when cancer spending has greatly accelerated, the death rate due to cancer rose 7.5 per cent, less than two-thirds of which increase can be attributed to lung cancer. In 1940 the breast cancer rate, now 1 in 8, was then 1 in 20.

At this point in our history, we need to develop a balanced approach that recognizes and deals with all facets of a disease that one in three of us will get. While a continued search for improved treatment and a possible cure is all very well and good, we should acknowledge that prevention is both feasible and preferable. The causes, in most cases, are clear. Systematic research can pinpoint them in more detail and social policies can eliminate them from public and home life. It's an approach that promises quick and lasting societal benefits. Good data from Israel, for instance, show that, when in 1978 they banned three pesticides known to accumulate in breast tissue, the breast cancer rate immediately dropped.¹⁴

"We must", as John Bailar says, "get serious about prevention."

What is stopping us, however, is the almost suffocating hold the medical-industrial complex retains over cancer policy, and the hugely powerful chemical industry's interest in protecting its products.

Using solely toxicology and epidemiology to investigate cancer-environmental links is like taking a dim lantern into a dark wood to look for criminals. You may find a criminal, but if you don't, you'd be foolish to claim the woods are criminal-free.

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Winning the War Against Cancer? ... Are They Even Fighting it?

by Samuel Epstein

In 1971, President Nixon launched his so-called War on Cancer. Twenty seven years and billions of dollars later, we are still in the grips of a growing cancer epidemic. While most of that money has been squandered on a search for "cures", virtually nothing has been done to prevent exposure to carcinogenic chemicals in the environment, despite overwhelming evidence that contamination of our air, water, and food is a major cause of cancer. Unfortunately, as the author explains, the 'Cancer establishment' is controlled by the very industries that generate such contaminants. This is the problem that must be addressed if we are to wage a genuine and successful war on cancer.

In 1992, 69 highly respected and prominent experts in industrial medicine, carcinogenesis, epidemiology and public health, co-signed a statement heavily criticizing US federal cancer policies, with particular reference to the National Cancer Institute (NCI). Among other things, the statement charged:

"Cancer now strikes one in three and kills one in four Americans, with over 500,000 deaths last year. Over the last decade, some 5 million Americans died of cancer and there is growing evidence that a substantial proportion of these deaths was avoidable.

We express grave concerns over the failure of the "war against cancer" since its inauguration by President Nixon and Congress on December 23, 1971. This failure is evidenced by the escalating incidence of cancer to epidemic proportions over recent decades. Paralleling and further compounding this failure is the absence of any significant improvement in the treatment and cure of the majority of all cancers.

A recent report by the American Hospital Association predicts that cancer will become the leading cause of death by the year 2000 and the "dominant speciality" of American medicine. The costs in terms of suffering and death and the inflationary impact of cancer, now estimated at \$100 billion annually (nearly 2% of the GNP), is massive. These costs are major factors in the current

health care crisis, with per-case Medicare payments exceeding those of any other disease.

We express further concerns that the generously funded cancer establishment, the National Cancer Institute (NCI), and the American Cancer Society (ACS) and some twenty comprehensive cancer centres, have misled and confused the public and Congress by repeated claims that we are winning a war against cancer. In fact, the cancer establishment has continually minimized the evidence for increasing cancer rates which it has largely attributed to smoking and dietary fat, while discounting or

ignoring the causal rôle of avoidable exposures to industrial carcinogens in the air, food, water and the workplace.

Furthermore, the cancer establishment and major pharmaceutical companies have repeatedly made extravagant and unfounded claims for dramatic advances in the treatment

and 'cure' of cancer. Such claims are generally based on an initial reduction in tumour size ('tumour response') rather than on prolongation of survival, let alone the quality of life which is often devastated by highly toxic treatments".

The cancer establishment, NCI and ACS, responded with a media campaign of personalized criticism. Furthermore, the NCI and ACS misrepresented the February 4 statement as exclusively mine (e.g. Anonymous, 1992a; Lawrence, 1992). Reacting to my responses and the ensuing publicity, the NCI invited me to present an "Evaluation of the National Cancer Program" at the May 5, 1992 meeting of the National Cancer Advisory Board, at which the Presidents Cancer Panel and NCI scientific and administrative staff were also present. The following article is in part based on my May 5 presentation to them.

"We express further concerns that the generously funded cancer establishment has misled and confused the public and Congress by repeated claims that we are winning a war against cancer."

Dr Samuel S. Epstein, MD is professor of Occupational and Environmental Medicine at the School of Public Health, University of Illinois Medical Centre, Chicago. He is the author of *The Politics of Cancer* (Sierra Books and Anchoir/Doubleday), co-author of *Hazardous waste in America* (Sierra Books), and *The Breast Cancer Prevention Programme* (Macmillan, USA)

"The NCI", according to their own literature, "launched the cancer prevention awareness program in 1984 as part of our overall effort to reduce the rate of cancer mortality to one half of the 1980 rate (from 168/100,000 to 84/100,000) by the year 2000."

Within a subsequent few years, however, the NCI made the poorly publicized but startling admission that its objective of reducing cancer mortality was unrealistic. NCI now actually anticipates further *increases*, and not *decreases*, in cancer mortality rates, from 171/100,000 in 1984 to 175/100,000 by the year 2000!¹ This is a remarkable admission of the NCI's failure to even hold the line against increasing cancer mortality rates and the nation's second leading cause of death.

Worrying Trends

Cancer now strikes one in three and kills one in four, up from an incidence of one in four and a mortality of one in five in the 1950s. Age-standardized incidence rates in the overall US population have increased sharply from 1950 to 1988 (Table 1), by 43.5%; this percentage understates the absolute increase which is masked in part by declining stomach cancer rates. Rates for some common cancers have increased more sharply, lung by 263%, prostate by 100%, and male colon and female breast by about 60%. Rates for some of the less common cancers have also increased more sharply: malignant melanoma, multiple myeloma, and non-Hodgkin's lymphoma by well over 100%, and testis and male kidney by about 100%, to name a few. The only major declines have been for stomach and cervix cancers (see Table 1).

Increasing incidence rates have been accompanied by less sharply increasing mortality rates. From 1975 to 1984, overall age-standardized mortality rates increased by 5.5% from 162/100,000 to 171/100,000, while rates for those over 75 years increased by 9.0% from 1,212/100,000 to 1,351/100,000.² Americans aged 65 and over are now at a ten-fold higher risk of developing cancer than younger age groups.³ The discrepancy between incidence and mortality trends probably largely reflects the overdiagnosis of benign as malignant neoplasms, especially for the breast and prostate.⁴

Contrary to their own data, both the NCI and the ACS have insisted until very recently that cancer incidence and mortality rates, other than those due to tobacco, are not increasing:

"We are certainly not experiencing an overall epidemic of cancer, except for that attributable to cigarette smoking"⁵

Support for such unfounded assertions, however, persists from sources still relied upon by the NCI as authoritative:

"[The increase in mortality from cancer] can be accounted for in all industrialized countries", we are told by Sir Richard Doll, of whom more is written in this issue, "by the spread of cigarette smoking."⁶

Overwhelming data indicating the opposite is true have however been piling up:

"In the USA and United Kingdom, mortality rates for lung cancer ... have actually begun to decline in men, due in large part to reductions in smoking.⁷ Moreover, despite these reductions in lung cancer, incidence and mortality for many other types of cancer increased from 1969 to 1986 in 15 industrial countries, especially in persons over age 65.⁸ The causes of these recent increases in cancer cannot simply be explained by smoking, but appear to reflect other exposures to changing

Summary Changes in Cancer Incidence, 1950-1988*

Table 1.

Primary site	All Races Estimated cancer cases 1988†	Percent incidence changes in whites 1950-1988
Stomach	24,800	-72.9
Colon/rectum	147,000	10.6
Larynx	12,200	58.7
Lung & bronchus	152,000	262.8
Males	100,000	222.5
Females	52,000	511.7
Melanoma of Skin	27,300	303.3
Breast (females)	135,000	56.9
Cervix uteri	12,900	-77.7
Corpus uteri	34,000	-5.2
Ovary	19,000	2.9
Prostate gland	99,000	100.3
Testis	5,600	96.1
Urinary bladder	46,400	54.5
Kidney & renal pelvis	22,500	102.1
Hodgkins disease	7,400	20.6
Non-Hodgkin's lymphoma	31,700	154.1
Leukaemia	26,900	4.0
Childhood cancers	6,600	21.3
All sites excluding lung	833,000	29.1
All sites	985,000	43.5

* NCI, 1991; data age-adjusted to the 1970 U.S. standard population.

† Excluding basal and squamous skin, and all in situ cancers.

factors in the environment".⁹

Furthermore, even assuming incorrectly that all lung cancer is due to smoking, about 75% of the increased cancer incidence since 1950 has been in sites other than the lung (Table 1).

Little or No Change in Survival Rates for Common Cancers

Over the last two decades, NCI and ACS leadership, with support of the cancer drug industry, has made over-optimistic claims for success with the latest anticancer drugs, based sequentially on cytotoxic chemotherapy, interferons, and

recent biotechnology products including tumour necrosis factor, monoclonal antibodies, and interleukins. Responding to criticisms of such claims,¹⁰ the NCI asserted:

"There is clear and striking evidence for improvements in cancer treatment, not only for the less common disease in

younger age groups, but also for the common tumours that affect older age groups".¹¹

Their position, however, is poorly supported. The overall five-year survival rates for all cancers have not materially improved, with the notable exception of paediatric and other common cancers such as testicular, even in more recent years. From 1974 to 1987, overall five-year survival rates increased marginally from 49.1% to 51.1% for all ages and races, and decreased from 38.6% to 38.4% for blacks.¹²

Such unfounded claims for advances in ability to treat and cure cancer are meeting, not surprisingly, with increasing scepticism:

According to the General Accounting Office, "for the

Contrary to their own data, the cancer establishment has insisted until very recently that cancer rates, other than those due to tobacco, are not increasing.

majority of the cancers we examined, the actual improvements (in survival) have been small or have been overestimated by the published rates ... NCI does not systematically alert readers of its annual statistics reviews to potential sources of bias that affect changes in survival rates ... It is difficult to find that there has been much progress ... (For breast cancer), there is a slight improvement ... (which) is considerably less than reported."¹³

"The real survival rates (for the common cancers) have hardly changed since the sixties and seventies"¹⁴

Based on a recent comprehensive review of the clinical oncology literature and a questionnaire survey of over 350 cancer specialists and research units worldwide, a leading German biometrician¹⁵ concluded that:

"At least 80% of cancer deaths in Western industrial countries are due to advanced epithelial (as opposed to connective tissue) malignancies. Apart from lung cancer, particularly small-cell lung cancer, there is no direct evidence that chemotherapy prolongs survival in patients with advanced epithelial malignancies.

"The majority of publications equate the effect of chemotherapy with (tumour) response, irrespective of survival. Many oncologists take it for granted that response to therapy prolongs survival, an opinion which is based on a fallacy and which is not supported by clinical studies. To date there is no clear evidence that the treated patients, as a whole, benefit from chemotherapy as to their quality of life.

"With few exceptions, there is very little scientific basis for the application of chemotherapy in symptom-free patients with advanced epithelial malignancy. Although this is the opinion of a good number of well-known oncologists, the ongoing studies do not take this fact into account."

NCI current claims for cancer cures are now more muted¹⁶:

"In patients with disseminated forms of the common epithelial tumours, both complete remissions and cures continue to elude us."

Professional Mindsets in the National Cancer Institute

The key problem in the leadership of the cancer establishment is a professional mindset fixated on diagnosis, treatment and research, coupled with relative indifference to and ignorance of cancer cause and prevention. Critically, the current 18-member National Cancer Advisory Board (NCAB) "almost totally lacks expertise in occupational and environmental carcinogenesis,"¹⁷ which is clearly in violation of section 407(a)(1)(B) of the National Cancer Act, which requires that no less than five members "shall be individuals knowledgeable in environmental carcinogenesis."¹⁸ The same is true of the current 3-member executive President's Cancer Panel which also lacks expertise in cancer prevention.

Even more critically, the composition of the executive policy-making Cancer Panel reflects the same myopic skewed mindsets of the NCAB. The Panel's three members are Chair Harold Freeman, a surgeon and oncologist; Geza Jako, a surgeon; and Nancy Brinker, founder of the Susan Gomen Breast Cancer Foundation. None of these members has professional or other background qualifications in environmental or occupational carcinogenesis, or indeed in cancer prevention.

Conflicts of Interest

Problems of professional mindsets in NCI leadership appear further compounded by poorly recognized institutionalized conflicts of interest.¹⁹ For decades, the war on cancer has been dominated by powerful groups of interlocking professional and financial interests – with the highly profitable drug development system at its hub – and a background that helps explain why "treatment" not prevention, has been and still is the overwhelming priority, as indeed it is for most physicians. The members of the generously funded cancer establishment include: the NCI; the ACS; a network of 57 National Cancer Centres including 22 Comprehensive Cancer Centres, such as the prototypical New York's Memorial Sloan Kettering, whose annual budget exceeds \$350 million; NCI and ACS contractees and grantees at leading universities; and major pharmaceutical companies. Cancer care is big business, not just science or charity, with cancer drug sales of well over \$1 billion annually.

Actual connections between the cancer establishment and the drug development industrial complex, chemical, pharmaceutical and biotechnology companies, include Bristol-Myers Squibb, the nation's largest chemotherapy drug producer, which also controls key positions on Sloan Kettering's board (the biggest cancer centre in the USA). Bristol-Myers was

recently charged by the Food and Drugs Administration with "promoting several unapproved, and unproven, uses of six cancer drugs, including the best sellers in its \$850 million a year line of oncology products".²⁰ Other board members have also close affiliations with oil, steel, and various large corporations; of particular

additional interest is the interlocking relationship of Sloan Kettering's board with the media giants. Another major component of the cancer drug industry is Sandoz Othram Ltd (now Novartis), a huge pharmaceutical company, which recently signed a \$100 million cancer drug development deal with Boston's Dana-Farber Cancer Institute.

A more obvious conflict of interest relates to the three-member Presidentially appointed Cancer Panel which controls NCI priorities and policies. The most long-standing past chairman of the panel was Benno C. Schmidt, an investment banker, senior drug company executive, and member of the Board of Overseers of the Memorial Sloan Kettering comprehensive cancer centre. He was followed by the late Armand Hammer, Chairman of Occidental Petroleum, a major polluting industry and manufacturer of carcinogenic chemicals.²¹ Congress has recently warned against such conflicts of interest in the Public Health Service:

"The Secretary shall by regulation establish criteria for preventing and for responding to the existence of any financial interest ... that (A) will create a bias in favour of obtaining results ... that are consistent with financial interest; or (B) may be reasonably expected to create such a bias."²²

Failure to Provide Information on Prevention to Congress and Regulatory Authorities

Reflecting professional mindsets and institutionalized conflicts of interest, for over two decades the NCI has consistently failed to provide Congress, Federal, and other regulatory agencies with scientific information on the importance of primary cancer prevention, with specific reference to

Even assuming incorrectly that all lung cancer is due to smoking, how can they explain that about 75% of the increased cancer incidence since 1950 has occurred in sites other than the lung?

reducing avoidable exposure to environmental and occupational carcinogens, and also on fundamental principles of carcinogenesis and epidemiology. Illustrative are carcinogenic dietary contaminants, culminating in the Administration's 1988 revocation of the 1958 Delany Law, a law which banned the deliberate addition to food of any level of carcinogen.²³ As emphasized by the group of 69 experts: "This critical law was revoked in spite of the overwhelming endorsement of its scientific validity by a succession of expert committees over the past three decades." Such failure by the NCI contrasts with its stated cancer control objectives recommending interventions with "other Federal agencies, State agencies, local government, private industry, professional organizations, voluntary organizations and the media."²⁴

Questionable Relevance of Basic NCI Research

The NCI has traditionally maintained that basic research on the mechanism of carcinogenesis at a cellular level is one of its highest priorities to which major resources are allocated. The relevance of such research to the NCI's overall mission is, at best, questionable. There is little apparent evidence for its relevance to cancer prevention. The views of some of the nation's leading molecular biologists and recipients of substantial NCI funding are illuminating:

"I have no idea when we'll know enough to develop anything that's clinically applicable, and I don't know who's going to do it ... It's not a high priority in my thinking."²⁵ And according to Varmus, "You can't do experiments to see what causes cancer. It's not an accessible problem, and it's not the sort of thing scientists can afford to do."²⁶

Congressional scepticism on the NCI's high priority for basic research appears fully justified.²⁷

Low Budget for Prevention

Of an approximate \$2 billion budget for 1992, the NCI allocates about \$645 million, or 30%, to "cancer prevention", of which the Division of Cancer Etiology (DCE) receives about 82% and the Division of Cancer Prevention and Control (DCPC) the remainder. Included in the so-called "cancer prevention" budget is an allocation of some \$335 million, 17% of the total budget, for "primary cancer prevention", defined as "those research activities designed to yield results that are directly applicable to the identification of risk and to interventions to prevent disease or the progression of detectable but asymptomatic disease."²⁸

Perhaps not surprisingly, the NCI has apparently never initiated any scientific "interventions" in legislative, regulatory, or public arenas of any sort, designed to prevent or reduce avoidable exposures to any carcinogens other than tobacco. A mere one per cent of the total NCI budget is allocated to research into occupational cancers.

With the exception of wide-ranging smoking programmes, only nominal funding, of \$50 million at most, appears for research on avoidable carcinogens in air, water, food, home and workplace. Furthermore, there is no evidence of any funding for interventions directed at reducing such avoidable exposures. The Congressional reaction has been one of little surprise. Indeed, as they point out:

"A number of scientists have suggested that cancer prevention receives an even smaller percentage of the budget than what NCI considers primary prevention."²⁹

What's more, NCI leadership has confused Congress as is clear from the following statement in the 1991 Congressional Report on NCI authorization and appropriations which relied on and quoted from NCI representations³⁰:

Exposure to synthetic chemicals: a leading cause of cancer in Farmers

There is overwhelming evidence that the dramatic increase in cancer rates is linked to increased chemical production over the last century. Annual production rates for synthetic, carcinogenic and other industrial chemicals increased from 1 billion pounds in 1940 to more than 500 billion pounds annually during the 1980s.

The evidence that chemicals cause cancer comes from animal and human tests. It is very difficult to study cancer in the general population. Even for tobacco, it took several decades and many million subjects to establish the carcinogenicity of tobacco smoke, which is still challenged by industry.

For studying cancer in the general population there is no practical method for looking at multiple exposures. However, there are very strong data from occupational studies.

Perhaps the clearest correlation between chemicals and cancer rates involves farmers. In the 1940s, American farmers used some 50 million pounds of insecticide. By the 1970s, insecticides use had grown among farmers to 600 million pounds, and currently more than one billion pounds of insecticides are used each year.

Farmers are far healthier than the typical American. For the most part they do not smoke and they have low rates of most cancers, heart disease, and other ailments. However, for the last several decades, farmers have experienced high rates of several cancers, including leukaemia, non-Hodgkin's lymphoma and cancers of the brain and prostate. Animal and epidemiological studies have linked several of these cancers with exposure to pesticides or solvents.

In addition, since 1976 several human studies have documented a strong association between breast cancer rates and increased body levels of organochlorine pesticides and other industrial chemical contaminants.

Since the dawn of the petrochemical era in 1940, less than 10 per cent of new industrial chemicals have been adequately tested by government or industry for carcinogenicity. In addition, of approximately 500 carcinogens identified in animal experiments, less than five per cent have been subjected to epidemiological study by the National Cancer Institute or by industry.

Extracted from Cancer Prevention News

"NCI Director Samuel Broder has written, 'Prevention is the most cost-effective way to deal with any disease or set of diseases; cancer is not an exception. Ultimately, the real gains in reducing cancer incidence and mortality will come from preventions.' The primary focus of the Cancer Prevention Research Program is to develop and evaluate strategies of the prevention of cancer. The primary goal of cancer control is to change 'personal behaviour and patterns of practice to maximize the impact of cancer prevention and control regimens on cancer morbidity and mortality.' For this reason, cancer prevention and control activities hold the greatest promise of achieving the goal of significantly reducing cancer incidence and mortality by the year 2000."

In other words, for the NCI, cancer prevention means trying to change lifestyles without in any way seeking to reduce unknowing exposures to industrial carcinogens in air, water,

food, the home and the workplace. In this the NCI not surprisingly receives support from the ACS and the chemical industry. Such misrepresentation is further compounded by its failure to admit to Congress that it has abandoned its unrealistic objective of "significantly reducing cancer incidence and mortality by the year 2000".

Downplaying Environmental and Lifestyle Factors

Current NCI estimates on the causes of cancer are largely based on an obsolete analysis of trends in cancer mortality from 1933 to 1977 reported over a decade ago, and as such reflect a lack of recognition of the multiple causes of some, if not most, cancers. What's more, the Doll and Peto conclusion that "there is no evidence of any generalized increase (in cancer mortality) other than that due to tobacco," was reached by excluding consideration of people over the age of 65 and blacks, just those groups in which more than half of all cancer deaths have been reported, and by incorrectly ascribing lung cancer almost exclusively to smoking. It should also be emphasized that the 1981 Doll and Peto estimates are devoid of any cited quantitative scientific data, apart from tobacco for which the confounding variable of occupational exposures was ignored.

The basis of Doll and Peto's estimates is as follows: they assumed that diet causes 35% (ranging up to 70%) of cancers and that smoking causes 30% and that these together with other causes, such as alcohol and sunlight, total 96%. This leaves a balance of 4%. To bring these figures neatly up to 100%, they conveniently ascribed 4% to occupational causes. They attempted to dignify this tenuous hypothesis by circular referencing of other blame-the-victim advocates, including Higginson, Armstrong and Wynder, who in turn cited earlier publications of Doll and Peto as their authority. Doll's continuing insistence on his obsolete blame-the-victim hypothesis, which trivializes the rôle of environmental and occupational exposure to industrial carcinogens is scientifically unsupported.

Trivializing Other Causes of Lung Cancer

Smoking is indisputably a leading cause of disease and death from cardiovascular disease and lung cancer, among other diseases. However, NCI leadership has trivialized the major rôle played by occupational and urban causes of lung cancer, evidence for which includes the following:

1. The incidence of lung cancer in nonsmokers has more than doubled over recent decades.
2. Lung cancer rates in black men are some 40% higher and have been increasing more rapidly than in whites over the last few decades.
3. The incidence of adenocarcinoma of the lung, which is less clearly related to smoking than are squamous and oat cell carcinomas³¹, has increased over recent decades³² to 26.5% and 32.4% in whites and blacks, respectively.³³
4. The rôle of occupation as a major variable was ignored in nearly all of the some 30 retrospective studies associating lung cancer with smoking.³⁴
5. There are strong positive associations, largely indepen-

dent of smoking habits, between lung cancer and occupational exposure to a wide range of carcinogenic products, such as arsenic, chrome, nickel, and BCME, and carcinogenic processes, such as copper smelting, uranium, zinc and lead mining, spray painting, and tannery work.³⁵

6. The high lung-cancer rates in workers in casting areas of iron foundries are related to their daily inhalation of polycyclic aromatic hydrocarbon carcinogens equivalent to 10-20 packs of cigarettes³⁶; these estimates ignore the incremental rôle of silica.

7. On the basis of studies incriminating urban air pollution and lung cancer, the 1970 "National Panel of Consultants on the Conquest of Cancer" concluded that "lung cancer (is) undoubtedly attributable to the air pollution in certain environments."³⁷ Subsequent studies, including those on diesel exhaust, have also incriminated air pollution as a significant cause of lung cancer.³⁸ Other studies have demonstrated excess lung cancer incidence in communities residing near large petrochemical plants.³⁹ We should note that US industries in 1991 discharged into the environment some 3.6 billion pounds of chemicals, including a wide range of carcinogens.⁴⁰

8. Non-smoking-attributable causes of lung cancer were found to range from 13% in white men to 28% in black women, and to be 67% higher in black than white men and 16% higher in black than white women.⁴¹

"Non-smoking-attributable lung cancers are", according to Schneiderman, "among the three or four most common cancers (in terms of mortality) in the US".⁴²

In the face of this and other evidence, the NCI and ACS have until very recently tried to explain away increasing cancer incidence rates by ascribing them almost exclusively to smoking.⁴³

The Doll and Peto conclusion that "there is no evidence of any generalized increase (in cancer mortality) other than that due to tobacco", was reached by excluding consideration of people over the age of 65 and blacks, just those groups in which more than half of all cancer deaths have been reported, and by incorrectly ascribing lung cancer almost exclusively to smoking.

Trivializing Occupational Cancer Mortality

The NCI current estimate that occupational cancer is responsible for only 4% of total cancer mortality⁴⁴ is largely based on obsolete analyses of cancer trends from 1933-1977,⁴⁵ and flies in the face of existing evidence, including the following:

1. Over the last few decades, a large number of new studies have implicated a wide range of additional carcinogenic products and processes as causes of cancers in various organs, particularly lung, brain, bladder, kidney, and multiple myeloma.⁴⁶
2. The National Institute for Occupational Safety and Health (NIOSH)⁴⁷ has estimated that approximately 11 million workers are exposed to occupational carcinogens. Surveillance of these workers by the NCI and the NIOSH is minimal, at best.
3. In the same year as Doll and Peto published their 4% estimate, which NCI leadership regularly cites, Peto also admitted to divergent estimates of up to an order of magnitude greater: "Occupational factors are likely to account for ... a 'large' percentage (e.g. 20-40%) of all US cancer ... (Even low estimates) represent large enough absolute numbers of deaths to justify both intensive research and political action ... A mere 2.5% of all US cancer deaths would represent some 10,000 deaths per year."⁴⁸
4. Of 37,000 total cancer deaths each year in New York

State, 3,700 are estimated to be due to occupational exposures.⁴⁹ Since the exposure patterns of the New York and national work forces were shown to be similar, the annual mortality from occupational cancer would thus be approximately 50,000, or about 10% of all cancer deaths.

5. It is estimated that asbestos, the single most important known occupational carcinogen, will have caused some 300,000 cancer and other deaths by the year 2030, including 60,000 mesotheliomas, that are not related to smoking.⁵⁰ As recently emphasized,⁵¹ such evidence negates continuing assertions by Doll, (on whom the NCI still relies heavily for its low 4% estimate of occupational causes of total cancer mortality), that asbestos is responsible for only a "few cases or mesothelioma".⁵²

6. Some 20 US and international studies have incriminated parental exposure to occupational carcinogens as major causes of childhood cancer,⁵³ whose incidence has increased by 21% since 1950.

7. Based on a recent analysis of cancer mortality trends in 15 industrialized countries from 1969 to 1986, it was concluded that "we have identified changes in the incidence and mortality rates for cancers at other sites (than those related to smoking) ... in the middle and older age groups throughout the industrialized world."⁵⁴

Little Evidence to Support NCI High Fat Diet Judgement

"A high intake of fat has", according to the NCI, "been associated with cancer of the breast, colon, rectum and prostate, and possibly pancreas, uterus and ovary. Dietary factors are estimated to account for approximately 35% of cancers".⁵⁵

Their high fat hypothesis, however, is largely based on Doll and Peto's research,⁵⁶ and reports by other related "blame-the-victim" advocates which provide only weak and inconsistent supporting evidence. What's more, Peto himself subsequently retracted this 35% estimate:

Recommendations for reducing dietary fat "should", he says, "chiefly be because they will help avoid heart disease, rather than because they may well avoid cancer, ... the evidence in this respect is less secure."⁵⁷ "We'd like to have definitive evidence (on diet and cancer), but we don't have it."⁵⁸

Furthermore, "the results of case-control studies⁵⁹ have produced at best inconsistent results,"⁶⁰ on the links between dietary fat and breast cancer, which NCI policy makers still of course explicitly accept.

A Failure to Recognize Preventable Causes of Breast Cancer

Despite expenditures of over \$1 billion on breast cancer over the last two decades,⁶¹ "we must conclude that there has been no progress in preventing the disease."⁶² NCI programmes on breast cancer prevention reflect questionable science, as illustrated both by their emphasis on high fat diet itself as a major cause and an apparent unfamiliarity with evidence incriminating a wide range of carcinogenic pesticides and other xenobiotic (contaminants that are foreign to the living world) dietary contaminants. None of the NCI's past heavily funded nutritional studies which claimed an association between dietary fat and breast cancer, as well as colon and other cancers, has investigated or apparently even considered the confounding variable of carcinogenic contaminants. And

Community Contamination ... no laws broken

Organochlorines are just one among dozens of cautionary tales concerning man-made poisons in the environment. Downwind from the British Petroleum refinery and chemical plant in Lima, Ohio, local residents have formed Allen County Citizens for the Environment (ACCE) to monitor the biggest polluter in their state. Among the compounds the company has released into the air and water are benzene, acrylonitrile, formaldehyde, ethylbenzene, methyl ethyl ketone and carbon tetrachloride. According to former President and ACCE member Norine Warnock: "I have health problems and my four-year-old daughter has serious respiratory problems. Maybe those problems are not connected to BP but maybe they are ... The guy across the street has cancer. The woman down the street has brain cancer. The woman around the corner has brain cancer. The woman who lives next door to my child's friend has cancer. The woman on the next block has breast cancer. The guy next door to her has cancer. And so does the woman next door to him. Those are just the houses I can see when I am looking out my own front door."

Paul Hawken

"Those are just the houses I can see when I am looking out my own front door."

even less understandable is the NCI's failure to consider the rôle of dietary contaminants in its proposed multimillion dollar studies on the relation of diet and breast cancer. In the light of this, we should note that evidence for the rôle of these contaminants is extensive and convincing⁶³:

1. Carcinogenic pesticides, such as DDT, chlordane and dieldrin, which concentrate in animal fats, induce breast cancer in rodents.⁶⁴

2. Promotion by DDT of mammary tumours induced in rodents by the potent carcinogen acetamidophenanthrene "might be considered possible contributors to the high incidence of breast cancers."⁶⁵

3. DDT and PCBs concentrate in human breast cancer tissue itself in contrast to adjacent non-neoplastic tissue.⁶⁶

4. Breast cancer mortality in premenopausal Israeli women declined by 30% following regulations which reduced the levels of DDT and

other carcinogenic pesticides in dietary fat, in spite of increasing fat consumption among the population.⁶⁷

5. In view of the known carcinogenicity of exogenous estrogens, lifelong exposure to estrogenic contaminants in animal fat, due to their unregulated use as growth hormones, is clearly a risk factor for breast cancer. Warnings of such breast cancer risks, including that by the NCI's past leading expert in endocrinology, have gone unheeded by the cancer establishment.⁶⁸

6. Finally the addition of estrogens renders more potent the carcinogenicity of irradiation in rodent breasts.⁶⁹ Estrogens also have a synergistic effect on the induction of mammary

The NCI's indifference to cancer prevention and to reversing the escalating incidence of cancer persists unchanged, as does its insistence that cure for cancer only needs increased research funding.

cancer in rats by polynuclear hydrocarbon carcinogens.⁷⁰

Apart from ignoring the rôle of avoidable dietary contaminants, the NCI has also failed to investigate the hazards of mammography, particularly the probable relation between increasing breast cancer rates and the high dose mammograms administered without warning to some 300,000 women in the 1970s' Breast Cancer Detection and Demonstration Program (BCDDP), advocated by the NCI and ACS. Based on a wide range of previously published epidemiological data, an authoritative international expert group in 1972 estimated incremental breast cancer risks of approximately 1% per rad exposure.⁷¹ Thus, a pre-menopausal woman given one mammogram annually, for ten years, with a conservative estimated dose of two rads per exposure, would be at 20% excess risk.

A confidential memo by a senior NCI physician in charge of the screening programme⁷² may explain why, in spite of warnings by the National Academy of Sciences (NAS) in 1972 and by their own key scientific staff,⁷³ women were not warned of this risk. The memo may also account for the cancer establishment's enthusiasm for the BCDDP programme:

"Both the (ACS) and NCI will gain a great deal of favourable publicity because they are bringing research findings to the public and applying them. This will assist in obtaining more research funds for basic research and clinical research which is sorely needed."⁷⁴

The NCI has failed to explore safe alternatives to mammography,⁷⁵ which is all the more serious in view of evidence of excess breast cancer mortality in pre-menopausal women following mammography, and even more so following accumulating evidence of its ineffectiveness for detecting early breast cancer in younger women.⁷⁶

"There is no evidence", according to a recent Canadian study,⁷⁷ to support the introduction of service mammography for women under 50, and some may argue that there should be a moratorium on all mammography for symptom-free women in this age group outside randomized control trials.⁷⁷

The NCI still ignores carcinogenic dietary contaminants and high dose mammography in the 1970s as preventable causes of breast cancer.⁷⁸ Meanwhile, the NCI designates its infamous 'tamoxifen chemoprevention trial' as "primary cancer prevention". In May 1992, the NCI initiated this trial on 16,000 healthy women at increased risk of breast cancer.^{79,80}

Tamoxifen, a structural analogue of diethylstilbestrol (DES), induces covalent DNA adducts in rodents, thus making "this drug a poor choice for the chronic preventative treatment of breast cancer."⁸¹ It is a "rip-roaring liver carcinogen",⁸² inducing highly malignant liver tumours in 15% of rats⁸³ at doses equivalent to the daily 20mg dose, and in 71% at the higher 40mg dose.⁸⁴ This experimental evidence of potent carcinogenicity is confirmed by two case reports of liver cancer among 931 women receiving 40mg tamoxifen doses in the Stockholm trials, and more strikingly by several reports of endometrial

cancer, particularly in the Stockholm trial, documenting a 6.4-fold relative risk.⁸⁵ The risk was, however, dismissed by Peto as "no big deal".⁸⁶ It should further be emphasized that the median follow-up for all the seven reported tamoxifen trials was only 80 months⁸⁷; very few healthy women have taken the drug for more than five years.⁸⁸ Thus, tamoxifen appears to be a much more potent human carcinogen than is currently admitted by the NCI. As recently concluded: "The tamoxifen project is a travesty of science and a parody of cancer prevention."⁸⁹

Trivializing Environmental Pollutants as Causes of Avoidable Cancer

"Pollution" and "industrial products" are, we are told, contrary to an extensive body of evidence, together responsible for only 3% of cancer deaths. Such an estimation, however, is based, we should note, within the context of the exponential production and manufacture of a wide range of synthetic organic chemicals, particularly industrial carcinogens, from one billion pounds per annum in the

1940s to over 400 billion pounds annually by the 1980s.⁹⁰ Only some 10% of these new industrial chemicals have been adequately tested for carcinogenicity.⁹¹ More critically, of some 120 carcinogens identified in experimental animals over the last two decades, less than 10% have yet been subjected to epidemiological study by the NCI or by industry.⁹²

On what grounds therefore can so sweeping an assumption possibly rest?

The obvious rôle of environmental pollution as a substantial cause of increasing cancer rates is illustrated by reference to just one class of industrial chemicals, carcinogenic pesticides:

1. Some 53 carcinogenic pesticides are registered for use on major crops, such as apples, tomatoes and potatoes. Consumption of common foods with residues of 28 of these pesticides have been associated with some 20,000 excess annual cancer deaths.⁹³

2. Some 34 pesticides are commonly used for professional lawn care treatment at rates up to five times greater than that used agriculturally. Ten of these pesticides are known to induce cancer in rodents⁹⁴; this evidence has been confirmed for one of

these pesticides in occupational studies by NCI epidemiologists.⁹⁵ Recent studies have also demonstrated major excesses of lymphomas in dogs living in homes whose gardens receive regular lawn care treatment,⁹⁶ and infants and children, like dogs, are also clearly at major risk from such exposures. Of relevance in this connection is the EPA's recent report that the theoretical maximum levels of some dietary pesticide residues, including carcinogens, may exceed published standards by a factor of more than 10,000.⁹⁷

3. Over the last three decades, tens of millions of US homes have been treated for termites by subterranean application of the slowly degradable carcinogenic pesticides chlordane and heptachlor.⁹⁸ These pesticides are a complex mix of some 150 components, including undisclosed potent carcinogenic contaminants termed "inert" by the Environmental Protection Agency and industry.⁹⁹ The agricultural use of these pesticides

Complementing NCI's fixation on treatment, diagnosis and basic genetic research, is its continued trivialization of the well documented scientific evidence on avoidable causes of cancer.

While finally admitting that it had lost the war against cancer, NCI blamed not its own misdirected priorities but rather its lack of funding.

was phased out after 1975 EPA suspension/cancellation hearings concluded that their food residues posed an "imminent hazard" of cancer.¹⁰⁰ It was subsequently determined that routine treatment could result in persistent air contamination with exposure levels greater than those which the EPA had determined posed an imminent cancer hazard on food, and which posed risks in the order of 300-3,000 excess annual cancer deaths. Commonplace misapplication of these pesticides resulted in higher air contaminant levels and still higher cancer risks. No epidemiological studies have ever been conducted on the millions of people living in contaminated homes, in spite of repeated recommendation.¹⁰¹

Little Has Changed

Since my presentation to the NCI and the publication of my report on which this article has been largely based, six years ago, the NCI's intransigent indifference to cancer prevention and to reversing the escalating incidence of cancer persists unchanged, as does its insistence that cure for cancer needs only still more research funding.

The incidence of cancer continues to escalate. From 1950 to 1988, the overall per cent in whites increased by 44%. Based on the latest published NCI data, these rates increased more sharply, by 23%, from 1973 to 1994.¹⁰² These increases are real and persist after adjusting for an ageing population and smoking. Nevertheless, the NCI persists in its claim that cancer is a declining public health threat.

On December 16, 1997, anticipating the twenty-fifth anniversary of the 1971 launch of the "War Against Cancer", the NCI claimed in a highly publicized press release that we had "turned the tide against cancer". As evidence, the NCI pointed to a "Nearly 3% reduction" in cancer mortality from 1991 to 95. They admitted, however, that this is mostly due to a decline in lung cancer deaths from smoking in men, and to improved access to health care, particularly among African Americans.

More importantly, the number of people getting cancer in America has been and still is on a steady rise. The "tide against cancer" incidence has not only not been turned back, but now strikes more than one in three, up from an incidence of less than one in four a few decades ago. Incidence is increasing overall and in a broad range of cancers at all ages, including: childhood leukaemia and brain cancer, non-Hodgkin's lymphoma and melanoma among young and middle-age adults; and prostate and breast cancer in older groups. Cancer incidence – the total number of people getting cancer as opposed to the smaller numbers developing fatal cancers – is a much more significant and accurate measure of cancer trends than is mortality.

Further, the picture on mortality, when examined closely, is much less rosy than the NCI would have us believe. Since 1991, cancer mortality rates for Americans over the age of 65 continues its four-decade-old climb. Also, there has been a sharp increase in mortality from non-smoking-related cancers, including multiple myeloma, non-Hodgkin's lymphoma, chronic leukaemia and pancreatic cancer.

Furthermore, the recent 3% decline in mortality rates claimed by the NCI is statistically suspect, based as it is on age-adjusting to the 1970 US population. As emphasized by Dr. John Bailar in his May 1997 testimony before a Senate Subcommittee on Labour, Health and Human Services, the decline is only 1% when rates are more appropriately adjusted to the 1990 population.¹⁰³ Bailar further testified that this minimal decline is more likely due to early detection than improved treatment and to improved access to health care, and that the decades-old claim that "the cure is just around the corner" is old

Dubious Links

When women started asking about prevention of breast cancer in the 1980s, they examined the scientific research "establishment" and found it dominated by men who had close ties to industries that produce carcinogens. For example, as recently as the late 1980s, the board of overseers of the Memorial Sloan Kettering Cancer Center was comprised of bankers and industrialists. Before Leo Wade became the director the Sloan Kettering Center, he had a long career as medical director at Standard Oil of New Jersey, and he was a member of the American Petroleum Institute, the National Association of Manufacturers, and the Manufacturing Chemists Association. Under Wade's leadership, Sloan Kettering never weighed in on the side of prevention.

In 1990 – and for several years before that – the National Cancer Institute's "National Cancer Advisory Panel" (an influential three-member group with direct access to the President – now called the President's Cancer Panel) was headed by Armand Hammer who was also, at the time, chairman of Occidental Petroleum, a major polluter and manufacturer of carcinogenic chemicals. When Hammer announced a drive to add a billion dollars to the NCI's budget, the goal was "to find a cure for cancer in the next ten years". None of the money was earmarked for prevention.

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hat now. "We are not questioning the value of treatment; treatments are curing half of all patients. This is not a dispute over whether the glass is half full or half empty. The problem is that it is the same half full now as it was several decades ago."

Despite the NCI's continued hype about major advances in cancer cure, the five-year survival rates from 1974 to 1990 have improved only minimally, from 49 to 54% for all races, from 50 to 55% for whites, and from 39 to 40% for African Americans.¹⁰⁴

Bailar further agreed with the long-standing position of the author and the statement by the February 4, 1992 coalition of leading independent US public health scientists: "I'm convinced that a major emphasis in cancer research should be shifted from cancer treatment to cancer prevention."

Budget and Priorities

Since the "War Against Cancer" was launched by President Nixon in 1971, the budget has increased by over ten-fold from \$223 million to \$2.6 billion in 1998. This rate of increase has been steepest in recent years.

Year	NCI Budget (billions)
1992	1.8
1993	2.0
1994	2.1
1995	2.1
1996	2.3
1997	2.4
1998	2.6 (estimated)
1999	3.2 (requested)

Early this year, NCI director Dr. Klausner sent Congress a blueprint for spending \$3.2 billion in 1999. In an urgent appeal for more money Dr. Klausner placed almost exclusive emphasis on the need for expanding research on genetics, cancer diagnosis and treatment. "Knowledge about the fundamental nature of cancer exploding". Noteworthy, was the virtual absence of any reference to cancer prevention.

While the NCI claims that funding for cancer prevention has approximately doubled from \$115 million in 1992 to \$255 million in 1998, past review reveals almost exclusive emphasis on smoking, nutrition, (excluding dietary carcinogenic contaminants of food), and chemoprevention. Otherwise, only nominal funding, \$50 million at most, is directed to research on avoidable carcinogens in air, water, consumer products – foods, cosmetics and household products – and the workplace. Illustrative is the NCI's minimal commitment to occupation – the single most avoidable involuntary exposure to carcinogens involving some 12 million male and 4 million female US workers. The NCI's current allocation for occupational cancer, both intramural and extramural, of \$19.4 million, less than 1% of its total budget, has remained virtually unchanged over the last six years.

Powerful support for the NCI's requests for further funding has been spearheaded by a well orchestrated campaign to lobby Congress and persuade the public to accept the groundless and decades-old myth that further research is the only answer to the cancer epidemic. In January 1995, the National Coalition for Cancer Research, sponsored by the American Cancer Society and the cancer drug industry, launched an industry-funded "Research Cures Cancer" campaign, focussed exclusively on finding newer and better cancer drugs without any reference whatsoever to prevention. The latest initiative, launched in October 1997, is "The March". This encompasses hundreds of events nationwide, culminating in a "historic march on Washington DC in September 1998 – to encourage government to increase the woefully inadequate funding for research" to cure cancer. Like the National Coalition for Cancer Research, the "March" is sponsored by the drug industry, with support from cancer survivor groups.

Faulty Science

Complementing the NCI's fixation on treatment, diagnosis and basic genetic research, is its continued ignorance, trivialization or manipulation of the burgeoning and well documented scientific evidence on avoidable causes of cancer. Fundamental to this is the NCI's continued reliance on a 1981 "guesstimate" that "occupation, pollution and industrial products" are responsible for only 7% of cancer deaths.¹⁰⁵ Apart from the fact that these myths have been fully rebutted in a peer-reviewed scientific publication,¹⁰⁶ there is substantive evidence of extreme bias of the principle "guesstimate" author in his gross exaggeration of the "blame-the-victim" causation of cancer, not to mention his well documented relationship with industry.¹⁰⁷

Among the more egregious examples of the NCI's faulty or manipulative science is its virtual equation of lung cancer with smoking, whilst ignoring the strong evidence incriminating a wide range of occupational causes included among "non-smoking-attributable" cancers, particularly in women, accounting for 23% and 28% in whites and blacks, respectively. Non-smoking attributable lung cancers are now among the three or four most common causes of cancer deaths.¹⁰⁸

The NCI still insists that fat *per se* is a major cause of many cancers, in the absence of documented evidence, while ignoring unarguable evidence of a wide range of carcinogenic contaminants in fat.

Furthermore, escalating cancer incidence rates are simply explained away by the NCI as being due to ageing of the population, even though such rates are age-adjusted ... or as being due to smoking, which again requires 'forgetting' the fact that mortality rates for males in the US and the UK are declining. Also ignored is the 100% or greater increase in the incidence over recent decades of a wide range of non-smoking cancers including multiple myeloma, non-Hodgkin's lymphoma and testicular cancer, and a 40% increase in brain and nervous sys-

tem childhood cancers.

In common with the position of the American Cancer Society, the NCI maintains outrageously that breast cancer is "simply not a preventable disease". There are, in fact, a wide range of avoidable causes, and measures which women can take to reduce their risks.¹⁰⁹

Cancer Prevention Outreach

With the exception of tobacco the NCI has failed to develop any systematized documentation or registry of avoidable carcinogens, and to make such information available to the public. This is in striking contrast to the NCI's plethora of publications, educational materials, and the comprehensive Public Cancer Database System which deals with information on cancer diagnosis, treatment and clinical research. Its indifference to cancer prevention is further exemplified in its 15-member Consumer Liaison Group established in November 1997 to create a forum of exchange between the scientific community and cancer advocacy groups, and to develop "a mechanism by which the NCI can obtain advice and feedback from the consumer community on a broad range of issues." The majority of the consumer advocates in this group are cancer survivors with no representation of public interest groups with a track record of expertise and involvement in cancer prevention. Not surprisingly their priorities are limited to access to high-quality treatment, rehabilitation and psychosocial support, with no reference whatsoever to cancer prevention.

Apart from an absence of public outreach on cancer prevention, the NCI has still not initiated any formal or informal interventions in legislative or regulatory arenas, designed to provide government with scientific information on avoidable involuntary exposures to any known environmental or occupational carcinogens.

"New Initiatives" in Cancer Prevention

With belated sensitivity to growing concerns on its minimal priorities for cancer prevention, the NCI has developed a series of highly publicized 'damage control' initiatives. However, these too reflect a fundamental ignorance of the principles of primary cancer prevention.

One such initiative was the creation in April 1996 of a "Cancer Prevention Programme Review Group" of 19 non-governmental experts. Their 70-page report, submitted to the NCI in June 1997, focussed on five alleged major approaches to cancer prevention: "modifiable risk factors", largely tobacco avoidance; "animal models", for investigating new chemopreventive agents, and for studying markers of exposure to carcinogens; "genetic predisposition's to cancer"; "chemoprevention trials"; and "behavioural research". Avoidable exposure to carcinogens received short shrift: about half a page. While stating that chronic exposure to these carcinogens "probably contributes 5% to 10% of the deaths due to cancer", it was claimed that this was a problem for regulatory agencies, and not the NCI.

Another initiative was the convening of a "Cancer Control Program Review Group". Its report, submitted to the NCI in September 1997, virtually equated cancer prevention with behavioural modification. This report emphasized tobacco avoidance, 'Five-A-Day' fruit and vegetable diets, and avoidance of excessive sun exposure, and called for expansions of programmes directed to this myopic and exclusionary "blame-the-victim" concept of cancer prevention. No reference was made to avoidable exposures to environmental and occupational carcinogens.

A more creative initiative was floated in a 1994 report.¹¹⁰ While finally admitting that it had lost the war against cancer, the

NCI blamed not its own misdirected priorities but lack of funding and of direct representation of the NCI at the cabinet level.

Needed Reforms

Reflecting the NCI's continued intransigent indifference to cancer prevention and its unresponsiveness to the damning indictment of its policies by the February 4 coalition of leading experts in public health and carcinogenesis, the Cancer Prevention Coalition, supported by a wide range of public interest groups*, made the following explicit recommendations:

- The NCI must be held accountable for its failed policies and for over \$30 billion taxpayer support for "the war against cancer".
- The NCI must undergo radical reforms in its programmes, priorities and leadership.
- Cancer prevention must receive greater emphasis in NCI policies, achieving parity with all other programmes combined over a five-year period.
- The NCI budget must be held hostage to such reforms under the terms of the Government Performance and Results Act of 1993.

Expanding on these recommendations, in a recent letter to President Clinton, the Cancer Prevention Coalition stated: "The Government Performance and Results Act of 1993 requires federal agencies to define their goals, develop appropriate strategies and be accountable to taxpayers. Implementation of this Act should involve holding the NCI's budget hostage to radical reforms of its failed policies. Its long-standing unbalanced preoccupation with research on the magic bullet cure for cancer, and with basic research of tenuous relevance, must be redirected towards a major emphasis on cancer prevention – including clear recognition of citizens' inalienable right-to-know of available scientific information on avoidable carcinogenic exposures."

* Breast Cancer Action, San Francisco, CA; Center for Constitutional Rights, New York, NY; Center for Media & Democracy, Madison, WI; Citizen Action, Washington, DC; Environmental Research Foundation, Annapolis, MD; Food and Water, Inc., Marshfield, VT; Greenpeace USA, Chicago, IL; Mother Jones magazine, San Francisco, CA; Pesticide Action Network, San Francisco, CA; Project Impact, Oakland, CA; Pure Food Campaign, Washington, DC; Radiation and Public Health Project, New York, NY; Women's Community Cancer Project, Boston, MA; Women's Environment & Development Organization, New York, NY.

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Sir Richard Doll: A Questionable Pillar of the Cancer Establishment

by Martin Walker

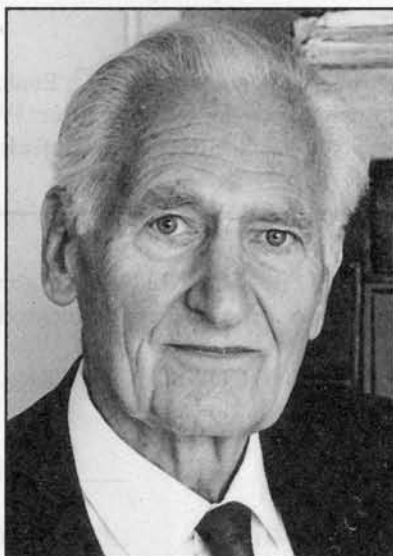
The Imperial Cancer Research Fund writes in its current publication, Preventing and Curing Cancer: "One of the biggest myths in recent years is that there is a cancer epidemic caused by exposure to radiation, pollution, pesticides and food additives. The truth is that these factors have very little to do with the majority of cancers in this country. In fact, food additives may have a protective effect – particularly against stomach cancer." One would presume that the Imperial Cancer Research Fund would only dare make a statement of this sort, which runs counter to endless serious studies on the subject, after exhaustive research over many decades on the possible carcinogenic effects of exposure to these environmental factors. However, unbelievable as it may seem, this august institution fully admits that it has never carried out any such research! How then can it conceivably make such a statement? The answer is that it is entirely based on the pronouncements of Sir Richard Doll, seen to be the greatest living expert on the subject, and whose every word is gospel among the members of Britain's cancer establishment. Let us look carefully at the career of Sir Richard Doll in order to trace the origin and development of this most questionable pillar.

On October 17, 1997, the news programmes and the newspapers made frequent mention of new evidence from three studies supervised by Sir Richard Doll, and originally published in the *British Medical Journal*, which purported to show that 'passive smoking' caused lung cancer.¹

That same day, in London's High Court, Mrs. Justice Smith handed down her judgement in the case of John Hill, who had taken a civil action against the owners of a farm upon which he had worked. He claimed that exposure to organophosphate (OP) insecticide at work had adversely affected his health. Mrs. Justice Smith ruled that his ill health was partly at least "attributable to psychological factors". With the exception of Britain's most subversive 6 am radio programme, *Farming Today*, little publicity was given to the court hearing.^{2,3}

Curious double standards

These separate sets of circumstances, occurring as they did on the same day, give voice to a number of issues relating to the way we perceive health and the environment. The first and most obvious is that thirty years after Richard Doll and



Sir Richard Doll; considered the greatest living expert on cancer.

Bradford Hill published their first epidemiological study on the high rates of lung cancer amongst GPs who smoked,⁴ the public are still in thrall to the idea that cigarette smoking is the single most important public health problem we face in Britain.

Secondly, the judgement in the OP case demonstrates something which is difficult to understand within the context of truthful scientific research. It has been recognized for hundreds of years that agricultural and industrial chemicals, especially those of which we have had no evolutionary experience (xenobiotic chemicals), can have serious adverse effects upon humans, but, unlike the public issue of cigarette-induced lung cancer, the history of both academic judgements and plaintiff actions with respect to chemicals is almost a secret history.

Research by the Medical Research Council into the use of organophosphorous compounds predates the work of Doll and Bradford Hill on cigarette smoking.⁵ Initial scientific conclusions in the late 1940s and 1950s were not in the least reassuring. There are presently hundreds of OP cases waiting to come before the courts, including over 100 Gulf War syndrome cases. The great majority of complaints involving OPs have been made by farmers who were pressed, by law, between 1975 and 1993 to dip sheep and treat cattle with washes of OP as a deterrent to warble fly. Almost all the cases which have so far reached court have, like cases brought by others suffering from Multiple Chemical Sensitivities (MCS), floundered on two medical,

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legal and scientific arguments. First, that it cannot be "proved" that exposure to apparently toxic chemicals can cause *long-term* and ongoing systemic damage to health. Secondly, that any damage caused by chemicals is relative, dependent first upon their method and duration of use, and second upon the susceptibility of the injured party. In this way the chemical company is defended and the sufferer blamed for having a weak constitution.

One question raised by these issues is why the medical research establishment and the State have allowed a confused, unscientific and sometimes almost mystical appraisal of the risk of cigarette smoking to entirely shape the public policy debate over cancer? Why have so many research scientists in developed societies, and particularly in Britain, refused to investigate the chemical causes of cancer, despite their increasingly telling effect upon the epidemiological picture of cancer, ill-health and the quality of life?

In comparing the responses of scientists, doctors and the media to both cigarette smoking, chemicals and cancer, the career and philosophy of Sir Richard Doll emerges as a convincing guide and marker to changing perceptions and modalities.

The Career of Sir Richard Doll

Sir Richard Doll has been considered England's most influential epidemiologist for the last thirty years. Doll first did work on mortality in asbestos workers in the 1950s, producing a paper in 1955⁶. His conclusions came down decidedly on the side of asbestos workers, whose health he said was being put in jeopardy.

In his first Rock Carling Fellowship Lecture in June 1967, Richard Doll stated clearly that prevention of cancer was a better strategy than cure.⁷ He considered that an "immense" number of substances were known to cause cancer. In 1954, for instance, he stated, along with Bradford Hill, that besides cigarette smoking, exposure to nickel, asbestos, tarry products in gas production, and radioactivity, were major causes of cancer.⁸ He believed that cancer rates varied with environment, geography and class, and he argued that poor, working class people, able to afford only a poor diet, were more likely to get cancer of the stomach. In the late sixties, Richard Doll could have been considered a radical.

Following the announcement of a 1968 study, which suggested that more women than was previously realized might suffer complications from the Pill, Doll found himself in a head-on confrontation with both the pharmaceutical companies and the moral hegemony of his profession. The 'medical authorities' chose to interpret his report in such a way as to justify the conclusion that "the new assessment need cause no alarm among the million British women now believed to be using the pill."⁹

In common with other 'public health' scientists of the pre-war and immediately post-war periods, Richard Doll considered that workers faced the greatest and most consistent threat to their health in the workplace. In October 1977 Doll spoke out against the research carried out by the National Radiological Protection Board (NRPB) and British Nuclear Fuels (BNFL) into the health risks of the nuclear industry; his message was unequivocal. Research by these organizations, he said, "had not been carried out in a way that would satisfy even an ordinary university department. They did not do what was recognized as necessary in epidemiological studies – analyse

all the available data."¹⁰

Again, in 1977, Doll came into conflict with the medical establishment, when he was outspoken about the yellow card scheme, a scheme used by doctors to report adverse drug reactions to the Committee on the Safety of Medicines. In that year it had become apparent that there were adverse effects to the use of Practolol (Eraldin), a heart drug which was withdrawn after five years, when it became apparent that it caused various illnesses in patients.

The importance of Doll's earlier work in shaping public health policy is beyond dispute. As he has grown older, however, his frequent public appearances on the world stage, like those of an ageing rock star, have increasingly articulated an industry-accommodating view of public health risks.

The Two Paradigms

In the contemporary world, two paradigms vie for ideological power over public health, especially in the area of cancer diagnosis and treatment. The two paradigms do not present whole or homogeneous conceptual worlds; there are conflicts between them and on occasions they confoundingly dissolve into each other. Within the first paradigm, which has for some time been referred to, by detractors, as the 'lifestyle' paradigm,¹¹ it is held primarily that lifestyles by themselves, and without reference to the environmental conditions in which they are conducted, determine the individual's susceptibility to cancer and other chronic illnesses. For Sir Richard Doll, the leading exponent of this view, the cancer rate is not increasing – nor indeed could it increase, because lifestyles are becoming healthier. In fact, he assures us, in the most important areas

cancer cases are now falling and will continue to fall. Indeed, in 1985¹² Doll was of the opinion that cancer could be largely eradicated within the next few decades, which meant, in his opinion, that there was clearly no need for

any further corporate or political regulation.

In reality there is a rising level of certain specific cancers, such as male testicular cancer, myeloma, cancer of the bone marrow, female breast cancer, male cancer of the mouth (which has doubled over 30 years), and deaths from cancer of the pancreas, which have increased considerably in women while staying level in men. There have been increases in cancer of the cervix and melanoma in the 20 - 44 age group and a rising death rate among men suffering from prostate cancer. In 1990, Sir Richard, discussing these figures, was still sure that *on the whole* "there is, to my mind, good evidence we have been winning the fight in Britain."¹³ He reiterated this same message in 1992, when the *Independent* reported his views under the title of 'Doctors gaining ground in battle against cancer'.

Nevertheless, Doll favours more cancer research and he is personally very much involved with the Imperial Cancer Research Fund (ICRF). However, like other lifestyle proponents, he insists that the focus should be largely on research into the minutest details of cell biology in order to determine the exact mechanism of carcinogenesis. Doll has stated that major cancer charities like the ICRF should not become involved in education or preventive work. The ICRF, he said, "as its name implies, is there to do research."¹⁴ Needless to say this does not include research into the effects of environmental carcinogens, which the ICRF generally refuses to consider.

The second paradigm, which we might call the 'dissident' paradigm, represents a more socially holistic view of disease. Dissidents argue that many forms of cancer are rising alarm-

In the late sixties, Richard Doll could have been considered a radical.

ingly. Research as to the exact mechanism of carcinogenesis is a waste of energy and money, for chemical toxicity is partially or even largely to blame for many, if not most, cancers, as well as for the fall in the general level of public health. Dissidents argue that policy makers have got to act now to phase out the production of all reasonably well-established carcinogens.

Though Doll started off as a dissident, one who was clearly concerned with the health of the people he was serving, as his career developed his views gradually changed and he became one of the most powerful and influential promoters of entrenched industrial and political interests.

The Controversies

Smoking and Lung Cancer

Sir Richard first began publishing on smoking and lung cancer with Professor Bradford Hill in 1950. His two most effective early papers, published in 1954 and in 1956¹⁵ recorded the results of a longitudinal epidemiological study based upon 40,000 postal interviews sent out to general practitioners in 1951. The first results analysed the deaths of 789 of the doctors aged 35 and over who had died during the three years of the study. Thirty-six of them had died of lung cancer.

The conclusion, as has been continually reflected in the media, was, and has continued to be, that smoking is responsible for the huge increase in deaths from cancer of the lung. However, some responsible health care workers have asked whether or not smoking was perhaps not the sole cause, but one of a number of factors which might be "weakening the system in a way which makes it susceptible to cancer".¹⁶ Major concerns along these lines have been raised by research carried out in China where the peasant population smokes heavily and where there appears to be little difference in the rates of lung cancer between smokers and non-smokers.

Nevertheless, Sir Richard Doll's first major study has been bolstered by further studies that have come out with the same answer – lung cancer is almost entirely attributable to smoking. The political, social and economic effects of this singular message are still reverberating, despite the fact that today, lung cancer mortality rates for *non-smokers* are rising.¹⁷ To a degree, the success of this first work has become a screen behind which Sir Richard has dodged with increasing frequency, to avoid awkward but substantial issues about other man-made carcinogens.

Medical professionals, politicians, and health educationalists, reached a very speedy consensus on this issue, and other lines of investigation were consequently quickly abandoned.

By 1986, when *The Big Kill*, a 15-volume series was published by the Health Education Authority¹⁸ with consultative advice from Doll, an exact figure of individuals killed by smoking in England and Wales was given as 77,774, even though these deaths included those in which heart disease,

bronchitis, and emphysema clearly also played an important role. In 1993 when Sir Richard was interviewed,¹⁹ he cited a figure of 150,000 individuals who died prematurely as a consequence of smoking.

Questions have also been raised about the recorded incidence of death from lung cancer, said to be caused from smoking in the elderly. In the deaths of those over 65 it is exceptionally difficult to assess cause and even more difficult to establish what brought it on. These figures are not even addressed in *The Big Kill*, because as the Royal College of Physicians makes clear, "... this could not be done with much confidence, partly because certification of the cause of death in older people, who may suffer from a variety of disabilities, is less accurate than in younger people ... no attempt has been made to estimate the number of deaths due to cigarette smoking in older people".²⁰

This is a very weak excuse for excluding the elderly from the study – precisely those people who are most susceptible to cancer, and until recently those who constituted the major statistical group for the disease.

In the USA Doll's thesis has always been rejected by Professor Samuel Epstein, Professor of Environmental Medicine at the University of Illinois, and founder of the Anti-Cancer Coalition, who for decades has fought a lonely battle against the medical establishment on this issue, though today at least sixty other scientists working in the field have now endorsed his position. (see Epstein in this issue) In the UK, opposition to Doll's views came from Professor Simon Wolff, a toxicologist who was, before his premature death in 1995, the most committed of a new generation of scientists. Professor Wolff was particularly concerned about the effects of diesel and petrol exhaust pollution, which he saw as major factors in the development of lung cancer. He said:

"There is no doubt that cigarette smoking causes lung cancer, but there is also no doubt that air pollution, particularly from diesel, is a contributory factor, so important that perhaps without air pollution we would see a much lower rate of lung cancer than we have. For example, in rural China, where people tend to smoke very heavily and where air pollution is much less, the differences in lung cancer rates between smokers and non-smokers is very small, and lung cancer rates are about one

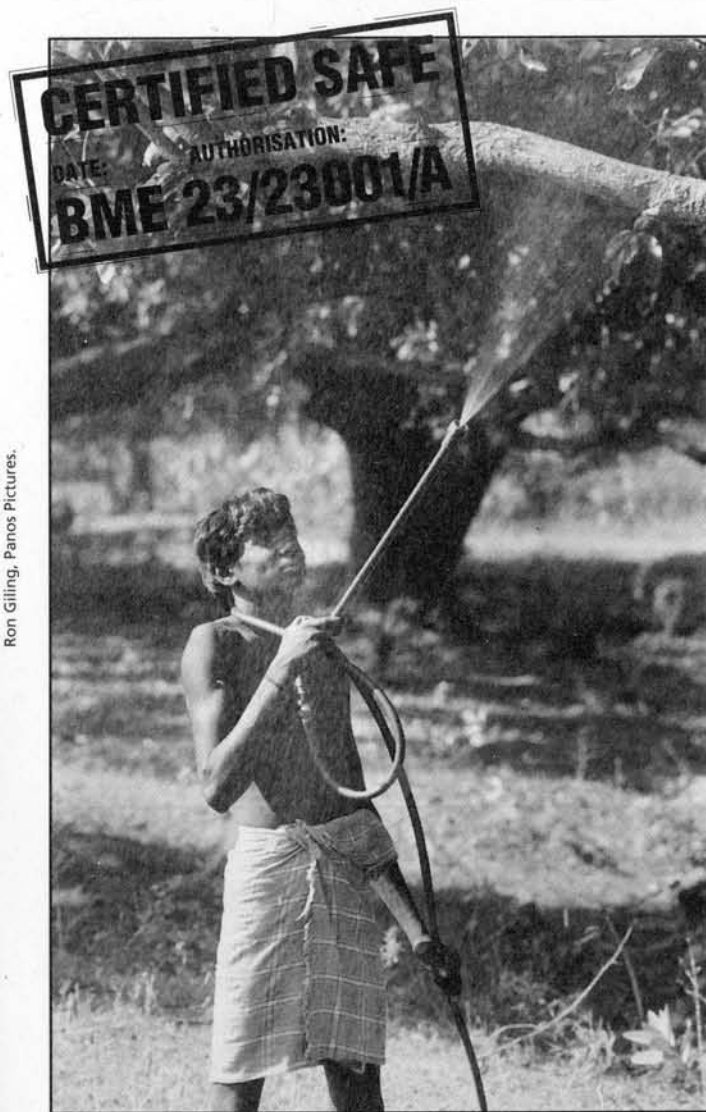
tenth of the lung cancer rates in industrialized countries."²¹

Cancer and Diet

Doll does not accept that air pollution of any kind may be regarded as a cause of lung cancer or of any other diseases of the respiratory tract. These can only be attributed to smoking, which he sees as accounting for 30 per cent of cancer deaths. Nevertheless, he does incriminate various natural – as opposed to man-made carcinogens. In a study commissioned by the American Academy of Sciences, which Doll conducted with his colleague Richard Peto in 1981,²² he identified various natural contaminants of raw food as natural carcinogens produced

As his career developed, Doll gradually changed and became one of the most powerful and influential promoters of entrenched industrial and political interests.

Doll has stated that the Imperial Cancer Research Fund, 'as its name implies, is there to do research'. Needless to say this does not include research into the effects of environmental carcinogens, which they generally refuse to consider.



Ron Gilling, Panos Pictures.

Doll has consistently, and in the face of all serious evidence on the subject, refused to accept that any man-made chemicals cause cancer.

during cooking. He sees these, together with obesity and the consumption of unspecified refined foods, as responsible for 35 per cent of cancer deaths. In this report pollution and exposure to industrial products are seen to account for no more than 3 per cent of cancer deaths.

Another "natural carcinogen" – alcohol – was incriminated in a report to the ICRF in 1982,²³ as both a cause of cancer of the respiratory tract and of the digestive tract. By 1983, the accent had shifted to the consumption of fats as a dietary factor in the induction of cancer.

Doll has advised people to consume more fresh fruit and vegetables, though, needless to say, he does not distinguish between fruits and vegetables produced organically and those produced by means of chemical agriculture, which contains all sorts of pesticide residues. Nor does he see the large number of food additives in the average modern diet as playing any role in the development of cancer. On the contrary he has denied this over and over again, notwithstanding the fact that an ever-increasing number of these chemicals have been classified by such organizations as the World Health Organization (WHO) and the Environmental Protection Agency (EPA) as proven or suspected carcinogens. This attitude very much coloured his 1992 keynote address entitled 'The Lessons of Life' at the Nutrition and Cancer Conference in the UK.

Agent Orange

Doll's refusal to accept that any man-made chemicals can cause cancer and other serious health problems could not have been better reflected than in the testimony he gave against the Australian veterans of the Vietnam war whose health had been devastated by exposure to 'Agent Orange'. Agent Orange was a mixture of the two well-established carcinogenic herbicides 2,4,5-T and 2,4-D (the former having since been taken out of production in every country in the Western world). Produced by the Monsanto Corporation, Agent Orange was used as a defoliant by the US forces, and it was in the interest of that company that Doll acted.

2,4,5-T is generally contaminated with an impurity known as dioxin, one of the most toxic substances known. The smallest amounts of this substance can produce a total degeneration of the liver, and it has been found to be 70,000 times more deadly than cyanide. This did not prevent the American forces from using 2,4,5-T to defoliate Vietnam – to strip away the tree cover, so important for their Vietcong opponents. Great swathes of jungle were destroyed and as much as one tenth of South Vietnam's rural countryside was devastated. Monsanto did very well out of it, as production of 2,4,5-T rocketed from 5.8 million pounds in 1958 to 13 million pounds in 1964, and to 42 million pounds in 1968.²⁴

In 1964, the National Cancer Institute commissioned a report to test the carcinogenicity of 2,4,5-T and it was found to cause birth defects, cleft palate and malformation of the kidneys in the animals tested. The report was kept secret.

In the meantime a large number of Australian veterans, whose health had been seriously affected while serving in Vietnam, campaigned for an inquiry into its effects.

A Royal Commission was eventually set up. Its focus was on soft-tissue sarcoma, the incidence of which had been linked in Sweden with the use of 2,4,5-T by two Swedish researchers, Olaf Axelson and Lennart Hardell, at the University of Umea.²⁵ The Commission went out of its way to discredit the evidence provided by these researchers and ended up by giving 2,4,5-T a clean bill of health. Axelson and Hardell, however, refused to give in. Supported by other scientists, they accused the Royal Commission report of being "a most questionable document" and of being "full of misquotations, distortions of information, and even falsification of facts". In a later paper they accused the Royal Commission of "lying in order to be able to disregard apparently inconvenient results".²⁶ Going even further, they showed that *almost all the conclusions* of the report had been taken word for word from the evidence of Monsanto's Australia Ltd.

Sir Richard Doll wrote a personal letter to the judge who headed the Royal Commission, in which he gave the Commission's report his seal of approval, validated the defence evidence of Monsanto, and defended Agent Orange, while also attempting to destroy Hardell's scientific reputation.

"Hardell's conclusions", Doll wrote, "cannot be sustained and in my opinion, his work should no longer be cited as scientific evidence. It is clear, too, from your review of the published evidence relating to 2,4-D and 2,4,5-T (the phenoxy herbicides in question) that there is no reason to suppose that they are carcinogenic in laboratory animals and that even TCDD (Dioxin), which has been postulated to be a dangerous contaminant of the herbicides, is at the most, only weakly and inconsistently carcinogenic in animal experiments."²⁷

This letter, the contents of which are irreconcilable with all the serious evidence on the subject, coming as it did from one of the most prestigious scientists in the field, had an electrifying effect. It could not have done more for Monsanto had he

taken out a full-page advertisement in the world's biggest circulation newspapers.

Low-level Radiation

Establishment scientists, politicians, medical researchers, and doctors, have almost always argued that exposure to low levels of radiation has a negligible effect on human health. If the opposite could be proved to be true, the consequences for the nuclear weapons and the nuclear power industries would be intolerable. William H Taft, US State Department attorney, in 1981 stated himself that "The mistaken impression (that low-level radiation is hazardous) has the potential to be seriously damaging to every aspect of the Department of Defence's nuclear weapons and nuclear propulsion programmes. ... It could adversely affect our relationship with our nuclear allies."²⁸

Of course this view has not been endorsed by serious and

objective scientists. Professor Linus Pauling, the double Nobel Laureate in the US, and Professor Andrei Sakharov in the USSR, calculated in the 1950s that millions of people would die prematurely from the ingestion of fission products resulting from fall-out from atmospheric bomb tests,²⁹ and many others have said likewise.

Doll's letter, whose contents are irreconcilable with all the serious evidence on the subject, could not have done more for Monsanto had he taken out a full-page advertisement in the world's biggest circulation newspapers.

Inevitably, Sir Richard Doll has been heavily involved in this field. In the 1950s, he was asked by the Government to look at the possible carcinogenic effects of strontium-90, a radionuclide generated by nuclear installations that mimics calcium and is taken up in the bones of growing children.

Doll was also engaged by the Medical Research Council (MRC) at that time to review

all the research conducted on the Hiroshima survivors. In his report on this issue Doll accepted that those who had been directly exposed to the bomb when it exploded would have a higher risk of leukaemia and other cancers; not so, however, those who had been exposed only indirectly to the bomb. For



In 1957 Doll had carried out two epidemiological studies, the results of which suggested that there could be a quantitative relationship between radiation and leukemia. By 1992 his tune had totally changed and he stated quite explicitly that "the effects of low-level radiation are so small as to be virtually zero."

them there was little risk of cancer or other health damage, and hence no evidence that low-level radiation in the form of fall-out could do any damage.

In 1957 Doll had been engaged by the Government to assess the quantitative relationships between exposure to radiation and the development of cancer. He had carried out two epidemiological studies, the results of which suggested that there could be a quantitative relationship between radiation and leukaemia. At that time he still had an open mind on the subject.³⁰ However, by 1992 his tune had totally changed and he stated quite explicitly that "the effects of low-level radiation are so small as to be virtually zero." This has been the view he has expressed ever since, in spite of the mounting evidence to the contrary.

In 1987 Doll presented the findings of a study on 'Cancer near nuclear installations' in *Nature*,³¹ which looked at the cancer rate in the vicinity of all Britain's 15 nuclear power stations (made up of 36 nuclear reactors). Predictably it concluded that there was "no increase in childhood leukaemia near any nuclear power station." However, very

shortly afterwards reports clearly demonstrating the existence of leukaemia clusters around nuclear installations began to appear. In August 1987, for instance, a government advisory group tried to establish the causes of the alleged increases in child leukaemia at Aldermaston, where atom bombs are produced, Harwell, the nuclear research centre south of Oxford, and Burghfield. The fact that leukaemia clusters existed in these areas was no longer denied, but the government advisory group still reported, very predictably, that they could not possibly be attributed to the activities of these three nuclear installations.

Even more embarrassing to Sir Richard Doll was the report, published in the *British Medical Journal* in October 1987.³² The report contained the results of two studies of childhood leukaemia in Seascale, the village which borders on the Sellafield nuclear reprocessing plant. The first study looked at one group of 1,068 children born near Sellafield between 1950 and 1984, and another a group of 1,546 children born outside the area but attending local schools. The leukaemia and cancer cases occurred only in those children born in Seascale. This fitted in well with the findings of a report by Sir Douglas Black, former chief scientific adviser to the Department of Health, in 1985.³³ Both studies were conducted by Dr. Martin Gardner, Professor of medical statistics at Southampton General Hospital, and Dr. John Terrell, District Medical Officer of Health at West Cumberland Hospital, Whitehaven.

Gardner and Terrell concluded that the children with leukaemia and other cancers were those whose parents had worked at the Sellafield processing plant. These results endorsed the campaigning views of CORE (Cumbrians Opposed to a Radioactive Environment), the key environmental group in that area, who believed that "the damage is from radioactive particles first inhaled by prospective mothers from

the atmosphere. In pregnancy the radioactivity is transferred to the foetus where it collects in concentrations up to a thousand times the level in the mother." Needless to say BNFL could not accept these findings. Their spokesman, Jake Kelley insisted that the retreatment plant was not to blame, and that "leukaemia in children can be caused by many things." It was predictably Sir Richard Doll who was engaged to give scientific weight to this denial.

In March 1989 Doll was engaged by the MRC and the ICRF to conduct yet another research programme to assess cancer risks (lymphoid leukaemia) in under 25 year olds in the population living within ten miles of a nuclear installation. The results of the study were again embarrassing.³⁴ The death rates were found to be 21 per cent higher than the national

average, yet this still did not persuade Sir Richard that there was a connection between radiation and leukaemia. In an interview with the *Daily Mail* he admitted that "until we find some other cause, we cannot say that it (radioactivity) is not responsible." Clearly though, he was very keen to find another cause, and hit on the

idea of a leukaemia virus, which could easily have been introduced by newly arrived workers coming to work at the Sellafield installations. The novel theory was also advanced that the over-clean homes of nuclear workers rendered their children more susceptible to leukaemia viruses.³⁵ Shamefully, this speculative viral infection, for which there is not a shred of evidence, remains the official explanation spouted by the nuclear industry and the Government alike.

That same year the conference organized by the United Kingdom Atomic Energy Authority (UKAEA) advised the Government not to reduce the maximum annual dose for radiation workers, as had been proposed the year before by the National Radiation Protection Board (NRPB) and also by the United Nations Scientific Committee on the effects of low-

level radiation, in the face of mounting evidence of the carcinogenicity of even extremely low levels of radioactivity. Clearly industry interests had to come first. Indeed, the new safety levels proposed from (50 to 15 millisieverts a year) would have led the nuclear industry to incur extra costs which it would have had difficulty in

meeting.³⁶

In March 1992, the UK Co-ordinating Committee on Cancer Research, which consists of the major cancer charities, announced a £6 million study to test the various hypotheses that have been put forward to explain childhood cancer around nuclear installations. Doll, predictably, expressed his firm belief in the viral hypothesis. A colleague of Doll's, Professor Mel Greaves, tried to rationalize an embarrassingly unconvincing thesis on the grounds that homes had become much cleaner and that the risk of leukaemia increases with rising living standards. In this way cleaner homes, which made us vulnerable to persistent viruses, rather than the much more chemicalized environment of our more affluent society were conveniently incriminated.³⁷

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Asbestos removal.



In 1955 Doll had carried out a study of mortality in asbestos workers showing that workers in the asbestos industry had a high risk of cancer. By 1983 he was again singing a different tune. A new report done by him and his assistant Julian Peto came to a totally different conclusion.

The Bomb Test Service Men

In the same way that Doll offered evidence against the Australian Vietnam war veterans, whose health had been devastated by exposure to Agent Orange, so was he engaged to demolish the case brought by Mr Ken McGinley, Chairman of a group of 1,500 members of the Nuclear Test Veterans Association, who in the 1950s were used as guinea pigs in test trials and whose health was seriously affected by radiation.

The case was first investigated by the Ministry of Defence. The study was then funded by the NRPB and the ICRF, who, in spite of the fact that not one of the servicemen had been examined clinically, decided that there was no evidence to prove that any of them had suffered from higher than normal radiation exposure. The testimony given by Doll and Darby, based on a statistical study that revealed a high incidence of deaths from leukaemia and multiple myeloma (attributed, Doll said, to a "statistical quirk") among those servicemen who had been exposed to radiation, confirmed the conclusion of the study.³⁸

A further study in 1993 on this same issue, by Doll and Darby, further confirmed their previous position, with minor reservations.

Significantly, though Doll has always refused to accept the connection between man-made radioactivity and cancer, he has always seen, for reasons best known to himself, *natural* background radiation as a major cause of leukaemia and other cancers.

Quite early on the NRPB had estimated that at least 2,500 people who lived in areas where there is a lot of granite, as in Cornwall, and were exposed to high levels of radon gas in their homes died of lung cancer every year in Britain. In 1990 however, Doll and Darby published a report for the ICRF in *Nature* which suggested that the figure may be as high as 5,000 cases a year.³⁹ Why, we might ask, if man-made radioactivity is so totally harmless, is natural radioactivity on the contrary so incredibly dangerous?

Doll's estimates of natural low-level radiation from Radon were based on an assessment of the levels of lung cancer among uranium miners exposed to high levels of radon gas. They came only months after Doll and Darby had yet again denied cancers at sites of nuclear installations. They showed that a decreasing exposure to radiation, instead of leading to a lower risk of cancer, actually increased the risk of cancer – in other words, that very low levels of exposure to this natural radioactivity were particularly harmful. Given these conclusions, why have Doll and his colleagues always insisted that only very high levels of *man-made* radioactivity were harmful?

It is easy to demonstrate that in every field in which Doll has been involved he has systematically defended the interests of industry and the State, even when these are in total conflict with those of people in general, and are irreconcilable with all the established knowledge on the subject.

Asbestos and Cancer

In 1955 Doll had carried out a study of mortality in asbestos workers. His report⁴⁰ was considered a landmark publication showing that workers in the asbestos industry had a high risk of cancer.

By 1983 he was singing a different tune. His career as a defender of corporate interests was now well under way. A new report done by him and his assistant Julian Peto came to a totally different conclusion.⁴¹

The Society for the Prevention of Asbestosis and Industrial Diseases (SPAID) criticized the methodology used by Sir Richard in a letter to the *Sunday Times* on the 26th April 1985: "Sir Richard Doll", SPAID insisted, has "used so many estimates, adjustments, approximations and hypothetical figures in order to assure us that only one person in 100,000 working in an office containing undamaged asbestos risks death, that SPAID is not reassured."⁴²

Nor, for that matter, one must assume, were the 30,000 people in the USA whose health had been devastated by exposure to asbestos and who were seeking compensation from their insurance companies – not to mention the 500 new ones who were deciding to do likewise every month.

Anaesthetics

There is some evidence that substances used as anaesthetics have a damaging effect on health.⁴³ The results of a study carried out on the subject was published in the April 1979 issue of the *British Medical Journal*.⁴⁴ It was based on a survey of the health of 10 per cent of all the anaesthetists in England and Wales – and it suggested that working with anaesthetics had a generally adverse affect on their health status. In particular it noted that there were excess spontaneous abortions in the families of anaesthetists, a lower fertility rate, a greater incidence of cancer, and a greater likelihood that children of anaesthetists would be born with congenital defects. The Medical Research Council predictably qualified the paper as "a one-sided review",⁴⁵ and Sir Richard Doll, one of its leading lights, did not waste any time in stating his complete rejection of the study's findings.

Fluoridation of Drinking Water

Sir Richard Doll's rôle in the debate on the fluoridation of water supplies was equally predictable. It has been known for a long time that fluoride is a poison. In October 1944 the *Journal of the American Medical Association* published an editorial stating "that the use of drinking water containing as little as 1.2 to 3 parts per million of fluoride will cause such developmental disturbances in bones as osteosclerosis, spondylosis, and osteopetrosis, as well as goitre."⁴⁶

In 1990 the American National Toxicology Program announced that it had established a clear link between fluoride and a type of bone cancer called osteosarcoma. It also indicated that fluoride might be responsible for a particular type of cancer of the mouth. However, it was in the interest of many powerful bodies that fluoride be added to our drinking supplies. This included the sugar industry and the aluminium industry, which was desperate to get rid of the vast amount of fluoride waste that its activities had generated.

Industrial interests were sufficient to influence the Royal College of Physicians' 18-member committee, which included Doll, to recommend the addition of fluoride to drinking water in January 1976.⁴⁷ The widespread criticism was raised that to impose this medication on the population at large without its prior informed consent, would be a breach of medical ethics.

Sir Richard Doll fully backed the report's conclusions, going even further than they did in declaring that, if anything, it was "unethical *not* to add fluoride to drinking water."⁴⁸

Lead in Petrol

The rôle played by Sir Richard Doll in the long controversy over the effects of exposure to lead in petrol on the health of children was equally predictable. Lead was originally added to petrol in the form of the organic lead compounds: tetramethyl and tetraethyl, both of which are absorbed through the skin and are extremely neurotoxic.⁴⁹ In the 1960s and 1970s, it became increasingly clear that children absorbed this lead into their blood through their lungs and by eating contaminated fruit and vegetables. Clear evidence of health damage from organic lead in petrol began to appear in the late 1970s. However, in Britain and America, the petrochemical companies ran a continuous campaign in favour of maintaining lead in petrol and generally denying its deleterious health effects.

In May 1980 the Department of Health and Social Security (DHSS) published the report of a study carried out by the MRC entitled *Lead and Health*, written by the Lawther Working Party set up by the Department of the Environment (DoE).⁵⁰ The Working Party concluded that there was no evidence for clinical lead poisoning, which fitted in perfectly with the propaganda of the petrochemical companies. It even went further, claiming that the removal of lead from petrol would lead to increased cancer-causing hydrocarbon emissions.

A study carried out by two members of the Lawther Working Party, Dr Yule and Dr Lansdown,⁵¹ drew conclusions that totally contradicted those of the Lawther Working Party.



Vehicle Exhaust, Portugal, Lisbon.

They found that, in almost every case, among a group of schoolchildren whom they examined, body-lead levels correlated with IQ and school performance, more strongly than did the social class of the children. The *British Medical Journal* (BMJ) declined to publish this paper.

In 1983 Professor Derek Bryce-Smith and Dr Robert Stephens refuted the DHSS report, accusing the MRC team of being hypercritical of all the studies which showed evidence of a relationship between levels of lead in petrol and mental function.⁵² They also showed that the blood lead safety levels set by the DHSS report were without "real scientific or medical basis".⁵³

However, in 1983 Sir Richard Doll was still arguing the case of the petrochemical companies. He insisted that there was not enough lead in the air to damage children's brains. Any adverse health effects caused by lead, he also insisted, were due to drinking water that had passed through lead piping. Lead in petrol could not be incriminated.⁵⁴

From a Friend of the People to a Friend of the Powerful

What lessons can be drawn from the career of Sir Richard Doll? How can we explain, in particular, his and other research scientists' failure to appraise seriously the subject of cancer and the environment?

Today nearly all the major institutions of scientific research which study the effect of chemicals and other toxins on health are financed, managed, supported or aided, by chemical and pharmaceutical companies. As a result it is increasingly difficult to find independent scientists within the area of environmental health. Those academics who fight the corner for sufferers of chemically induced illnesses are an eclectic grouping of medical clinicians, social scientists, philanthropists and community activists. They have, however, one thing in common: they lack funding and have on the whole been prised away from real power.

The first British Labour government which came to power in 1945, was open to the idea that science and government could work for the people. In 1947, the Medical Research Council, which had been created before the war, set up a toxicology research unit.⁵⁵ Its aim was to monitor the growing use of chemicals, including insecticides, fungicides, and organic solvents, and their effects on human health.

In the early fifties, the MRC Toxicology Unit did indeed research pesticides, and especially the effect of organophosphate insecticides on human health. By the mid-fifties, however, the unit was moving slowly away from its original brief, pushing chemicals to one side and liberally extending the research to cover more esoteric subjects. Significantly, in 1956, one of the Unit's nine research subjects was the "toxic properties of certain plants used as herbal remedies in primitive societies."⁵⁶ The accent was already on *natural* rather than *man-made* poisons.

Over the next thirty years, the MRC, while preserving its

Toxicology Unit, gradually dropped its research into toxic chemicals. During the 1970s and 1980s, as the drug companies increasingly offered funding, support and partnership projects, the focus of research turned towards cell-biology, pharmaceuticals and genetics. The emphasis was on the *good* rather than the *harm* that chemicals and industrial scientific processes could do. In the mid-nineteen eighties the Wellcome Foundation used the MRC as a vehicle for providing the scientific justification for the production of the first AIDS drug, AZT.⁵⁷ This was possible because by then the Council of the MRC was already dominated by individuals with vested interests in the chemical and pharmaceutical industry.⁵⁸ The very companies whose products should have been critically investigated by the MRC were, in one form or another, represented

on the Council of Britain's most prestigious medical research body. It is no coincidence that Sir Richard Doll has held office in that august institution for most of his professional career. Nor is it a coincidence that its present Chairman, Sir David Plastow, instead of being someone with a lifetime professional preoccupation with the health of the British people, is a man whose interests have been with the motor industry, whose polluting

activities are a major source of lung disease, including lung cancer.

What is true of the MRC is also true of the main cancer charities. Decades ago they were relatively independent from industry, arguing the case for 'the people'. Now they are all but departments of large pharmaceutical companies. The Imperial Cancer Research Fund, for which Doll worked for a large part of his career, is a case in point. While most lay people imagine that it is simply a worthy charity collecting money to research cancer, few will understand that it is itself a multi-million pound corporation which hardly makes a move independently of professional science, or its industrial pharmaceutical patrons and backers.

Through its council and its benefactors, the ICRF is run by, and mainly for, the profit of the pharmaceutical companies, the very corporations whose products would have to be investigated in any wide-ranging investigation of cancer and the environment.

The sort of cancer research

that is supported by the ICRF and other cancer charities is that which seeks to find 'cures' for specific forms of the disease.

The dissident position is of course that most of the money should go into searching for the environmental causes of cancer and then into wide-ranging preventive campaigns to eliminate the environmental factors involved. This emphasis, however, would bring cancer-research into head-on conflict with its industrial backers.

In the introduction to his book *Wings of Death*, Dr Chris Busby notes how: "... the control of research and publication in the area of radiation-dose and effect, has been assumed by the nuclear and military establishment, a powerful international lobby which grew out of the need for secrecy relating to defence uses of nuclear fission, and the realization of the

It is easy to demonstrate that in every field in which Doll has been involved he has systematically defended the interests of industry and the State, even when these are in total conflict with those of people in general, and are irreconcilable with all the established knowledge on the subject.

"To imply that the UK CCR was in some way under the influence of the nuclear industry ... this is certainly untrue." - Richard Doll

opportunities that there were for making immense amounts of money in this area."⁵⁹

Thus, much of the research undertaken by the UK Co-ordinating Committee on Cancer Research (CCR) on leukaemia and radiation, from the early 1990s onwards, has been funded by British Nuclear Fuels, the very company that operates the Sellafield nuclear re-treatment plant right next to Seascale, where the biggest child leukaemia cluster in the UK has been found. BNFL and other nuclear industry groups gave the UK CCR between £3 million and £6 million. The research undertaken was headed by none other than Sir Richard Doll.⁶⁰

From 1979 to the end of his career, Sir Richard also received a very substantial yearly reward for research into cancer from General Motors.⁶¹ This is of course hardly surprising given the wide range of problems which are increasingly associated with motor vehicle exhaust emissions, from global warming to cancer and various respiratory diseases.

Sir Richard has never hidden the source of this funding and has not even bothered to defend it. He does not feel there is any need to. In 1993, Doll wrote to Cumbrians Opposed to a Radioactive Environment (CORE), that had brought up the matter of the UK CCR BNFL grant: "To imply that the UK CCR was in some way under the influence of the nuclear industry ... this is certainly untrue."⁶²

The answer to that, of course, is that industry is not in the habit of funding research for the publication of studies which demonstrate the carcinogenicity of their products. On the contrary, all the evidence shows that it goes out of its way to suppress any such information which may occasionally surface.^{63,64}

In 1996, researchers from the Centre for Public Integrity (CPI), an American non-profit investigative research organization, set out to discover "how chemical companies manufacture controversial products, year in and year out, in the face of government regulatory efforts, and civil litigation by citizens who feel victimized, and investigative news stories."⁶⁵ They found that time and again Congress and regulatory agencies put the interests of the chemical industry before those of the public; that scientific studies financed by the chemical industry tended to find that suspected carcinogens, such as atrazine, formaldehyde and perchloroethylene, were "innocent", while scientific studies by non-industry sources tended to find them dangerous to human health.⁶⁶

The CPI also uncovered an extensive PR machine operated by the chemical industry, often with the complicity of the regulatory agencies, as well as a million-dollar service industry organized by chemical companies and associated organizations, to provide courtesy trips for regulatory officials.⁶⁷

"Today, in Europe and America wherever chemicals are likely to become the subject of criticism, the companies move in, balancing, propagandizing, controlling, mediating protests, funding pseudo-scientific research, buying people off and funding social ventures to enhance their reputation."⁶⁸

The dissident who questions the chemical companies, the industrial food companies, and inevitably the State, is branded as irrational, anti-science and anti-technology, and hence as a subversive standing in the way of progress.

In his 1983 Harveian Oration, Sir Richard Doll warned against environmentalists, who might "whip up irrational prejudice, unfounded in science".⁶⁹

Again, in 1992, writing in the *Daily Mail* at the time of the Rio Summit, Doll warned that we may be seeing "a new attitude emerge; an irrational ideology opposed to science, to industry and to progress."⁷⁰ That attitude, he told us, exists already.

"There is, for example, a large and powerful lobby against pesticides, which they say leave cancer-causing residues in our food. Yet scientific research has shown that those residues are some 1,800 times less than the amount of cancer-causing agents naturally present in the plants. The lobby does not seem to object to natural carcinogens; only to the infinitesimally small amounts introduced by man."⁷¹

If this is the level of intellectual reasoning of Britain's greatest epidemiological scientist, then we should all pray

for British science. Which edible plants have carcinogens in them 1,800 times more powerful than *which* pesticides? This, of course, he doesn't tell us. Nor could he, because these and similar statements routinely made by Doll and his sponsors, are pure fabrications.

The unbridled alliance of science and industry is transparent in Doll's *Daily Mail* article.⁷² He defended industry on six different occasions in the short article and asked us, not without a dash of desperation, to trust industry and industrialists, science and scientists. These, he said, are the people with the key to the future. He ended the article with a warning that we must stop environmentalists whom he describes as the "anti-science Mafia", from "hijacking" the Rio summit.⁷³

Sir Richard Doll believes strongly that whatever criticisms might be "laid at the door of industry and science", only "industry and science" can solve the problems of the modern world.⁷⁴

He tells us too, against all the evidence, that the continual, unregulated and untested introduction of chemicals into our food, can do the land, the farmers, and ultimately the consumers, nothing but good.

Fortunately Sir Richard and his colleagues are fighting a losing battle. It is becoming increasingly clear to the people that all this is not only false but the very opposite to the truth – mere propaganda for the chemical and nuclear industries that are, like the tobacco industry also, responsible for the present cancer pandemic. How many people today really believe that the leukaemia clusters found around just about all nuclear installations in the UK and elsewhere are caused by *viruses* introduced by outsiders? Who will believe that the main environmental carcinogens are natural ones like blue cheese, mushrooms and radon gas? How many people really believe that asbestos, lead in petrol, and organophosphate pesticides are harmless? Fewer and fewer, as the serious, independent evidence inexorably accumulates.

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He tells us too, against all the evidence, that the continual, unregulated, and untested introduction of chemicals into our food, can do the land, the farmers, and ultimately the consumers, nothing but good.

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Cancer: A Disease of Industrialization

by Zac Goldsmith

A major element in the accepted philosophy of the cancer medical establishment, is an assumption that cancer ran rampant among traditional people to as great an extent, if not greater, than that of modern industrial society, and as such is largely an unavoidable disease. But can such an assumption, so vital for the legitimization of a medical philosophy based on accommodation, rather than the prevention, of ill-health, be justified?

The 'health' of industrialized economies no longer represents the health of societies on which that ubiquitous Western economic model has been imposed. On the contrary, economic growth as a process is itself inextricably linked and in some ways dependent upon societal sickness. Thus, Irish economic analysts are able rightly to point out that anything resembling a lasting peace treaty in that country would have dire consequences for those many thousands employed in the business of accommodating, avoiding and dealing with the results of conflict. Likewise, the more cars built, sold and maintained, the greater the need for highways, highway patrol officers, road maintenance crews and of course ambulances with their accompanying wealth of medical wizardry. An increase in crime also provides a vacuum for growth, furthering the need for police, prisons and lawyers – not to mention huge opportunities for a rapidly increasing paranoia industry.

Consistent with this pattern, a billion dollar industry has grown up around the almost epidemic problem of cancer. Powerful institutions, vast multinational pharmaceutical businesses and a very large number of people have become wholly dependent not on prevention, but on the continued existence and growth of that problem. What's more, if it is true, as most independent researchers will testify, that man-made chemicals and industrial pollutants are more often than not the cause of this epidemic, then the very pillars of modern industrial economies stand to be toppled. As such, it can hardly be surprising that the cancer establishment and large chemical companies have set out systematically and in full force to discredit such an analysis with astounding determination.

Cancer is not increasing, we are told. It is both normal and natural that over one in three people must suffer from the disease. And, if we have experienced a small increase, then that, far from being lamented, is simply further cause for celebration that industrialization has brought with it an extension of life expectancy (and unfortunately the unavoidable increase in the risk of cancer which accompanies old age). What's more, undisputed cancer clusters surrounding virtually every nuclear power plant are coincidental ... it is, rather, natural foods like blue cheese, mushrooms and brazil nuts which are responsible.

A close look, however, at what few traditional, pre-industrial societies exist paints a very different picture. Few studies have been carried out, but those that have show almost a

nonexistence of the disease among those whose lifestyles have remained virtually unchanged for millennia. In order, however, for the cancer establishment to remain wedded to the more lucrative path of accommodation as opposed to prevention of the disease, an assumption that cancer is both traditional and (in order to justify further billions to be spent on research) decreasing, must be maintained and constantly justified in the face of evidence to the contrary. A belief in industrialization and 'progress' requires a faith in the same assumption, namely that traditional people in traditional contexts are more prone to such degenerative diseases, that the only salvation from cancer is further scientific research and high-tech medical gadgetry.

Traditional Society and Cancer

Sadly, we have allowed too much time to pass, subjected too many cultures to colonization and industrialization to be able to carry out an expansive and honest study of cancer among traditional societies, the likes of which barely exist today, except in

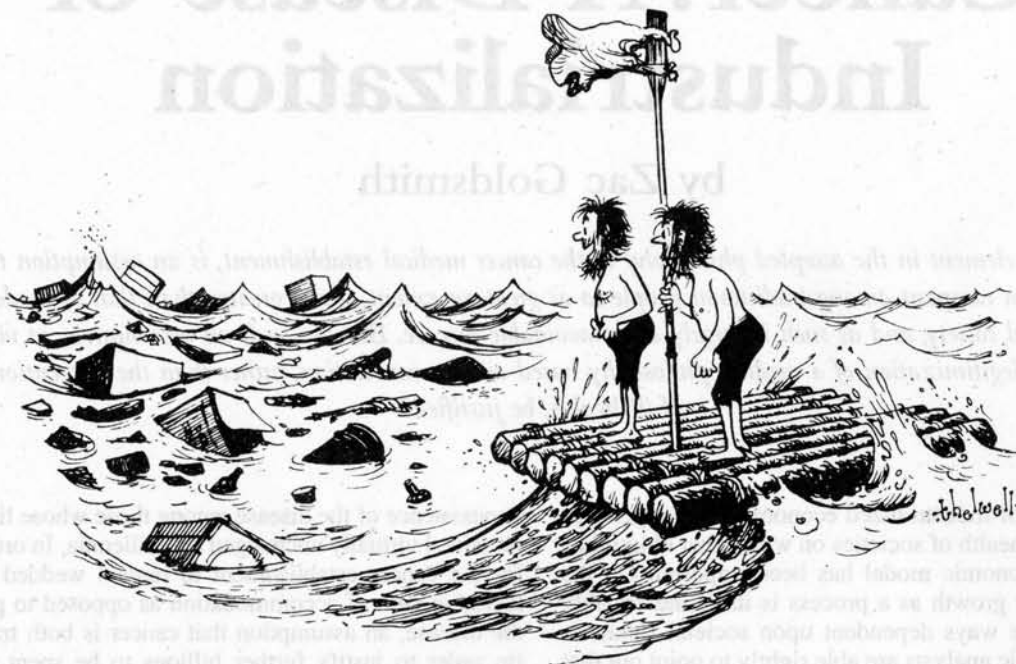
a few isolated, but now threatened, regions. Our conclusions, therefore, must be based on past scientific studies, as well as overwhelming anecdotal, experiential evidence.

Of course, there is little point from a business perspective in promoting research into

"On my arrival in Gabon, I was astonished to encounter no case of cancer"
Nobel laureate Albert Schweitzer, 1913.

the health of traditional people. As such, funding for research of that nature, which actually works to undermine the colossal medical establishment, and indeed our path to 'progress' itself, is hard to come by, if at all. Nevertheless, one such, by no means unique study, mostly, but not only, of North American Eskimos, was put together by Vilhjalmur Stefansson in 1960, entitled *Cancer: Disease of Civilization?*¹ In the preface, René Dubos, the late Professor of Microbiology at Rockefeller Institute for Medical Research, points out that "history shows that each type of civilization, like each social group and each way of life, has diseases which are peculiar to it ... From this broad survey", he continues, "there emerges the impression that certain diseases such as dental caries, arteriosclerosis, and cancers are so uncommon among certain primitive people as to remain unnoticed – at least as long as nothing is changed in the ancestral ways of life."

In 1915, the Prudential Insurance company of America published an 846-page report on Cancer, entitled, *The Mortality from Cancer Throughout the World*.² Its author was Frederick L Hoffman, chairman of the committee on statistics of the American Society for the Control of Cancer. Based on thousands



"Hello! we can't be far from civilisation."

of separate reports and all the available data, one of his conclusions was that "the rarity of cancer among native man suggests that the disease is primarily induced by the conditions and methods of living which typify our modern civilization." He goes on to explain that "... a large number of medical missionaries and other trained medical observers living for years among native races throughout the world, would long ago have provided a more substantial basis of fact regarding the frequency of occurrence of malignant disease among the so-called uncivilized races, if cancer were met with among them to anything like the degree common to practically all civilized countries" ... "Quite to the contrary," he continues, "the negative evidence is convincing that, in the opinion of qualified medical observers, cancer is exceptionally rare among the primitive peoples ..."

He later quotes in the same report from a book by Dr. Charles Powell,³ that "there can be little doubt that the various influences grouped under the title of civilization play a part in producing a tendency to cancer", and from Dr. W S Bainbridge's⁴ "outstanding contribution", *The Cancer Problem*, that, "with changed environment ... there came an increase in susceptibility to cancerous disease ... this susceptibility becoming more marked as civilization develops: in other words as environment changes."

"What are the conditions peculiar to civilized peoples, and absent from primitive races, which are associated with its prevalence and increase in the former, and its almost entire absence or relative infrequency in the latter?" he asks. "Cancer is unquestionably very rare in native races."⁵

Since then, the establishment has undergone a dramatic change, and in the face of clear evidence, it has become increasingly unfashionable, if not unacceptable, to suggest anything other than that traditional people lived, until the arrival of modern 'civilization', in conditions of extreme squalor, waiting for

the benign hand of modern civilization to scrape them from their muck, and build for them a worthy existence.

In 1836, however, such was the collective opinion among travelling men of medicine, that Sir George Back,⁶ accompanying the famous Dr. Richard King on an Arctic expedition, was greatly surprised "to learn how much disease ha[d] spread through this part of the country." His surprise would have been shared by most professionals and explorers of the time, who, from virtually every medical report in circulation, had become accustomed to viewing traditional people, living traditional lives as being superior in health by many measures to the 'white man'.

"On my arrival in Gabon, in 1913," wrote Nobel laureate Albert Schweitzer,⁷ "I was astonished to encounter no case of cancer ... I can not, of course, say positively that there was no cancer at all, but like other frontier doctors, I can only say that

if any cases existed they must have been quite rare."

Dr. Stanislas Tanchou,⁸ in his address to the Academy of Sciences in 1843 told of a Dr. Bac, surgeon-in-chief of the Second African Regiment, who had never once witnessed a case of cancer in Senegal, where he had been practising

medicine for six years. He told also of a M. Baudens, surgeon-in-chief at Val-de-Grâce, who practised medicine for eight years in Algiers, coming across only two cases of cancer, and of a Dr. Puzin who, of 10,000 people he allegedly examined, discovered only one case of cancer, that of a woman's breast.

In 1914, Livingston French Jones wrote in *A Study of the Thlingets of Alaska* that "While certain diseases have always been found among the Thlingets, others that now afflict them are of recent introduction. Tumours, cancers and toothache were unknown to them until within recent years."⁹

In 1925, under the title, *Health Conditions and Disease Incidence among the Eskimos of Labrador*, Dr. Samuel King Hutton wrote that, "some diseases common in Europe have

"Cancer is unquestionably very rare in native races." – Frederick L Hoffman,

Chairman of the committee on statistics of the American Society for the Control of Cancer.

not come under my notice during a prolonged and careful survey of the health of the Eskimos. Of these diseases, the most striking is cancer."¹⁰

In 1927, Associate Editor of New York City journal, *Cancer*, Dr. J Lyman Bulkley contributed an article, *Cancer Among Primitive Tribes*, to that journal, in which he wrote that his "observations on the subject were gathered during a sojourn of about twelve years among several of the different tribes of Alaskan natives, during which time he never discovered among them a single true case of carcinosis ... [I] feel that ... to civilization and all its influences may be attributed in a very large measure ... the increase in frequency of malignancy among primitive races."¹¹

In 1939, writing of his interview with Joseph Herman Romig, Alaska's "most famous doctor", Dr. Preston A Price claims that "... in his [Dr. Romig's] thirty-six years of contact with these people he had never seen a case of malignant disease among the truly primitive Eskimos and Indians, although it frequently occurs when they become modernized."¹²

In 1958, Dr. L A White wrote in a letter to Stefansson that "... it has been almost 17 years since I practised in Alaska. I was at Unalaska [Aleutian Islands] from 1934 until 1948, having previously spent 17 months at Metlakatla [Alaska Panhandle], then several months in 1939 at Klawock [Panhandle]; finally one and a half years at Bethel [Lower Kuskokwim]. My work led me to these conclusions: (1) hypertension and arteriosclerotic diseases were practically nonexistent among native peoples; (2) diabetes was extremely rare; (3) malignant disease was extremely rare - in fact I had only one proven case (Bethel, 1940). I saw no strokes nor coronary heart disease ..."¹³

The story it seems is very much the same wherever our once respected, now dissident thinkers cared to look. Sir Robert McCarrison, a surgeon in the Indian Health Service observed "a total absence of all diseases during the time I spent in the Hunza valley" [seven years] "... During the period of my association with these peoples, I never saw a case of ... cancer".¹⁴ Dr. Eugene Payne, we are told, "who examined approximately 60,000 individuals during a quarter of a century in certain parts of Brazil and Ecuador, found no evidence of cancer."¹⁵ Dr. Hoffman again speaks of the Indians of Bolivia, "among whom I was unable to trace a single authentic case of malignant disease. All of the physicians whom I interviewed on the subject were emphatically of the opinion that cancer of the breast among Indian women was never met with."¹⁶ Again, writing of the Hunzas, Dr. Allen E Banik and Renée Taylor describe "their freedom from a variety of diseases and physical ailments" as "remarkable ... Cancer, heart attacks, vascular complaints and many of the common childhood diseases ... are unknown among them."¹⁷ And, again of the Eskimos, Dr. George Plummer Howe believed strongly, that even if some cancers were going undetected, during years of work and thousands of check-ups, surely "external cancers could not possibly exist in the inspected regions for decades without being recognized or without resulting in deaths."¹⁸

'Progress' to Cancer

"Like practically all writers [emphasis mine] on the Labrador of the last hundred years," says Stefansson with obvious confidence in his underlying theme,¹⁹ "[Sir Wilfred] Grenfell is worried by the inroads of European disease among the native population. 'The sicknesses of the coast are not indigenous ... Contact with white men has blotted them out like chalk from a blackboard.'²⁰ From east to west," adds Stefansson, "... the medical missionaries all looked for cancer, and they never found it among the 'primitive', though they did find it among the 'modernized'."

When in 1934, a US Treasury's Public Health report²¹ was carried out, in which those regions and groups most and least prone to cancer were surveyed, it emerged, as one would expect from all we've heard, that incidence of cancer rose directly in parallel with Western industrial contact.

Interestingly too, in 1970, a study revealed that African Americans were ten times more likely then to contract cancer than were rural Africans living in Africa.²²

Roald Amundsen, author of *The Northwest Passage*,²³ wrote in 1908 that: "During the three-year voyage of the Gjoa we came in contact with ten

different Eskimo tribes in all, and we had good opportunities of observing the influence of civilization upon them, as we were able to compare those Eskimos who had come in contact with civilization with those who had not. And I must state it as my firm conviction that the latter, the Eskimos living absolutely isolated from civilization of any kind, are undoubtedly the happiest, healthiest, most honorable and most contented among them ... My sincerest wishes for our friends the Nechilli Eskimos is, that civilization may never reach them."

George Leavitt, another man of medicine, a 'stopgap' ship's doctor, was fascinated by cancer and spent many years working with Eskimos. Before the measles epidemic of 1900, he would have been in contact with up to 50,000 people. After years of questioning frontier doctors, and looking for a cancer victim among those with whom he was in contact, he eventually gave up, "because he was so sure by then that, except

among civilized Eskimos, no native cancers would be found in the Arctic."²⁴

A belief that cancer is very much the product of modernity was generalized in the late eighteen hundreds. Dr. John Le Conte, described as the "Father of the university

(of California)" by the National Academy of Sciences of the US, was one who fully shared this view, so much so that, jokingly he explained that Paris, suffering four times as many cancers at that time as London, must be four times more civilized. "... it may be to some extent consolatory to the inhabitants of England", he added "to discover that their recent mortuary records, from 1860 to 1867, indicate a very remarkable increase in the death rate from this disease."²⁵

In the July 1927 issue of *Cancer*, Dr. William Hay points out that "... tribes living naturally will show a complete absence of cancer till mixture with more civilized man corrupts the naturalness of habit; and just as these habits conform to those civilizations, even so does cancer begin to show its head ..."²⁶

"Civilization," is, according to Dr. Berglas, "in terms of

From east to west, the medical missionaries all looked for cancer, and they never found it among the 'primitive', though they did find it among the 'modernized'.

— Vilhjalmur Stefansson

"My sincerest wishes for our friends the Nechilli Eskimos is, that civilization may never reach them." — Roald Amundsen

Grim odds that every woman has to face

Dentists causing harm with x-rays

By Jeremy Laurence

CARELESS dentists who do not take the necessary precautions to protect themselves and their patients from harmful x-rays are putting themselves "at risk" - an opinion shared by the British Dental Association (BDA) in a report published last week.

The BDA report, which is a result of a survey of 1,000 dentists, says that 10 per cent of dentists do not wear lead aprons to protect themselves from x-rays. It also says that 10 per cent of dentists do not wear lead glasses to protect their eyes from x-rays.

The BDA report also says that 10 per cent of dentists do not wear lead gloves to protect their hands from x-rays. It also says that 10 per cent of dentists do not wear lead shoes to protect their feet from x-rays.

The BDA report also says that 10 per cent of dentists do not wear lead socks to protect their legs from x-rays. It also says that 10 per cent of dentists do not wear lead underwear to protect their bodies from x-rays.

Melanoma skin cancers increase

Adrian Raftery
Medical Correspondent

ONCE it was the people of the sun who were the victims of skin cancer, but now it is the people of the sun who are the victims of skin cancer.

The number of people who die from melanoma skin cancer in the United Kingdom has risen by 100 per cent in the last 10 years, according to a report published last week.

The report, which is the first of its kind, says that the number of people who die from melanoma skin cancer in the United Kingdom has risen by 100 per cent in the last 10 years.

Cancer 'link with TV transmitter'

A NEW ENVIRONMENTAL study has found a link between cancer and TV transmitters.

The study, which was carried out by a team of scientists from the University of Birmingham, found that the number of people who die from cancer in the area around a TV transmitter is significantly higher than the number of people who die from cancer in the area around a control site.

news

Childhood tumours: Scientists offer first explanation of how radioactive particles from over

'Pylon cancer' report boosts parents' battle

LEZ HUNT

THE report that children living near high-voltage power lines are at a higher risk of developing leukaemia and other childhood cancers has been welcomed by parents of children who have been diagnosed with these diseases.

The report, which was published last week, says that the number of children who die from leukaemia and other childhood cancers in the area around a high-voltage power line is significantly higher than the number of children who die from these diseases in the area around a control site.



Charity predicts 70pc increase in cancer cases over 20 years

Chris Mills
Medical Correspondent

THE number of people who die from cancer in the United Kingdom is expected to rise by 70 per cent over the next 20 years, according to a report published last week.

The report, which was published by the Cancer Research Campaign, says that the number of people who die from cancer in the United Kingdom is expected to rise by 70 per cent over the next 20 years.

The town that's dying of cancer

By Don Houston and Geoffrey Lean

Women 'increase cancer risk with long-term HRT'

Paul Holt, Medical Editor

Pill users face 10-year tumour risk

by Lois Rogers
Medical Correspondent

THE new findings, which are the result of a study of 10,000 women, suggest that long-term use of the pill increases the risk of developing cancer of the uterus and ovaries.

The study, which was carried out by a team of scientists from the University of Oxford, found that the number of women who die from cancer of the uterus and ovaries in the area around a pill user is significantly higher than the number of women who die from these diseases in the area around a control site.

Pervasive Secrecy Found in U.S. Files On Radiation Trial

By Philip J. Hitt

Toxic Waste Used in Fertilizers, Paper Says

Officials worry

Cancer: A Child of 'progress'

cancer, a juggernaut that cannot be stopped." Quoting Dr. G Schenk, Berglas²⁷ adds, "It is the nature and essence of industrial civilization to be toxic in every sense ... We are faced with the grim prospect that the advance of cancer and of civilization parallel each other."

The Health and Integrity of Traditional Society

If we are to question the dangerous path we are treading, which indeed we must, for obvious reasons, then we must also question the assumptions which justify such a path. And if we are to believe in the notion of linear, unending 'progress', as we are taught to from an early age, then clearly we must equally disbelieve in the integrity of the past. However, the distorted picture of historic human misery and poor health that is so often presented to us, simply does not bear up to the facts, figures and accounts that have been handed down to us. However, it is important again to remember that very few traditional societies have managed to withstand the Western industrial juggernaut. Of the few writings on traditional health that we can rely on, it is not surprising that the vast majority would have been carried out many years ago, when such societies still existed.

The distant Hebridean island of St. Kilda is one such society which was heavily documented by a number of writers from the eighteenth century until its collapse in 1930. Books have since been written about its sad demise, from a society of self-sufficiency, custom, arts and plenty, its own religion, language and unique cliff-based culture, to one of moral and eventual physical poverty, and consequent collapse.

"As long as St. Kilda remained remote from the world," writes Charles Maclean, "its society was viable, even utopian; but in the 19th century the island was 'discovered' by missionaries, do-gooders and tourists, who under the impression that they were bringing to St. Kilda the benefits of civilization brought money, disease and despotism. Unable to withstand the effects of increased contact with the mainland and 'civilization', the St. Kildan culture gradually disintegrated, the population dwindled and in 1930 the few remaining islanders asked to be evacuated because they could no longer support themselves."²⁸

Before corruption set in, the general health of St. Kildans was held in awe by all who visited. One of the early visitors, Dr. MacCulloch,²⁹ acknowledged "the good physique of the males", who, he said, "were well-looking, and appeared, as they indeed are, well fed; ... and bearing the marks of easy circumstances, or rather wealth." George Seton,³⁰ in 1877, wrote that "the remarkably healthy look of the children in arms was the subject of universal comment." He quotes a Mr. Wilson³¹ who described the men as strong, handsome, and "with bright eyes, and an expression of great intelligence," and Rear Admiral Otter,³² whose experience on the Island led him to believe that "those that survive infancy grow up strong, healthy men and women." "... ludicrous insinuations as to the

possibility of 'famine' are hardly worthy of notice," wrote Mr. MacDiarmid in the nineteenth century.³³

Maclean's own research revealed that "... in the days when they lived in almost complete isolation from the rest of the world the St. Kildans had been a strong and healthy race afflicted by few diseases. 'They never had a potion or physic given them in their lives,' wrote Martin, another student of the St. Kildan experience, 'nor know anything of phlebotomy; a physician could not expect his bread in this commonwealth.' ... But as contact with civilization increased, the health of the islanders declined. They became susceptible to diseases previously unknown in St. Kilda and by the 20th century a general debilitating weakness had set in. They suffered more and more frequently from colds, coughs, headaches and rheumatism, while dyspepsia, scrofula, ear disease and dysentery soon became common complaints ...

Contemporary opinion put the ill-health of the St. Kildans down to their peculiar diet and hard way of life, but it failed to take into account that the diet and lifestyle of the islanders had changed little over the centuries."³⁴

The culture and ways of the St. Kildans were wholly unique, the story of their demise is sadly not. The same has been documented else-

where, in Ireland, where Hugh Brody³⁵ describes a small town in which the local nurse claims that she dispenses "more anti-depressants than headache tablets", or the Portuguese village of Alto, where according to Robin Jenkins,³⁶ since a road linking it to the global economy was built in 1951, "most of the men...[have] in fact [become] alcoholics," and more recently Ladakh, in the Himalayas, where the once often remarked-upon health of individuals has been on drastic decline since they too were linked up to the Indian economy, which in turn has become ever more absorbed into the global economy.³⁷

The work of Professor Neel³⁸ reinforced this view: "I find it increasingly difficult," he wrote in 1970, "... to see in recent reproductive history of the civilized world a greater respect for the quality of human existence than was manifested by our remote 'primitive' ancestors ... The Xavante are in general, in excellent physical condition, and we have similar unpublished data on the Yanomama and Makiritare."

In 1948, Dr. Romig³⁹ described a "... general impression of average good health and considerable longevity" presented by the Eskimos. "On [their] diet the people were strong and did not get scurvy ... they did not have gastric ulcer, cancer, diabetes, malaria, or typhoid fever, or the common diseases of childhood known so well among the whites. For the most part they were a happy, carefree people ... It is with regret," he added, "that we see the slow passing of these once hardy people ..."

Some Doubts

While, today, such views are conveniently dismissed as "unscientific", they were readily accepted by those who were in regular contact with traditional people, before their demise.

While breast cancer today afflicts one in eight women in the US, the Canadian Medical Association, "In spite of strenuous efforts, [was] unable to discover one authenticated case of Eskimo breast malignancy."

Ironically, while it is encouraged and wholly accepted that we idealise and romanticize a societal model which has utterly failed us on so many counts, it is totally unacceptable, indeed politically incorrect to praise the only model for society which has proven a success.



"There can be little doubt that the various influences grouped under the title of civilization play a part in producing a tendency to cancer." – Dr Charles Powell.



"... tribes living naturally will show a complete absence of cancer till mixture with more civilized man corrupts the naturalness of habit; and just as these habits conform to those civilizations, even so does cancer begin to show its head ..." – Dr William Hay.

In those days too, however, various members of the establishment were naturally doubtful. One such man was superintendent Peacock,⁴⁰ who in 1957 wrote that "[W]hen I first came to Labrador, in 1935, I was told that cancer never occurred among Eskimos." He went on to describe six cases of death from cancer among the Eskimos. Further research, however, revealed that of those six, all had lived 'civilized' lives "... two men who died of stomach cancer whose respective wives died of womb cancer; and both of a pair of brothers who died of throat cancer." Peacock later came to believe that cancer was indeed "environmental in causation".

Still, however, current thinking is that cancer is not on the increase, and absurd denials and lies of the sort published in current newspaper headlines are increasingly forthcoming. But how can it be, by anyone's logic, that while breast cancer today, for example, afflicts one in eight women in the US,⁴¹ there has been virtually no sign of it among traditional people living traditional lives? We hear that of 10,000 patients seen by Dr. Puzin in Senegal,⁴² only one was seen to suffer from breast cancer, which we should note, is not a difficult cancer

to detect. And in 1957, Mrs. Griest,⁴³ head nurse of Farthest North Hospital, wrote, "This I know, in all my 17 years of nursing in the hospital, we never found any women with lumps in their breasts."

The Canadian Medical Association Journal in 1956 printed an article by three authors, Drs. Lawson, Saunders and Cowen,⁴⁴ in which it is pointed out that "for the past ten years we have been aware of the relative freedom of Eskimos [of the Canadian eastern Arctic] from breast cancer and cystic disease. In spite of strenuous efforts, we have been unable to discover one authenticated case of Eskimo breast malignancy."

It seems fairly indisputable that cancers, in this case of the breast, were extremely rare if they existed at all. And, if cancer is a disease of old age (which it certainly is no more), then that too fails to explain why traditional people have traditionally been free from the disease. For, contrary to what we are told, the life expectancy of traditional people can be higher than ours – if it is calculated from the age of ten rather than zero. Indeed, as René Dubos⁴⁵ has explained, "The increase in life expectancy is almost exclusively the result of the virtual elimination of mortality in the young age groups." Rather, he adds, this so-called increase in life expectancy often "represents merely prolongation of survival time through complex and costly medical procedures ... It corresponds to what has been called medicated survival."

With our modern medicine we have managed to reduce childhood mortality, but in the process, we have created ideal conditions for the growth of countless diseases, both degenerative and infectious. After the age of ten, it is less likely that we in the industrialized world will reach old age safely, than it is among traditional people. What's more, as a great many people will testify, the pre-death vegetative state, which may last for years in the industrialized world, is unknown traditionally. Rather, as Dr. Allen E. Banik explains, "Like the 'one hoss shay', all the Hunzakuts' bodily organs seem to expire at one time. One day the oldster is there; the next day he is gone."⁴⁶

"They live long, and remain youthful in mind and body until they die." The Hunzas, among whom, we have already seen, "cancer is unknown," famous above all for their remarkable longevity, "... today live in health and happiness to the age of 120 years ... the healthiest, longest-lived people in the world."⁴⁷

The same was said of the Eskimos. Dr. Simpson,⁴⁸ described in 1852, "a healthy and happy people of apparently high longevity ..." Dr. Greist⁴⁹ reaffirmed this view in 1955, "For untold centuries ... the Eskimo of the far North was healthy ... He lived to a very great age." The same has been told, particularly of the Cogi Indians of Colombia by Alan Ereira.⁵⁰

Sudden Change... Willful Amnesia

So why did the establishment change its views on the issue of traditional people and cancer? One obvious answer is given by Dr. Samuel Epstein⁵¹ in his new book on breast cancer, "Cancer treatment is big business, with multi-billion dollar annual cancer drug sales. Cancer prevention is very much less profitable, at least to big business." In other words, an industry developed around the problem, which required a belief that prevention was not an option, i.e. that cancer was both inevitable and natural.

But more fundamentally perhaps, the science itself which grew around the issue was flawed. In 1932, a disillusioned John Cope pointed out that in "more than thirty years ... a whole generation has been born, has lived and died; laboratories have been built in all parts of the civilized world; many thousands of scientists have been devoted to the quest, and whole libraries of magazines, articles and books testify to the

patience, industry and ability with which this pursuit has been conducted ... and yet not even the most sanguine research worker can point to anything that can by any stretch of the imagination be termed a solution to the problem which the researchers set out so confidently to answer.

"Experience has proved that those who have spent a good many years of their lives in experimental research have acquired modes of thought and habits of working which, to say the least, do not make them safe judges of the results of wider methods of inquiry. The very precision and exactitude of detail which are of so much value in intensive research, added to the restricted circumstances of the laboratory, lead to a narrowness of view, to a lingering over minutiae, which must needs unfit those so engaged from taking any part in forms of inquiry for which broad, spacious views are essential."⁵²

In 1957, the famous Dr. Berglas was of the same mind: "Over the years, cancer research has become the domain of specialists in various fields. Despite the outstanding contributions of these scientists, we have been getting farther and farther away from our goal, the curing of cancer. This specialized work, and the knowledge gained through study of the individual processes, has had the peculiar result of becoming an obstacle to the study of the whole"⁵³

If we are to deal with this all-consuming and terrifying disease which seems to affect every one of us directly or indirectly, then we must clearly determine what are the conditions in which it does not exist. Currently, our scientists do the exact opposite, spending millions on studying the process of mutation, the uncontrolled division of cells, observing cancerous growth on the backs of millions of doomed and suffering animals. But for what purpose? As Sam Epstein has pointed out, very little has been achieved through such a process. And do we really want to focus on accommodating what is an inherently unhealthy process? Surely, it would make more sense to study the context in which those who seem never to have been plagued by cancer once lived.

Ironically, while it is encouraged and wholly accepted that we idealize and romanticize, both to our doubting selves and more significantly to newly developing countries, a societal model which has utterly failed us on so many counts – it is totally unacceptable, indeed politically incorrect to praise the only model for society which has proven a success – traditional, pre-industrial society. Is it not odd that the only platform on which it is acceptable to extol the viability of traditional culture is on tourist brochures and catalogues doing so in order to commercialize and ultimately sell that viability?

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Children, Pesticides and Cancer

by Alison White

Young children consume more pesticide residues in food than any other age group. They are especially vulnerable to pesticides which cause cancer and damage to the immune and nervous system. The safety of pesticides is assumed until proven otherwise. We thus find ourselves in a seemingly endless cycle where pesticide after pesticide is brought to public trial having already caused great harm. One result has been an alarming rise in childhood cancers worldwide.

The New Zealand Total Diet Survey 1990/1991 shows very clearly that the estimated pesticide daily intake for younger children (aged one to three) is much higher than other age groups. Figure 1 shows that for three types of pesticides measured, organochlorines, organophosphates and fungicides, the estimated daily intake for young children is over double the intake of men. This is no doubt due to the fact that young children consume more food relative to their body weight than men and also because the types of food they eat more of, like fruit, tend to be more heavily sprayed.

This confirms findings of recent American studies^{1,2} which

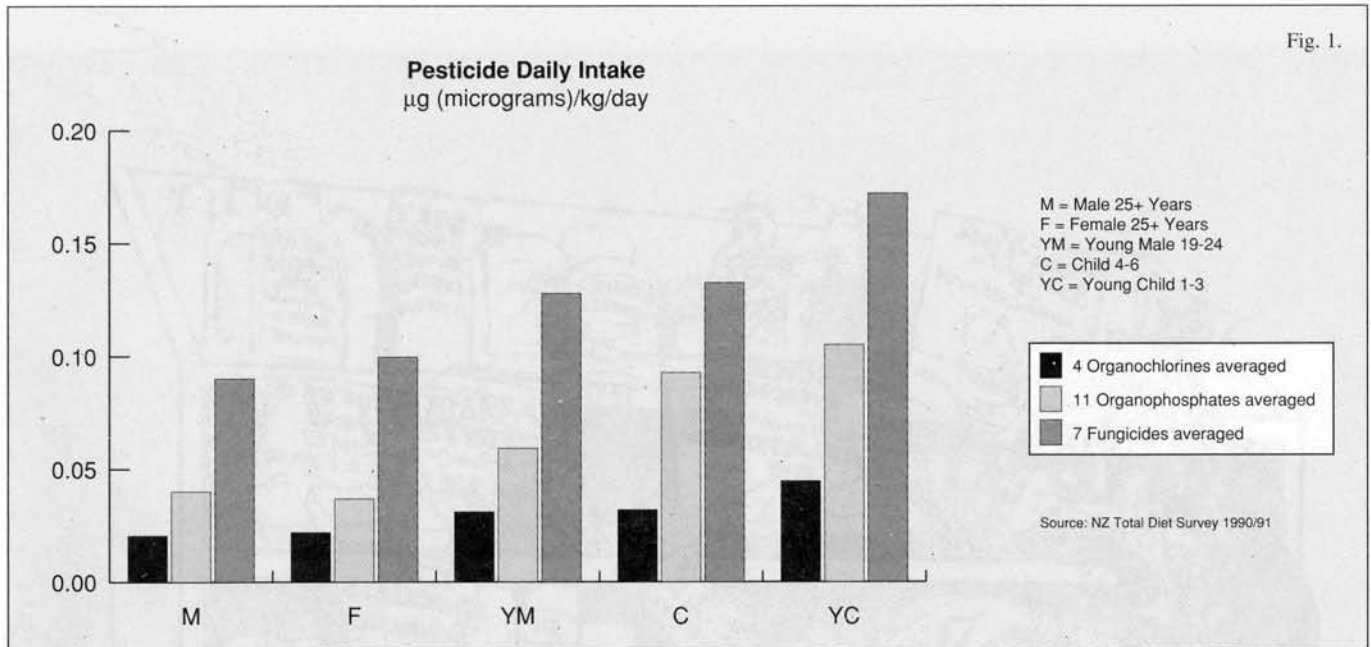
find that children are more at risk than adults from pesticide residues. The younger a child is, the more difficulty their body will have in coping with toxins in general. As the National Academy of Sciences (NAS) report concludes: "exposure to pesticides early in life can lead to a greater risk of chronic effects that are expressed only after long latency periods have elapsed. Such effects include cancer, neurodevelopmental impairment, and immune dysfunction."³

Susceptibility to carcinogens

A number of laboratory studies have shown not surprisingly



Fig. 1.



that animals are at greater risk of developing cancer if exposure began in infancy rather than later in life. Of 14 carcinogens reviewed by the US Natural Resources Defense Council, the young were more susceptible to 12. Another review found that the young were more susceptible to eight of the ten carcinogens examined.⁴ The reasons for such susceptibility may be linked with rapid cell division entailed in development and growth; but also with the fact that children have more of their lives still to live during which exposure and carcinogenic action may occur.

Several epidemiological studies document the increased incidence of cancer in children exposed to pesticides. A case-control study of 84 children with brain cancer in Maryland, USA, found that children with brain cancer were more likely to have been exposed to insecticides in the home.⁵ The US Children's Cancer Study Group found an increased risk of leukaemia in 204 children whose parents used pesticides in the home and garden.⁶ Another case-control study found a similar significant link between leukaemia in 123 children and the use by parents of pesticides.⁷

Susceptibility to neurotoxins

Children are also more susceptible to substances which cause nervous system damage. Of 31 neurotoxic metals, pesticides and other chemicals analysed in one review, there was an age-related difference in susceptibility for all but two. In 66 per cent of the cases where susceptibility differed with age, the young were more susceptible.⁸

The young are especially susceptible to the acute effects of organophosphate insecticides. Young rats are more susceptible than adults to the lethal effects of 15 out of 16 organophosphates tested. For some organophosphates, the fatal dose in immature animals has been reported to be only one per cent of

the lethal dose in adult animals.⁹ The NAS report concludes, "the exposure to organophosphate pesticide residues in food could be sufficiently high to produce symptoms of acute organophosphate poisoning [in children]."¹⁰ Their conclusion is based on the combined organophosphate residues likely to be found in any one food or combination of foods. Our local Toxins Action Group has on file reports of pesticide poisoning of children and adults from eating peaches, grapes and strawberries. Common symptoms include tingling mouth, sore stomach, and generally feeling unwell.

One reason that the young are so susceptible to neurotoxins is that the barrier inhibiting the passage of compounds from the blood into the brain is not fully developed. Also the process of myelination, in which nerve fibres are covered by a protective fat-like substance, called myelin, is not fully complete until adolescence. What's more, the blood capillary system in the brain is not fully developed and nerve fibres are still branching.¹¹

Behavioural effects that can lead to learning difficulties may follow relatively low-dose exposure and permanent learning difficulties

may follow sufficiently high-dose exposure to organophosphates.¹² A case-control study investigating chronic effects of acute organophosphate poisoning among 100 humans found that poisoned subjects still, even after an average of nine years, showed poorer intellectual functioning, abstract and flexible thinking and simple motor skills.¹³ A number of studies suggest that organophosphate and carbamate exposure before and immediately after birth can cause delays in reflex and sexual development, as well as delays in eye opening; alter nerve transmission function and neuroreceptor development; and in several cases, affect brain structure itself.¹⁴

As the NAS study concludes: "The data strongly suggest that exposure to neurotoxic compounds at levels believed to be safe for adults could result in permanent loss of brain function if it occurred during the prenatal and early childhood period of brain development. This information is of particular relevance to dietary exposure to pesticides, since policies that

"Policies that established safe levels of exposures to neurotoxic pesticides for adults could not be assumed to adequately protect a child less than four years of age."



"Yuck!! There's mud on these potatoes"

established safe levels of exposures to neurotoxic pesticides for adults could not be assumed to adequately protect a child less than four years of age."

Damage to the immune system

Hundreds of studies have shown that many pesticides adversely affect the immune system in animals and render them more susceptible to disease, and yet pesticides generally are still not required to be tested for immune-system suppression before they are put on the market. Few studies have been done on humans; some from Canada and the Soviet Union find that children and adults exposed to pesticides suffer immune system alterations and higher rates of infectious diseases and that the risk is known to be greatest among infants and those who are malnourished or chronically ill.¹⁵ In the agricultural districts of central Moldova, where pesticides have been used heavily, 80 per cent of "healthy" children were found to have suppressed immunity. Children

from these areas were three times more likely to suffer from infectious diseases of the digestive tract, and two to five times more likely to have infectious diseases of the respiratory tract.

One reason the human species has thrived for centuries is the versatility of the human immune system – the body's ability to overcome pathogens through more than one mechanism,

so that even if one is impaired, the body will still be protected. As Benbrook remarks, "scientists are worried that multiple, chronic exposures to chemicals that attack immune response may erode the immune system's multiple defences enough to make the body vulnerable to viruses and bacteria that, while always present, generally do

not trigger disease."¹⁶ A recent plague that killed dolphins in the Mediterranean, North Sea and North Atlantic turned out to be common viruses to which the animals were normally resistant. Blood samples from dolphins off the Florida coast showed high levels of pesticide residues, major infections and weak immune systems.¹⁷

A recent plague that killed dolphins in the Mediterranean, North Sea and North Atlantic turned out to be common viruses to which the animals were normally resistant.

What's for lunch?

Let's take a fairly typical (for New Zealand) and apparently "healthy" lunch and see what pesticide residues may be included as well. Data is from the NZ Total Diet Survey 1990/91.

Menu: A filled roll consisting of sausage, tomato, lettuce, butter and a white bread roll, followed by an apple.

Ingredients:

Sausage: DDE, chlorpyrifos-methyl, fenitrothion, pirimiphos-methyl

Tomato: alpha-endosulfan, beta-endosulfan, endosulfan-sulphate, chlorpyrifos, pirimiphos-methyl, chlorothalonil, dichlofluanid, dithiocarbamates, iprodione, procymidone, vinclozolin, permethrin.

Lettuce: alpha-endosulfan, beta-endosulfan, endosulfan-sulphate, chlorothalonil, dithiocarbamates, iprodione, procymidone, vinclozolin.

Butter: DDE.

White bread roll: chlorpyrifos-methyl, dichlorvos, fenitrothion, malathion, pirimiphos-methyl.

Apple: chlorpyrifos, captan, iprodione, vinclozolin.

What's wrong with these pesticides?

Some known long-term and chronic effects on mammals of the pesticides mentioned above in our lunch menu are listed alphabetically ^{28,29,30,31}

captan: a fungicide which can cause cancer, genetic damage, damage to the foetus and immune system.

chlorothalonil: a fungicide which can cause cancer, hyperexcitability, skin, eye and kidney damage.

chlorpyrifos, chlorpyrifos-methyl: organophosphates which are cumulative and can cause damage to the foetus, the developing nervous system and brain, impaired immune response, birth defects and other reproductive abnormalities typical of estrogenic compounds. In bulls: sterility and impotence. The major oxon metabolite is three times more toxic than the parent compound in inhibiting cholinesterase activity.

DDE: a very persistent metabolite or breakdown product of DDT, an organochlorine. It accumulates in the body, is an endocrine disrupter and can cause abnormal sexual development, allergies and impaired reproduction as well as cancer.

dichlorvos: an organophosphate which can cause cancer (and leukaemia and stomach tumours specifically), gene damage, immune-system damage, birth defects, damage to the foetus, aplastic anaemia, bone marrow, sperm and other reproductive abnormalities, kills human white blood cells and inhibits steroid synthesis. Likely to be an endocrine disrupter.

dithiocarbamates or EBCDs: fungicides including mancozeb, metiram, thiram, zineb which produce a



Wolfgang M. Weber, Still Pictures.

metabolite called ethylene thiourea (ETU) which increases on exposure to heat. This means if you cook something which contains these fungicides, the concentration of ETU increases. An endocrine-disrupter, the metabolite can cause abnormal sexual development and impaired reproduction as well as cancer, gene damage, birth defects, goitre, increased fluid in the skull and allergies. In New Zealand, celery, cabbage, lettuce, berryfruit, grapes, apples, pears, onions and tomatoes are most likely to contain these fungicides.

endosulfan: an organochlorine "strongly suspected to be contaminated with" dioxins (EPA 1994). It is estrogenic, an endocrine-disrupter and can cause abnormal sexual development and impaired reproduction. It can also cause cancer, gene damage, eye and kidney damage, suppression of immune response and red blood cell damage.

fenitrothion: an organophosphate which can cause gene and immune-system damage, behavioural deficits in newborn, is a suspect viral enhancer and implicated in Reye's syndrome.

iprodione: a fungicide which can cause cancer. Similar to procymidone and vinclozolin. (q.v.)

malathion: an organophosphate which can cause gene and immune-system damage, birth defects, delayed nervous-system damage, allergic reactions, behavioural effects, ulcers, gastrointestinal inflammation, damage to eyesight, abnormal brain waves.

permethrin: a synthetic pyrethroid which is an endocrine disrupter and can cause abnormal sexual development and impaired reproduction as well as cancer, immune-system, central-nervous-system and blood damage.

pirimiphos methyl: an organophosphate which can cause gene damage.

procymidone: a fungicide which can cause cancer. Structurally related to iprodione and vinclozolin. Strong evidence that it and the breakdown products of vinclozolin are anti-androgens (disrupt the normal action of androgens, the predominant sexual hormones of males).

vinclozolin: a fungicide which can cause cancer, genetic damage and birth defects and disrupt the endocrine system.

Which foods have more pesticide residues?

In New Zealand, pesticide residues were present in 56 per cent of 521 samples of foods analysed in the 1990/91 Total Diet Survey, which tested 107 foods judged to be consumed in the greatest quantity, representing over 70 per cent of foods consumed in New Zealand. In comparison a 1994 UK survey found that 33 per cent of 3,742 produce samples had pesticide residues and a 1992 US survey found that 35 per cent of 16,428 samples of food had pesticide residues.¹⁸

Some foods contain significantly more pesticide residues than others. Generally fruit tends to be more heavily sprayed. Peaches, strawberries and other berry fruit, oranges, apples, cherries and tomatoes tend to have more pesticides on them and have a greater percentage of samples with pesticides detected. These foods also tend to be more popular with children.

These foods can be compared to "New Zealand's Dirty Dozen Food" made or grown in New Zealand. Ranked according to the total number of pesticides found in each and the percentage of samples found

to have pesticide residues, these are: celery, wheat products, tomatoes, kiwifruit, apples, cucumber, peaches, strawberries, oranges, lettuce, pears and potatoes. Grapes and other types of stone and berryfruit are also likely to be

heavily contaminated with pesticide residues, but have not been included because they have not been analysed in New Zealand. Wheat products including bread, pasta and pastry are very heavily contaminated in New Zealand (96.6 per cent of 90 samples) because of the practice common in both New Zealand and Australia of applying post-harvest organophosphates in storage.

Meat is likely to contain DDE, a persistent metabolite of DDT. This was found in the NZ Total Diet Survey 1990/91 in 80 per cent of 40 samples of meat including beef, pork, chicken, lamb, sausages, meat pies and luncheon sausage and in 100 per cent of 16 samples each of butter and cheese. New Zealand's levels of DDE are high compared with those measured overseas, though the levels have been dropping gradually over the years, and this is because New Zealand deregistered most organochlorines relatively late, in 1989. The highest levels were found in lamb liver (.25 parts per million-ppm), lamb leg (.25ppm), lamb chops (.15ppm), butter (.07ppm), sausages (.06ppm) and cheese (.05ppm).

The US EPA dietary exposure estimates show an unusually narrow margin of safety between actual dietary exposure and levels posing risks to infants and children. In Germany labels are required to state "possible risk of irreversible effects, possible risk of impaired fertility, possible risk of harm to unborn child."

Aren't the pesticides in too low a dose to cause any damage?

This is the view of the New Zealand Pesticides Board, the Ministry of Health and many regulatory authorities throughout the world. It is much easier to live with the status quo where it is normal practice worldwide to use pesticides on our food than to restrict or ban certain pesticides, which would require energy and money. Evidence of harm of a pesticide has to be overwhelmingly strong before anything is done about it.

While some scientists think that there is a threshold below which no cancer can occur, other scientists have found that no threshold for carcinogens or cancer-causing agents exists.¹⁹ Significant tumour responses have been found even at the lowest doses of carcinogens tested.²⁰ Lijinsky and other studies suggest that it may not be possible to conduct valid experiments that allow the establishment of a safe threshold for exposure of people to any carcinogen identified through animal experiments. For this reason US regulatory agencies employ linear, non-threshold models.²¹

All testing of pesticides, when it has been done (most pesticides in current use have not been properly tested²²), is done of one particular chemical on animals. This certainly cannot reflect reality, where we are exposed to a cocktail of chemicals with every mouthful we take. (see Vyvyan Howard "Synergistic Effects of Chemical Mixtures", Vol.27 No.5) Possible synergistic effects where one chemical may interact or combine with another to form a more toxic compound are not taken account of.

As Benbrook remarks: "One of the principal and worrisome impacts of exposure to mixtures of pesticides, inert ingredients and other chemical contaminants in the environment is that one chemical might slow down the normal

detoxification of one pesticide or chemical, another might hasten the conversion of another chemical into a more active form, and a third might depress immune response or render a particular organ system temporarily vulnerable to disease."²³

It is known, for example, that the EBI (ergosterol-biosynthesis-inhibiting) fungicides prochloraz, propiconazole and penconazole increase the toxicity of organophosphates by hastening their enzymatic conversion to more biologically active forms. The EBI fungicides also synergistically enhance the toxicity of synthetic pyrethroids in honeybees.²⁴

One of the important new findings to emerge from recent research is that certain impacts following exposure to endocrine disrupters, toxic chemicals and drugs are observed only at very low concentrations – as little as a few parts per trillion – and disappear at higher doses. This is apparently because higher doses may trigger a detoxification mechanism and changes in cell metabolism that mask the low-dose effect. The changes often convert the invader to a more toxic form, or may block or disrupt other functions.²⁵

One study in Italy, designed specifically to

reflect both the levels of exposure commonly found in the human food supply, as well as the distribution of residue levels, found that a mixture of 15 pesticides impaired liver function and induced free-radical damage of DNA at low doses in rats. Significantly, the DNA damage was not observed at higher doses administered.²⁶ It was also found that the toxicity of the pesticides evaluated together could be significantly reduced if benomyl was excluded. (Benomyl, for example, has never been analysed in New Zealand food in spite of being used on a wide range of fruit and vegetables. Its analysis requires an expensive, separate test.

The assumption continues to be made that if food residues are below the Maximum Residue Limit (MRL), then adverse health effects are unlikely. One problem with this is, as the NAS report points out, that "many MRLs were set in the late

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Benomyl has never been analysed in New Zealand food in spite of being used on a wide range of fruit and vegetables.

'50s, without the benefit of current data on the health effects of pesticide residues".²⁷ And the NAS report also stresses that "the MRLs are not designed to provide a margin of safety for infants and children" [nor do] "surveys adequately represent foods eaten in large quantities by infants and children."

Conclusion

Children receive higher doses of pesticides than other age groups. They are especially vulnerable to pesticides which cause cancer, immune and nervous-system damage, and permanent damage affecting future generations could result. They are also especially vulnerable to the acute effects of organophosphate insecticides found plentifully in our food.

Recent scientific studies have conclusively demonstrated that certain pesticides in widespread use worldwide can block, mimic or otherwise interfere with the human endocrine system. These effects can occur at very low levels of exposure and may alter foetal and childhood development, disrupt bodily functions and increase susceptibility to disease. The chilling nature of these effects requires caution and prudence in allowing the continuing use of pesticides that could cause these effects in humans.

The Maximum Residue Limits set for each separate pesticide in food does not adequately protect our children. Foods which children commonly eat routinely carry multiple pesticide residues. These may interact in synergistic ways to

overcome the body's various defences. Yet most studies deal with each pesticide in isolation and authorities regulate them one by one. The health effects of multiple exposures to pesticides are unknown and largely not evaluated.

Scientific ability to quantify and contrast risks accurately – across all active ingredients, in all the combinations encountered in the real world – is years and probably decades away. In the meantime, governments urgently need to phase out pesticides, adopt integrated pest-management systems which

lower the use of pesticides and promote sustainable systems of growing which do not use pesticides. One immediate step which would better protect our children would be to calculate cumulative exposure estimates for certain closely related families of compounds, such as the EBDC fungicides and the organophosphates.

Steps that you can take to protect your children include growing your own pesticide-free food and, failing that, buying organic food. If you eat non-organic fruit and vegetables, it always pays to wash them properly and if possible peel them. In this way some but by no means all pesticide residues would be reduced.

When we stop regarding pesticides as safe until proven guilty, we shall stop being caught in this seemingly endless charade where pesticide after pesticide is brought to public attention with overwhelming evidence of harm already done. Children, future generations and the environment are, we now know, at serious risk from present pesticide use and policies.

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until proven guilty, we shall stop being
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Pesticide Use on Farm Animals: *Can We Regulate it?*

by Richard North

Under the current regulatory system, permits for the marketing of organophosphorous pesticides (OPs) as veterinary medicines are issued by the same agency that monitors their impact. In this article, the author highlights the inadequacies in current testing, authorisation and surveillance practices for OP chemicals; and asks whether a system in which the regulator is ultimately dependant on the major pesticide-producers for its financial survival is structurally capable of protecting public safety.

Under the Medicines Act of 1968, organophosphorous pesticides (OPs) for topical application on animals are considered veterinary medicines, i.e. substances used "to treat or prevent a disease". Administration of these pest-controlling agents is vested in the Veterinary Medicines Directorate (VMD), a Self-financing Regulatory Agency (or "Sefra") created in April, 1989, whose aim is to:

"... ensure the safety, quality and efficacy of all aspects of veterinary medicines in the UK thereby safeguarding public health, animal health and the environment and promoting animal welfare".¹

Safety evaluations of new medicines are conducted by the Veterinary Products Committee (VPC), a statutory body constituted under Section 4 of the Medicines Act. The VPC is serviced by the VMD, but reports to the Minister of Agriculture, who makes the formal licensing decision. The Committee draws its membership mainly from scientists, most of whom have direct or indirect pharmaceutical interests. In 1992, 11 of the 17 members had professional links with pharmaceutical companies which made OPs.

The Control System

The key feature of the control system is the product licence, now known as a "marketing authorization", which manufacturers of veterinary medicines are required to obtain for each of their products before they can be sold or supplied. According to the VMD, marketing authorizations are granted:

"... only after the product had undergone a rigorous assessment to establish its safety, quality and efficacy".²

For obvious reasons pesticides cannot be tested on human beings – so tests are carried out on animals using what is known technically as a "predictive model". Animals are used as "models" to predict whether humans might be harmed.

Licence applicants negotiate with VMD a "package" of safety tests, which are then carried out by the applicants, or commercial laboratories on their behalf. The results are then submitted to the VMD – and thence to the VPC – for scrutiny. However, the regulators have no means of independently verifying the results submitted to them.

Initially, a series of 'primary toxicity tests' is conducted, using laboratory animals to assess the short-term effects of a chemical. During these tests, there is a requirement that any mutagenicity indications are "noted". Carcinogenicity, however, is evaluated mainly through longer-term tests. These involve exposing rats or mice to daily doses of the test substances for the natural life-span of the test animals – two years in the case of a rat and 18 months for a mouse. Doses are based on the maximum daily intake levels set for humans. In the case of OPs, experiments are also conducted with hens to determine neurotoxic effects.

Sufficient Regulation?

On the face of it, the "predictive model" approach seems comprehensive and effective, though unpleasant. Market authorization for a new substance takes 2-3 years, and the cost of testing is estimated at over £500,000 – although it can be much more. It is, there-

fore, not surprising that chemical producers have considerable confidence that the system represents:

"... a products guarantee. Extensive tests will have proved that it will be of good, consistent quality, that it will work and, above all, that it is safe." *Veterinary Practice* (November 1996).

But is such a rosy view justified? The tests rely on the assumption that the experimental protocols explore all the significant toxicological hazards and that animals such as the mouse, the hen and the rat adequately model the behaviour of humans. But the differences between animal and human responses are so well known that they do not need stating. Animal tests cannot predict safety for humans with any degree of confidence.

"The regulatory system is trusted to have done everything necessary to protect the public interest, and government has done everything to encourage this trust. Yet, that trust is abused and betrayed."

Dr Richard North is an advisor on food and safety, and former environmental health officer.

As to the hazards explored, there is considerable difficulty in interpreting data on low-level responses, or cumulative effects, especially in relation to multiple low-dose exposure. No attempt is made to predict what might happen to people during their longer life-spans. As regards the testing for potential neurological damage – so important with OPs which are known to have effects on the nervous system – the “hen test” has been acknowledged to be seriously inadequate. Furthermore, as late as November 1996, Baroness Cumberlege – for the Department of Health – was forced to admit that the Government had no data on safe levels of OPs to which pregnant women can be exposed.

Other limitations relate to the testing of chemicals in isolation. In the real world, users are often exposed to many different chemicals, sometimes sequentially, sometimes together. It is well known that combinations of chemicals can exhibit levels of toxicity considerably in excess of their cumulative effect when they act separately. This is known as synergism – otherwise referred to as the “cocktail effect”. Additionally, exposure to one chemical – even at levels which are normally regarded as safe – may sensitize users to other, completely different chemicals. These then exert harmful effects at levels well below those where any such effect might be expected. Neither the “cocktail effect” nor sensitizing potential are explored in marker authorization testing.

Even if the protocols for the “predictive model” were adequate when applied to any particular chemical, they necessarily lag behind “state of the art” clearance practices. Once a chemical is given a “market authorization” it remains “safe”, even if subsequent improvements in testing procedures might have shown up defects which questioned the adequacy of the original procedures. There is no requirement, except in occasional reviews, for new safety tests to be applied retrospectively. Thus, the longer a product has been on the market, the less appropriate its safety testing will have been.

In these failures lies a great danger. Many people are persuaded that a benevolent government has subjected these chemicals to rigorous testing and has ensured that all the necessary safeguards are in place. The regulatory system is trusted to have done everything necessary to protect the public interest, and government has done everything to encourage this trust. Yet, that trust is abused and betrayed.

The reason for this is simple. As long as chemicals have an official seal of approval, both manufacturers and licensing authorities have a vested interest in supporting safety claims. Manufacturers do so for obvious reasons. The regulators support them because, if they do not, they may bear some responsibility – not least for the payment of compensation (which would amount to many millions of pounds) for the failure to detect health risks. If the regulators take action to withdraw chemicals without strong evidence they also face compensation claims from the manufacturers who are no longer permitted to trade.

Victims of suspected adverse reactions, who without product licensing could have sued the manufacturers directly-now have to determine the relative liability of manufacturers and

Government licensing agencies, adding difficulties to an already complex process. The manufacturers claim they cannot be liable because they conformed with licensing criteria, while the regulators fall behind their procedures. The government, in turn, is reluctant to admit to deficiencies in the system it set up. Thus the licensing system presents impenetrable hurdles for many victims. Far from protecting them it actually ends up protecting manufacturers.

Post-licensing Surveillance

The most effective means of ensuring public safety in relation to toxic substances released for use is field epidemiology, much favoured by the World Health Organization. One would therefore expect post-release epidemiological data to be sought after in relation to licensed veterinary medicines such as OPs, under the designation of “post-licensing surveillance”. Used effectively, this system could provide early warning of unexpected safety problems with a chemical. High incidence of ill-health, clusters of ill-health, or adverse effects reported by particular occupational groups could allow fine-tuning of licence conditions, restrictions

on specific applications, or even withdrawal of products.

The VMD is responsible for the surveillance function, monitoring what are known as “suspected adverse reactions” (SARs), the bureaucratic jargon for reports of ill-effects from the users of licensed chemicals or the animals they treated. But its system is extraordinarily passive. Rarely are attempts made to ascertain whether users are adversely affected, by means of immediate and detailed field investigations. Simply, if users are affected, it is their responsibility to obtain the appropriate official form – if they know it exists, and if they recognize that their condition is associated with product use, they must then complete it and send it to the VMD. Then, according to the VMD:

“All suspected adverse reaction (SAR) reports should be acknowledged within three working days and summaries of all SAR reports are presented quarterly to the VPC ... Follow-up action is taken based on advice received from the VPC.”

But the follow-up action, in the rare event that it occurs, is usually to approach the victim and to ask him or her for more information. Effectively, sufferers must investigate their own illnesses.

Compare this with the system for following up food poisoning arising from commercially-produced food. In the first instance, suspected food-poisoning is a notifiable disease. Doctors are required by law to report on it. On receipt of reports, upwards of 6,000 environmental health officers are available to carry out field investigations. These officials are backed by a network of microbiological laboratories, public health consultants, and MAFF veterinary officials. Response time is measured in hours rather than days, and information is shared nationally through a network of interconnected computers.

Yet, despite the potentially life-threatening effects of OPs and other pesticides, there are rarely any investigations on a scale even remotely similar to those carried out for even minor food-poisoning incidents. Furthermore, there is no unified

Thus the licensing system ends up protecting manufacturers.

The regulatory agency is entirely dependent on its “customers” - the pharmaceutical companies - for its income. Necessarily, it will tend to avoid actions which might prejudice their profitability.



A gift from the Chemical Industry.

information-sharing network. Thus, even when “suspected adverse reactions” are reported, the VMD is often unable to offer anything other than “inconclusive” findings.

Intellectual Corruption

It is hard to explain the VMD’s apparent lack of enthusiasm for implementing an effective post-licence surveillance scheme, also exhibited by its advisers in the VPC, other than in terms of a phenomenon known as intellectual corruption. This is where an agency in charge of both the investigation of potentially unsafe products and the issuance of permits for those goods is disinclined to carry out rigorous monitoring, for fear of exposing failures in their own certification procedures.

In effect, what this means is that in setting up the VMD the Government has allowed the agency to act as judge and jury in its own cause. In its “market authorization”, it offers an assurance that a product is safe to use. It must then monitor usage for signs that the products are not safe after all, and that the assurance was wrongly given. This is too much to ask of anybody: that it can second-guess its own decisions, and find them wanting, especially when the legal and financial consequences of any such admission can be massive.

Regulatory Capture

There is yet another mechanism which affects the activities of the regulators, known as “regulatory capture”; where the bulk of an agency’s finance comes from the organization(s) it regulates. There is a “provider-purchaser” relationship, and thus a situation where “he who pays the piper calls the tune”. By entering into this relationship, the regulator becomes a “captive” of the industry it serves.

In the case of VMD, “capture” has occurred because the agency is entirely dependent on its “customers” – the pharmaceutical companies – for its income. Necessarily, it will tend to avoid actions which might prejudice their profitability. Furthermore, because the agency is also required to be “cost-effective”, it is more interested in promoting the interests of those larger customers which make a positive contribution – i.e., those which pay more in fees than they cost to regulate. Smaller operations, which cost more to police than they contribute, are discriminated against. It therefore comes as no great surprise to find that the most enthusiastic supporter of greater regulatory control is always big business.

This unhealthy partnership between the regulators and the industry leaves the market open to “regulatory conspiracy”,

where regulation is proposed by an alliance of the agency and its major "customers" (often supported unwittingly by campaigners for greater safety). The effect is usually to increase the agency's fees and raise the cost of competing in the market. This drives out competitors, excludes new entrants and delays or prevents the development of safer (and cheaper) products.

This mechanism is by no means theoretical. In 1995, a small pesticide manufacturer (Aquas-persions Ltd) wanted to market a product called "Hugtite", an environmentally friendly pesticide based on modified potato starch. However, although this product could be safely used as an ingredient for soups, gravies, stews and sauces, without approvals, for use as a pesticide it had to go through the full safety clearance procedure. The cost of testing – a minimum of £250,000 – and the three years necessary to generate it has caused the company to withdraw interest.

Potential customers have thus been required to use dangerous chemicals to achieve pest control. By seeking tighter controls on safety, the regulatory machine has served only to protect the interests of its major pesticide-producing "customers", while undermining the potential for less dangerous alternatives to enter the market.

An Alternative Model?

One possible way of dealing with OPs (and other pesticides) is by using the system employed for food quality and composition. Here, with some exceptions, there is no requirement to license a new product. There are, however, numerous enforcement officers in the field checking on compliance with standards. If products fall short of standards, prosecutions are instigated and, if proven, stiff penalties are imposed. By this means, the regulators act as advocates for the victims, not as potential defendants protecting themselves against claims of maladministration or worse.

Manufacturers, in a new pesticides safety model, might similarly be allowed free access to the market but be governed by a specific "duty of care". Unlike the food "model" however, this would need to be backed by a registration scheme. Producers would be required to lodge with the regulator details of their products, the testing undertaken and toxicological results, and to update information as it became available.

No further direct control, prior to release, would be exercised. But the regulator would monitor product usage for adverse effects, with additional scientific research where necessary. Borrowing from the food-poisoning investigation model, it would be necessary to have a cadre of skilled officials capable of investigating reports. For this, the system devoted to investigating food-poisoning – with its network of environmental health officials, medical officers and laboratories – might be extended to cover toxicological investigations.

Where investigators found evidence of failure to exercise the "duty of care", prosecutions could be undertaken. Following this, victims would almost certainly have established the facts on which their claims for compensation could be based, without then having to mount their own cases unaided – as is the situation at the moment. Because of this,

most manufacturers might settle out of court, the risks being covered by mandatory insurance.

Despite the absence of statutory pre-release licensing, a form of pre-release certification would still be carried out. No commercial company could undertake the release of a product until it had carried out necessary checks to ensure, as far as was practicable, the product was safe to use. These checks would be risk-driven and, therefore, relevant and up-to-date – repeated as necessary through the life of the product. For some products, like "Hugtite", the test regime might be less onerous – and considerably less expensive – than currently imposed, and, for others, it might be more severe. Should a manufacturer not have made the necessary checks, it would be unlikely that insurance could be obtained, which would mean that the product could not be released for sale.

This mechanism would also avoid the "regulatory capture" situation identified earlier. With no entry cost imposed by the regulators, it would no longer be only the larger enterprises which could afford the pre-clearance testing and licensing fees currently necessary to bring products onto the market.

The risk would be borne entirely by commercial firms – or their insurers – and the regulators become independent of the industries with which they are concerned. They would no longer need to exclude new entrants from the market and drive smaller competitors out of business, reinforcing a monopolistic cartel amongst the survivors. They could collate data and monitor failure, without bearing any responsibility for the failures detected. By this means, using insurance as a regulatory mechanism would also obviate the need for Sefras. Industry operators would, instead, have to demonstrate to their insurance companies that they had introduced and maintained suitable control systems to ensure that the primary regulatory objectives were secured.

In adopting this alternative model, the regulatory authorities would keep their hands clean. They would not be tainted by failures of regulatory systems, or reliant on those they regulate for their incomes. Furthermore, they would not be held responsible for the conditions they monitor, as they would be distanced from them – thereby avoiding the "intellectual corruption" which dogs the existing system.

Only with a properly funded, totally independent surveillance system, wholly separate from the "prior approval" system of market authorization, ... can we begin to make sense of the increasing burden of ill-health caused by licensed, so-called "safe" products. That will only happen when there is more general recognition that current controls are not the solution, but part of the problem.

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The Clan of One-Breasted Women

by Terry Tempest Williams

I belong to a Clan of One-breasted Women. My mother, my grandmothers, and six aunts have all had mastectomies. Seven are dead. The two who survive have just completed rounds of chemotherapy and radiation. I've had my own problems: two biopsies for breast cancer and a small tumour between my ribs diagnosed as a "borderline malignancy". This is my family history.

Most statistics tell us breast cancer is genetic, hereditary, with rising percentages attached to fatty diets, childlessness, or becoming pregnant after thirty. What they don't say is living in Utah may be the greatest hazard of all.

We are a Mormon family with roots in Utah since 1847. The "word of wisdom" in my family aligned us with good foods – no coffee, no tea, tobacco or alcohol. For the most part, our women were finished having their babies by the time they were thirty. And only one faced breast cancer prior to 1960. Traditionally, as a group of people, Mormons have a low rate of cancer.

Is our family a cultural anomaly? The truth is, we didn't think about it. Those who did, usually the men, simply said, "bad genes". The women's attitude was stoic. Cancer was part of life. On February 16, 1971, the eve of my mother's surgery, I accidentally picked up the telephone and overheard her ask my grandmother what she could expect.

"Diane, it is one of the most spiritual experiences you will ever encounter."

I quietly put down the receiver.

Two days later, my father took my brothers and me to the hospital to visit her. She met us in the lobby in a wheelchair. No bandages were visible. I'll never forget her radiance, the way she held herself in a purple velvet robe, and how she gathered us around her.

"Children, I am fine. I want you to know I felt the arms of God around me."

We believed her. My father cried. Our mother, his wife, was 38 years old.

A little over a year after Mother's death, Dad and I were having dinner together. He had just returned from St George, where the Tempest Company was completing the gas lines that would service southern Utah. He spoke of his love for the country, the sandstone landscape, bare-boned and beautiful. He had just finished hiking the Kolob trail in Zion National Park.¹ We got caught up in reminiscing, recalling with fondness our walk up Angel's Landing on his fiftieth birthday and the years our family had vacationed there.

Over dessert, I shared a recurring dream of mine. I told my father that for years, as long as I could remember, I saw this flash of light in the night in the desert – that this image had so

permeated my being that I could not venture south without seeing it again, on the horizon, illuminating buttes and mesas.

"You did see it," he said.

"Saw what?"

"The bomb. The cloud. We were driving home from Riverside, California. You were sitting on Diane's lap. She was pregnant. In fact, I remember the day, September 7th, 1957. We had just gotten out of the service. We were driving north, past Las Vegas. It was an hour or so before dawn when this explosion went off. We not only heard it, but felt it. I thought the oil tanker in front of us had blown up. We pulled over and suddenly, rising from the desert floor, we saw it, clearly, this golden-stemmed cloud, the mushroom. The sky seemed to vibrate with an eerie pink glow. Within a few minutes, a light ash was raining on the car."

I stared at my father.

"I thought you knew that," he said. "It was a common occurrence in the fifties."

It was at this moment that I realized the deceit I had been living under. Children growing up in the American Southwest, drinking contaminated milk from contaminated cows, even from the contami-

nated breasts of their mothers, my mother – members, years later, of the Clan of One-breasted Women.

It is a well-known story in the Desert West, "The Day We Bombed Utah", or more accurately, the years we bombed Utah: above-ground atomic testing in Nevada took place from January 27th, 1951, until July 11th, 1962. Not only were the winds blowing north covering "low-use segments of the population" with fallout and leaving sheep dead in their tracks, but the climate was right. The United States of the 1950s was red, white and blue. The Korean War was raging. McCarthyism was rampant. Ike was it, and the Cold War was hot.² If you were against nuclear testing, you were for a communist regime.

Much has been written about this "American nuclear tragedy". Public health was secondary to national security. The Atomic Energy Commissioner, Thomas Murray, said, "Gentlemen, we must not let anything interfere with this series of tests, nothing."

Again and again, the American public was told by its government, in spite of burns, blisters and nausea, "It has been found that the tests may be conducted with adequate assurance

*A news release typical of the times stated,
"We find no basis for concluding that
harm to any individual has resulted from
radioactive fallout."*

of safety under conditions prevailing at the bombing reservations." Assuaging public fears was simply a matter of public relations. "Your best action", an Atomic Energy Commission booklet read, "is not to be worried about fallout." A news release typical of the times stated, "We find no basis for concluding that harm to any individual has resulted from radioactive fallout."

On August 30th, 1979, during Jimmy Carter's presidency, a suit was filed, *Irene Allen versus The United States of America*. Mrs Allen's case was the first on an alphabetical list of 24 test cases, representative of nearly 1,200 plaintiffs seeking compensation from the United States government for cancers caused by nuclear testing in Nevada.

Irene Allen lived in Hurricane, Utah. She was the mother of five children and had been widowed twice. Her first husband, with their two oldest boys, had watched the tests from the roof of the local high school. He died of leukaemia in 1956. Her second husband died of pancreatic cancer in 1978.

In a town meeting conducted by Utah Senator Orrin Hatch, shortly before the suit was filed, Mrs Allen said, "I am not blaming the government, I want you to know that, Senator Hatch. But I thought if my testimony could help in any way so this wouldn't happen again to any of the generations coming up after us ... I am happy to be here this day to bear testimony of this."

God-fearing people. This is just one story in an anthology of thousands.

"Gentlemen, we must not let anything interfere with this series of tests, nothing."
— Thomas Murray, the Atomic Energy Commissioner.

On May 10th 1984, Judge Bruce S. Jenkins handed down his opinion. Ten of the plaintiffs were awarded damages. It was the first time a federal court had determined that nuclear tests had been the cause of cancers. For the remaining 14 test cases, the proof of causation was not sufficient. In spite of the split decision, it was considered a landmark ruling. It was not to remain so for long.

In April 1987, the Tenth Circuit Court of Appeals overturned Judge Jenkins's ruling on the ground that the United States was protected from suit by the legal doctrine of sovereign immunity, a centuries-old idea from England in the days of absolute monarchs.

In January 1988, the Supreme Court refused to review the Appeals Court decision. To our court system it does not matter whether the United States government was irresponsible, whether it lied to its citizens, or even that citizens died from the fallout of nuclear testing. What matters is that our government is

immune. "The King can do no wrong."

In Mormon culture, authority is respected, obedience is revered, and independent thinking is not. I was taught as a young girl not to "make waves" or "rock the boat".

"Just let it go," Mother would say. "You know how you feel, that's what counts."

For many years, I have done just that – listened, observed and quietly formed my own opinions, in a culture that rarely asks questions because it has all the answers. But one by one, I have watched the women in my family die common, heroic



Ch. Zuber, Still Pictures.

deaths. We sat in waiting rooms, hoping for good news, but always receiving the bad. I cared for them, bathed their scarred bodies, and kept their secrets. I watched beautiful women become bald as Cytoxan, cisplatin and Adriamycin³ were injected into their veins. I held their foreheads as they vomited green-black bile and I shot them with morphine when the pain became inhuman. In the end, I witnessed their last peaceful breaths, becoming a midwife to the rebirth of their souls.

The price of obedience has become too high.

The fear and inability to question authority that ultimately killed rural communities in Utah during atmospheric testing of atomic weapons is the same fear I saw in my mother's body. Sheep. Dead sheep. The evidence is buried.

I cannot prove that my mother, Diane Dixon Tempest, or my grandmothers, Lettie Romney Dixon and Kathryn Blackett Tempest, along with my aunts developed cancer from nuclear fallout in Utah. But I can't prove they didn't.

My father's memory was correct. The September blast we drove through in 1957 was part of Operation Plumbbob, one of the most intensive series of bomb tests to be initiated. The flash of light in the night in the desert, which I had always thought was a dream, developed into a family nightmare. It took 14 years, from 1957 to 1971, for cancer to manifest in my mother – the same time Howard L. Andrews, an authority in radioactive fallout at the National Institute of Health, says radiation cancer requires to become evident.

The more I learn about what it means to be a "down-winder", the more questions I drown in.

What I do know, however, is that as a Mormon woman of the fifth generation of Latter-Day Saints, I must question everything, even if it means losing my faith, even if it means becoming a member of a border tribe among my own people. Tolerating blind obedience in the name of patriotism or religion ultimately takes our lives.

When the Atomic Energy Commission described the country north of the Nevada Test Site as "virtually uninhabited desert terrain", my family and the birds at Great Salt Lake were some of the "virtual uninhabitants".

Under the cover of darkness, ten women slipped under a barbed-wire fence and entered the contaminated country. They were trespassing. They walked toward the town of Mercury,⁴ in moonlight, taking their cues from coyote, kit fox, antelope, squirrel and quail. They moved quietly and deliberately through the maze of Joshua trees. When a hint of daylight appeared they rested, drinking tea and sharing their rations of food. The women closed their eyes. The time had come to protest with the heart, that to deny one's genealogy with the earth was to commit treason against one's soul.

At dawn, the women draped themselves in mylar,⁵ wrapping long streamers of silver plastic around their arms to blow in the breeze. They wore clear masks, that became the faces of humanity. And when they arrived at the edge of Mercury, they carried all the butterflies of a summer day in their wombs. They paused to allow their courage to settle.

The town that forbids pregnant women and children to enter because of radiation risks was asleep. The women moved through the streets as winged messengers, twirling around each other in slow motion, peeking inside homes and

watching the easy sleep of men and women. They were astonished by such stillness and periodically would utter a shrill note or low cry just to verify life.

The residents finally awoke to these strange apparitions. Some simply stared. Others called authorities, and in time, the women were apprehended by wary soldiers, dressed in desert fatigues. They were taken to a white, square building on the other edge of Mercury. When asked who they were and why they were there, the women replied, "We are mothers and we have come to reclaim the desert for our children."

The soldiers arrested them and the ten women were blindfolded and handcuffed.

I was one who crossed the line at the Nevada Test Site and was arrested with nine other Utahns for trespassing on military lands. They are still conducting nuclear tests in the desert. Ours was an act of civil disobedience. But as I walked toward the town of Mercury, it was more than a gesture of peace. It was a gesture on behalf of the Clan of One-breasted Women.

As one officer cinched the handcuffs around my wrists, another frisked my body. She found a pen and a pad of paper tucked inside my left boot.

"And these?" she asked sternly.

"Weapons," I replied.

Our eyes met. I smiled. She pulled the leg of my trousers back over my boot.

"Step forward, please," she said as she took my arm.

We were booked under an afternoon sun and bussed to Tonopah, Nevada. It was a two-hour ride. This was familiar country. The Joshua trees

standing their ground had been named by my ancestors, who believed they looked like prophets pointing west to the Promised Land. These were the same trees that bloomed each spring, flowers appearing like white flames in the Mojave. And I recalled a full moon in May, when Mother and I had walked among them, flushing out mourning doves and owls.

The bus stopped short of town. We were released.

The officials thought it was a cruel joke to leave us stranded in the desert with no way to get home. What they didn't realize was that we *were* home, soul-centred and strong, women who recognized the sweet smell of sage as fuel for our spirits.

This piece is taken from *Refuge: An Unnatural History of Family and Place* by Terry Tempest Williams. Reprinted by permission of Pantheon Books, a division of Random House, Inc. and Brandt & Brandt Literary Agents.

Notes

1. Located in south-western Utah, mainly in Washington County.
2. Events and figures of the 1950s: the Korean War (1950-53) pitted the combined forces of the Republic of Korea and the United Nations against the invading armies of Communist North Korea; McCarthyism, after Republican senator Joseph S. McCarthy, refers to the Communist "witch hunt" led by the senator, which intensified a fear of Communism and in turn stimulated the build-up of nuclear weapons; "Ike" is the nickname of Dwight D. Eisenhower, President from 1953 to 1961; the Cold War refers to the power struggle from the end of World War II to the late 1980s between Communist countries under the influence of the USSR and the capitalist bloc represented by the United States and Western Europe.
3. Substances used in chemotherapy for cancer patients.
4. Town in southern Nevada bordering the Nuclear Test Site.
5. A filmy synthetic material.

From Reductionism to Holism in Our Understanding and Treatment of Cancer

by Peter Mansfield

Cancer, as a failure of the parts to conform with the body as a whole, cannot be explained by neo-Darwinian biologists – let alone medical scientists – rooted as they are within a reductionist paradigm. Only once we again acknowledge the forces that underlie wholeness can we really hope to undermine cancer.

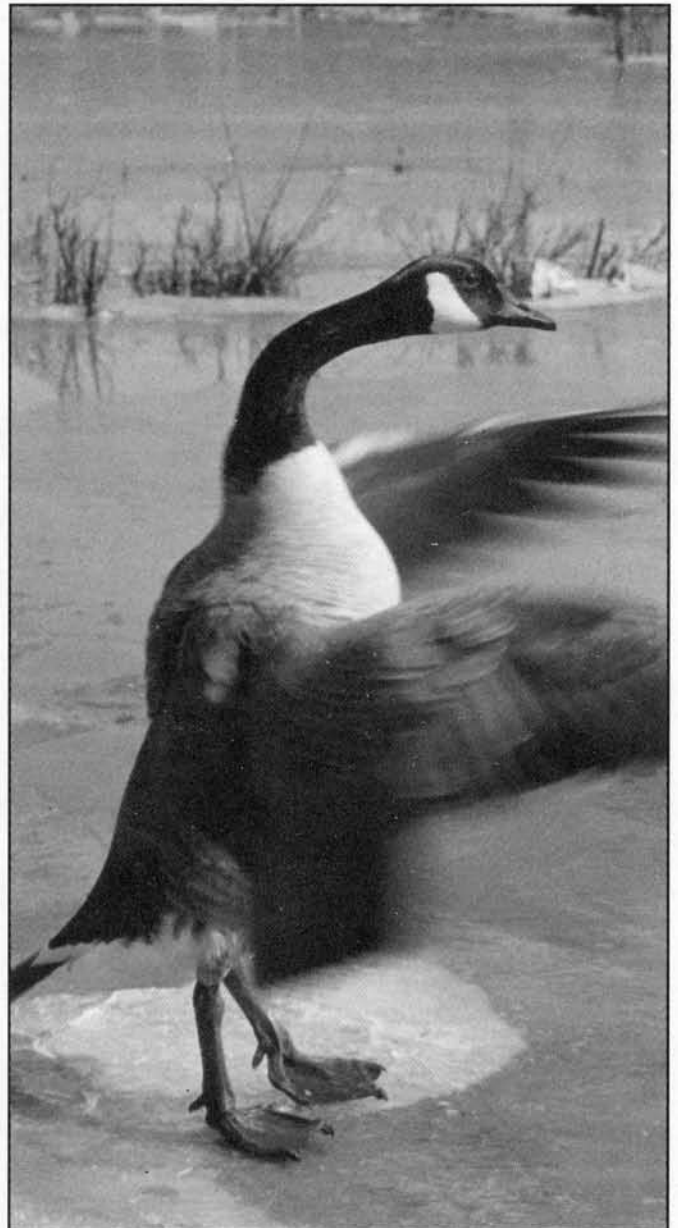
Twentieth century biology can describe brilliantly the structures of cells of which organisms are made. We can go further and describe in great detail the various types of cell present in different parts of the body, and the wondrous arrangement of these cells within the various tissues and organs we recognize as bodily substructures. We cannot, however, yet offer an acceptable account of how these differences come about. The difficulty is fundamental and very simple. As we understand it now, the most fundamental information about an organism is held, not in one central place, such as the brain, but contained in each separate cell of the organism.

We assume that this information is held in the cell nucleus as genes on DNA, unique to a particular organism but copied identically in all the separate cells of that organism. We suppose that the form of each organism is encoded somehow in its gene pool. This, however, requires cells in different parts of the organism to read the differences between them from identical pools of information, which is logically impossible. The fundamental sub-structure of living things, as we now know it, offers no plausible mechanism that could determine the variety of cells or the characteristic forms adopted by the hierarchy of tissues, organs and whole bodies into which masses of cells arrange themselves. We cannot explain why, when cells multiply, a bodily form develops rather than a random, amorphous mass.¹

From our knowledge to date, we can only justify cautious speculation. DNA clearly defines the content, if not the structural arrangement, of cells individually. It probably enables each cell to receive and interpret information about the forms and functions in which it is involved. It cannot, however, originate the form or functions of the whole organism: for that we must look outside the cell. A radical re-think of this kind is essential if we are to understand cancer.

Malignant cells function abnormally and ignore form altogether. Malfunction may result from disturbances we already understand, but defiance of form need not. We require some better idea of how form is imposed in order to understand how

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Information Services.

it can be defied, and whether we can ever then reassert it.

This additional perspective – loosely dubbed “the whole is greater than the sum of its parts” – is the defining characteristic of holism. Modern medicine, while laying claim to it in principle, functions without any reference to it. But we should remember, however, that modern medicine is the exception. Every other known medical system is holistic in principle and in practice. Some of them deal only with wholes, ignoring separate parts entirely.

Were scientists in the West to take holism seriously as a fundamental research question, however, we should find it extremely fertile territory. With reference to cancer treatment specifically, worldwide experience shows that a balanced application of modern and holistic methods achieves far more success and wellbeing, with many fewer and less severe adverse effects, than exclusive saturation with our present destructive methods. The treatment need not be as unpleasant as the disease!

Best Guess

The scientific method, in the hands of a few gifted dissidents, has already yielded useful insights into the nature of wholeness and the creation of shapes in nature. The key to progress is a willingness to ignore artificial frontiers between academic disciplines.

We have become accustomed to expressing shapes by discrete, digital means because it fits with electronic technology. This is never better than approximate, however. A form varies continuously, and we should expect it to be expressed in some continuous medium such as a field. Fields of various kinds, such as gravity and magnetism, clearly do affect organisms, but theories about their relevance are rare in biology. Dr Rupert Sheldrake is the most prominent modern biologist to explore their potential. What he calls “the hypothesis of formative causation”² suggests that living things get their shape from copying a memory of all similar creatures from the past. His hypothesis calls for fields rather like three dimensional maps, containing information about each place in the field rather than forces such as gravity acting there.

In the quite different theory of quantum mechanics, such maps are called “scalar fields”.³ Sheldrake’s ideas have not yet taken the high ground but account neatly for many biological puzzles and have collected a large dossier of experimental support. For biologists and medical scientists this territory is clearly unfamiliar, and serious dialogue with theoretical physicists is hard for them. Nevertheless, if we wish to further cancer science along our accustomed lines, it is time to start.

Holistic Origins

Meanwhile, ideas like these have been familiar in oriental cultures for thousands of years. The entire system of Chinese medicine, for example, assumes that flow of life-energy – “chi” – in a beautifully interlocking pattern of energy systems governs form and function, and that any breakdown of health can be directly accounted for by an energy imbalance that was present for some time previously. The task of the physician is to read the dynamic of these energy systems and maintain

their harmony. He pays no attention to cellular or organic disturbances, which will only arise at a much later date if he allows distorted energy flow patterns to persist.⁴

Sharp distinctions between flesh and the forces which organise it are by no means confined to the East. Paracelsus spoke generally of a natural healing force (“vis mediatrix naturae”). Hahnemann was more specific with his “vitis dynamis”⁵ and began to medicate the life-dynamics of his patients with those of herbs or minerals, which he separated from their substance by a serial process of alternate dilution and vigorous shaking. Homoeopathy works, judged even by scientific standards⁶; but not because of atoms in dilute solution. Somehow dilution of the medicament intensifies the life force inherent in it – and, unexpectedly, reverses its effect to exactly the opposite of the undiluted force.

Goethe, better known as a poet, wrote extensively on scientific themes⁷ along these lines. An admirer of his, Rudolf Steiner, founded the Anthroposophical Movement on this basis during the early part of the present century. His influence in education, art and medicine remains

stronger in Germany, the Netherlands and Austria than in the UK. He wrote rather obscurely – others have put it better⁸ – of nesting bodies of finer and finer substance which penetrate and surround each form in nature, connecting one with another. He prompted a series of remedies whose basis is not the chemical properties of the ingredients, but their form and physical character. For example, honey is employed as a formless source of heat, not as chemical sugars. In the cancer field Steiner proposed the use of homoeopathic mistletoe, extensive trials of which have produced favourable (though not spectacular) results.

Elsewhere in Europe Bircher-Benner was exploring the healing powers of fresh, live food. He recognized that its effects could not be accounted for solely by its chemical constitution, and spoke in addition of its “sunlight value” – how well it energized the characteristic but complex light absorption spectrum of the consumer, the interference pattern of which shapes the individual. This neat idea can only be part of the truth but emphasizes the less tangible nature of the forces that form us.

By that time nutrition was being analysed by chemists,

some of whose efforts have obscured rather than illuminated the basic issue. Epidemiologists, on the other hand, have seen clearly enough how diet may prevent cancer and other chronic degenerative diseases.⁹ The Cancer Help movement of modern times has produced many remarkable anecdotes of sustained recovery from the terminal stages of cancer – despite often scurrilous hostility from a defensive cancer medical establishment.¹⁰

More recently attention has been drawn to the paradoxical effects of purified nutrients such as betacarotene, in contrast with the unambiguous benefits of the same nutrient when consumed in its natural context as part of a food. We are beginning to rediscover that food has to be whole to be wholesome. It has even to be fresh, and a proportion of it eaten whilst still alive. Evidently the continuing presence of life energy in a meal is part of the nourishment it offers. It certainly makes an impor-

We should remember that modern medicine is the exception. Every other known medical system is holistic in principle and in practice. Some of them deal only with wholes, ignoring separate parts entirely.

We have become accustomed to expressing shapes by discrete, digital means because it fits with electronic technology.

tant contribution to flavour and to satisfaction of appetite. Furthermore, the leading feature of food grown 'organically' is the far greater intensity of its life energy.¹¹

If exponents of the nature of life and health represent the left wing of scientific opinion over the last four millennia, the ideas prevalent in Western culture are clearly of the ultra-right. We have already established the outcome of modern views: where would holism have led?

Cancer as a whole

According to the holistic view, the human body consists of cells collectively sculpting a form set out in a holographic pattern, within something like a scalar field mechanism. The better this process works, the more intense the vitality of the cells and the organism. This radically simplifies the ways in which cancerous change may develop:

- The holographic pattern may be damaged – projecting the wrong image, which the body then copies in good faith. Hahnemann coined the term "miasm" for such a pattern error, and even recognized one which favours warts, cysts and tumours which he called the sycosis miasm. He also devised means of removing miasms, rendering this sort of cancer among the most treatable by homoeopathy;
- The holographic pattern may be perfectly formed but insufficiently energized – too faint for the cells to read it reliably under pressure. In this situation cells that become cancerous (as many do each day, by errors in cell division or by free radical damage) escape surveillance, however well equipped the immune system may be;
- The holographic pattern may be perfect and well energized, but bombarding the cells with free radicals or poisoning them with toxins may prevent them from reading off field information or from carrying it out. This is the most dangerous form of cancer since, if it escapes control at its inception, it rapidly outruns the faculties available to control it as they weaken progressively. This form of the disease can and must be prevented by dietary and environmental measures.

A well formed, energized, toxin-free body may yet be inadequately nourished, so that it still cannot sustain the scalar image. The same would apply to the cancer, however, and in practice few if any cancers arise purely from nutrient starvation. Likewise, genetic anomalies tend to produce relatively rare developmental disorders arising early in life, rather than cancerous changes which would probably – like the rare hydatidiform mole – be lethal to the pregnancy in the first place. Injury, a prosaic but reliable source of illness, probably never directly causes cancer.

To an holistic doctor, therefore, the paramount task is to prevent cancer in the first place by sustaining the energy-matrix and by keeping the body clean and well nourished. This calls for a congenial social framework and a rich variety of live food grown naturally, without chemicals which pollute it and the consumer. Vital, clean, well-grown food transmits not only isolated nutrients but structural integrity and vitality to the person eating it – the cabbage is a lot more than the aggre-



We cannot reasonably expect people to be intact and full of vitality unless they eat food with these same properties.

gate of its chemical components! We cannot reasonably expect people to be intact and full of vitality unless they eat food with these same properties.

That is the required environment, but the individual needs also the chance to develop a certain maturity within it. We need a strong sense of the meaning and value of life, including our own.

This endows a personal sense of purpose and value, without which we cannot resist threats to life. Mutual self-respect is the basis for community life and for emotional reaction, which is the communal counterpart of appetite within the individual. Just as we need to react to hunger so as not to starve, so we must respond to emotional

reactions and resolve them to be at peace with each other and within ourselves.

Woolly as all this may sound, it corresponds well with experience both personal and professional, and it rests on an impressive body of scientific evidence collected over the past century whose only defect is to be out of sympathy with the presently fashionable idiom.

In The Event

In the event that cancer should arise, despite the best efforts to sustain health and integrity in the first place, the prime task is to establish why. A family history suggests a holographic patterning defect – Hahnemann's "sycosis

miasm" or otherwise – which may yet respond to a suitable energy-adjusting medicine, though this will not be enough in itself to stop the established cancer from continuing to grow. Errors in the holographic pattern are acted out slowly so we cannot expect the benefits of correction to be swift. However, just at the time when treatment usually stops and the cancer consultant pronounces the patient to be "in remission", holistic attempts to trace and remove causative factors should be kicking in.

The Cancer Help movement has produced many remarkable anecdotes of sustained recovery from the terminal stages of cancer – despite hostility from a defensive cancer medical establishment.

The leading feature of food grown 'organically' is the far greater intensity of its life energy.

In a great many cancer histories there was a moment, often around eighteen months before the cancer was diagnosed, at which serious damage was done to the victim's self-esteem. This usually involves a major shock to the social fabric of the victim's life – a death, a divorce, job loss – but more exceptionally may be a previous bout of severe and protracted illness of some other kind, such as a series of virus infections. These are circumstances in which loss of vitality – faintness of the holographic pattern – is a major common factor, and we currently give far too little attention to swift and full restoration of that vitality. We should at times like these be feeding convalescents with freshly juiced vegetables and fruits, rest, space, love, time and caring attention. Our first instinct should not be to burden them with relatively useless and potentially toxic medication, through ignorance of (or lack of respect for) the alternatives. There is more at stake than getting them back to work!

But there remains a large raft of cancer cases in which no clear individual life circumstance offers a plausible explanation. Brain tumours, lymphomas and leukaemia in young people often seem to fit this category. Here the most plausible explanation for the disease is damage to the cell mechanism, making it unable to respond to the scalar matrix, and the most likely candidate is toxic pollution or free radical damage. This is not a proposition that can ever be proved experimentally or scientifically since the problem could never be isolated for systematic examination. Consequently the debate on this point generates far more heat than light. Industries, not surprisingly, defend

their products, even as their own executives or employees fall ill from the consequences of their pollution.

Cancer: Symptom of Health-free Values

There are very few genuine malingerers. But there are also very few people who have ever experienced health vividly enough to strive to regain and enjoy it. Professionals tend to sneer cynically at any suggestion that health is even attainable – “the real world” is for them one in which disease is inevitable. We possess neither a health culture nor a health service, for all that we bandy the word “health” about.

There is no reason, apart from industrial self-interest, why food, drinking water and air should not be kept clean of chemicals that might accumulate in the body of the consumer, progressively undermining the processes of health with each passing year. We could, with a little sustained effort, pay more attention to the nature of work

and play, and ensure that everyone has a chance to explore themselves through living. These simple measures would enable us to regain and maintain genuine health. That in itself would trigger a drastic decline in demand for medical care, probably to around a fifth of its present level. We could then afford to finance health-enhancing practices such as yoga, massage, reflexology, acupuncture, osteopathy and a host of others with equally proven benefit. We could place a little emphasis on basic research into health, the causes of form and the nature of vitality. We could restructure education to draw out and feed the appetite for living, and commission the faculties for nurturing it. Beveridge and his associates were not naïve to suppose that a genuine service for health would reduce the demand for medical services. They were simply never given the opportunity to establish such a service.

Those who fear this would cause collapse of our economy can have no perception of what is really at stake. No industrial effort of any kind can ever possibly replace what we stand to lose if personal and environmental health is weakened any further. No amount of curative resources could ever make good what happens through neglect of a health-nurturing habit attainable and affordable by everyone.

‘The real world’ is for them one in which disease is inevitable.

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The Diversity and Effectiveness of Natural Cancer Cures

by Walter Last

"In 1989, the incidence of cancer topped one million (USA) for the first time and the number of deaths reached 500,000, (yet) in the name of orthodoxy, both new and traditional scientific theories are suppressed, medical records seized, clinics shut down, and innovative clinicians thrown in prison. But while orthodoxy appears to have all the cards – money power, prestigious credentials, influence in the major media – the continuing failure of orthodox medicine to deal satisfactorily with the major forms of cancer guarantees the growth of non-conventional approaches ... It is the job of the true scientist ... to take a serious and open-minded look at all methods and claims ..." –The Cancer Industry by Ralph W. Moss (1991).

An amazing multitude of different cancer cures have been described in books and articles. Former cancer victims have written about their recovery which often involved nothing more than living peacefully on an organic raw-food diet. Others attribute their cure to immune-enhancing factors, alternative technology or meditation and guided imagery, sometimes to specific remedies, but commonly in various combinations of any of these methods. There are so many combinations and variations, the list seems to be endless.

To bring some order to this confusing diversity, I would

like to form a few broad categories in which the main treatment is based either on nutrition, specific remedies, or mind improvement.

Nutrition Cures

In one way the simplest method was used by the Danish doctor Kristine Nolfi. She cured her own cancer with a hundred per cent organic and vegetarian raw-food diet and then continued to cure cancer patients in the same way on her health farm. She lost her medical licence for using "dangerous" and unap-



The collection of medicinal herbs on Mount Oku, Cameroon.

Mark Edwards, Still Pictures.

proved methods but her fame nevertheless spread throughout Scandinavia. In New Zealand Dr Eva Hill did much the same thing to cure her own cancer and to help many of her patients.

Ann Wigmore pioneered and promoted wheatgrass juice after curing her own cancer with it in combination with an organic vegetarian diet. Together with Victoras Kulvinskis she formed the Hippocrates Health Institute in Boston, and branches and health farms using wheatgrass juice quickly sprang up in many countries.

In South Africa Johanna Brand, a naturopath, invented the now famous grape cure by curing herself of stomach cancer in the 1920's. For six weeks she ate nothing but grapes and she regards black varieties as the best. Thousands of former cancer victims have testified as to the effectiveness of her method. Because it is now so difficult to obtain unsprayed grapes, commercially sprayed grapes have sometimes been used after thorough washing in warm soapy water and careful rinsing, but recent evidence suggests this would be quite ineffective in terms of removing a number of potentially carcinogenic pesticides used on grapes. But availability of organic grapes is improving.

The Gerson Therapy

Best known nutritional cure is probably the Gerson therapy. Born in Germany, Dr Max Gerson emigrated to the US in 1938. His diet consists mainly of fresh, preferably organic, fruit and vegetables. He stressed a high potassium content which is more in the skins or outer part of root vegetables than in the centres. Sodium, on the other hand, was to be severely restricted – the diet was completely without added salt but with added potassium salts instead.

In addition, Gerson prescribed hydrochloric acid with pepsin, pancreatin, high doses of Lugol's solution for iodine together with freeze-dried thyroid, niacin, Royal Jelly and injections of vitamin B12 with crude liver. In addition, raw liver juice was used for its high content of enzymes. Later, with increasing chemicalization of agriculture, the liver juice was omitted while linseed/flax oil was belatedly added to the list of supplements. Liver detoxification with frequent coffee enemas was another cornerstone of the Gerson therapy; otherwise patients with advanced cancer might die despite disappearing tumours.

Gerson treated hundreds of so-called terminal cases, of which about 50 per cent recovered. Dr Issels used the Gerson therapy successfully in Germany. In addition, he realized the harmful influence of dead or infected teeth and mercury amalgam fillings on the outcome of cancer therapy. His patients therefore had to have all unhealthy teeth removed at the beginning of the treatment.

Other German Therapists

Dr Johanna Budwig found high-quality linseed/flax oil combined with 'quark' and a mainly vegetarian raw-food diet most effective. Quark is the German word for cottage cheese but made from lactic acid fermented raw skim milk as used by Budwig. This provides not only the beneficial fermentation

products, but also a high amount of sulphur-amino acids. These are mainly cysteine and methionine which together with the polyunsaturated fatty acids in linseed/flax oil can quickly restore the oxidative energy production in and around tumours and cause them to regress.

Dr Hans Nieper, another respected German cancer therapist, used in addition to a good diet a wide range of supplements to inhibit tumour growth, activate the immune system, degrade the tumour with large-scale enzyme supplementation and to strengthen the liver and general metabolism. Nieper expects about a 50 per cent survival rate of 'terminal' patients. If patients survive for 18 months on this programme, their statistical life expectancy becomes about normal, unlike with chemotherapy where life expectancy continues to drop after 18 months.

The Kelly Approach

Dr W D Kelly is an American dentist who was given only one month to live, with multiple tumours of the liver,

pancreas and other organs. He cured himself with a vegetarian raw-food diet with the addition of various supplements but especially with high doses of pancreatin. Pancreas enzymes are very effective in destroying tumours and sometimes even too effective. Kelly, like Gerson and other holistic cancer therapists, saw the greatest danger in a too rapid destruction of the tumour which can kill the patient with poisons generated by the disintegrating tumour proteins. He recommended daily Epsom salts purges during the critical period and, if required, also coffee enemas.

After helping thousands of patients by supplying individualized information to the patient's doctor, he believes that cancer can usually be cured if there is at least one month, but preferably three months, of life expectancy when starting the programme.

As a simple, but somewhat expensive, self-test for the early detection of cancer before tumours can be found clinically, he

recommends taking six to eight pancreatin tablets after each meal for four weeks. If you feel worse after these four weeks with nausea, headaches or fatigue, there is likely to be a cancerous condition. If you feel better instead, brighter and with more energy, the condition is pre-cancerous. If there is no difference, there is probably no early cancer, but there

may already be a clinically detectable malignant tumour present. As it takes several years for a tumour to become clinically detectable, it might be good to make such a test once a year.

Kelly has an extensive documentation with 10,000 medically verified diagnoses. In one study all his cases of pancreas cancer were investigated. With conventional treatment there were virtually no survivors after five years. He had 22 cases on record. Of these, ten never started the treatment and survived for 67 days. Seven followed it partially and survived an average of 233 days, while the five who followed the Kelly treatment completely all recovered fully.

European Developments

Earlier in this century Are Waerland became famous for a successful diet that consisted of sour milk and similar products,

Gerson treated hundreds of so-called terminal cases, of which about 50 per cent recovered.

With conventional treatment there were virtually no survivors of pancreatic cancer after five years. Of Dr. Kelly's 22 cases, the five who followed his treatment completely all recovered fully.

whole grains raw or only partly cooked as well as fruits and vegetables. There are still many active Waerland groups in Germany and Scandinavia. Bircher-Benner advocated a similar lacto-vegetarian raw-food diet. He invented the, by now famous but greatly deteriorated, muesli. The macrobiotic diet based on cooked brown rice and only a minimum of raw food is very different from all the other anti-cancer diets. It has a mild cleansing effect and some cancer victims claim to have been cured with a strict macrobiotic diet.

From 1951 Dr A Ferenczi in Hungary used large amounts of beetroot successfully for tumour regression; up to 1kg daily has been used. The active ingredient is the purple colouring matter containing anthocyanin. It is now also available as a freeze-dried powder.

Enhancing the Immune System

Nearly 10,000 Americans cross the border into Mexico every day for medical treatment, largely because most holistic cancer clinics have in effect been eliminated in the US and are now just south of the border down Mexico way. While these clinics also give dietary advice, they rely mainly on specific remedies, such as laetrile, ozone therapy, herbs and specific immune-enhancing measures.

Garlic is frequently used as a supporting remedy in the treatment of cancer. It has proven anti-cancer properties. Not only does it protect against the formation of tumours, including metastases, it also inhibits the growth of established tumours. In addition, it strengthens the immune system and improves the detoxifying ability of the liver.

Two other remedies used widely in the Mexican and other cancer clinics are Vitamin C and hydrazine sulphate. Vitamin C treatment for cancer was pioneered by Linus Pauling and Ewan Cameron who found greatly increased survival times for terminal cancer patients with 10g of Vitamin C daily. Now it is often used in even larger amounts, just below the threshold where it causes diarrhoea; initially it may also be infused intravenously.

Hydrazine sulphate was discovered by Dr Joseph Gold for use in cancer treatment. It blocks a liver enzyme which converts the lactic acid produced by a tumour back into glucose, a reaction which takes much more energy from the patient than it generates. It is mainly used with 'terminal' patients, who report improved appetite, normalized weight, increased strength and less pain.

Diversity in Practice

The Bristol Cancer Help Centre in England, formerly under the direction of Dr Alec Forbes, offers a wide-ranging holistic programme similar to the Mexican clinics. This includes a vegetarian diet of largely raw foods supplemented by specific vitamins, minerals, enzymes, ginseng and herbs in addition to colonic cleansing, visualization, biofeedback, relaxation, meditation and spiritual healing.

Dr Maud Fere in New Zealand claimed success with a much more limited programme that had helped her to cure her own bowel cancer. She advocated a good vegetarian diet but her main emphasis, similar to Max Gerson's, was that there must be no salt in it. She also found it necessary to acidify the body which is too alkaline with cancer. Her standard supple-

Nieper expects about a 50 per cent survival rate of 'terminal' patients. If patients survive for 18 months on his programme, their statistical life expectancy becomes about normal, unlike with chemotherapy where life expectancy continues to drop after 18 months.



Medicinal herb stand in the street of Sao Paulo.

ments were diluted hydrochloric acid, diluted phosphoric acid, ammonium chloride and tincture of iodine.

Dr Seeger, the German cancer researcher, found Zell Oxygen most helpful to "normalize" cancer cells by restarting their oxidative energy production. Zell Oxygen is a culture of special young yeast cells very high in oxygenating enzymes.

It works best combined with Royal Jelly.

Jethro Kloss was a well-known early American herbalist of the 'old school'. For cancer treatment he used mainly red clover blossoms, violet leaves and flowers, the roots of burdock and yellow dock, golden seal, echinacea, aloes, agrimony, dandelion root, supposedly with good success.

Even more famous and most widely used in many countries, is the Hoxsey herb mixture. It originated about 1925 in the US with thousands of patients attesting to its usefulness in overcoming their cancer. The internal remedy consists of amarga, berberis root, buckthorn bark, burdock, licorice, poke root, prickly ash, red clover, stillingia root and potassium iodide. There were also three external remedies to be painted on any visible tumours to make them dry up and fall out.



After analysing cancer survival statistics for several decades, Dr Hardin Jones, Professor at the University of California, concluded in 1975 that "patients are as well, or better off untreated." Jones' disturbing assessment has never been refuted. What's more, three studies by other researchers have upheld his theory.

Traditional Remedies

Essiac (Ojibway Indian Tea) is another famous cancer herb mixture developed about 1922 by the Canadian nurse, Rene Caisse. In 1937 the Royal Cancer Commission found that Essiac was effective against cancer and in 1938 Essiac came within three votes of being legalized as a remedy for terminal cancer. After this, Rene received special permission to treat terminal cancer patients but was not allowed to take money for it. At the time of her death in 1978 the Canadian Ministry of Health & Welfare destroyed her huge collection of documents and patient files on the effectiveness of Essiac.

The four ingredients are rhubarb root, burdock root and slippery elm as blood purifiers and the tops of young sheep's sorrel (*Rumex acetosella*) to destroy cancer cells. The use of Essiac is gradually spreading to other countries but there is also a warning that some distributors have substituted yellow dock or curly dock for the essential sheep's sorrel.

A tea made from leaves and stems or twigs of pawpaw is an old Aboriginal cancer remedy. It was revealed to Stan Sheldon

on the Queensland Gold Coast in 1962 who cured his rapidly spreading tumours in both lungs within two months. This remedy is now widely used throughout Queensland. According to an article in *New Scientist*, a chemical has been discovered in one kind of pawpaw which is one billion times more effective against cancer cells than presently used anti-cancer drugs.

Another Aboriginal cancer remedy is the maroon bush, while the use of mistletoe preparations is based on ancient European folklore. Wobe-mugos is imported from Germany and contains proteolytic enzymes from hydrolysed beef pancreas, thymus and other glands. It is claimed to be very beneficial in so-called terminal conditions.

Stimulating the Immune System

Another group of remedies is specifically designed to stimulate the immune system. In the 1950s Krebiozen made headlines in the US, promoted by a respected scientist, Dr Andrew Ivy. Five hundred doctors used it and 20,000 testimonials of cancer victims stood behind Dr Ivy and his co-workers at their trial. They were acquitted, but the American Medical Association (AMA) succeeded in blacklisting Krebiozen.

Dr B Coley was an early US cancer pioneer who used a special vaccine to induce fever and inflammation in cancer patients. Out of 500 cases, half remained free of malignancy during follow-up for 5-54 years.

Virginia Livingston-Wheeler is a US microbiologist. She combines a vegetarian diet with a vaccine prepared from the patient's own body fluids. Most widely used, however, especially in Germany, are vaccines related to the tubercle bacillus that were developed by Prof Enderlein.

In Japan, Dr Hasumi claims outstanding success in curing cancer with a vaccine made from the patient's own urine; however, it works only if the immune system is still sufficiently strong. In addition to the successful homoeopathic cancer treatment by the US doctor E G Jones before homoeopathy was outlawed, Dr W F Koch also gained the support of thousands of patients with his homoeopathic oxidation catalyst. Mistletoe, too, is often given in homoeopathic form. A 'folk healer' told me that he found Ammon. Carb. 30 excellent for cancers in animals as well as in humans.

Somewhat hard to take for many is urine therapy. J W Armstrong in his book *The Water of Life* relates many cases of medically diagnosed cancer that appeared to be cured after a urine fast usually lasting for about three weeks, drinking nothing but one's own urine and additional water. With this, Armstrong regarded cancer as rather easy to cure; "child's play" he called it, except if someone had previously already received radiotherapy. The Greek Professor of Internal

Medicine, E V Danopoulos, discovered that urea was the most potent anticancer factor in urine. At first he treated several liver cancer patients with it who recovered and then he also used it successfully with many other advanced cancers. However, after the publication of his

A ten-year study published in The Lancet showed that just belonging to a support group and meeting once a week doubled the life-span of advanced breast cancer patients.

results in *The Lancet* in 1974 he experienced increasing harassment and retired from medical practise.

Dr William Lane in the US noticed that sharks do not develop cancer. This prompted him to experiment, with good results, with shark cartilage, which is now commercially available. Also shark oil is useful. Gaston Naessens in Canada was very successful curing cancer by injecting a modified camphor compound into lymph nodes to strengthen the immune sys-

The Conventional Approach

To orthodox physicians, there are three basic ways to treat cancer.

- Chemotherapy, which uses toxic drugs, not only destroys cancer cells, it also attacks normal cells, including those of the bone marrow – the foundation of the immune system – and cells of the intestinal walls and hair follicles. Chemotherapy can drastically undermine the immune system's ability to fight off otherwise harmless bacteria. Many of the drugs used in chemotherapy are known carcinogens or cancer-causing agents. According to John Cairnes, M.D., of Harvard University's School of Public Health, chemotherapy drugs objectively help no more than five per cent of cancer patients. Overuse of chemotherapy – a \$750 million-a-year racket in American drug sales alone – is an international scandal.
- Radiation is useful in slowing down certain cancers but rarely cures. It often causes significant damage and dysfunction in organs and tissues. Like chemotherapy, radiation can severely weaken the patient's immune system.
- Surgery leaves cancerous cells behind in 25 per cent

to 60 per cent of cancer patients, allowing malignant growth to recur, as numerous studies have shown. In disrupting the tumour, both surgery and surgical biopsy (a procedure to detect cancer in its early stages) may contribute to the spread of cancer.

Although conventional techniques have been successful in controlling early stages and relatively rare forms of the disease, these treatments do little to improve the outlook for most patients. On the contrary, "the possibility exists that treatment makes the average situation worse," according to the late Dr Hardin Jones, then professor at the University of California.

After analysing cancer survival statistics for several decades, Jones concluded in 1975 that "patients are as well, or better off untreated." Jones' disturbing assessment has never been refuted. What's more, three studies by other researchers upheld his theory.

Orthodox doctors sometimes claim that all non-conventional cures are due to spontaneous remissions or the after-effects of conventional therapies. This argument is untrue. Spontaneous remission may reverse cancer in 1 out of 10,000 cases.

What Doctor's Don't Tell You, Vol.2, p.7.

tem. He claims a long-term remission rate of 75 per cent. His remedy, called 714-X, is now available from Canada.

Overheating a tumour is another well-known means of inhibiting tumours. Cancer cells are damaged or weakened by temperatures of 42-43 degrees C. which are still harmless for normal cells. To overheat internal tumours, daily bath temperatures are gradually raised over a period of weeks or months up to 47 degrees C. Various precautions are required. As after ozone therapy, the damaged tumour becomes highly responsive to any additional holistic therapy. In addition, the blood circulation is greatly increased.

Mind Improvement

The power of the mind is apparent from the fact that tumours frequently become evident about a year after an emotional trauma, such as the loss of a close relative. Before, the tumour may have been dormant or slow-growing, but the temporary suppression of the immune system through excessive grief or mental depression allowed the tumour a growth spurt.

A ten-year study published in *The Lancet* of women with advanced metastatic breast cancer found that just belonging to a support group and meeting once a week doubled the lifespan, as compared with a control group that had been medically treated in the same way. In addition to some well-known support groups such as those run by the Bristol clinic in England or Ian Gawler's support group in Victoria (Australia), there are now small groups, often in connection with meditation groups, in many cities.

The most powerful setback to recovery, on the other hand, is a medical pronouncement that the condition is incurable and terminal, especially if a time limit is mentioned. This then becomes a self-fulfilling hypnotic suggestion, just like "pointing the bone" in other cultures, and it is then difficult for a holistic therapist to change this medically implanted death

wish into hope and faith, which are the cornerstones for recovery. As John A McDougall, M.D. points out in *The McDougall Plan* (1985) :

"During the past 20 years, the cancer death rate has increased by almost 9 per cent. The death rate (for six major areas of cancer growth) has stayed the same or increased during the past 55 years. Furthermore, most victims of these cancers sooner or later die of their disease. Such indisputable facts attest to the failure of current early detection programmes and the drug/radiation/surgery therapies for most cancer(s) ... (The truth is) our dollars have been directed towards methods that make money for health professionals but provide little help for the victims ..."

Adapted with the kind permission of Chris Wheeler, from a series of articles published in *Soil & Health*, the magazine of the Soil & Health Association of New Zealand Inc, of which he is director.

The New Zealand Soil & Health Association's work with organic farmers and growers has to a large degree been passed into the hands of the NZ Biological Producers and Consumers Council (recently renamed Bio-Gro NZ in line with its IFOAM-monitored organic certification service) and the Association itself has become more orientated towards an organics advisory and information service, consumer issues of food safety, pesticide-use reform, and holistic health issues.

The Association has as its platform *Soil & Health*, a bi-monthly consumer journal with sales of 5,000 throughout New Zealand.

The Association's second edition of Walter Last's bestselling book *The Self Help Cancer Cure*, headlining holistic cancer therapy, was published early in January and has already sold out its first print run.



The Women's Environmental Network
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WEN is a non-profit making organisation educating, informing and empowering women and men who care about the environment.

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***The Waste Prevention Campaign** initiated the Waste Minimisation Bill (formerly the Waste Prevention Bill) which now has government support. We have published a report Preventing Nappy Waste and a Sustainable Conference Pack and we are working with Spitalfields Market on a project to reduce waste produced by the market.

***Putting Breast Cancer on the Map** aims to involve local communities in researching the links between women's health (mainly breast cancer) and environmental pollution, with the long term aim of creating a healthier environment for all. This new National Lottery funded project provides an information pack for women and local groups concerned about the issue.

***The Food Transport Campaign** looks at food production and consumption, promotes local food and setting up of farmers markets through workshops and an action pack. We also provide training sessions on campaigning skills to enable residents to campaign for more locally sourced food. **Please help us to continue our good work and all of our current campaigns by joining WEN, giving a one off donation or affiliating your group or organisation. WE NEED YOUR SUPPORT. Please send sae.**

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The Business of Breast Cancer

THE BREAST CANCER PREVENTION PROGRAM

by Samuel Epstein, MD, and David Steinman with Suzanne LeVert

Macmillan, USA, 1997, 416pp, \$24.95 (hb), ISBN 0 02 536192 9

If a woman who dies of breast cancer loses (on average) 20 years of her life, then over the last 10 years the UK has lost 3 million woman years. What if some of this time was lost through ignorance and neglect? What if a large proportion of these cases was avoidable?

Genetic causes receive huge publicity, but they account for only five to ten per cent of breast cancer cases. And the attention they get reinforces the impression that breast cancer is "in the genes" and cannot be prevented. That is not to say that for those five to ten per cent of women this research is not absolutely vital, but we must also begin to look at a wider horizon of causes if we are ever to prevent this disease which destroys so many lives.

On the other hand, "cancer treatment is big business, with multi-billion dollar annual cancer drug sales. Cancer prevention is very much less profitable, at least to big business." Dr Samuel Epstein and David Steinman's book *The Breast Cancer Prevention Program* looks at this issue and many more to explain why "the most important story – the one that could truly save lives – is not being told, at least not by the mainstream press." The book advocates lifestyle, dietary, political and personal changes we can make to protect ourselves against breast cancer.

Based on the US experience but with a British edition soon to be released, this book gives a frightening but thoroughly in-depth account of "what you don't know *can* hurt you." It is dedicated to Dr Epstein's mother and grandmother, both of whom survived breast cancer.

The author, gives a good explanation

Reviews

of women's risk of getting breast cancer, in the US, at different ages, and gives easily understood examples of the effect of doubling the average risk at various ages. At 25 the risk of getting breast cancer during a year is 1 in 19,608. Doubling this risk makes cancer still a very rare occurrence. The average risk increases to 1 in 622 when we reach 35, which is a huge increase in just ten years. But at 60 the risk is one in 24, and doubling it means that one in every twelve women of that age in a community or grouping would get breast cancer. The risk increases enormously with age: over 80 per cent of cases occur after 50, and this striking fact is rarely discussed or explained.

In 1995 the National Breast Cancer Centre of Australia produced an overview of genetic risk factors. Women with no family history of breast cancer (most women fit into this category) have a lifetime risk of between 1 in 13 and 1 in 8, whereas women at potentially high risk – that is, those who have a family history, have a 1 in 4 to 1 in 2 chance of developing breast cancer. Epstein states "No one is helpless against the medical, environmental and lifestyle risks of breast cancer. Once you have identified the specific risks you face, you then have the power to eliminate or at least radically reduce them."

Women may feel powerless in the face of such a daunting task and we should be campaigning for industry, governments and the cancer establishment to take the lead by focussing on prevention and encouraging clean practices, processes and products. Breast cancer is a societal problem. As countries industrialize their manufacturing and agriculture, and introduce synthetic chemicals and nuclear power, breast cancer rates rise. As Epstein points out, immigrants rapidly take on the risk pattern of their new country.

To get cancer you can be born with a mutation, which makes breast cells more likely to multiply uncontrollably and produce a cancer. But this explains only five to ten per cent of cases, and even with these, cancer is not inevitable unless other factors add to the process. Otherwise some breast cells may become mutated during life, because of ionizing radiation or contact with chemicals that alter the DNA in the cell. In

either case, other chemicals then act as promoters, encouraging the growth and multiplication of the rogue cells. The immune system can stop the cancer by wiping out the mutated cells.

Oestrogen is a major promoter of breast cancer – men, although they have breast tissue, rarely get breast cancer, because they have little oestrogen to promote it. The author writes at length about the "oestrogen window" between menarche (first menstrual period) and menopause. The theory is that the longer this window is open and not interrupted by child-bearing and breast-feeding, the greater the risk of breast cancer, even though most cases still occur after the window has closed. The book states that a full-term pregnancy causes breast cells to mature and become less responsive to oestrogens and to carcinogens. However, there is no reference for the animal evidence invoked for this statement, and more explanation of "mature" breast cells would have been helpful. The number of cases rises steeply after the age of 50 – the risk of an 80-year-old woman getting breast cancer in one year is one in ten.

Breast cancer has always existed, but it used to be far rarer before industrialization. The book starts by quoting US statistics, which include:

- Breast cancer is the leading cause of death in women between the ages of 35 and 54.
- In 1971, a woman's lifetime risk for contracting breast cancer was 1 in 14. Today it is 1 in 8.
- Among white American women the incidence of breast cancer increased by 55 per cent between 1950 and 1992 (data for black women were not completed until the 1970s).

In 1733 it was observed that breast cancer was much more common in nuns than in women who had had children. What could explain these pre-industrial cases? Samuel Epstein's book implies that these cases were initiated by natural mutations, and promoted by higher than average normal body oestrogen. The mutations could have been caused by background radiation, and by the mutagenic form of oestradiol, which is produced in larger quantities if a woman has an inactive lifestyle and eats a diet rich in fat. The changes brought by industrialization include: a sedentary

lifestyle and fatty diet for more people, more radiation, carcinogenic and oestrogenic pollutants, and additions such as the Pill and breast implants. The book lists a "Dirty Dozen" risk factors that we can begin to address:

Modern medical risks

Oral contraceptives, with early and prolonged use. Oestrogen replacement therapy, with high doses and prolonged use. Premenopausal mammography, with early and repeated exposure. Nonhormonal prescription drugs such as some anti-hypertensives. Silicone gel breast implants, especially those wrapped in polyurethane foam.

Dietary and environmental risks

Diet high in animal fat contaminated with undisclosed carcinogens and oestrogenic chemicals.

Exposure in the home to household chemicals or pollution from neighbouring chemical plants and hazardous waste sites.

Workplace exposure to a wide range of carcinogens.

Lifestyle risks

Alcohol, with early or excessive use. Tobacco, with early or excessive use. Inactivity and sedentary lifestyle. Dark hair dyes, with early or prolonged use.

These possibilities ought to be highlighted, but it is hard work to get from the book much indication of how seriously to take these risks. There is so much information and it takes a lot of time to assess the amount of evidence for each hazard, so the temptation is to assume everything is dangerous and not act to change anything. This feeds the notion that we have to go back to a pre-industrial lifestyle to reduce breast cancer. The cancer establishment is too ready to imply that we somehow accept a bargain – we pay the cost in breast cancer because our lives are so convenient and luxurious. In fact, to prevent breast cancer we have to pick out possible changes, find allies and devise programmes to achieve them. The book is a good blueprint and a challenge to activists, but an individual woman reading it could well feel overwhelmed. It would be better read by someone who already has some knowledge and has started to act. If it was the first book you read about breast cancer, the sheer number of possible causes might seem

overwhelming. There seems to be a particular concentration on hair dye – this is based on occupational studies of hairdressers and seems well founded. But the emphasis on it is bound to make some women feel that nothing is safe and therefore it is not worth bothering to change anything.

Section Two attacks the medical establishment for refusing to give weight to prevention, and explores influences such as the contraceptive pill, hormone replacement therapy, mammography and breast implants. It argues against chemoprevention, which includes tamoxifen given to healthy women in large trials as a highly-publicized prevention measure – the trials did not include any other advice about lifestyle changes which could have helped these women. There is an interesting chapter on common drugs, including Valium, and their suspected links to breast cancer. However, Valium is given to depressed women who may for the same reason have lowered immunity and therefore be more vulnerable to cancer.

The chapter on mammography

As countries industrialize their manufacturing and agriculture, and introduce synthetic chemicals and nuclear power, breast cancer rates rise ... what's more, immigrants rapidly take on the risk pattern of their new country.

attacks its portrayal as prevention by the cancer establishment. It quotes a British doctor, Maureen Roberts, who, when dying of breast cancer, wrote in the *British Medical Journal*: "Screening is always a second best, an admission of failure of prevention or treatment . . . there is an air of evangelism [about the benefits of mammography], few people question what is actually being done. Are we brainwashing ourselves into thinking that we are making a dramatic impact on a serious disease before we brainwash the public?" Epstein goes on to mention the risks of X-rays as ionizing radiation and quotes Dr John Gofman in his book *Preventing Breast Cancer* as saying that past medical radiation is probably the single most important cause of the modern breast cancer epidemic. However, Epstein goes on to conclude that for most postmenopausal women, screening can be used with caution. This is not so for

women under 50 for whom screening is ineffective in detecting cancers. The premenopausal breast is one of the most radiosensitive organs. He warns everyone to avoid non-essential medical radiation and advocates safer means of breast screening, including self-examination. About one to two per cent of women have a genetic mutation which makes them ultra-sensitive to radiation: some researchers think that these women may account for up to 20 per cent of breast cancers annually in the US.

The book is hard-hitting on a woman reading it and the early sections of the book are particularly addressed to the individual, as the author addresses us as "you". The first set of causes are ones that we cannot easily alter for our own lives; the age at menarche, age at first pregnancy and whether we breast-feed. It may be too late by the time we approach menopause to have an influence by eating less fat, taking more exercise, or to have five children to halve our risk! It is as if the authors are saying, "here is a set of traps you women are stuck in." We don't think they mean this, but nevertheless the book, with its relentless listing of causes,

is a strange mixture of empowerment and burden. This book would best be read alongside another, more holistic, book to balance the effect – one which encourages us to love our breasts rather than regarding them as a source of danger!

The authors do give a comprehensive picture of probably all the factors in the home, the immediate area, the workplace and in foods that have been linked with breast cancer. They are healthily sceptical about medical treatments and synthetic chemicals and give a useful section on interpreting study results, beginning with the obvious consideration of who is funding the research.

In "Where you Live" Epstein looks at the implications of living near sources of environmental pollution, which could influence the risk of developing breast cancer. "Studies show that where you live affects your susceptibility to cancer – studies also link increased breast cancer risk directly to living near chemical plants, hazardous waste sites, and nuclear facilities." The Women's Environmental Network's (WEN's) breast cancer project aims to enable people to look at connections in their own areas between influences such as radiation and pollutants and locally raised incidence of breast cancer. In much the same way as Long Island residents mapped their locality for links between

their elevated incidence of breast cancer and local sources of environmental pollution, WEN hopes to encourage individuals and communities to compile maps of their localities in England. Our priority will be to give people a clear picture of possible causes and ways to reduce risk. This book will be a valuable tool for activists, more as a reference and checklist than individual guide.

In "Setting a new agenda", the authors describe the 'cancer establishment' in the USA – the combination of leading hospitals, universities and drug companies. "Cancer treatment is big business, with multi-billion dollar annual cancer drug sales. Cancer prevention is very much less profitable, at least to big business." They condemn the American Cancer Society for placing a higher priority on fund-raising than on the public's right to know the facts. Cancer charities there appear to have decided that prevention is impossible: in the UK medical experts are sceptical that

women can change their behaviour and they regard the mention of chemical causes as alarmist and perhaps unprofessional. In any case the effect on anyone wanting to put more emphasis on prevention is the same.

Zeneca Pharmaceuticals – a spin-off of ICI – "has been the sole multimillion dollar funder of the US National Breast Cancer Awareness Month since its inception in 1984. Zeneca is also the sole manufacturer of tamoxifen, the world's top-selling anti-cancer and breast cancer 'prevention' drug" and directly manages eleven cancer centres in US hospitals. A UK version of this book would do well to explore connections in this country, the home of Zeneca.

The final section of the book also criticizes the US National Breast Cancer Coalition, in spite of its success in getting money for research, for still doing little to make women aware of avoidable risks like certain chemicals. The impression is usually that the US is more aware

of dangers from chemicals than the UK, but it seems from this book that there is little difference. The book ends with a section entitled "Learn all you can – and get involved" in which schools and universities are urged to do more to help young women live lives that help prevent breast cancer by encouraging sports, educating about known risks and teaching breast self-examination. It advocates contacting insurance companies who might fund preventive approaches to breast cancer, as they already do for heart disease. In fact, it is full of stimulating ideas for action, which could be adapted for other countries such as the UK. That many factors in society cause breast cancer does not mean we cannot change them. A society in which breast cancer rarely 'raised its ugly head' would clearly be a healthier, more sustainable society for everyone.

Helen Lynn and Ann Link,
Women's Environmental Network

Systemic Healing

SELF HELP CANCER CURE BOOK

by Walter Last, Chris Wheeler, and a panel of Soil & Health Association writers.

Soil & Health Association of New Zealand Inc, P O Box 36-170, Northcote, Auckland, NZ, Tel/Fax: +64 (0)9 480 4440, E-mail: <soil@health.pl.net>. 1997, 128pp, \$NZ 19.95 (A4 pb)

The *Self Help Cancer Cure Book*, published by New Zealand's organics and holistic health activist group, the Soil & Health Association, has become something of a legend in the South Pacific over the past five years with its regularly updated information on cancer cures, and exposé of the manner in which holistic therapists are persecuted by the medical establishment as soon as they encroach on what has become a very lucrative field.

The opening section of this latest issue, "The Politics of Cancer", provides a barely believable account of the scams, corruption and constant undercover battles waged by the medical establishment in order to maintain the widely held myth that cancer is a mystery disease with no known cause or cure.

As Chris Wheeler, Association President and editor of the edition makes clear from the start in a chapter headed, "Who owns cancer? ... We, the

People, or the Cancer Establishment": "It will probably be news to most that holistic treatment of cancer ... producing total remissions and even cures [a word forbidden by law in most countries when applied to normally terminal diseases such as cancer] has been routinely going on for years in both New Zealand and Australia and elsewhere in the world ... largely unrecognised by the media and general public."

"The Holistic Treatment & Cure of Cancer", "The Treatment of Children with Cancer", "Alternative Treatments & Cures for Cancer" and "Spotlight on Some Special Cancer Remedies", are all sections which deal with therapies specific and general. The first two sections introducing the book's main theme of cure, continually emphasize the role that politics plays in misinforming people as to the causes, prevention and cure of cancer.

Quoting from Dr Samuel Epstein's *The Politics of Cancer*, Wheeler notes that the dominant view among scientists dealing with cause is that most modern cancers have an identifiable cause. "Cancer is caused mainly by exposure to chemical or physical agents in the environment," says Dr Epstein. This can only spell bad news for a country like New Zealand, whose absurdly high degree of pesticide abuse renders a Kiwi's daily diet between 4 and 800 times more polluted with toxic agricultural residues than that of a typical

North American citizen.

As for the cures themselves, the general message is that a clean, and above all organic diet is key both to staying free of cancer and indeed curing it. In maintaining this position, the book's main authors all hark back to the original work in nutritional treatment of cancer, set out in Dr Max Gerson's epic, *A Cancer Therapy – Results of Fifty Cases*, which is still very much the holistic Bible of cancer prevention and cure.

Indeed the main therapy outlined at length by Walter Last in a chapter headed "Overcoming Cancer – A Holistic Programme" owes its central core to Gerson's methods of cure, which are still being practised in clinics across the Mexican border in Tijuana and in largely self-help situations all around the world.

This latter is, of course, the book's avowed purpose – to bring together in an inexpensive form, most of the Do-It-Yourself information on cancer prevention, treatment and cure, which has been known and experienced for the past 200 years. Astonishingly, were you to try to set up even on an unpaid basis a means of offering the treatments described in these 128 pages, in all likelihood, you'd end up in court, if not jail, which, when seen in the context of the sheer butchery and misery carried out by modern means, is fairly absurd.

Edwynn Raschbottom

We All Live "Downstream"

LIVING DOWNSTREAM: An Ecologist Looks at Cancer and the Environment

by Sandra Steingraber

Addison-Wesley, Reading, MA, 1997,
357pp, \$24, ISBN 0 201 48303 3

Sandra Steingraber, who has a doctorate in ecology, could also subtitle her book "a poet looks at cancer and the environment". Her unique ability to combine professional know-how and poetic insight, in spite of the book's theme, makes this book a joy to read. Her straightforward message says: we all live downstream from pesticides and industrial wastes dumped in the environment, which can be linked to the rising rate of cancer. Steingraber gives lyrical expression to this cold fact, making the reader see those chemicals not just as abstract numbers and unpronounceable names, but as real entities breaching the reader's body – which indeed they do.

Living Downstream reflects Steingraber's origins and how she perceives her relation to the natural environment. In so doing, she puts a complex social issue of cancer, industrial action, and government policy into personal terms with which the reader can identify. Steingraber evokes a sense of one-with-nature in the way Annie Dillard does in her *Pilgrim at Tinker Creek*.

Steingraber grew up in the state of Illinois, a contoured plain grooved by deep river valleys. Although living in town, she acquired a close affinity through her farming uncle with the corn and soybean fields on the plains. This personal experience becomes a basis of the book's theme. She tells us that Illinois is the largest producer of soybeans in the United States. Soybeans find their way in countless forms into practically every commercial food product sold in the United States and abroad, from soft drinks to bread to animal feeds.

As she points out, you the reader have probably eaten food grown here in Illinois. And because soybean molecules are absorbed by you to become your own molecules, she continues "you are the food grown here," which is not particularly comforting, considering

that you live downstream from some 54 million pounds of synthetic pesticides dumped annually on Illinois corn and soybean.

Not all agree that synthetic chemicals in the environment are linked to rising cancer rates (one in three persons now contracts cancer at some point in her or his life). Steingraber evokes the tension between government cancer authorities, who claim the link is insignificant, and the damning evidence that the link is all too real. Her tone is neither inflammatory nor accusatory. For instance, she contradicts cancer authorities who would have us believe that, if people stopped smoking, ate a balanced diet, and exercised, most cancer would vanish. She quotes verbatim a brochure issued by the US Department of Health and Human Services which says that 80 per cent of cancer is tied to the way people live their lives. She overlays this bald assertion with a quote from *Human Genetics: A Modern Synthesis*. "As much as 90 per cent of all forms of cancer is attributable to specific environmental factors."

In 1832, New York city health authorities, faced with a cholera epidemic and at the time knowing nothing

polluter, a coal-burning power station. She doesn't attempt to link her own cancer with her childhood environment, but instead weaves a precise tapestry of chemical production, waste dumping, human exposure and cancer.

All her comments are backed by rigorously researched scientific data. She has delved through reams of government toxic release data and the most recent cancer statistics. The book is full of new data supporting the link between cancer and environmental contaminants. The science, although unobtrusive, is there for the reader who wants the technical details.

Living Downstream carries an upbeat message: go upstream, prevent environmental contamination, and we can prevent much of cancer. The book makes a deft case for this approach, contradicting cancer authorities for whom prevention means early detection.

Early detection, while important to the individual who contracts cancer, is badly flawed as a broad social strategy for dealing with cancer. Cancer cells in the early stages divide painlessly and without stress. In breast cancer, for instance, by the time a tumour has reached a size large enough to be felt physically or be detected in a mammogram, it has already been growing six or more years. The cancer cells may have already metastasized, making treatment difficult. A good reason for looking upstream for the solution.

Steingraber probes the prevention issue by going deep into our collective human soul. Human hands and human decisions are responsible for the way society

constructs and destructs. She looks at her home state, which, in the space of three generations, was transformed from a prairie of six-foot high grass into a landscape of pesticide-laden crops on the plains and heavy industry in the river valleys. The rising incidence of human cancer is a neon-light message from nature that the transformation has gone askew.

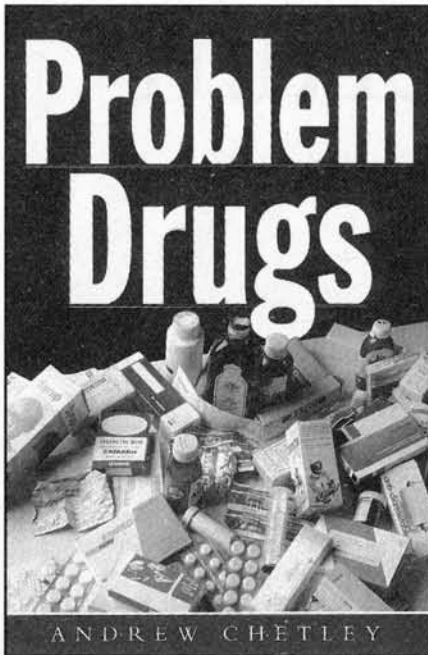
Living Downstream grabs you in the gut and leaves you with the urge: we have to do much better in adapting modern society to the laws of nature. The book has an index, 270 references and an annotated list of key organizations and government telephone numbers related to chemicals and the environment.

Ross Hume Hall

Her home state was transformed into a landscape of pesticide-laden crops on the plains and heavy industry in the river valleys. The rising incidence of human cancer is a neon-light message from nature that the transformation has gone askew.

about the bacteria, issued a brochure that told citizens how to change their lives to avoid the disease. Steingraber points out that, while advice to *cook* food indeed helped, it wasn't *uncooked* food causing the cholera; it was rather the fecal contamination.

Steingraber has more than a professional interest in the link between chemicals in the environment and cancer. At age 20, she was diagnosed with bladder cancer. This form of cancer was one of the earliest forms identified with exposure to specific carcinogenic chemicals. Steingraber doesn't belabour her personal travail. Her diagnosis remains quietly in the background as she describes her childhood growing up in Pekin, located in the Illinois River valley, surrounded by chemical plants, fertilizer factories and the state's worst



A Patent Oversight

PROBLEM DRUGS

by Andrew Chetley

Zed Books, with Health Action International, London and New Jersey, 1995 (reprinted 1997), 338pp, £14.95/US\$22.50 (pb), ISBN 1 85649 320 2

It has always baffled me that doctors, who are recruited as intelligent beings, cannot see how much they rely on people with axes to grind. Even their basic training is constrained within a narrow world in which only pharmaceuticals, surgery, ionizing radiations and now genes are considered respectable treatment options. They are launched upon their professional careers equipped with some knowledge of cells and organs but no concept of health, no idea about what makes whole people tick and far too little respect for individual humanity. The best of them learn something from the people they then try to help, but most rely on a corporate identity bestowed upon them through membership of professional corporate bodies, and familiarity with the welter of scientific knowledge expounded in medical journals. Since few practitioners have much time for systematic reading, however, most of them come to rely heavily for current news on the pharmaceutical representative.

The influence of major drug firms does not stop at free samples, gifts and

outings for prescribers of their products, however. They fund and direct a great deal of medical research. Their advertising keeps medical newspapers circulating and influences the prosperity of even the most respected journals. They underwrite post graduate medical education programmes. They support, directly and indirectly, professional bodies, medical colleges and teaching hospitals. The sheer might of their resources influences quangos, governments and international agencies. In short, they set the medical agenda throughout the industrialized world, almost single-handedly.

The reason they can afford this huge acculturation exercise, and their motive for investing in it, is patent law. Designed originally to protect the inventor from plagiarism, this body of international legislation has become a corporate obsession. Patents, rather than medical priority, drive medicinal research.

The dynamic is simple enough. Any novel product which can be both patented and licensed as a medicine becomes hugely profitable while the patent lasts. However, it takes most of the life of the patent – even with the fraudulent short-cut of animal experimentation – to complete the testing programme required for licensing purposes. The window of highest profitability may last only five years. Small wonder, then, that the promotional effort should be so maniacally out of proportion to the real value of the drugs evolved in this hot-house climate.

If Andrew Chetley is aware of this preposterous situation, he gives no indication of it. He studies a series of drug

quotas to fill.

His analysis is thorough and convincing enough, but his solutions fail to impress. He ventures into territory, such as nutrition, of which he clearly knows little. His treatment suggestions are too nihilistic, ignoring even the useful folk remedies that were unjustifiably displaced by drugs in the first place. He should not, in fact, make pronouncements about treatment at all without the customary warning to consult a competent practitioner. When it comes to distinguishing the potentially lethal exception from common self-limiting symptoms, protocol is no substitute for personal attention.

He calls for more research without apparently appreciating how uneven that playing-field is. Almost all research is bent on patent-hunting, for how else is a big-time underwriter to get his money back? This may explain Chetley's lack of interest in alternative medicines. Many have been researched quite well, but positive results in homoeopathy, chiropractic and yoga are played down by well-resourced apologists for their patented competitors. By definition, traditional and folk remedies, as well as natural foods, are beyond patent law.

His clarion call, however, is for more and better national and international regulation. Amen to that, but let it be by amendment of patent law, at least as far as it affects medicinal products. Profiting from genuine advance is worthy and justified: profiteering from bad law is neither. At present we discard inexpensive, safe, well-known remedies merely because they are too accessible.

They are replaced by newly-licensed, expensive unknown quantities, designed chiefly to maintain the profitability and competitive advantage of a drug house. The costs and side effects are going ballistic while the benefits are increasingly hard to find.

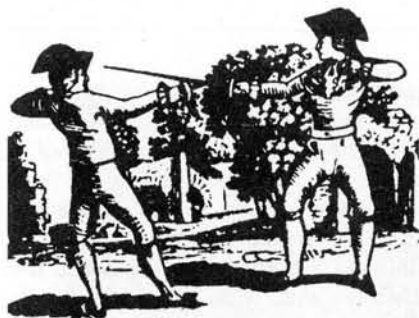
We have here a global, largely self-regulating industry that has become hide-bound to a body of legis-

lation which threatens to choke on its own prosperity. This is not the first conundrum of its kind, but it is probably the largest we have yet had to face. To solve it we need to redraft patent law globally along sane, ecological lines. This is a stupendous task. When it is recognized and discussed, widely and openly, we shall have made a start.

Peter Mansfield

At present we discard inexpensive, safe, well-known remedies merely because they are too accessible. They are replaced by newly-licensed, expensive unknown quantities, designed chiefly to maintain the profitability of a drug house.

categories and excessive claims against which he and Health Action International have campaigned successfully. For the most part, however, his account serves only to underline the overwhelming scale of the commercial forces that need to be regulated. He sees the problem largely as a threat in the developing world, whose teeming populations are ripe hunting grounds for salesmen with surpluses to dump and



Letter Forum

Where is the magic word?

I recently received a complimentary back issue of *The Ecologist* (Vol.27 No.4, July/August 1997) which I read with great interest. But in perusing its pages I looked in vain for any reference to the one factor which is the cause for the trashing of our ecosystem. Not until I read the letter from Mr Andrew Ferguson on the second to last page of the issue did I come upon the magic word *population*. To paraphrase him, the maths is simple: if there are 5 billion people producing an average of 4 tons of carbon dioxide per annum, the total number can be reduced either by lowering the emissions per capita or by reducing the number of people. The failure of yours and other environmental groups to acknowledge this truism is not necessarily a sign of "wilful amnesia", however. More likely, you deem it beyond the scope of your programme or powers to do anything about the runaway population explosion, which now threatens our species with a fate akin to that which befell the dinosaurs some 60 million years ago. (In their defence it must be pointed out that they were not responsible for their own demise).

In Z. Goldsmith's perceptive review of the gospel according to Bill Gates ("The Road Ahead") there is a fleeting reference to population growth: he takes issue with Mr Gates' contention that affluent and better educated people seem to be less inclined to procreate uncontrollably. Goldsmith may be right in his assertion that "*initial* (my emphasis) population explosions have always coincided with major technological changes", but it is an irrefutable fact that countries with a high standard of living and level of education tend to maintain a more stable population. Whether this utopian state can be achieved through the universal application of

cybernetics and "surfing the internet", however, is open to debate. But there is no doubt in my mind that, unless we take immediate steps to voluntarily reverse the current trend, a solution will be forced upon us in the not too distant future, either in the form of some cataclysmic natural disaster, or in the form of genocide on a scale which will make Hitler, Pol Pot and the Hutus look like rank amateurs.

Accordingly, it is with keen interest that I look forward to reading your forthcoming issue on population, as promised in your postscript to Mr Ferguson's letter. Keep up the good work!

Gard E Binney

CO₂ emissions and population

The article by Simon Retallack on global warming (*The Ecologist*, Vol.27 No.6) was highly commendable. I was glad to receive confirmation that the Global Commons Institute (GCI) still believes that division of the carbon budget will have to be on some sort of per capita basis, and even more pleased to know that "whatever may be *The Ecologist's* reservations, the adoption of per capita allocations within a global carbon budget may be the only practical way of bringing the rapidly industrializing world to set a legal cap on its emissions."

On the other hand, the GCI and *The Ecologist* appear to be equally blind to the implications of what they suggest is necessary. In 1990, the USA was emitting 20 tons/capita, Germany 12 tons, UK 10 tons, France 6 tons, and Portugal 4 tons/capita. Surely it is unlikely that the world is going to agree to emitting less than 4 tons/capita. But let us lean over backwards to be optimistic, and

assume that while one half of the world limits itself to 4 tons per capita, the other half (choosing population rather than affluence) will limit itself to 2 tons per capita. In other words, an average of 3 tons per head. What population will that allow? The Intergovernmental Panel on Climate Change have told us – and it is something which is almost arithmetically obvious – that only when fossil fuel emissions are reduced to 9 billion tons a year will carbon dioxide levels stabilize. Thus the aforementioned 3 tons per head will allow a maximum population of 3 billion, about half of the present world population. Where is that bit of realism to be found within the GCI or *The Ecologist*?

Andrew Ferguson
11 Harcourt Close
Henley-on-Thames
Oxon
RG9 1UZ
UK

Balance unimportant to *The Ecologist*

I am writing to apologize for any possible confusion arising from the letter I sent you which was published in *The Ecologist* [Letter Forum, Vol.28 No.1] in response to an article by Dr Vyvyan Howard. I wrote it from a position of misunderstanding, assuming that a journal publishing science articles would be interested in balance. However, after noting the position taken in articles in *The Ecologist* Vol.27 No.6, I conclude that balance is not important for *The Ecologist*, which appears to be a political rather than scientific journal.

Dr Nigel Moore, CBiol, MIBiol
BP Chemicals Limited

DIARY DATES

3-4 April 1998: **INTERNATIONAL SUSTAINABLE DEVELOPMENT RESEARCH CONFERENCE**, Weetwood Hall, Leeds. Over 50 papers from 17 different countries. Further information from: Elaine White, ERP Environment, PO Box 75, Shipley, West Yorkshire, BD17 6EZ, UK. Tel: +44(0)1274 530408; Fax: +44(0)1274 530409.

23-25 April 1998: **Ecologue XXI WINDENERGY SYMPOSIUM**, Narbonne, FRANCE. In English and French. For more information, contact *Ecologue* XXI, BP8 - 11200 Fabrezan, FRANCE. Tel: +33(0)4 68435474; Fax: +33(0)4 68435475; E-Mail: <ecologue@easynet.fr>

9 May 1998: **THE NATURAL HEALTH AND ECOLOGY SHOW**, Watershed Media Centre, Bristol. An opportunity to explore the many options available for keeping mind, body, spirit and the environment healthy. For further information and programme, please contact: Sally Packer. Tel: 01934 813407.

19-21 May 1998: **URBAN WORLD 98**, Scottish Exhibition & Conference Centre, Glasgow, SCOTLAND. Featuring exhibitions and presentations on urban regeneration, town planning, economic development. For further information, contact Alan N McGuinness, tel: +44(0)1698 420600.

2-3 July 1998: **ECO-MANAGEMENT and AUDITING CONFERENCE**, University of Sheffield, UK. For more information, contact ERP Environment, PO Box 75, Shipley, West Yorkshire, BD17 6EZ, UK. Tel: +44(0)1274 530408; Fax: +44(0)1274 530409.

6-10 July 1998: **1ST WORLD CONGRESS OF HEALTH AND URBAN ENVIRONMENT**, Madrid, Spain. In Spanish and English. For more information, contact TILES A OPC, S.L., Londres 17, 28028 Madrid, Spain. Tel: +34(1)3612600; Fax: +34(1)3559208; E-Mail: <tilesa@wpa.es>

9-11 September 1998: Annual Conference and Exhibition of the Remote Sensing Society, **DEVELOPING INTERNATIONAL CONNECTIONS**, Chatham Maritime, Kent, UK. Emphasis on international collaborative projects and those between Developed and Developing World participants. For further information, contact: School of Earth and Environmental Sciences, University of Greenwich, Medway Towns Campus, Chatham Maritime, Kent, ME4 4AW, UK. Tel: +44(0)181 3319803; Fax: +44(0)181 3319805; E-Mail: <rss98@gre.ac.uk>

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1998 International Women's Day for Peace and Disarmament, May 1998. ANNUAL INFORMATION PACK. Joint publication of the International Peace Bureau and the International Fellowship of Reconciliation. Please send a cheque for £3, payable to the International Peace Bureau to: IPB, 41 rue de Zurich, 1201 Geneva, Switzerland. Tel: +41 22 731 6429; Fax: +41 22 7389419.

NEW DEMOCRACY MOVEMENT. Problems of pollution and health are the result of inadequate control over forces of reckless money-power. The campaign to upgrade the quality of democracy has important implications for environmentalists. Info-update (send SAE): NDM, PO Box 187, Chesterfield, Derby. S40 2DU.

BACK ISSUES OF ENVIRONMENTAL MAGAZINES. I have a collection of back issues of *The Ecologist*, *UNESCO Courier*, *Conservation Society News*, *Your Environment*. If interested, contact Mr F H Oliver, 343 St Alban's Road West, Hatfield, Herts. AL10 9RN. Tel: 01707 274 800. Transport charges only.

HOLIDAYS

10TH ANNUAL ANIMAL WELFARE RETREAT. 12-13 June 1998, Maryvale Pastoral Centre, Bramley, nr Guildford, Surrey. For details and application form, send SAE to Mrs Brenda Perridge, 8 Dukes Close, North Weald, Epping, Essex, CM16 6DA. Tel: 01992 522534.

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Ancient Futures: Learning from Ladakh

by Helena Norberg-Hodge

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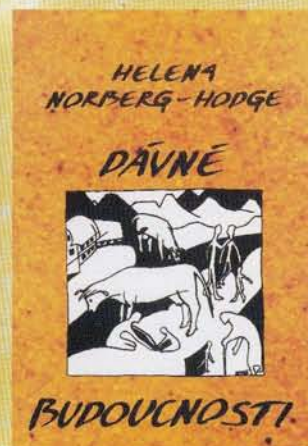
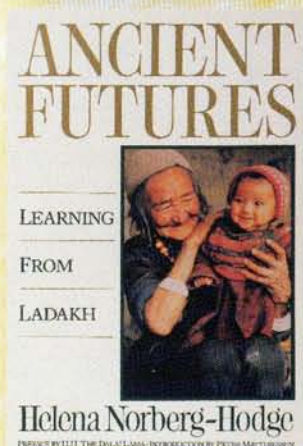
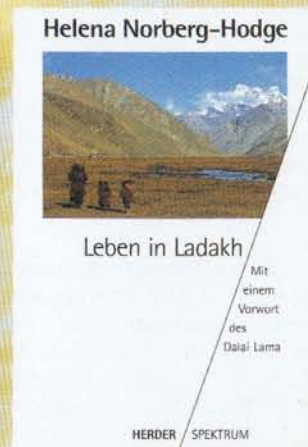
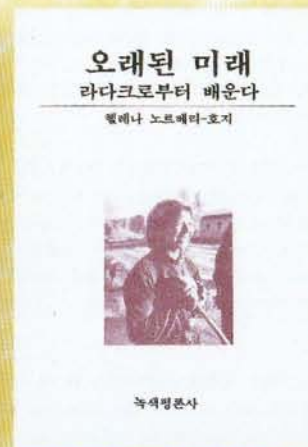
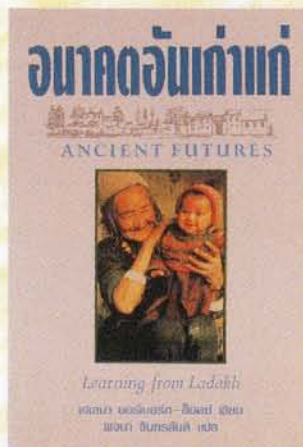
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