

The Ecologist Digest

Nuclear Power: Bombs, Accidents, and the Arms Race

Nuclear plant's director murdered, Bill Cemlyn-Jones, *The Guardian*, May 6th, 1982

Terrorists have assassinated the director of the nuclear power centre at Lemoniz, near Bilbao. Mr Angel Pascual Mugica, aged 45, was shot dead by a four man ETA (Basque separatist) commando when he was leaving his home for his office at Lemoniz ten miles away. He was accompanied by a police car and, during the gun battle between police bodyguards and the ETA gunmen, his son was wounded. No other casualties have been reported and the gunmen made a successful escape. In January 1981, Mr Jose Maria Ryan, the chief engineer of the Lemoniz project, which is still under construction, was assassinated by the ETA. After the Ryan murder, the Iberduero company, which had suffered several terrorist attacks, decided to end their operations unless they had full Government co-operation.

Setback for nuclear power plans, Michael Prest, *The Times*, April 26th, 1982

New Central Electricity Generating Board (CEGB) forecasts of United Kingdom power demand to the end of the century are so low as to challenge the need for major additions to generating capacity over the next two decades. The figures are particularly damaging to the case for a large nuclear construction programme. The forecasts conclude that on the most optimistic assumptions for economic growth, electricity demand will expand by an average of 2 per cent a year. This is less than half the average increase during the 1970's. At the opposite end of the CEGB's range of five forecasts is the assumption of a static or shrinking economy, which would mean contraction in electricity demand. The mid-range forecast that demand will go up by about 1 per cent a year is likely to be used by the Electricity Council's medium-term development plan.

Pollution at Windscale 'will cause cancer', *The Times*, April 9th, 1982

Radioactivity discharged so far from the Windscale nuclear plant in Cumbria would result in 30 cancer deaths and as many non-fatal cancers and genetic defects, according to a report by the Political Ecology Research Group. Windscale was the most heavily polluting of all the world's nuclear establishments.

The plutonium distributed in the Cumbrian coastal strip was equal to that deposited in radioactive fallout from atmospheric nuclear tests, the report said. Mr Albert Booth, Labour MP for Barrow-in-Furness, told a London press conference: "The United Kingdom is a major polluter of the marine environment and accounts for 95 per cent of all radioactivity dumped in the sea." Windscale was discharging a million times as much plutonium as any comparable plant, he alleged. "That is a most incredible figure. It has to be investigated by the Government." The report, commissioned by the Greenpeace conservation group and written by Mr Peter Taylor, biologist, and the director of the research group, said highly toxic plutonium could be breathed in from sea-spray. The tiniest amounts caused fatal lung cancer. To say that levels were low in terms of the legal limit that discharging waste into the sea could be allowed was irresponsible, he said.

Rickover steps down, Blasts Nuclear Programme, Not Man Apart, April 1982

The man probably most responsible for the large scale use of nuclear power in America resigned in January amid bitter words for the programme he helped so much to create. Admiral Hyman Rickover told members of the Congressional Joint Economic Committee that if he had his hand on the tiller, he would sink the subs he had responsibility for and try to eliminate dependence on nuclear power. Admiral Rickover directed the US nuclear submarine programme for 40 years. Commercial nuclear plants were directly adapted from submarine reactor designs, and many leaders of the US nuclear industry learned at his knees and sold their products on the submarine programme's experience. Rickover was replaced in his job by Vice Admiral Dinniard McKee. Safety details of the nuclear submarine programme have never been released to the scientific community, despite numerous appeals. It is generally accepted, however, that the submarine reactor programme is much better run than commercial reactors, both because naval reactors are smaller in size and Rickover has an iron-hand reputation. Asked about commercial nuclear power, Rickover told the Joint Committee: "We do not take into account the potential damage the release of radiation may do to future generations. . . Every time you produce radiation, you produce something that has a life, in some cases for billions of years, and I think the human race is going to wreck itself. It's far more important that we get control of this horrible force and try to eliminate it." The Admiral also took umbrage with President Reagan for failing to consult him on nuclear policy. "In fact," said Rickover, "some presidents asked me —

President Truman did and President Carter did and even President Eisenhower — but this president never did." As for his pet subs, Rickover told the committee he "would sink them all... I'm not proud of the part I've played in it. I did it because it was necessary for the safety of this country." He added, "Put me in charge of (disarmament) and I'll get you some results."

US Energy Consumption drops . . . Again, Jim Harding, *Soft Energy Notes*, May/June 1982, Volume 5, number 2.

For a second consecutive year, US energy consumption has dropped sharply, reaching a rate in 1981 that was actually lower than in 1973, despite a 20.3 per cent rise in real gross national product. Last year's energy consumption fell to 73.9 quads (78 EJ), roughly a five quad drop from two years ago. Virtually the entire fall has been reflected in petroleum consumption, which has fallen 14 per cent in two years, and, more importantly, in imported petroleum consumption, which is down 33 per cent. For the first time since the OPEC oil embargo of 1973, the value of US energy imports fell. About two-thirds of the reduction in 1981 energy use resulted from falling industrial demand for petroleum. This fall was not balanced by commensurate increases in natural gas or coal use, as both also fell last year, suggesting that improved energy efficiency or a change in the industrial market are more at fault than other factors. (Real GNP grew 2 per cent last year, and is expected to fall slightly this year.) About half the remaining reduction in last year's consumption was in transportation, which now consumes nine times more oil than utilities and two-and-a-half times more oil than industry. Transportation statistics in the US are poor, but preliminary data suggest that this reduction was evenly distributed across trucks, airplanes, and automobiles.

Reactor leaks corrode nuclear credibility, *New Scientist*, April 8th, 1982

Pressurised water reactors in the US are plagued with corrosion that has cost the industry, consumers and the government hundreds of millions of dollars as operating companies try to plug the proliferation of leaks in reactor cooling systems caused by corrosion. In an internal memorandum of the government's Nuclear Regulatory Commission, nuclear engineers outline a serious trend that leapt into international prominence in January 1982 with the accident at the Ginna nuclear plant in New York (*New Scientist*, February 4th, p 291). On 25 January, at least one of several hundred thin tubes carrying superheated and pressurised water from Ginna's radioactive core through a steam generator ruptured. Radioactive water contaminated the secondary water in the steam generator, which normally is heated to steam by the tubes and used to drive turbines for electricity. Small amounts of radiation escaped. Plant operators at Ginna kept the accident under control. But corrosion has

affected identical tubes in at least 40 reactors in the US, the memo says. There is also evidence that pressurised water reactors in other countries are suffering from similar corrosion. Corrosion is expensive. About one-quarter of the time spent on repairing reactors in the US is spent working on steam generator tubing. Replacing tubes at one plant alone, Turkey Point in Florida, will cost some \$460 million. To date there have been four serious tube ruptures, and many more minor leaks. The NRC admits that it has not fully studied the consequences of several tubes rupturing simultaneously. Should tubes rupture during a serious accident elsewhere in the plant, such as a loss of coolant to the reactor core, serious complications could develop that might prevent emergency cooling water from dousing the core.

Urals disaster: explosion or just pollution? Sarah White and Christopher Joyce, *New Scientist*, April 22nd, 1982

An official US report on the allegations that a large area in the Urals near the town of Kyshtym was contaminated by an explosion in a store of radioactive nuclear waste in 1957 or 1958 is raising a storm of controversy. The report agrees that land around the town was contaminated by radioactive chemicals. But it tries to refute the claim — first made by Russian exile Zhores Medvedev in *New Scientist* (vol 72, p 264) — that the contamination resulted from a major incident involving nuclear waste. Critics say the report tries to discredit Medvedev by misrepresenting him. The report sets out to discredit an allegation that Medvedev never made — that the Kyshtym disaster involved a nuclear explosion — and appears to be most concerned to deny the possibility of any major accident involving nuclear waste. The authors, Diane Soran and Danny Stillman, claim three factors were responsible for slowly but completely contaminating the environment near Kyshtym. First, they say that water used to cool the nuclear reactors on the site was, from 1950 onwards, pumped into an artificial lake in the north-eastern part of the Kyshtym industrial complex. Since the fuel rods in the reactors were often leaky, the water was heavily contaminated. By 1953, the report says, the water in the lake had become dangerously radioactive. It was nevertheless drained into the Techa river, which spread the contamination. The report claims that a second source of contamination was acid rain which devastated vegetation for 20 kilometres around the Kyshtym complex. Guessing about the technology the Soviets employed in the Kyshtym plant, Soran and Stillman say that nitric acid must have been used to extract plutonium-239 from irradiated fuel elements. This method, used in the US, generates nitrogen oxides, iodine and xenon, which, the report says, were vented from a stack 150 metres high. They claim that yellowish gases belched from the stack every day and all day for years on end and that acid rain formed from the nitrogen oxides and perhaps iodine-131. The third factor explaining the contamination around Kyshtym, according to the report,

concerns the disposal of nuclear waste. Soran and Stillman say that because of the severe pressure on the Soviet Union to develop an atomic bomb quickly, open ponds rather than sealed tanks were used to store highly radioactive waste from the plant that processed reactor fuel to make materials for bombs. If this were true — and the report claims that a dry lake bed has been spotted about six kilometres south-east of the complex — then caesium and strontium in the waste would have been leached out into the local clay soil as the liquid in the pond evaporated. If left to dry out, the lake bed could have been covered by a highly radioactive dust that high winds would disperse. An independent specialist on the disposal of radioactive waste has criticised this thesis as highly implausible. This specialist said that the radiation levels involved in open-pond storage would have been enormous.

The Los Alamos researchers are quick to point out that if there was an explosion, it was a chemical one involving nuclear waste and not a nuclear explosion, thus refuting what they mistakenly claim to be Medvedev's thesis. Walter Patterson, an energy consultant and author of *Nuclear Energy*, who has followed the Kyshtym debate for some years, is scathing about the report. He said: "The report adds little that is new and that little only from unattributed sources; and its conclusions, dredging up again the suggestion of a nuclear weapons accident, indicate that the authors do not even really believe their own analysis. It is a muddled, incoherent piece of work and looks essentially like yet another attempt by the US nuclear establishment to muddy further the waters around Kyshtym."

France's breeder leaks, but doesn't sink, Andrew Lloyd, *New Scientist*, May 13th, 1982

Two incidents in an ageing steam generator have resulted in the temporary shutdown of France's demonstration fast breeder reactor, Phénix at Marcoule in the Rhone Valley. Both incidents involved leaks in the sodium cooling circuits in the breeder. Sodium leaking from these circuits can be particularly dangerous because it reacts violently with both air and water. But the Commissariat at L'Energie Atomique (CEA) points out that there was no radioactivity released to the environment during the incidents, despite the damage caused. The most recent incidents involved leaks of only a few litres. Both took place in the second of Phénix's three steam generators, well away from the contaminated sodium in the primary circuit. The first came to light on 29 April when a routine check on sodium in the secondary circuit showed an abnormally high concentration of hydrogen in the liquid, indicating a reaction between sodium and water had taken place somewhere. The reactor was halted and the faulty generator drained. The next day, the same generator sprang a leak and released several litres of sodium. This caught fire on contact with the air, but the blaze was rapidly brought under control with a powder the CEA developed specially for extinguishing sodium fires. Though the powder easily coped with the few

litres of sodium that escaped, the CEA has no experience of dealing with larger releases.

UK plutonium worries US Senate, Deborah Shapley, *Nature*, Vol. 297, May 27th, 1982

US senators may soon start investigating the fate of as much as four tons of fuel-grade plutonium that the United Kingdom supplied to the United States over several years on the understanding that it would be used only for civilian purposes, but which may have been put into nuclear warheads by US authorities. The plutonium originated in the Magnox reactors of the Central Electricity Generating Board. Last October the two governments apparently agreed that the United Kingdom would resume providing plutonium to the US Department of Energy (DoE) to help directly with the DoE's programme for producing and modernizing US nuclear warheads. Under a previous barter agreement that ran from 1964 to 1971, the United States supplied the United Kingdom with highly enriched uranium for its nuclear submarine programme and with tritium for UK nuclear weapons. In return, the United Kingdom supplied an unspecified amount of plutonium from Magnox reactors. The terms of the accord have always been secret, but in 1964 a British government spokesman indicated that the United States had no intention of using the plutonium thus obtained for nuclear weapons. Now, however, Senators Gary W Hart (Democrat, Colorado), Alan K Simpson (Republican, Wyoming) and George J Mitchell (Democrat, Maine) seem likely to act on a request from a public interest group that they look into how much plutonium was shipped to the United States between 1964 and 1971. According to the Natural Resources Defense Council, existing US nuclear weapons utilize about 90 tonnes of plutonium (plus or minus 15 tonnes). Current weapons-grade plutonium production by DoE has run about 1.4 tonnes per year, but DoE wants to step this up to 2 to 3.5 tonnes annually. In October, the UK government allegedly agreed to send more plutonium to the United States. The British plutonium may be going to fuel the breeder at Clinch River so that fuel otherwise destined for the breeder can be diverted into nuclear weapons. John Moore, Parliamentary Under-Secretary of State at the UK Department of Energy, was questioned about the plan in March. DoE seems likely to continue to press the United Kingdom for more plutonium, because Senators Hart, Simpson and Mitchell have succeeded in cutting off another possible source — by a vote of 88 to 9, on 30 March, the Senate voted for an amendment to prohibit DoE from using spent fuel from commercial reactors for its nuclear weapons programme. The issue at stake is not only the historic separation between civilian and military nuclear programmes, but also the precedent that DoE is setting for other countries. Critics of DoE's plans argue that if the United States starts taking civilian spent fuel from its weapons programme, it will not have a leg to stand on when it tries to dissuade other countries from doing likewise.

Chemicals, Drugs, Health and Pollution

Toxic waste survey is promised, Pearce Wright, *The Times*, April 19th, 1982

The Department of the Environment is to obtain estimates of how much dioxin waste has been accumulated in Britain, where it is dumped, and what hazard it could be to water resources. The action on dioxin, the highly poisonous compound that came into public prominence when a chemical works exploded at Seveso in Italy in July, 1976, comes after the report of a tribunal set up by Derbyshire County Council. That inquiry examined the circumstances and consequences of the disposal of dioxin-contaminated waste in the wake of an explosion in 1968 at a Coalite company factory at Bolsover. In a report to the Secretary of State for the Environment, the tribunal confirmed that the waste had been deposited at an old open-cast mining site now restored to agriculture. The report recommended that the site should continue to be monitored and that the waste should never be disturbed. While accepting those recommendations, Mr Michael Heseltine, Secretary of State for the Environment, has rejected a request for a public inquiry into dioxin.

Chemicals pose foetus danger through father, too, Angela Singer, *The Guardian*, May 10th, 1982

Industrial chemicals can damage an unborn child through the father's contact with them at work as well as through the mother's exposure to them, according to research to be published later this year. The researchers also conclude that the potential dangers of at least 50 chemicals should be examined further. The authors of the report are Dr Sue Barlow and Mr Frank Sullivan, both from Guy's Hospital, London. Mr Sullivan, senior lecturer in pharmacology says that men were as vulnerable to reproduction hazards as were women. Development of the foetus depended on the sperm as well as the egg. Although the most likely effects would be infertility and abortion, the results could be malformation and post-natal effects such as cancer. The children of male anaesthetists, for example, have been known to suffer minor birth malformations. Studies of the effects in the workplace are unlikely in the near future, however. The Health and Safety Executive's deputy director of medical service, Dr George Sorrie, told *Health and Safety At Work* magazine: "It is not unlikely that many of the chemicals affecting women also affect the male reproductive system." But, he said: "the present state of basic knowledge, such as the quantity of sperm needed, is such that it is impossible to standardise this into epidemiological study."

New look at 2,4,5-T weedkillers, Hugh Clayton, *The Times*, May 17th, 1982

A cautious new assessment of possible links between cancer and 2,4,5-T weedkillers has been referred by the Government to the Advisory Committee on Pesticides. The committee was criticized by trade unions in 1980 when it cleared such substances for use in Britain, although they had been banned in other countries. Swedish research which the committee then considered of doubtful value is covered by the new study, published in *The Lancet* by Professor Ernest Acheson, professor of clinical epidemiology at Southampton University and Mr David Coggon of the Medical Research Council's environmental epidemiology unit. They say it seems possible that soft-tissue sarcomas have arisen in association with exposure to substances such as 2,4,5-T. They add that there is too little information to determine whether 2,4,5-T or its contaminant, dioxin, is likely to be responsible for any link with sarcoma, a rare type of cancer, and conclude that "it is as yet impossible to estimate with any precision" the risk of sarcoma from 2,4,5-T weedkillers. Professor Acheson and Dr Coggon say that neither Swedish nor American studies provide conclusive evidence that the incidence of sarcoma is increased by exposure to 2,4,5-T. "However when they are considered together, the whole becomes more persuasive."

Chemical crop spray blamed for 'gassing' villagers, *The Guardian*, May 17th, 1982

Chemical spraying on farm crops is blamed for causing illness to people living in a Midlands village. They suffered from inflamed eyes, wheezy chests, and skin rashes. People at Stretton-on-the-Fosse, Warwickshire, say that a gas cloud developed a few days after the spraying and settled round the village, which lies in a hollow. In a separate incident, 40 miles away at Ombersley, Hereford and Worcester, farm chemical spraying is believed to have caused the destruction of a million young plants in a nursery. In both cases selective weedkillers approved by the Ministry of Agriculture have been blamed. In the second incident, at Ombersley, Mr Norman Anderson, of Six Acres Nursery, lost nearly a million young plants, mostly lettuces and brassica. The chemical allegedly used in nearby fields is a "progressive" weedkiller of broadleaf plants not wanted in cereal crops. Mr Anderson claimed that it drifted on to his land after spraying. Within two days the plants in his nursery died and he was flooded with complaints from people to whom he had supplied plants. Ministry scientists have taken samples of plants, soil, and water for analysis. A Ministry spokesman said both sets of chemical allegedly used were approved by the pesticides advisory committee.

Pathologist admits asbestos test doubt, Andrew Veitch, *The Guardian*, May 1st, 1982

A senior pathologist has admitted that the normal method of examining the lungs of workers alleged to

have been killed by asbestos cannot detect fibres from the most common type. To win compensation, a pneumoconiosis panel has to be convinced there are enough fibres in the body to have caused the disease. Threequarters of the applications are rejected. The technique for assessing most of these applications cannot trace the short fibres from white asbestos. About 76,000 tons of this type of asbestos were imported into the UK last year. It can only count the longer fibres from blue asbestos (amphibole) and only a proportion of these, according to Dr Francis Whitwell, a consultant pathologist at Broadgreen Hospital, Liverpool, and a member of the Asbestos Research Council. Blue asbestos is effectively banned in Britain. Dr Whitwell was defending the technique following criticism from scientists at the World Symposium on Asbestos, in Montreal. They said conventional tests were misleading, and called for the use of electron microscopes. Dr John McDonald, professor of occupational health and safety at McGill University, Montreal, said: "What we see with the ordinary microscope is not the fibre that's causing the trouble." Dr Frederick Pooley, from University College, Cardiff, who has been rechecking lung tissue from workers whose cases had come before pneumoconiosis panels, said: "It is now generally accepted that reliable results of asbestos burdens in lung tissue can only be obtained by using electron microscopes." His colleague, Dr John Wagner, from the Medical Research Council's pneumoconiosis unit at Penarth, Glamorgan, said that unless electron microscopes were used, potentially dangerous fibres would be missed. Dr Whitwell replied that pathologists did not have the resources to conduct sophisticated tests. The Health and Safety Executive is urging the Government to halve the permitted level of white asbestos in factories.

Valium linked to brain damage, Christine Doyle, *The Observer*, April 18th, 1982

Brain damage similar to that found in very heavy drinkers and alcoholics is being discovered in people who have taken the popular tranquiliser Valium for long periods. Valium is among the world's most commonly prescribed drugs, and the new findings described by a British specialist at a conference at the US National Institute of Health provide further evidence for extreme caution in taking tranquilisers for more than short periods of time. Brain 'scans' on a small group of 20 patients who had been taking Valium for five to ten years reveal evidence of cerebral atrophy or neuronal 'drop-out', and brain shrinkage among other signs of impairment. Five of the 20 patients had normal brain scans. A further ten had chiefly normal scans but also had varying signs of some changes that might indicate impairment. The last five, however, showed what was described as "gross abnormality", which was very similar to changes in alcoholic brains. Professor Malcolm Lader, Professor Psychopharmacology at the Institute of Psychiatry in London, who carried out the study, insisted that his work is "very preliminary" and does not necessarily indicate cause and effect. He

calculates from available figures that there are perhaps 250,000 people in the United Kingdom and one million people in the United States who have taken tranquilisers for more than seven years. "If our figures are extrapolated, this could mean there are 100,000 people in the UK with funny-looking brains." One senior biochemist from Hoffman La Roche, makers of Valium, stated, "There is nothing wrong with these drugs when used correctly. I think such things should not be announced before one is really certain you have eliminated other reasons for the scans," Professor Lader replied: "We are well aware that our patients are a highly selected group. On the other hand, we cannot wait several years in order to conduct a prospective study to see if something is happening. These are very useful drugs when used cautiously, but we have seen patients who were put on Valium years ago for their anxiety, have had repeated prescriptions and have not seen a doctor since. I think we must now focus on the long-term effects."

Whitehall acts on cavity foam peril, John Coates and Deyan Sudjie, *The Sunday Times*, May 23rd, 1982

An investigation has been ordered by the Department of the Environment to find out how toxic gas, which affects the eyes, nose, throat and chest, can seep into homes through cavity walls that have been filled with heat insulating foam. Cavity walls have two walls, one inside and the other outside. Problems have arisen when formaldehyde gas given off by the urea-formaldehyde foam used for insulation leaks into rooms through the inside wall. Now scientists from the government's Building Research Establishment are to monitor 300 homes to find out how this happens. About 1¼ million houses and other buildings, including schools, have been insulated with this foam in Britain over the past 20 years. The 12-month probe has been ordered following concern about the toxic effects of formaldehyde. There have been reports that it can accumulate in dangerous concentrations in certain sorts of buildings for long periods. In the US, the use of urea-formaldehyde foam for cavity wall insulation has been banned because government scientists there have not been able to determine a safe limit of exposure to formaldehyde gas. Congress is discussing plans this week to help 500,000 American home owners with the cost of removing the foam.

DDT has no sting for Brazilian bees, *The Times*, May 11th, 1982

A species of bee has not only learnt to live with the DDT that is used to control malaria in the remote part of Brazil but is attracted to and collects the insecticide. The bees come to no harm but probably gain no benefit from their bizarre behaviour. The partiality of males of *Eufriesia purpurata* to DDT came to the attention of Dr Donald Roberts, then of the University of Brazil in Brasilia, and his colleagues there and at the United

States Army Environmental Hygiene Agency in 1978 while they were studying the ecology of the mosquito that carries the malarial micro-organism to humans. Five bees collected along the Ituxi river, which starts near the border with Bolivia in north-west Brazil, contained very high concentrations of DDT, particularly in the region of the pouches on the hind legs in which pollen is collected. A year later, scientists demonstrated that wooden boards sprayed with DDT attracted male bees and that large numbers of the bees visited the interior walls of the local residents' houses to collect the DDT that accumulated there from anti-malaria spraying operations. More recently Dr Roberts and his colleagues have captured, marked and recaptured bees collecting DDT to show that they survived the insecticide to return to their collecting grounds. Furthermore, if held in captivity, they lived as long as bees that had not been exposed to DDT.

Scandal of modern slums forces demolition, *The Sunday Times*, April 11th, 1982

Many thousands of council flats and maisonettes built only five to fifteen years ago are so badly constructed that they are unfit for human habitation and will probably have to be demolished at a cost of hundreds of millions of pounds. The flats, built in many parts of Britain, are made of concrete slabs and panels, stacked on top of one another like Lego. This building method, known as "system building", was introduced into Britain in the Sixties to meet the huge demand for new cheap, quality-built homes to replace slums. Now these new flats and maisonettes are as bad as or worse than the dank Victorian houses they replaced. The blocks are prey to damp on such a scale that people living in them say they suffer more from bronchial diseases, exzema and mental disorders than people in other types of dwelling — and local doctors back them up. On the Bransholme Estate in Hull, one of the Yorkshire Development Group estates, the tenant's action group discovered that 274 out of the 342 tenants they interviewed said their families were suffering from health problems claimed to be causes — or exacerbated — by living conditions. Many local authorities have already started demolishing their system-built homes, beginning in 1979 in Birkenhead, Merseyside, where two 10-storey blocks were blown up because of "problems of maintenance and social management". Their main problems was they leaked when it rained and nobody could make them watertight.

Record Dioxin Level Discovered in Trout from Lake Ontario, *Ontario Conservation News*, Vo. 9, No. 10, May 1982

The highest levels of the toxic chemical dioxin ever found in minnows and lake trout have been detected in tests conducted by Ontario's Environment Ministry in the Niagara River and Lake Ontario. The Ministry found that 11 large lake trout collected in the Port Credit area of Lake Ontario contained levels of dioxin averaging 27.4 parts per trillion, which is above government guidelines of 20 PPT of dioxin in the fish. Ontario

Environment Minister Keith Norton told the Legislature that adult males should eat lake trout only once a month, while women of child-bearing age and children under 15 should not eat it at all. Dioxin is one of the most toxic chemicals known to man — one two-hundredth of a drop can be fatal — and was produced as a by-product in the production of trichlorophenol by Hooker Chemicals and Plastics Corp. at Niagara Falls, N.Y. The U.S. Environmental Protection Agency says Hooker also buried many tons of dioxin-contaminated wastes in at least three dumps, all of which are known or suspected to be leaking into the Niagara River. The most significant finding of the study was the substantially elevated level of dioxin found in 3-month-old spot-tail shiner minnows caught in the mouth of Cayuga Creek which drains the Love Canal on the U.S. side of the Niagara River. The dioxin levels in the minnows averaged 59 PPT, which on Ontario scientist said indicates that dioxin is still flowing into the Niagara River. "It's fresh TCDD (dioxin)", said Allan Johnson, a trace contaminants specialist with the Ontario Environment Ministry. He said that Love Canal could be leaking despite the construction of an elaborate drainage ditch around it two years ago. Mr Johnson also said a lot of other creeks around Love Canal drain into Cayuga Creek and they are still contaminated. Mr Johnson argued that dioxin levels found in minnow samples at the mouth of the Niagara River where it flows into Lake Ontario "suggests other inputs, meaning there is more than one source of dioxin." He said that Ontario is worried that dioxin is leaking from two other old Hooker dump sites, the Hyde Park dump and the S Area dump, both of which are suspected of leaking into the Niagara River.

Clear risks, Jane Wynn, *Nature*, Vol. 297, May 20th, 1982

The British anti-lead lobby is flying high. Results now emerging from recent studies seem to be persuading scientific and medical opinion that the government should take further action on the lead content of petrol. Total elimination was advocated by many of the participants at an international conference organized in early May by the Campaign for Lead Free Air (CLEAR). Des Wilson, chairman of CLEAR, is confident that the conference was given conclusive evidence that the position of the government is becoming increasingly isolated and untenable. The Lawther report, he said, had been completely discredited. Professor Lawther now says that the elimination of lead in petrol did not conflict with the findings of his working party and that "if there were damn all, nobody would be happier than me." Professor Michael Rutter (Institute of Psychiatry, London), a member of the Lawther committee, came down firmly in favour of the elimination of lead from petrol: "the level of probability is such that I think it is worth acting on." CLEAR moves confidently into battle having already captured the support of the Labour party. The National Executive Committee pledged last month that a future Labour government would eliminate lead in petrol. CLEAR's sights are now set on the party conference where it is

confident of rallying support from the other opposition parties. While much of the new evidence is not yet published, the Royal Commission on Environmental Pollution has now also launched an investigation into lead. It has heard evidence from the British Medical Association (BMA) supporting the link between low blood lead levels and impaired mental function. The Royal Commission plans to investigate the sources of lead in the environment and its pathways to man. The commission also plans to "get to the bottom" of arguments about the technical and economic implications of reducing lead in petrol below that promised by the government last year. The commission may be confronted with strongly held opinions — Des Wilson described Associated Octel, the British company owned by Shell, BP, Chevron, Mobil and Texaco, which supplies the lead for petrol, as "the biggest mass child poisoners in the world today." The oil companies say, however, that they will co-operate with the government if it calls for a ban on lead in petrol. The buck has now been passed.

More dangers from asbestos and its substitutes, *New Scientist*, April 8th, 1982

Women workers exposed to asbestos may run a higher risk than normal of developing cancer of the ovary. A survey of 500 women who worked in a Nottingham gas-mask factory during the Second World War putting asbestos filters into masks shows that five of them had died of cancer of the ovary by 1978. Statistically, less than three deaths from this cause were expected in the group. B. K. Wignall of St George's Hospital and A. J. Fox of the City University, both in London, report this finding in the current issue of the *British Journal of Industrial Medicine* (vol. 39, p. 34). They say: "The excess of deaths from carcinoma of the ovary, unexpected at the start of the study, appears to be related directly to exposure to asbestos." Wignall and Fox traced 500 of the 535 women who worked in the Nottingham factory between 1939 and 1944. By the end of 1977, 133 of them had died. Far more of them than expected had died from cancer of the lung or mesothelioma (cancer of the lining of the lung or abdomen). Ten of the women died from lung cancer (fewer than four were expected to die from this disease) and 12 died from mesothelioma (fewer than one death from this cause was expected). Such dire consequences of working with blue asbestos were not unexpected; previous research had shown irrefutably that blue asbestos causes these diseases. But the discovery that five of the women died from ovarian cancer was a real surprise. The suspicion that asbestos might have been the cause of these deaths grew stronger when Wignall and Fox analysed their data more closely. Using old factory records (backed up by interviews with women who had worked in the factory and were still alive in 1971), they found that not all the 500 women they had traced had done jobs that involved exposure to asbestos. Some, for example, had merely stitched webbing on to the masks; none of the women who were not exposed to asbestos died from ovarian

cancer. Another paper in the same issue of the journal by Cynthia Robinson and other researchers from the National Institute of Occupational Safety and Health in the US suggest that alternatives to asbestos are not completely safe. The report indicates that one alternative (fibres spun from minerals or industrial slag) might cause cancer of the digestive system. The researchers traced 596 people who had worked in a Midwestern factory making mineral wool, and later on slag wool, between 1940 and 1948. By 1974, 15 of these workers had died from cancer of the digestive system. Only 11 or 12 were expected to have died from this disease. The difference is not statistically significant but it does suggest that mineral wool may not be harmless.

Kenyan farmers risk their lives for smokers, John Madeley, *New Scientist*, April 8th, 1982

A British tobacco company is endangering the lives of Kenyan farmers by supplying them with a pesticide that they cannot use safely. The pesticide is aldrin, which most Western governments either ban or severely restrict. The US Center for Disease Control says the chemical's suspected health hazards include "cancer damage to the foetus, nervous disorders." A spokesman for British American Tobacco (BAT) in London admitted that these supplies include aldrin, which is made by Shell. The leaflet that comes with the aldrin, prepared by a local company called Crop Protection Chemicals, explains that the pesticide is "safe to use if precautions are followed". The precautions are: "Keep away from children and avoid contaminating rivers and streams. Always wash with soap and water after use. Symptoms of poisoning include headaches, dizziness, nausea and shivering — consult a doctor immediately." In the West it may be easy to take such precautions. In Kenya the precautions are difficult, if not impossible, to observe. Much of Kenya's tobacco grows in the remote rural areas of Meru, Bungoma, Busia and South Nyanza. Soap is often unavailable, and some farmers in very remote areas have probably never seen a doctor in their lives: let alone one they could consult "immediately". The instructions are printed in English and Swahili but there are at least 15 languages in Kenya, so even if the farmers can read, there is no guarantee that they will understand the instructions. Of wider concern is the effect that aldrin and other pesticides could have on village water supplies. Most tobacco farms are in comparatively hilly regions where chemical run-off is common. The head of the Environmental Liaison Centre in Nairobi, Celestous Juma, says: "It is just not possible to stop chemicals getting into the water supply." The pesticide trade in Kenya raises the issue of the morality of multinational companies selling and using chemicals that are banned in their home countries. Britain is one of the largest exporters of pesticide to developing countries, supplying 12 per cent of the world market. The British charity Oxfam is about to publish a book which claims that this trade is putting the health of millions of farm workers at risk — and killing thousands every year.

Chemical mix-up contaminates Michigan people, *New Scientist*, May 6th, 1982

A study of scientists at New York's Mount Sinai School of Medicine shows that 97 per cent of the state's population has been contaminated with polybrominated biphenyls (PBBs). The source of the poisoning was an accident in 1973: the Michigan Chemical Corporation accidentally mixed "Firemaster" flame retardant with "Nutrimaster" feed for dairy cattle. Before the mix-up could be discovered months later, milk and livestock had been contaminated. Five years later, when the Mount Sinai study started, tissue samples in 844 subjects showed PBB levels up to 36 parts per million, with a mean of 0.4 ppm. Blood from another 1681 adults and children showed that 70 per cent of them were contaminated, but at much lower levels of about 1 or 2 parts per billion. The contamination was worse in children and men: children might have drunk more contaminated milk and men have less body fat over which to distribute PBBs than do women. "It was disastrous for the farmers," said the leader of the Mount Sinai study, Dr Mary Wolff. In addition to the economic loss they suffered, it is now clear that farmers have the highest levels of contamination, and over the next 20-30 years could begin showing higher rates of cancer (if the responses of laboratory rats to small doses of PBBs hold true for humans). "The study shows that, from a point source, such a chemical is persistent and spreads... across a larger area," Wolff told *New Scientist*. The study also found varying amounts of polychlorinated biphenyls (PBB) and metabolites of the pesticide DDT in the state's population.

Wildlife and Conservation

Dam threatens Malaysia's national park, Ziauddin Sardar, *New Scientist*, May 6th, 1982.

Anger is mounting in Malaysia over the government's decision to flood part of the peninsula's only national park under 60 metres of water. In February, the government announced its decision to dam the River Tembeling to create a 130-square kilometre lake in the Taman Negara National Park. The idea is to provide hydroelectric power — but environmentalists say that the project will destroy the valuable plant and animal life of the area, including some of the oldest forest in the world. Most of the Malaysian forest, reckoned to be 130 million years old, has already been cut down for timber. The Taman Negara is the only place in mainland Malaysia where the forest is protected. The region is also the home of many rare and valuable species of animals. Among the park's wildlife are 250 species of birds, the seladang (wild ox), two types of deer, tapir, tiger, leopard, sun bear and Sumatran rhinoceros. There are primates: gibbons and monkeys, and reptiles such as monitor lizards. The chairman of the Malayan Nature Society, Kiew Bong Heang, said:

"Most of Malaysia's wild animals and flowers are of the lowland species. Damming the Tembeling River could affect more than 70 per cent of the lowland fauna and flora." The flora range from lowland dipterocarpaceous forest and riverine vegetation near Mount Kuala, through the oaks and laurels of intermediate altitudes, to the upper mountain ericaceous vegetation near the summit of Gunong Tahan, the peninsula's highest mountain. The dam will displace the Orang Asli, indigenous Malaysians whose numbers are dwindling along with the jungle in which they live. Malaysian anthropologists believe that resettling 3000-5000 Orang Asli away from deep jungle to open land will destroy their culture and lifestyle. Mohammad Taib Osman, of the University of Malaya, argues that the dam represents a serious threat to their way of life: "When the plan materialises, the Orang Asli area will be submerged... the traditions that are embedded in their way of life and related to their physical environment would be lost." Another fear about the project is that it could spread disease. In recent years there have been some isolated cases of schistosomiasis, which is spread by water snails, in Malaysia and in neighbouring Thailand. The snails that spread the disease thrive in still or slow-moving water — which the dam would provide. There have been no cases of the disease in the area so far — but autopsies showed up cases in 1978 nearby.

Water Buffalo: Neglected, Misunderstood, Colin Norman, *Science*, Vol. 215, March 19th, 1982

Although some 130 million water buffalo plow the rice paddies of Asia, haul vast quantities of goods, and provide an important source of meat and milk, they are a neglected resource, according to a report published by the US National Academy of Sciences. They may also be among the world's most misunderstood animals, at least as far as Westerners are concerned. The water buffalo would also benefit from a wider appreciation of its economic and social importance — especially among development planners who often seem more intent on replacing water buffalo with tractors than on enhancing their usefulness. They provide 70 per cent of the milk consumed in India, two-thirds of the meat in the Philippines, and more meat in Egypt than any other domestic animal. In South China, Thailand, Indonesia, Malaysia, the Philippines, and Indochina, they supply 20 to 30 per cent of the agricultural draft power; for many families, the water buffalo is essential for raising food crops. They even provide a key ingredient of pizza-mozzarella cheese comes from water buffalo herds in southern Italy. The water buffalo however is not without problems. Some of the prime breeding stock is fast disappearing, because farmers often castrate the biggest bulls and use them as draft animals or send them to slaughter. Moreover, because of the relative scientific neglect of the beast, little is known about its reproduction and genetics. The report thus says that urgent action is needed to preserve outstanding buffalo specimens and learn more about the animal's genetic potential.