

The Ecologist Digest

Nuclear Power: Bombs, Accidents, and the Arms Race

Nuclear Power Costs, *Environment* (Spectrum Section), December 1981, Vol. 23 No. 10.

In Austin, Texas, voters have overwhelmingly decided to end their participation in a four-city nuclear plant project that is currently six years behind schedule and four to five times (\$3-4 billion) over its original budget; a similar ballot measure was narrowly defeated two years ago. In Washington state, voters passed an initiative measure which requires public agencies to secure voter approval before issuing bonds to finance the construction or purchase of utility plants generating 25MW of electricity or more. Prior to adoption of the initiative, the Washington Public Power Supply System could issue revenue bonds without public consent. The initiative resulted from the supply system's decisions (in 1969 and 1974) to build five nuclear plants. This project has incurred huge cost overruns and is at least 6 years behind schedule; the total cost was to have been \$4.1 billion, but it is now estimated that it would cost at least \$24 billion to finish all five plants. Power rates have risen as much as 500 per cent during the past three years for some large industrial users in the area. Six billion dollars in bonds have already been issued and must be repaid by power consumers even if no power is ever produced by the plants.

Nuclear Wastes strewn across Moruroa Atoll, *Not Man Apart*, February/March 1982.

Disregarding government regulations which bind them to secrecy, French civil engineers stationed on Moruroa Island in Polynesia have revealed to the Australian press that plutonium and other radioactive debris stored on one of the Atoll's beaches had been swept out to sea by storms earlier in 1981. The island is the home of the French nuclear bomb testing program. According to the engineers the debris had been on the beach since 1975, when several pounds of plutonium dropped on the beach during safety design tests. The plutonium 239, which has a half-life of 24,400 years, was covered with cement and slated to be cleaned up at a later date. Since that time, radioactive wastes, including irradiated clothing and equipment stored in steel

drums and vinyl bags, have also been dumped on the beach. Before the first of a series of storms hit in March 1981, the waste heap was said to measure 90,000 square feet. On the morning after the tropical storm, the beach was strewn with ripped vinyl bags and pieces of asphalt containing the plutonium. In addition, barrels of radioactive wastes were floating in the lagoon. The civil engineers claim that because of the mounting pressure of an escalated nuclear arms race, the French stopped sealing off their radioactive wastes in drums and sinking them 900 feet into the earth, as required by international law. They believe these procedures were abandoned in an effort to save time and money.

Leak alert at N-plant. *The Guardian*, 26th January 1982.

Radioactive steam leaked from a nuclear power plant at Ontario, in New York state, on January 26th 1982, prompting officials to shut the plant down and declare a "site emergency". A site emergency is the second highest nuclear emergency classification. A spokesman for Rochester Gas and Electric which owns and operates the R.E. Ginna nuclear plant, said that a small release of radioactive steam through a plant vent has now been stopped and the reactor was being cooled down. He said some radioactive water had spilled on to the containment floor of the 470-MW pressurised water reactor. No radiation has been found outside the plant.

Widow of A-plant welder to sue firm, *Angela Singer, The Guardian*, 24th November 1981.

The widow of a 27-year-old man who died of myeloid leukaemia after working at a nuclear power station for 13 weeks is to sue her husband's employers. Damages are being sought from the engineering contractors, Babcock Power Limited (part of Babcock and Wilcox) and the Central Electricity Generating Board. Mr. Grahame Turner, a welder, worked at Bradwell power station in Essex from July to October 1979. He died in August, 1981. Mr. Turner worked at Bradwell replacing brackets to the bellows on the cooling system for one of the two reactors. Welding flaws in the cooling systems for both reactors were the reason for Bradwell's being shut down last year. Faults were found in the main gas ducts for the gas used in the cooling circuits. In a statement to his solicitors shortly before he died Mr. Turner said that he had always been a fit and healthy man, and had led an active sports and social life. "I never had any serious illness of any kind. I was perfectly fit

until I went to Bradwell," he said. A survey published this summer in the *New England Journal of Medicine* suggested an unexpectedly powerful ability of low-level radiation to induce leukaemia. Another study of the effects of atomic weapons dropped on Hiroshima and Nagasaki indicated that low-level radiation might be three to five times more dangerous as a promoter of cancer than previously believed. Mr. Turner's widow, Jacqueline, a nurse, is being supported in her claim by her husband's union, the Boilermakers' Society.

Nuclear leak blamed on fuel rod error, Nicholas Timmins, *The Times*, 12th November 1981.

A mistake by staff at the Oldbury-on-Severn nuclear power station, near Bristol, was partly responsible for a radiation leak at the nuclear reprocessing plant at Windscale, Cumbria in October. The leak led to the plant, now renamed Sellafield, being closed for 24 hours, and contaminated milk on farms near by. The board said that nuclear fuel rods, which had just been removed from the reactor, were wrongly sent to Windscale. They should have been stored for at least 90 days before dispatch, to allow short-lived radioactivity to die away. As a result the fuel was more radioactive than it should have been when it was reprocessed, resulting in the release of more than seven curies of radioactive iodine. British Nuclear Fuels Ltd, which runs the Sellafield plant, yesterday refused to say whether it normally checks fuel to make sure it is not too radioactive for treatment before putting it into the reprocessing line. The generating board said the error occurred because newly discharged fuel was stored in a skip in a cooling pond alongside the area where fuel ready for reprocessing has its outer skin stripped off before dispatch to British Nuclear Fuels. Seven newly discharged fuel elements were taken in error from the wrong skip and mixed with a consignment of 200 fuel rods that were ready for dispatch. Six of those fuel rods went into the reprocessing line at Sellafield on October 4, 27 days after they had come out of the reactor, resulting in the release of radioactivity.

Council warned on reactor plan safety, Richard Norton-Taylor, *The Guardian*, 19th October 1981.

An accident in a pressurised water nuclear reactor (PWR) in Britain would produce 10 times as many casualties as one in the United States, the Friends of the Earth have told Suffolk County Council. The Friends of the Earth report on the PWR's safety problems, based on one drawn up by the Nuclear Installations Inspectorate, says that two years ago the inspectorate noted that the assumptions in American studies on evacuation of the population would probably not be practicable in Britain because of its higher population densities. For these reasons, says FOE, a British PWR should have far higher safety standards than American designs. Yet for financial reasons, the CEBG recently accepted a

much cheaper design than the one originally proposed. This will be based more closely on traditional American standards. The Friends of the Earth now suggest that the Government is "playing off safety considerations against cost, and giving more weight to the latter."

Bleak future for German nuclear industry, Siegfried Buschschluter, *The Guardian*, 3rd October 1981.

West Germany's nuclear power industry faces a prolonged period of uncertainty with potential cuts in capacity, temporary shutdowns and even complete closures. These bleak prospects affect not only existing reactors but also research and development projects, such as the fast-breeder reactor at Kalkar on the Lower Rhine and the high-temperature reactor at Schmehausen. While the fast-breeder project has been affected by delays in construction and a rise in costs, conventional boiling water reactors still have unresolved problems of waste disposal and reprocessing. Originally put at DM1.5 billion the development cost of the Kalkar reactor is now expected to rise over DM5 billion. The Bonn Government has told the electricity-generating industry it would have to bear a higher share of the total cost if the project was to go ahead. Since this has been rejected by the utility companies, a temporary shutdown of the project is likely. Three separate developments have given the nuclear waste disposal problem a new twist. The French Government has imposed a moratorium on reprocessing foreign nuclear fuel rods at the La Hague plant in Brittany. This could affect the operation of four German atomic power stations. An administrative court in Luneburg, North Germany, ordered an end to building work at a proposed intermediate deposit for highly radioactive nuclear fuel at Gorleben. And an administrative court in Darmstadt ruled that no quantities of spent fuel rods should be deposited in nuclear power stations because atomic reactors were intended to produce electricity and should not be used for storing fuel elements. The combined impact of these developments is likely to lead to the shutdown of several nuclear power stations in West Germany. Mr. Harald Schaefer, Social Democratic chairman of the Parliamentary Commission on "future nuclear energy policies," warned yesterday. The suspension of reprocessing at La Hague is potentially the most damaging blow to the German atomic power industry. Five hundred and thirty-five fuel elements with a total weight of 191 tonnes were scheduled to be sent to the French reprocessing facility this year. Of these, 127 tonnes have already been delivered. If the remaining 64 tonnes are not reprocessed, it would affect operations of four atomic power stations — at Biblis, Wuerigassen, Stade, and Unterweser. Another embarrassing setback for the nuclear power industry came with the ruling by the Darmstadt administrative court that spent fuel should not be stored on the site of atomic power stations in large quantities. The court rejected a decision by the Hesse Economics Ministry allow-

ing operations of the Biblis Nuclear Power Plant to store spent fuel on the premises for up to six years. If the reactor cannot be equipped with fresh fuel there would not be enough space to store spent fuel elements, and eventually it would have to shut.

Some of our uranium is 'missing', *New Scientist*, 12th November 1981.

A long-standing error in uranium prospecting techniques may mean that the world's uranium supplies are not quite as plentiful as had been supposed. Members of a working group of the OECD's Nuclear Energy Agency believe they have discovered discrepancies of up to 20 per cent in the calibration of probes that log gamma radiation in bore-holes for assessing uranium deposits. Such probes help to detect uranium in sandstone deposits, which account for about half of the world's known resources. Just how much uranium supplies have been overestimated is difficult to calculate. Tentative estimates put the amount of uranium which will be "lost" as a result of the discovery at five per cent or more. But the main impact may be on private firms which have committed themselves to extracting uranium from "marginal" deposits. Many American deposits are regarded as only just profitable, so the impact on supplies could be more serious if companies pull out of ventures which now look uneconomic.

Problems of Waste Disposal, Ted Harrison, Special to *The Ecologist*.

The claim by the pro-nuclear lobby that the long-term disposal of radioactive waste is a problem that is all but solved was strongly challenged in September by one of the nuclear industry's most distinguished supporters. Professor John Prentice, head of the geology department at King's College, London, told an international conference on safety and the environment that to devise a totally safe repository for active wastes will test scientific skills to the utmost. While saying that he thought the task was not impossible, he said, "It will demand sustained and collaborative effort by geologists, mineralogists, chemists, physicists, metallurgists and engineers. The waste generated by nuclear power stations differs from other wastes in that no treatment, chemical, physical or organic is known which will in any way modify the process of radioactive decay; only time, and in some cases a very long time, will reduce the hazard arising from this. Since it is not easy, and perhaps impossible, to define what levels of radioactive release to the environment are non-hazardous, dilution is probably not acceptable as a method of disposal. We are forced back, therefore, to containment." The greatest hazard to subsurface waste disposal, Prof. Prentice said was the movement of groundwater. Although movement was predictable in the short-term, things could change in

the longer term with changes in climate. Dramatic climatic changes, resulting in glaciation and deglaciation, have taken place very recently, on a time-scale measured in thousands and not millions of years. "The extension of the permafrost zone would totally change the pattern of groundwater circulation . . . and the effect of glaciation is known to accelerate erosion of the land-surface so that areas of softer rock could be scooped out to depths of hundreds of metres." Prof. Prentice argued that although high active waste could be kept on the surface in Britain for a number of years yet, the scientific work to find out how best to dispose of it should be carried out now, so that when the waste is finally disposed of, it will be in circumstances that will be as safe as possible. "It is arguable," he said, "that the greatest disposal problem is created by the class of intermediate wastes arising from filtering, scrubbing and effluent treatment processes. This arises in relatively large volumes and is significantly active. A special problem is created by intermediate wastes which are contaminated by plutonium."

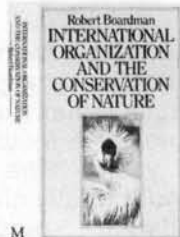
Thornburgh gets a hearing, Eliot Marshall, *Science*, Vol. 214, 9th October 1981.

When Pennsylvania Governor Richard Thornburgh came to Congress on 22 September to ask for money, he urged his listeners not to think of his request as a form of "charity" or a "bailout." He wanted financial help for the utility that must clean up the damaged nuclear reactor at Three Mile Island. This is not an onerous duty, Thornburgh said, but a national opportunity "that no one . . . can afford to lose." It is a chance to finance a "national college of nuclear crisis management." Thornburgh pleaded: "Our college is going broke, Mr. Chairman, and it needs help in the form of tuition." It will cost \$1 billion or more to clean up the damaged reactor. The insurance funds are beginning to run out, and roughly \$800 million worth of cleaning remains to be done. The local utility, Metropolitan Edison, cannot support the work. Its parent company, General Public Utilities (GPU) of Parsippany, New Jersey, is financially pinched as well and is paying for the cleanup at a slow pace. The rate-setting commission in Pennsylvania refuses to increase charges to electric customers to cover these costs. As a result, the governor took it upon himself to propose a plan for joint financing of the cleanup, to be shared by the federal government (\$190 million), GPU (\$245 million), the nation's electric and nuclear industries (\$190 million), Pennsylvania (\$30 million), and New Jersey (\$15 million). Although the hearing resolved none of the financing problems, it demonstrated clearly that Congress is in no mood to lend a helping hand. The committee members agreed that something must be done soon to clean up the mess at Three Mile Island and to remedy the generally underinsured condition of the nuclear electric industry. But no one suggested that Congress would lead the way.

The Ecologist Recommends

International Organisation and the Conservation of Nature

by Robert Boardman
(Macmillan Press)
£15.00 No. ER 1211

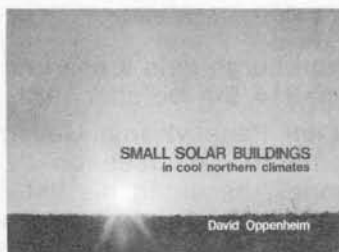


Many wild species of fauna and flora are already extinct. With other disappearing, the world habitats being eroded at an alarming rate, a thoughtful look at the activities of international conservation bodies is especially timely. Robert Boardman traces the history of international conservation from the scientific congresses and pressure groups of the nineteenth century to the global and regional strategies of the 1980s, and assesses the impact of the work of governmental and non-governmental agencies on state policies and international law.

Conservation in the Arctic and Antarctic, environment and development issues in East Africa, and migratory bird protection are the subjects of three case studies.

Small Solar Buildings in cool northern climates

by David Oppenheim
(The Architectural Press Ltd)
£12.95 No. ER 1213



There is a growing interest in the exploitation of solar energy as one of the options available to the building designer. Unfortunately the vast majority of the available texts cater exclusively for buildings in warm, sunny climates, with little reference to the much more difficult problem of how to exploit the sun in cool, temperate zones. This book fills a distinct gap by addressing itself to the latter problem in a very practical way.

Dry Lands Man and Plants

by Robert and Marina Adams
and Alan and Ann Willens
(The Architectural Press Ltd)
£15.00 No. ER 1215



Over a quarter of the world's surface is arid or semi-arid, and this total is increasing sharply as the result of climatic change and growing pressures from an expanding and hungry world population. Man himself is contributing alarmingly to the continuous depletion of the stock of usable lands through unconsidered exploitation: fertile areas are degrading rapidly and marginal ones are turning into deserts. This book shows how the threats to such fragile territories can be arrested, controlled and reversed

The Footpaths of Britain A Guide to walking in England, Scotland and Wales

by Michael Marriott
(Queen Anne Press)
£8.95 No. ER 1212

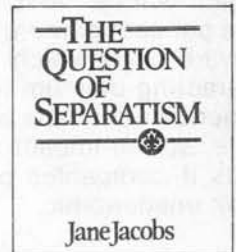


Britain is a walker's paradise. A huge network of footpaths in every part of the country leads the walker through a wide variety of landscapes often along routes established since the Middle Ages or even earlier. Michael Marriott has written this practical guide to our footpaths from the South West Coast Peninsular walk round Land's End to the Scottish Highlands and Islands.

The book has detailed, up-to-date information on the walker's basic needs, accommodation, sampling facilities and places of interest on and around each footpath. *The Footpaths of Britain* also contains 60 specially commissioned maps of each path based on the latest revisions of the Countryside Commission.

The Question of Separatism

by Jane Jacobs
(Junction Books Ltd)
£9.95 No. ER 1214

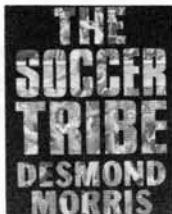


In her first book for more than a decade, the author of *The Death and Life of the Great American Cities* addresses one of the dominant political issues of the day. What happens when the people of a region or province consider the possibility of seceding from their mother country?

through the careful management of dry-land ecosystems. It examines the characteristics of arid and semi-arid environments throughout the world and describes the kinds of vegetation they are able to support. Drawing their lessons from nature, the authors show how indigenous vegetation can be used to create developments which are self-sustaining in the long run, based on an approach that works with nature rather than against it.

The Soccer Tribe

by Desmond Morris
(Jonathan Cape)
£12.50 No. ER 1216



Football has rituals and ceremonies, superstitions and beliefs just as remarkable as those of any primitive culture. This book looks in detail at the 'soccer tribesman' and the increasingly important role that the sport has to play in modern society. The book includes sections on: Tribal ritual (the taboos and punishments; the tribal heroes; the tribal trappings (the banners and badges, the trophies and medals); the tribal elders (the directors and referees); the tribal followers; and the tribal tongue (the chants and slogans, the cheers and curses).

Three Mile Island The hour-by-hour account of what really happened

by Mark Stephens
(Junction Books Ltd)
£4.95 No. ER 1218



It is now over three years since the attention of the world was rivetted to a previously unknown town in Pennsylvania where, for more than a week, experts grappled with the problem of averting a major nuclear disaster involving the No. 2 reactor at Three Mile Island. Mark Stephen's book at last provides a readable and comprehensive account of the many faceted events unfolded during those days dealing, as it does, with both the technical and institutional factors operating before, during and in the aftermath of the accident. The author's involvement with the Public Information Task Force, which reported on the role of the media in portraying the accident, has placed him in an eminent position to produce such a work and the task has been executed with an all too rare combination of good journalistic style and technical accuracy.

Waste Recycling for Energy Conservation

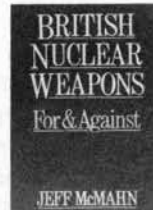
by David Kut and Gerald Hare
(The Architectural Press Ltd)
£25.00 No. ER 1220



The cost of disposing of society's rubbish has reached such huge proportions that the recycling waste, which conserves both energy and raw materials, makes increasing economic sense. This book is intended as a practical guide to the why and how of waste recycling for public authorities, engineers and architects, and for plant operators and supervisory personnel; indeed for anyone involved in the planning and operation of recycling and recovery plants.

British Nuclear Weapons For and Against

by Jeff McMahn
(Junction Books Ltd)
£9.95 No. ER 1217



This book is exceptional in the highly polemical literature of nuclear weapons. In terms readily intelligible to the ordinary reader, the author breaks down the policy alternatives and adduces the arguments which bear on the question: should Britain disarm? Often he shows that the problem is much more complicated than either side is inclined to recognise. The book concludes that there is no case for Britain retaining nuclear weapons and this position is reached by clear and rigorous argument. A book on nuclear weapons that does not preach to the converted—and which deserves to make converts.

Common Plants as natural Remedies

by Cynthia Wickham
(F. Muller Publishers)
£7.50 No. ER 1219



Many wild plants have beneficial qualities which were once well known and valued and are now being rediscovered. This book gives an account of the healing and nutritional properties of some sixty such common plants and their uses, particularly in herbal medicine and homeopathy. Most of these plants offer an inexpensive treatment for minor ailments, or have tonic or cosmetic properties. Recipes, tisanes or other concoctions are given for those species which are benign and safe to use.

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Los Alamos loses a contaminated worker, *New Scientist*, 22nd October 1981.

Security officials at the Los Alamos National Laboratory in New Mexico, one of the US's top weapons laboratories, are puzzled at how a worker contaminated with plutonium managed to leave the site without being detected. The breakdown in security occurred after a "potentially significant" accident that exposed 18 workers to deadly plutonium dust last week. The accident happened like this. A worker in a research laboratory sliced up a metal canister that had held plutonium and during the day 17 other laboratory workers were exposed to the radioactive particles released. In all, 11 were actually contaminated: all but one received insignificant doses. But the worker who handled the canister is still under observation. Officials say he could have received more than the maximum lifetime body burden of plutonium allowed — 40 nanocuries. Another contaminated worker left the site before the accident was discovered. A spokesman for Los Alamos said they did not know how this worker managed to leave undetected. He speculated that either the monitors were defective or the worker deliberately evaded them. Once outside, the worker contaminated a car and the home of a friend where he spent the night. The next day, a decontamination team from Los Alamos tracked him down and found that he had received a relatively minor dose.

Poseidon missiles 'liable to explode accidentally', Harold Jackson, *The Guardian*, 24th November 1981.

Highly secret tests conducted at the Lawrence Livermore laboratory in California have shown that the conventional explosive in the warheads of many Poseidon missiles can be set off by a tiny impact — in some cases by a drop of as little as 15 inches. In a recent accident at the Holy Loch submarine base, one of the missiles was reported to have fallen 17 feet while being winched on to the USS Holland. Any nuclear warhead must be triggered initially by a conventional chemical explosion. The chemical explosive in the Poseidon — known as LX-09 — was described in an assessment made by the laboratory as "sensitive and potentially dangerous." A development programme "to produce a safer, high energy explosive" was recommended in the early 1970s but there are still hundreds of Poseidons carrying LX-09. Major-General William Hoover, director of military application at the US Department of Energy, said that replacement of the explosive could take another "three to five years." The volatility of the explosive was revealed after it had accidentally ignited at the factory where most of America's nuclear warheads are assembled. Three men were killed in bay 11-14A on two different explosives, LX-09 and LX-14. The LX-09 was being machined on a lathe when one of the workers struck it with a rubber mallet — a practice approved under the standard safety regulations. The widows of the victims sued for compensation and much of the information about

the properties of LX-09 emerged in the subsequent court actions. The actions ended in October with the court holding that, for technical reasons, the Government was not liable for the men's deaths.

Grand Jury probes faked safety tests at Three Mile Island, *Not Man Apart*, December 1981.

Allegations by a former control room operator of deliberate test-result falsifications at the Three Mile Island reactor, have led to a federal grand jury investigation in Harrisburg, Pennsylvania. In May 1979, Harold Hartman told investigators from the Nuclear Regulatory Commission that safety valves at the plant were leaking profusely for at least three months prior to the accident. He said that test results "had to be fudged every time . . . we had to do something to make it right." When he told supervisors about the leakage rates, Mr. Hartman said he was told to "get a good leak rate", which probably does not mean a bounteous one, lest the reactor be shut down. NRC safety officials forwarded the allegations of falsified reports to the Justice Department in early 1980, and the wheels of justice have led to the current investigation.

Military Grapples with the Chaos Factor, William J. Broad, *Science*, Vol. 213, 11th September 1981.

The US Joint Chiefs of Staff have drawn up a \$7-billion wish list that addresses one of the most intractable and poorly understood of all the perceived deficiencies in the national defence; the lack of reliability of the military's systems for electronic command, control, and communications, especially under conditions of nuclear war. Within the military and the Congress, there has been growing awareness of the systems' vulnerabilities. And last month, the General Accounting Office, a long-time critic of the present military systems, issued a report calling them fragile and inflexible. A prime cause of the vulnerability of present communications systems is electromagnetic pulse (EMP), which occurs in the aftermath of a nuclear explosion. Defence strategists say a single Soviet warhead detonated 200 miles above Nebraska would blanket the United States with an EMP of 50,000 volts per meter, shutting down the power grid, performing an electromagnetic lobotomy on computer memories, and knocking out unprotected communication systems from coast to coast (*Science*, 29 May, p.1009; 5 June, p.1116; and 12 June, p.1248). The chaos produced by EMP would make it difficult if not impossible for the President to contact and direct the strategic U.S. nuclear forces. High-altitude EMP was discovered nearly two decades ago, but the dimensions of the threat have been slow to dawn on Pentagon planners because of the evolution of technology. Military awareness of the EMP threat has always lagged a constant distance behind the

increasing vulnerability of technology spun off by the semiconductor revolution. During the late 1970s, it was discovered that integrated solid-state circuits are 10 million times more likely to be knocked out by EMP than are vacuum tubes.

Chemicals, Drugs, Health and Pollution

Warning on over-use of antibiotics, *The Times*, 27th November 1981.

The World Health Organization (WHO), in a warning about the growing danger of a world-wide recrudescence of infectious diseases such as acute pneumonia, meningitis and cholera, is calling for an end to the excessive use of antibiotics, which has led to the development of resistant bacteria. Dr. Stuart Levy, Professor of Molecular Biology and Microbiology at Tufts University Medical School, Boston, said that laboratory tests showed a three-fold increase in intestinal resistant bacteria over the past five years. WHO, a United Nations agency, is drawing up recommendations for curtailing application of antibiotics, including doctors resisting "social persuasion" in prescribing. For pharmaceutical companies, Dr. Levy said, this means "certain drugs will not be used to the same extent". Dr. K. B. Sharma, of Lady Hardinge Medical College, Delhi, said they had found resistant bacteria in 80 per cent of hospital patients and 60 per cent of staff.

Cadmium in Denmark, Spectrum Section, *Environment*, Vol. 23, No. 8, October 1981.

A two-year study of cadmium by the Danish Environmental Protection Agency has resulted in a wide-ranging report on the problems created by this toxic metal. Of special concern to the authors of the report is the growing amount of cadmium pollution in agricultural soils and, therefore, in the food supply. Cadmium is harmful to human lungs, bone tissue, and specially kidneys. It can contribute to high blood pressure and cancer and, because it is excreted only very slowly, it continues to build up indefinitely in the body. The pollution of agricultural lands with cadmium comes primarily from atmospheric fallout — 18 tons, about one-third of which is from foreign sources. Another 8 tons enters the soil directly through application of commercial fertilizers. Based on current consumption trends, the study projects an increase of 0.8 per cent annually of cadmium in the soil. This would mean that 200,000 Danes would attain critical cadmium concentrations within the next 100 years.

Tobacco Barons and Health reshuffle, Adam Raphael, *The Observer*, 15th November 1981.

During the negotiations a year ago between the Government and the tobacco industry on the latest voluntary agreement on tobacco advertising, Sir George Young was approached by Conservative whips and warned that if the companies were driven too far against the wall, the industry's support for the party would be in jeopardy. The tobacco companies are estimated to spend more than £100 million a year in promoting their products. A fair slice of the promotional budget goes on sports and other forms of sponsorship, which the industry has found to be the most convenient way of getting round the ban on television advertising imposed under the provisions of the 1964 Television Act. Pressure from the Department of Health, led by Mr. Jenkin and Sir George Young was however threatening to restrain this escape route, much to the industry's chagrin. In July, however, there was an informal conversation at a Downing Street reception between the Prime Minister's husband, Mr. Denis Thatcher, and the Minister of State for Health, Dr. Gerard Vaughan, in which Mr. Thatcher suggested that the Health Ministers should realise that sport would be hard hit if tobacco sponsorship were threatened. Dr. Vaughan reported this conversation with the Prime Minister's husband at the department, and recommended that Ministers should take a more relaxed view about the whole issue of tobacco sponsorship of sport. When Downing Street was asked why Mr. Thatcher had intervened with a Minister in this way, the Prime Minister's political liaison officer, Mr. Derek Howe, said that it was not the practice to confirm or deny private conversations, but Mr. Thatcher had a life-long personal interest in sport and expansion of sports facilities for young people. Someone who keeps a critical eye on the parliamentary manoeuvres of the tobacco lobby is Mr. Michael Daube, a senior lecturer in health education at Edinburgh University and a former director of Action on Smoking and Health (ASH). He told me last week: "I can see no other conceivable reason for moving Sir George Young and the other Health ministers, apart from the fact that they were getting much too close to success."

Antibiotic level in milk highest in Europe. *The Guardian*, 27th January 1982.

The level of antibiotics found in British milk is higher than in any other European country according to a report commissioned by the agriculture minister, Mr. Peter Walker. The report also claims there is a danger that pesticides used in crop spraying get into milk through cattle feed. At present there are no tests to detect pesticides, and tests for antibiotics and sediment — of soil and dung — are carried out on a random basis so some contaminated milk is sold for public consumption. At present the Milk Marketing Board fines farmers from 5p a litre for a first offence to 9p for a third and subsequent

offences if antibiotics are found in their milk. "We are not convinced that consumers' best interests are being served by ignoring the possibility of pesticide contamination", said Dr. Janet Cockcroft, the Committee's chairman. "More and more pesticides are now being used by farmers and the likelihood of contamination is there, but no tests at all are being carried out. We are also concerned that the incidence of mastitis is still very high in this country, and the need to use antibiotics could be greatly lessened by good husbandry and scrupulous hygiene." Mastitis, a disease of the udder, is endemic in most dairy herds in Britain. The MMB asks farmers to withhold all milk from cattle that have been treated for it with antibiotics. But this involves a loss of income, while to send contaminated milk for sale means a fine at worst. "We believe the MMB should refuse to pay anything for contaminated milk, and that this would lead to a tightening up of control by farmers", said Dr. Cockcroft.

Grim Future for Polluted Rivers, *New Scientist*, 17th December 1981.

A twenty-year campaign to clean up Britain's polluted rivers has come to a halt. The prospects for further improvement on the 1034 km of "grossly polluted" and 2220 km of "poor" rivers and estuaries in Britain are "bleak", says a new report on river quality by the National Water Council. Since 1970 the length of grossly polluted rivers dropped by half following "high investment in the early and mid-1970s". But since then capital spending on sewage works has been cut by 50 per cent. And now "deferment of investment . . . ageing sewage treatment works, overloading of works and greater complexity of trade effluents" are making some rivers dirtier. In the past five years 46 km of rivers have slid back into the "grossly polluted" category. A new and disturbing finding in the report — the first national survey since 1975 — is an increase in pollution from farms. This is a "major problem" in many rural areas — notably the West Country and parts of the North West, including the Lake District. Deliberate and accidental spills of silage, waste from factory farms and sheep dips can kill all life in a stream for several kilometres. But an even bigger problem, according to the report, is the run-off of fertilisers and nutrients from intensive arable land into streams. More than 1300 km of previously unpolluted rivers are now "doubtful" as a result. Most grossly polluted rivers and estuaries are in two of the ten water authority regions of England and Wales. There are 311 km of rivers in this category in the North West and 418 km in Yorkshire. (The rest of the regions have 253 km of grossly polluted rivers between them.) Water authorities there have abandoned all spending designed to

improve the quality of rivers. Instead they are trying to maintain existing standards. Yorkshire says it would cost £200 million to clean up its rivers.

Resistance of disease vectors to pesticides: present status, *WHO Chronicle*, 35 (1981).

Since the meeting of the WHO Expert Committee on Insecticides in 1975, resistance has continued to spread and to affect disease control programmes in many countries. The most significant development has been the appearance of multiresistance in several important vectors. The seriousness of the technical and financial problems faced in some malaria control programmes, due in part to the emergence or further spread of organophosphate resistance in *Anopheles* species, cannot be overemphasized. Altogether, 51 species have been reported to be resistant to one or more insecticides: 34 are resistant to DDT, 47 to dieldrin, and 30 to both DDT and dieldrin. Organophosphate resistance has been recorded in 10 species and resistance to carbamates in 4 species. Forty-two species of *Culicine* Mosquitos have been reported to be resistant to one or more insecticides. Of these, 37 are resistant to DDT, 27 to dieldrin/HCH, and 23 to organophosphate insecticides. *A. aegypti* in many parts of Africa and Asia has developed resistance to organochlorine insecticides. *Culex quinquefasciatus*, a major vector of bancroftian filariasis, is generally resistant to organochlorine insecticides and resistance to organophosphate insecticides is appearing in different parts of the world. *C. pipiens* has been discovered to be multiresistant in many countries. In the laboratory this species has been shown to develop resistance to methoprene, the insect growth inhibitor. *C. tritaeniorhynchus* and *C. gelidus*, the major vectors of Japanese encephalitis, have now been shown to be resistant to DDT in Bangladesh; the former species is resistant to DDT, dieldrin/HCH, and temephos in China. *C. tarsalis*, which was already multiresistant in the U.S.A., has been shown in the laboratory to develop resistance to methoprene. Resistance to DDT in the *Simulium damnosum* complex, members of which are the principal vectors of onchocerciasis in Africa, has been confirmed. Resistance to temephos, the insecticide used in the Onchocerciasis Control Programme in West Africa, was detected in early 1980 in two species of the *S. damnosum* complex in a localized zone of Ivory Coast. Resistance to DDT in *S. hargreavesi*, a nonvector species in Mali and Upper Volta, has also been reported. The body louse (*Pediculus humanus humanus*) has developed resistance to DDT in virtually every area in which the compound has been used for control for any length of time.