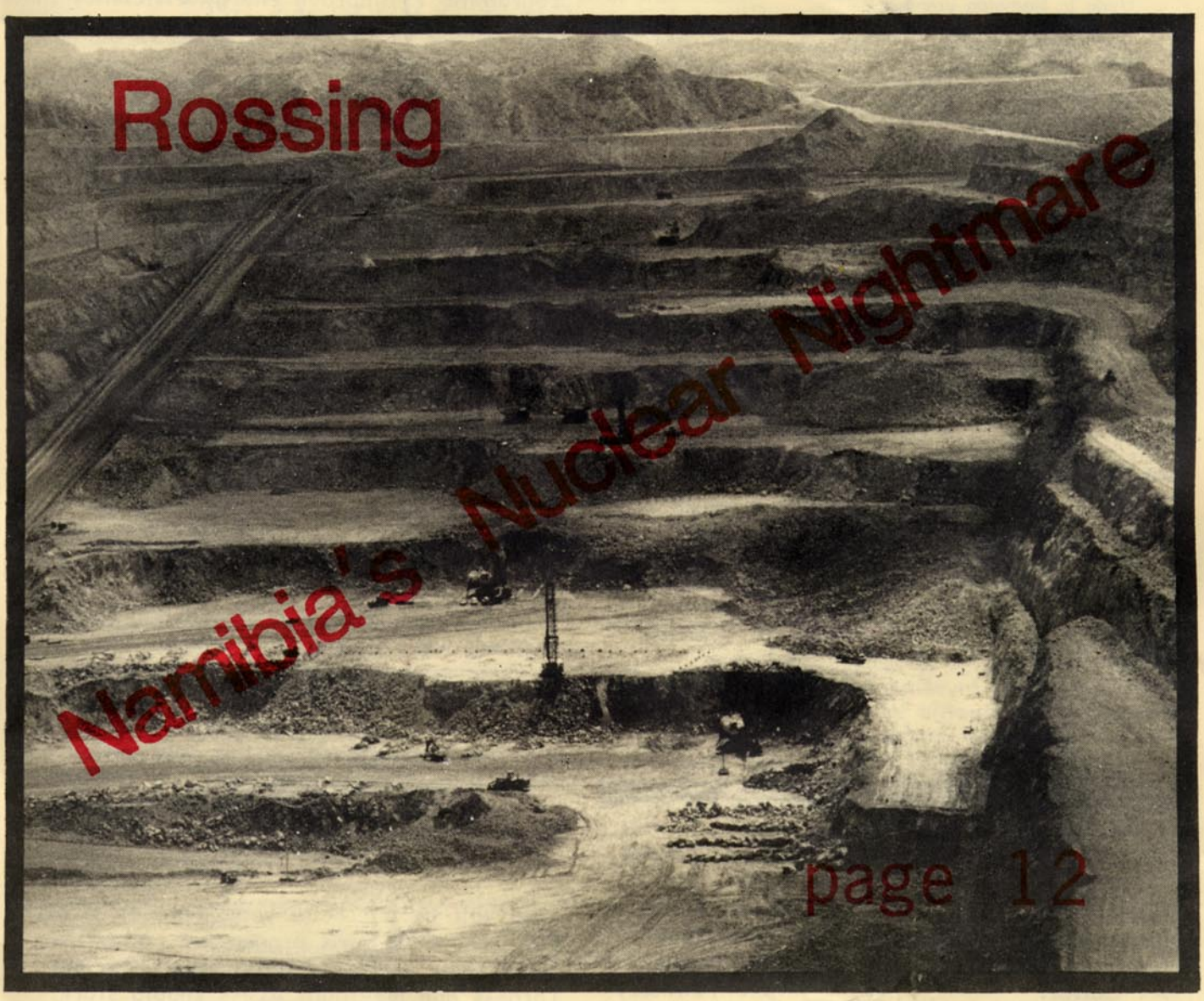
The Anti-Nuclear & Safe Energy Journal

SCRAM

NUCLEAR POWER? NO THANKS

63 60p



CONTENTS

PATRICK GREEN is FoE's radiation consultant.
DAVID CROUCH is a researcher at Sussex University's Science Policy Research Unit.
DAVID CLARK works for the Namibia Support Committee's uranium campaign.
MARTIN CALDWELL is Convenor of Scottish Nuclear Free Zones Steering Committee.
BRIAN JOHN is involved with the Milford Haven Energy Park project.
MEGAN JONES is the press officer for the Intermediate Technology Development Group.

Editor: Steve Martin
News Editor: Thom Dibdin
Features Editor: Pete Roche
AT Editor: Mike Townsley

This Journal is produced for the British Anti-Nuclear and Safe Energy movements by the Scottish Campaign to Resist the Atomic Menace.

We welcome contributions of articles, news, graphics and photographs.

Deadline for the next issue:
Articles (900 words/page), 5 February
News & graphics, 15 February

ISSN 0140 7340 Bi-monthly.

SCRAM, 11 Forth Street, Edinburgh
EH1 3LE. Tel: 031 557 4283/4.

COMMENT

A string of bids from private industry to run power stations surplus to the CEGB's requirements, or to build new ones, means that there are plans for a total of 4GW of non-nuclear capacity already in the pipeline. It has recently been revealed that the conversion of commercial, institutional and industrial stand-by generators to CHP could produce 5GW of power for 5% of the construction cost (per kW) of nuclear plant. Sheffield City, despite not being a 'lead city' for CHP, have taken the lead and begun work on a refuse-fuelled district heating scheme. The European Commission are drawing up a programme to improve energy efficiency in the Community by 20% by 1995.

These developments, a mere selection, indicate the changing tide of opinion on energy issues. The CEGB are running out of time for their nuclear ambitions. Around 4,000 individuals and organisations have already objected to the CEGB's application to build a PWR at Hinkley Point in Somerset. After Hinkley C, their future plans are for 5 more PWRs, a total capacity of 9GW - as much as can be generated by the non-nuclear means mentioned, and that is before taking energy conservation into account.

Nuclear waste, however, is still the industry's Achilles Heel. The early response from communities all over Britain to the Nirex discussion document shows that we are no closer to finding a solution to the problem of nuclear waste management. There is no reason to suppose that the responses in the past, from Scotland, Wales, northern and southern England, were in any way unique. They want a say in nuclear waste management policy, but they want a fair crack of the whip - the present discussion is hog-tied from the start because deep disposal is the only option on offer. Even though long-term dry storage is not an option, the evironmental groups are putting it forward, and we hope the public will take it on board. Nirex must give way.

1988 will be a crucial year. Hinkley C heralds the start of a PWR programme, Nirex may name their preferred option and site, and Torness and Heysham AGRs should start generating power. But with opposition to nuclear power growing, and the renewable and energy efficiency technologies making great strides, the nuclear industry will be up against it. Renewable energy R&D in this country will benefit the developing world, and ending the import of Nambian uranium will undoubtedly benefit that country in their struggle for independence. We must loosen the grip of the nuclear industry.

"The Way Forward"

Every previous Government nuclear waste initiative has been blocked by public pressure. STEVE MARTIN here describes the background to the latest plan, and suggests we can win again.

In December 1981 the Government called off the high level (HLW) nuclear waste geological research programme following three public inquiries and considerable opposition. They claimed their research demonstrated in principle the feasibility for deep disposal.

A review of the research showed it was safer to store the HLW for a cooling off period of at least 50 years, rather than dispose immediately - a major plank in the opponents' argument was accepted. The following March Dr Stanley Bowie, a leading nuclear geologist and member of the Government's Radioactive Waste Management Advisory Committee (RWMAC), resigned over the decision and claimed that, without research "a fully informed decision on geological disposal in this country would be impossible."

Of the two disposal methods used at that time, sea dumping of bulky low level (LLW) and intermediate level (ILW) wastes and land disposal of solid LLW at the Drigg shallow trench, only Drigg now remains operational. The sea dumping route was abandoned in 1983 due to industrial action by the NUS, international political pressure and detailed scientific arguments against the unsatisfactory 'dilute and disperse' principle upon which the programme hinged. Drigg also came in for serious criticism from the Environment Committee in 1986 - "We conclude that Drigg is not an acceptable model for any future dispoal site." An £8.5m refurbishment programme for the site was announced in 1987.

Nirex was formed in 1982 with the remit to implement a disposal strategy for solid LLW and ILW - HLW and liquid LLW discharges from nuclear plants were specifically excluded from the remit. Two potential sites, one each for ILW and LLW, were announced in 1983 - Billingham and Elstow repectively.

Billingham was withdrawn in 1985 because of local opposition, although the Government claimed the decision was to allow the nuclear industry time to develop further containment and conditioning systems. Nirex are understood to still prefer Billingham!

In 1986 three further LLW sites were announced - Bradwell, South Killingholme, and Fulbeck. The communities joined together in opposition and commissioned scientific reports which indicated that shallow trench burial was unsuitable for LLW.

Wide-scale opposition grew, and on 1 May 1987, six weeks before the General Election, all four sites were abandoned following, according to the Government, Nirex's reappraisal of the cost effectiveness of separate repositories against one single facility for both ILW and LLW. Over £15m had been spent on site investigations. The fact that all four sites were in Tory constituencies did not go unnoticed - RWMAC again were critical, and threatened to disband: "If decisions on disposal sites are made for political or economic reasons, then these are things on which the committee is not competent to advise the Minister."

The constant U-turns on nuclear waste policy prompted by public opposition, and criticised by the Government's own expert advisers, has resulted in the recently published Nirex consultation document, 'The Way Forward: a discussion document for the development of a repository for the disposal of low and intermediate level radioactive waste.' It's aim is to "promote discussion and to seek constructive contributions to the task of ensuring that radioactive waste is managed safely."

The document outlines three options, each involving deep permanent disposal, between which the public are asked to choose by 31 May. They are: under the sea, accessed offshore; under the sea, accessed from the coast; and under land. Long-term storage is discounted because, "It is Government policy that wastes should be disposed of.'. .and the periods of storage should be the minimum compatible with safe disposal."

Of the three options, Nirex appear to prefer the land-based concept - see the table showing Nirex's comparisons of the three options. To overcome the only disadvantage they see with their preferred option, Nirex hint at incentives: "How can Nirex be a good neighbour and bring benefits to the local community?" They mean bribes.

Should we take part in a public consultation with Nirex, when they are offering a 'Hobson's Choice' and when they admit they "do not expect a unanimity of views and cannot undertake adequately to reflect all comments in the report"? The foregoing illustrates that public opinion has formed Government policy on nuclear waste for the last ten years; there's no reason why it should not continue to do so.

But, we are able to negotiate from a position of strength. The experts allege that insufficient site-specific geological research has been done: it will be "impossible" to move to disposal at this stage. We, therefore, should call on Nirex, the Government and the industry (in reality the same outfit with different hats) to drop the disposal options and instead store all categories of waste at power station sites in new fail-safe dry storage facilities.

This programme must have implicit in it the commitment to phase out the nuclear stations and cease reprocessing, the largest contributor by volume to the waste problem. At least we will then know what we have to deal with instead of relying on estimated arisings.

If they choose to ignore public comments and use draconian anti-democratic methods to impose their solution on some community we would be justified in opposing the programme. We've stopped them before and we'll stop them again, if we stick together.

CONCEPT	ADVANTAGES	DISADVANTAGES
Under Land	Feasibility of excavations proven by precedent of mining. Relatively simple ground investigations. Single handling of waste at surface. Less expensive concept, with confidence in cost estimates. International consensus of concept. Easy access	Under someone's 'backyard'.
Under the Seabed Accessed from the Coast	Feasibility of excavation proven by precedent of mining. Single handling of waste at surface. Simple waste emplacement. Concept comparable to under land. International consensus of concept. Easy access.	High cost of ground investigations. Possible international political ramifications. Legally more complex.
Under the Seabed accessed at Sea	Away from anybody's 'backyard". Low groundwater flow likely at depth under sea.	Concept not proven by precedent. High cost of geological investigations. Likely to be most expensive concept with least confidence in estimates. Double handling of waste, at port and offshore. Sea transport subject to weather. Platform provides a limited operating work area. Possible international political ramifications. Legally more complex.

To receive your free copy of the Nirex document write to:
UK Nirex Ltd, Curie Avenue, Harwell, Didcot, Oxfordshire.

For a briefing on the document and the alternatives, send £2 to:
SCRAM, 11 Forth Street, Edinburgh.

WEST LOTHIAN DISTRICT COUNCIL SUPPORT FORTH ESTUARY LOCAL AUTHORITIES

in their efforts to monitor
and contain radioactive discharges

VISIT OUR STALL AT

THE EDINBURGH PEACE FESTIVAL

19/28 February, 1988

Torness

The Government has admitted that an accident at Torness nuclear power station could cause a national emergency.

In a letter to Lothian Regional Council, Ian Lang, the Scottish Office industry minister said that the present emergency arrangements for Torness "provide an entirely valid manner of responding to an equally entirely improbable event". The emergency evacuation zone would not therefore be increased.

The letter states that in the case of the Torness "reference accident" being exceeded, the emergency response is capable of being extended to the point where "ultimately a national emergency would exist". Ian Lang believes that "the view has always been taken" that provision for such a scenario should exist. However, SCRAM was unable to find any pre-Chernobyl reference by Government ministers to the possibility of such catastrophic accidents.

Hinkley Point

Over 3000 objections have been made against Hinkley C, including one from the local West Somerset District Council.

The normally pro-Hinkley council say that Hinkley C would be "contrary to established planning principles...". This leaves Sedgemoor DC as the only authority in the area to be strongly for Hinkley C. Other authorities to object to the PWR include 5 Welsh Counties, 18 Welsh Districts and in S.W. England, 3 Counties and 6 Districts.

In an opinion poll carried out in the constituencies of Bridgwater and Taunton, only 23% of those interviewed (using a quota sample system) were in favour of expansion, with 44.5% against. Amongst those with a connection to Hinkley (through work or close friendship), 41.7% would like to see the PWR go ahead, and 30% opposed it.

U.S.A.

US nuclear power stations may not be able to operate for their full design life because they are aging more rapidly than originally expected.

According to a new study from Public Citizen, the US pressure group, as American nuclear plants get older, they produce less power, cost more to operate and maintain, and expose workers to increasing doses of radiation.

Public Citizen say that because utilities assess the economic viability of nuclear plant using a 40 year life, without allowing for these aging effects, nuclear electricity will become more costly than predicted. This will nullify the ecomomic arguments for continued operation of older plants.

NIREX

UK environmental groups are making a united response to the NIREX nuclear waste consultation exercise.

The groups have unanimously rejected the three 'options' put forward by NIREX (see page 3). They are proposing their own "Option Four" which calls for on-site dry storage of radioactive waste at the point of production.

Option Four, agreed by 36 anti-nuclear groups from all over the UK, has been proposed because NIREX is only offering a selection of dumping options. According to the groups, "the public are given no opportunity to assess the long term storage of nuclear waste as an option, even though this is within the capability of current technology, unlike the 'disposal' options".

The groups are concerned that NIREX have ignored high level waste and failed to adequately address the overall problem of nuclear waste management. They point out that Sellafield is only mentioned by NIREX as a potential dump site and not as the main source of nuclear waste.

The environmental groups are calling on all interested parties to take part in the NIREX discussion and help make the case for Option Four.

Radiation

New research confirms that some Cumbrians received over the annual permitted dose of radiation in 1986.

According to scientists at Harwell, who have been studying shellfish and fish radioactivity levels in Cumbrian near-shore waters, some shellfish eaters will have received 0.76 mSv during 1986. The maximum annual dose permitted to the public is 1 mSv.

While the study is concerned with Sellafield discharges, it does not take into account the effects of Chernobyl. Shellfish assimilate radionuclides particularly fast, yet the study does not include any samples taken in the first 26 days after the cloud arrived over Cumbria. Anyone eating shellfish in this period will have received an extra dose, taking their total dose well above the 0.76 dose quoted.

Further, the study does not make any allowance for the average dose to Cumbrians. According to the NRPB, this would have been 0.19 mSv, excluding any dose from shellfish.

David Webster, who has made a special study of the Chernobyl fallout (SCRAM 62), has said this highlights the continuing problem of warning critical groups during nuclear accidents. "The National Response Plan for local authorities as yet makes no provision for warning groups who are routinely exposed, significantly to near the international limit. These people must be reminded that they are particularly at risk."

Waste

SCOTLAND

- Ross-shire Against Dumping (RAD) are taking the NIREX consultation one step further by holding a referendum.

RAD, which was formed at a meeting attended by over 250 people in Invergordon, are planning to hold a postal ballot under the guidance of the electoral reform society. The ballot will cover the area of Ross-shire which has been identified by NIREX as potentially suitable for a waste dump.

RAD's convenor, Lorraine Mann, told SCRAM that they are waiting for more precise information from NIREX so they can identify the exact area of Easter Ross to be balloted. The result of the ballot will be announced before the end of the consultation process in May.

- The ballot is expected to cost £2000. Donations can be sent to: Ann Jones, Ashgrove, Hilton, by Tain, Ross-shire.

USA

- Over optimistic cost assumptions for nuclear waste disposal are keeping the price of US nuclear electricity artificially low, according to a new report from Public Citizen.

US utilities pay a per kWh fee for future costs of high level waste disposal. This fee is assessed annually by the Department of Energy (DOE). According to the new study, the assumptions used are flawed, making the current fee inadequate.

Public Citizen claim that by using more realistic scenarios, the fee could be up to ten times higher. If the fee reflected the full cost of waste disposal, this could tip the balance against continued operation of at least some nuclear power plants.

BELGIUM

- A Belgian plan for offshore islands to bury non-recyclable wastes could also be used for nuclear waste, according to documents obtained by the Flemish Green Party.

The 3 km diameter waste would be in Belgium's territorial waters. They are being proposed as an alternative to dumping sludge and industrial effluent in the North Sea. An internal memorandum obtained from CFE, one of the four companies proposing the scheme, indicates they could also be used for toxic and nuclear wastes.

FRANCE

- All four sites proposed for further investigation as high level waste dumps (SCRAM 59) have met with local opposition.

Around the Segre site, in Maine-et-Loire, a referendum held by the local Mayors showed that opposition runs from 75-92%. There was no local consultation before the sites were selected.

Italy

Nuclear power in Italy has been effectively killed off by the strength of the anti-nuclear vote in last November's referendum. The European Fast Breeder (FBR) programme is also threatened.

In the much delayed poll, voters were asked to say "yes" or "no" to the abrogation of three key nuclear laws. The resounding vote for abrogation, supported by a majority of the political parties, has been interpreted by the Government as a vote of no confidence in nuclear power.

Nationaly, the vote will abolish financial incentives to local authorities hosting nuclear plant, and revoke the power of a governmental committee to impose stations on unwilling communities.

Theoretically, this will only effect future nuclear stations. However, Prime Minister Goria announced to the Italian senate on 20 November that the 25 year old Latina magnox station, supplied by the UK, will be closed and work on the unfinished Trino-2 PWR halted. Goria hinted that the Trino-1 PWR and the Caorso BWR may also be closed. The only unaffected station will be the almost complete Montalto di Castro.

Internationally, Enel, the State Electricity Board, will not now be able to collaborate in foreign nuclear projects, apart from research and electricity importation. Lower party political support for abrogation of this law leaves the outcome uncertain and open to interpretation. However, Goria's decision to withdraw the plutonium from the PEK research FBR bodes ill for the European Fast Breeder programme, in which Enel has been a major partner since 1971.

Significantly, Enel will have to withdraw from the Superphenix and SNR 300 FBR projects, in which it has a one third share. This will deal a blow to the morale of the other collaborators at a time when it is already low, and seriously jeopardise the future of the projects.

The other FBR collaboration from which Enel will have to withdraw is EFRUG, the European Fast Reactor Utilities Group, formed in 1983 to implement certain intergovernmental memoranda of understanding. The workings and formal agreements of EFPUG are highly complex and not widely published. It is not therefore possible to predict the outcome of withdrawal, although other utilities are reported to be "concerned".

A further area of uncertainty is private industrial collaboration. Italy is as much involved in this area as any other. However, as the abrogated law had only indirect relevance, it is through this level that any future FBR initiatives are likely to proceed.

- The Yugoslav parliament has agreed to impose a moratorium on nuclear power until the end of the century.

West Germany

ALKEM

Two managers charged with illegally operating the Alkem plutonium fuel fabrication plant at Hanau in West Germany have been acquitted.

The Hanau state court found that the managers had not complied with West German Atomic Law (which requires public participation during licensing procedures), when changing the operation of the nuclear plant. Rather, they had resorted to a conventional practice of obtaining informal agreement from the energy supervisory offices, in a process known as "Vorab-zustmmung".

While the court found this practice illegal, it could not be proved that either the two managers, or the three officials from the energy supervisory offices, charged with aiding them, were actually aware of this. All five were duly acquitted, but not before the judge had criticised them for treating such an important matter as nuclear safety in a superficial manner.

In a separate development, Alkem has finally received a construction licence, after operating under a "temporary licence" for the last twelve years.

The new licence is understood to increase the amount of plutonium which Alkem can possess from 460 kg to 2.6 tonnes. Alkem, the only West German company licensed to use plutonium, keeps its stockpile in a bunker next to the Governments'. The Government has refused to itemise the plutonium flow to and from its stockpile. This has lead to allegations that Alkem has been using the Government's plutonium as a buffer store to keep its own stock below 460 kg.

BRIBES

The bribery scandal surrounding the West German nuclear waste handling and transport firm of Transnuclear Gmbh (TN) (SCRAM 60), has claimed another victim, this time in Belgium.

The head of Belgium's Nuclear Research Centre (CEN) has been sacked for accepting some £16,000 in bribes from TN officials, in return for making waste disposal contracts at below market prices.

While most of the bribes have been concerned with contract making, safety violations have also become an issue. This stems from West German press reports of testimony given to the investigating federal prosecutors. TN employees have alleged that power station radiation protection staff have been taking bribes to ignore lapses in safety procedures. This is highlighted in an allegation, denied by CEN, that a road accident in late 1986 involving low level liquid waste was covered up, because the waste was in containers designed for solid waste.

Switzerland and Sweden have also been drawn into the affair. The Swedish firm of Stadsvik Energiteknik have denied federal investigators' allegations that its officials received bribes in connection with an agreement to swap spent LWR fuel from West Germany for plutonium from Swedish reactors.

Foreign involvement in the scandal has re-awakened interest from the West German Parliament. Last August, the supposedly anti-nuclear SPD had sided with Government rejection of a call from the Green Party to convene a top level inquiry into the affair. It now appears that the SPD are re-assessing their position.

News in brief

SIZEWELL A

- Staff at Sizewell A were criticised after failing to "come up to scratch" during the NII's annual examination of the station's accident response.

SELLAFIELD

- A worker in a fuel fabrication plant received a dose of radiation in excess of the annual limit during an accident last November. In a seperate incident two other workers were also contaminated.

HINKLEY POINT A

- Radioactive discharges from the station - which is the UK's most polluting - are 2000 times those from West Germany's worst station.

SUPERPHENIX

- The French government has agreed in principle to allow Superphenix to operate without the faulty fuel drum, in which several new cracks have been discovered.

INDONESIA

- Indonesia's nuclear energy agency is negotiating with three foreign consortia for the purchase of a commercial nuclear power station.

BRADWELL

- During a fire fighting exercise at Bradwell, a sea water pipe failed to work because the tide was too low.

ALBANIA

- Albanian officials have confirmed that the country is looking to spend $1 million on a research reactor.

WEST GERMANY

- A new study has concluded that over 66% of West Germans oppose the use of nuclear power.

SPAIN

- The provisional start-up licence for Vandeloss-2 has been withdrawn following a disastrous emergency evacuation exercise.

Privatisation Notes

Cecil Parkinson has announced that he is considering selling off the electricity industry with a binding requirement to fill between 20 and 25% of future generating capacity with nuclear power, thus proving that the Government cares more about nuclear power than it does about the free market. If there is any danger that private electricity companies will take decisions on economic grounds that conflict with its political objectives, then free enterprise gets ignored.

Parkinson justifies this new move by citing the electricity industry in California, where the state has ruled that 10% of energy supply must come from renewable energy. What he didn't mention was the generous tax incentives which have made the Californian wind farms so successful. Nor did he mention the fact that before the electricity companies can invest in new supply, they are required to investigate all alternatives, including demand management.

● The authors of the right wing Centre for Policy Studies' (CPS) latest pamphlet point out that, while promoting nuclear power to increase security of supply might have made some sense in 1979, it is now, at best debateable. In 1979 oil prices were rising, coal was expensive and supplies were at the mercy of the miners. Today the situation is quite different, and another Chernobyl would seriously undermine any chance of nuclear power becoming publically acceptable.

According to CPS one obvious alternative method of improving security of supply would be to end restrictions on coal imports, and the burning of natural gas in power stations. Private companies are unlikely to want to invest in nuclear power, either existing or new stations. The Tories should recognise that their two aims of promoting nuclear power and competition are inconsistent. Even if the Government decides to go-ahead with the construction of publically funded nuclear stations, they would undermine the profitability of privately owned power stations, because the nuclear ones would have to be used for baseload.

● The privatisation debate was further complicated by the announcement that electricity prices in England and Wales are to rise by 15% over the next two years to finance the construction of 10 new power stations. The requirement for these new power stations has been calculated by extrapolating the growth in demand over the past few years to the end of the century. This is precisely the sort of methodology which has caused so many problems in the past. The CEGB are hoping to start building five new stations - three nuclear and two coal - by the end of 1988. This is overoptimistic to say the least, unless they are railroaded through the public inquiry system. But by the time it is privatised, most alternative options could have been foreclosed until well into the next century.

If the Government really believes the industry's forecasts, and are serious about introducing competition, then why don't they ask for tenders from private companies now? Independent suppliers and entrepeneurs with ideas for demand saving investments could bid against the CEGB to supply the necessary capacity.

● The CEGB are desperately trying to prove that they can promote competition without being broken up. They have started negotiations with five private companies who want to build and operate power stations. The largest of these would be a coal-fired station on the Thames relying on imported coal. Other coal stations are being discussed for sites in Wales and East Anglia, and a combined cycle gas-fired station is being considered for Dorset. Together these schemes could produce as much electricity as one and a half Sizewell Bs.

● Despite their efforts, the CEGB appear to be losing the battle to remain intact after privatisation. CPS have produced a plan called 'privatised transition to competition'. Initially all generation and transmission functions would be owned by a joint venture company. Gradually this company would sell off representative blocks of power stations. Each block would have a mix of type and age of station which would be geographically dispersed. Eventually the joint venture company would be left with the national grid and the nuclear stations.

The CEGB's counter attack accused the authors of being "out of touch with reality" and "in the world of the ivory tower, not the cooling tower." "It is hard to resist the conclusion" they allege, "that they are more interested in treating the electricity consumer as a guinea pig than in providing a service." They calculate that it would cost £1billion a year to break up the CEGB, leading to a 10% increase in prices.

● The Government, however, aren't so quick to dismiss the idea of breaking up the CEGB. Whitehall now seems to favour splitting the Board into three parts. One company would run the grid, another would operate around 25% of the generating capacity, and a larger company would run the bulk of the generating capacity including the nuclear stations.

● Meanwhile, in Scotland, the two electricity boards have fallen out over the best method of privatisation. The SSEB favours the setting up of a holding company which would have two operating companies based on the existing Boards.

The Hydro Board, on the other hand, is now convinced that it should go it alone into the private sector. Indeed it is beginning to regard its lack of nuclear capacity as a positive attraction to would-be investors.

● The Department of Energy are clearly looking for a method of privatising electricity which will not kill off nuclear power. Whether or not they'll find one which is acceptable to potential investors is open to question. The Government could have achieved their objectives of maintaining a secure supply and introducing an element of competition far more easily by amending the 1983 Energy Act. If the Act was given some teeth by setting up an independent body to oversee the setting of tariffs, then new private generators, including local authority run CHP schemes would have been able to get a fair price for their electricity.

Instead we are left with the prospect of 150,000 job losses as a result of privatisation, and a nuclear industry insulated against the market forces which threaten to kill it off in other parts of the world.

Finnish Nuclear Protest

In his second piece on Finland following his visit this summer, THOM DIBDIN examines the anti-nuclear movement and looks at Finland's response to Chernobyl, and proposals for nuclear waste disposal.

On 26 April 1986, 2000 people demonstrated in Helsinki against the building of a fifth Finnish nuclear reactor, oblivious to the catastrophe happening 800 miles away in the Ukraine. Unknown to the protesters, Finland would be the first Western country to detect the radioactive fallout and the fifth reactor would be the first to succumb to the political fallout.

The reactor had been the main target of the anti-nuclear movement since 1982, when the pulp and paper industries called for 500 to 1,000MW of new power, preferably nuclear. Despite a growing awareness of environmental politics in Finland, expressed in the growing support for the Green Movement, the campaign had not been achieving results. Most anti-nuclear Finns believed that nothing could be done to block the increase in nuclear capacity.

According to Maria Keele of IVO, the state electricity board, a decision on the reactor had been imminent in May 1986. The newly formed Perus Voima Oy (PVO), charged with purchasing the new reactor, were certain that it would be on-line by 1993. Their only remaining question was who would supply it: Sweden, West Germany or the Soviet Union?

Perhaps the nuclear industry had become blasé, or perhaps they really believed their own propaganda. Whatever the reasons, the Industry, the statutory bodies and the Government all failed to perceive Chernobyl as a threat. Olkiluoto Nuclear Power Station in south west Finland was the first place in the West to detect the Chernobyl cloud. Yet, for over 24 hours, little was said publicly, and only then under pressure from the media.

STUC, the Finnish Centre for Radiation and Nuclear Safety, failed to make any recommendations for countermeasures for over six days, while politicians and officials went on TV and asserted that the fallout would have no effect. One year later, STUC issued a press release recommending that freshwater fish should not be eaten as a main course "more than 2 or 3 times a week," in the areas most contaminated by Chernobyl fallout. Furthermore, small fish should not be consumed at all.

This irresponsibly lax reaction played straight into the hands of EVY, the Finnish anti-nuclear and safe energy campaign. Within a week, opposition to nuclear power had doubled to some 60-70% of the population, while EVY had a monopoly of information to the public - if the nuclear authorities could not properly respond to an accident in the Ukraine, how could they properly respond to one at home?

For EVY, the short-term battle was won. Support for the fifth reactor was now political suicide. However, EVY became victims of their own success: many environmentalists who had perceived the reactor as the main target, dropped out of the campaign to address other issues, such as the over exploitation of Finland's lakes for hydro-power. Chernobyl had, however, motivated a certain amount of new blood to join the campaign.

NUCLEAR WASTE PLANS

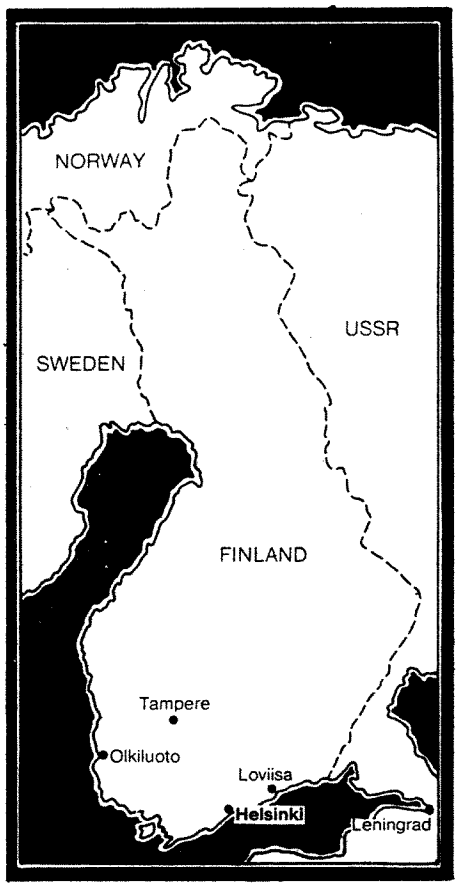
Meanwhile, PVO and IVO have not dropped their plans for the reactor but have merely shelved them until the political will returns. They are also still planning to find a final repository for spent fuel from Olkiluoto. The siting of this nuclear waste dump is currently the single most important issue in the Finnish anti-nuclear campaign. Spent fuel from Loviisa is not such a pressing issue in Finland, as it is returned to the USSR. (see SCRAM 62).

The Olkiluoto spent fuel is not reprocessed, but is currently retained on site, in a recently completed interim wet storage facility, capable of holding all the spent fuel that will be generated during the station's design life.

The Industrial Power Company, TVO, who run Olkiluoto, envisage the fuel will remain in storage until 2020, when they plan to place it in canisters and dispose of it in the Finnish bedrock. There are no plans to monitor the final repository, although TVO are so sure of its integrity that they have claimed that "corrosion of the canisters will take at least one million years".

In the early '80s TVO commissioned the Finnish State Geological Research Institute to examine every Finnish commune for their geological suitability for the repository. Each commune was graded from 1 to 5 for a variety of geological criteria, including, most importantly, fissuring and the presence of fractures.Some places were rejected immediately because of population and other criteria, leaving only a handful of "suitable" sites. The transport of nuclear waste to Lapland was also rejected as colonialism.

Unfortunately for TVO, none of the more geologically suitable sites, was politically suitable. They were, and still are, in a tricky situation: if, as they claim, they are to find the best possible site, they will have to force themselves onto an unwilling commune; if this is not politically expedient, then they will lay themselves open to the charge of not putting safety first.



Despite TVO's predicament, EVY are having their own problems, mainly of getting across what is basically a complex argument. However, the mood in Finland remains essentially anti-nuclear and the environmental lobby is still strong. Support for EVY is obvious in Parliament, where the Greens have 4 seats, and the Rural Party with 9 MPs is also totally opposed to nuclear power. EVY have also initiated research into a safe energy strategy for Finland, which is being carried out at Tampere University.

Nor is EVY alone. Several other groups are carrying out non violent direct actions against nuclear power. Notable amongst these are the Green Mutants and Women For Peace. The Green Mutants recently cut a memorial into the bedrock of an island near Helsinki. The memorial lists all those responsible for nuclear power in Finland. In a radio interview the Mutants stated that they wanted to ensure that those who took the decisions for nuclear power also took the responsibility. By marking their names in the rock, they could still be held responsible, even if they conspired to die before the consequences of their actions became known.

The Women for Peace group are no less imaginative. During the opening of the new Parliament in March 1987, they caused chaos in the public gallery by wailing in lament for the nuclear age and they threw 200 handkerchiefs, with messages against nuclear power, to the MPs assembled below.

Contact: *Pursimiehenkatu 29 A, SF 00150 Helsinki, Finland.*

Dose Limits Down

The continued operation of several UK nuclear sites is in doubt following the recommendation by the NRPB. in November that current scientific evidence can justify a three-fold decrease in dose limits. PATRICK GREEN assesses its impact and describes how the nuclear industry are marshalling the arguments against legal implementation.

The International Commission for Radiological Protection (ICRP) outraged many people in October by deferring a change in the radiation dose limits, until at least 1990, despite impressive scientific evidence in favour of an urgent change (see SCRAM 62).

The National Radiological Protection Board (NRPB) were apparently not prepared to wait, and have taken the unprecedented step of acting independently on the issue. In mid-November they held a press conference where they stated that the scientific evidence justifies an immediate change. The statement read:

> "The (ICRP, following their Como meeting) concluded that the results of a definitive study of the new calculations of doses. . .has raised the risk estimate for the exposed population approximately twofold. This, the Commission considers, is not sufficient to warrant a change in dose limits. . .*We consider that guidance is required* and the Board therefore advises. . .Government departments and agencies who have regulatory responsibilities to consider the implications for dose limits of this change in risk factors". (Emphasis added)

This statement is a clear vindication of the stance adopted by environmental organisations over the past few years. It is also a clear acknowledgement that radiation risks are underestimated and have been for some time, and that our scientific evidence is right.

ICRP CONTRADICTED

The NRPB have recommended that radiation workers should receive on average no more than 15mSv a year (the danger level as highlighted by FoE) and that members of the public should receive no more than 0.5mSv a year from any one nuclear installation. The current 1mSv limit will, however, remain in force as the principal public dose limit.

Furthermore, the NRPB contradict the ICRP's view that it is acceptable for a radiation worker to be exposed near the dose limits (SCRAM 62):

> "as long as the legal dose limits remain at their present levels. . . it is even more important to keep all exposures as low as reasonably achievable, since continued exposure near the dose limits represent a level of risk which verges on the unacceptable."

For members of the public:

> "continued exposure at 1mSv per year again probably verges on the unacceptable."

Whilst the NRPB guidance has no legal force in the UK, the Health and Safety Commission have announced they will be re-examining the Ionising Radiation Regulations (IRR), although it is unclear at the present time how long this process will take.

These recommendations amount to a threefold reduction in the dose limits. They are an important first step in improving safety standards and should be followed urgently by amendment of the IRR.

The recommendations were issued as an interim guidance pending the final review of the A-bomb dosimetry data. The latest evidence from the Japanese Radiation Effects Research Foundation clearly demonstrates a two fold increase in risk above ICRP, with preliminary evidence of a 5-15 fold increase. As the authors of this paper don't expect the final review to change their conclusions, their is no logical reason to suppose that a further delay will effect the evidence of a 5-15 fold increase in risk; if anything, the evidence will increase. The NRPB may therefore need to recommend further changes in a few years time.

Already it appears the NRPB have upset the nuclear industry; they have stated it is unnecessary and expensive for them to make improvements. Some nuclear managers have suggested stations may have to close with the subsequent job losses. Such statements amount to economic blackmail and clearly demonstrate the contemptuous attitude that sections of the industry have to the health of their workforce.

Furthermore, the industry's links with the ICRP are obvious when they claim they don't need to follow the NRPB's advice because the ICRP have not recommended a change. These statements demonstrate the urgent need for the IRR to be amended, as the industry won't act voluntarily.

The NRPB have estimated that 2000 workers routinely receive more than 15mSv a year. These are mainly employed in the 'dirty end' of the nuclear industry, eg Sellafield and in professions like industrial radiography and medicine. Plants such as Winfrith, where 6-14% of the workforce receive annual doses above the new target, could also be affected. The nuclear industry's PR departments frequently make the ludicrous claim that nuclear plants are safe places to work - clearly if a worker routinely receives an annual dose of 15mSv, under the NRPB advice the plants are not safe.

SELLAFIELD THREATENED

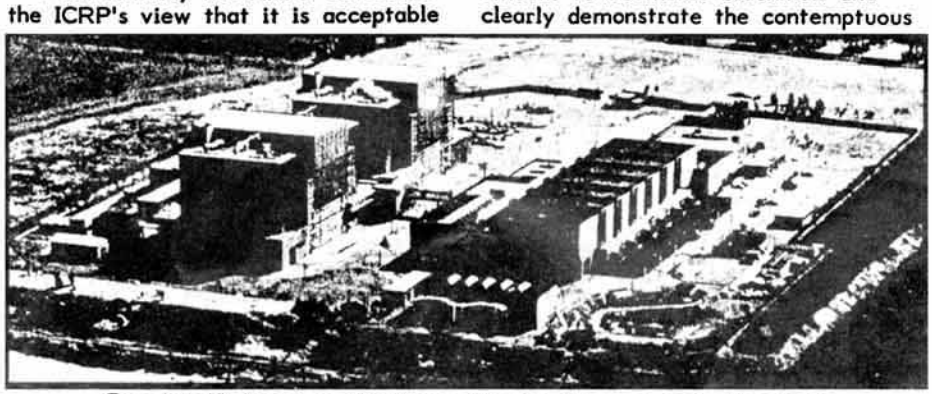
The new proposed installation-specific public dose limit of 0.5mSv will severely affect some of the older Magnox stations, like Berkeley and Bradwell from which local people receive a direct gamma dose of 1.2mSv and 0.7mSv respectively.

The biggest doubt is over Sellafield. The plant's authorisation to discharge gaseous radioactive waste is currently being reconsidered by the Department of the Environment. Under the proposed authorisation, British Nuclear Fuels (BNFL) have assessed the likely doses to the local critical group using 'pessimistic' assumptions. These suggest an adult can expect to receive a maximum dose of 0.47mSv a year, and a ten year old child 0.62mSv, from gaseous discharges alone. No figures have been provided for a one year old child; these would be higher still.

The Radioactive Waste Management Advisory Committee have already recommended a target of 0.5mSv and BNFL use the above figures to demonstrate it is "most unlikely that this limit would be breached." How this statement is justified is hard to imagine! Also, when one considers the dose arising from eating locally caught fish, it seems impossible for Sellafield to comply with the new NRPB target.

The NRPB statement is a major breakthrough: it doesn't go far enough, but it is an important first step and should be welcomed as such. It shows that the new NRPB (Roger Clarke has replaced John Dunster as Director) are capable of acting on their own. However, pressure must be maintained to ensure that the proposed reductions are not the last to be made.

The most significant point in this development is that a national radiological protection authority have acted independently of the ICRP. The only conclusion to draw is that the ICRP have lost scientific credibility with the NRPB, and if other countries follow suit then the ICRP will be in danger of not having a function in the field of radiological protection.



Bradwell Power Station: Under threat of closure?

Low Level Leukaemia Link

The debate over whether cases of childhood leukaemia recorded in the vicinity of nuclear installations are radiation-induced has received considerable media attention since the Yorkshire TV programme in 1983. Further reports are expected shortly. In this, the first of two articles, DAVID CROUCH, examines the basis of the NRPB's assertions that there is no link between environmental plutonium and childhood leukaemia, and questions their presuppositions.

Sir Douglas Black describes the problem of understanding cancer risk in the vicinity of nuclear installations as "accounting for the gap between the number of cases of childhood leukaemia expected from estimating radiation exposure, and the larger number seen."

That the number "seen" is indeed larger, sometimes much larger, than expected on the basis of radiological theory is now conceded in most quarters. R McKeague of the UK Atomic Energy Authority (UKAEA) is in a small minority when he argues that "some epidemiologists ignore the fact that large errors are inherent in the science of epidemiology. Until this is recognised, all sorts of spurious results will emerge, which is unhelpful to our objectives."

The dominant question now is whether or not the radiobiological models used to estimate environmental radiation risks are allowing for sufficient margin of error or uncertainty to account for the discrepancies with epidemiological observation. In 1984 the Director of the National Radiological Protection Board (NRPB) stated that they "have sought diligently for plausible sources of error of this magnitude and failed to find them." Since then the Board have retreated somewhat from this position.

PRECISE METABOLISM UNKNOWN

Atomic radiation comes in 3 basic types: alpha, beta and gamma. Beta and gamma radiation can penetrate many centimetres of human tissue, whereas the relatively massive alpha particles travel but a fraction of this distance before their energy is dissipated. Alpha particles wreak far greater havoc on individual cells, but only within a tiny volume.

These facts have two important consequences. Firstly, a person's internal burden of beta or gamma emitting radionuclides can be measured using a body scanner. For alpha emitters this is impossible - internal exposure cannot be detected until autopsy. Secondly, a speck of beta or gamma emitter lodged in the body irradiates its surrounding tissue uniformly. On the other hand, an alpha emitter irradiates only a minute sphere of tissue a few microns in diameter.

Thus for an accurate calculation of cancer risk it is likely to be extremely important to know the precise metabolism and distribution of alpha emitting radionuclides in relation to the specific cells in the body where different types of cancer may originate.

What is the significance of these observations for the controversy over child leukaemia around nuclear installations? In the first place, there is far greater uncertainty over the extent to which local children have been exposed to alpha emitters such as plutonium. Secondly, both the metabolic behaviour of plutonium and the location of the cells capable of becoming leukaemic (leukaemogenic cells) are not known with any confidence. Thus the risk calculations for Sellafield assume the sensitive cells to be confined to the bone marrow.

RADIUM CAUSES BONE CANCER

In experiments on animals, however, lymphatic leukaemia of the type observed around Sellafield and Dounreay has also been induced by irradiating the lymph nodes in the lungs of rats, though not in mice or dogs. Sir Edward Pochin of the NRPB has remarked in this regard: "I don't know whether we are closer to the dog, the mouse, or the rat in the terms of the lymph node behaviour." R H Mole, ex-Director of the Medical Research Council Radiobiology Unit, recently stated: "Whether radiation-induced acute lymphatic leukaemia in childhood originates in bone marrow rather than in some other irradiated tissue, however, is not known."

The question then poses itself: do such doubts over the radiobiology of plutonium mean that exposure to it could be responsible for the Sellafield leukaemias? The NRPB reject this possibility out of hand. They argue that experience with children injected with radium in the course of treatment for ankylosing spondylitis and tuberculosis shows that exposure to environmental plutonium *cannot* cause leukaemia. Radium is an alpha emitter and is thought to accurately mimic the behaviour of plutonium in the body. Of the 200 children injected with radium, not one has developed leukaemia - bone cancer (osteosarcoma), however, did develop.

This argument exposes a certain circularity in the NRPB's position: if plutonium cannot cause leukaemia then why did they bother to perform the Sellafield and Dounreay plutonium calculations in the first place? Surely this was a pointless ritual? This is further evidence that the NRPB embarked on their work with a strong presupposition that the leukaemias were not radiation induced.

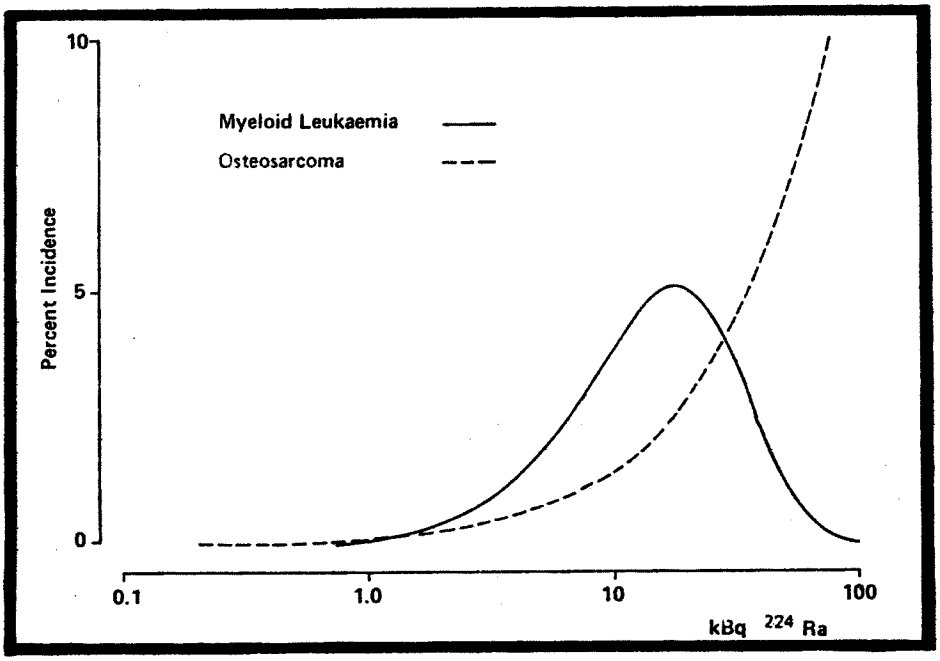
Though superficially persuasive, the argument is far from watertight. A counter-argument, however, must account both for the prevalence of osteosarcoma and the total absence of leukaemia in the children . In approaching the former, we must examine the location of the osteogenic (bone cancer sensitive) and leukaemogenic cells in relation to the distribution of radium and plutonium in bone.

EXPERIMENTS ON MICE

The osteogenic cells are thought to lie within the thin endosteal layer that covers the bone surfaces, whereas the leukaemogenic cells are located in the bone marrow. Radium is assumed to be a bone "surface seeker", that is, it is deposited on the bone surfaces. Its short radioactive half-life (3.65 days) means that it decays at the bone surface and thus irradiates the osteogenic in preference to the leukaemogenic cells. Plutonium, on the other hand, has a long half-life. It too is taken to be a bone surface-seeker, but its radioactive longevity means that in the course of the continuous process of bone recomposition which takes place in the body it is likely to be smeared out through the bone *and* the marrow.

Thus radium is not necessarily an accurate mimic of plutonium: the latter may irradiate far more leukaemogenic than osteogenic cells, thus possibly accounting for the prevalence of osteosarcoma amongst the radium-treated children.

But what of the observation that no leukaemia has developed amongst these children: surely some portion of the bone marrow must have been irradiated with consequent activation of leukaemogenic cells, so why no leukaemia? A start has recently been made to unravelling this enigma within a programme of research at the Medical Research Council (MRC). Researchers note that doses to the radium-treated children were immense - far in excess of those expected as a result of exposure to plutonium in the environment. Cancer is thought to



Relationship between radium dose and the incidence of disease in mice

be caused by replication of damaged cell DNA. Large doses of radiation are known to kill cells outright, so that damaged cells are prevented from replicating altogether. Perhaps, it was suggested, doses of alpha radiation large enough to kill the leukaemogenic cells may still generate bone cancers.

To test this idea the MRC exposed groups of mice to different doses of radium. At low doses the mice contracted leukaemia and not osteosarcoma. As the dose increased, the incidence of leukaemia fell away and that of osteosarcoma rose sharply. These results are thus consistent with the hypothesis that amounts of bone-seeking alpha emitter sufficient to induce osteosarcoma may also be sufficient to sterilise those cells in the marrow that have leukaemogenic potential.

A similar experiment with plutonium has not confirmed the initial results with radium, and of course there is no guarantee that human physiology is the same as that of the mouse. The basic point stands, however, that the MRC's research leaves open the possibility that environmental plutonium may be responsible for the observed child leukaemias around nuclear installations.

The Black Inquiry set in motion further research, some results of which have recently been published. This work suggests that the leukaemia excess near the Sellafield plant is confined to those children who were born in the vicinity: there is no such excess amongst children who moved into the area after birth. This result points to the possibility that it is the foetus which is most at risk from environmental radiation.

IN UTERO RISK ESTIMATES

Two further observations potentially increase the plausibility of this hypothesis. In the first place, of the 14 leukaemia cases recorded in children living in the nearby village of Seascale, 3 were born in 1957 - the year of the Windscale fire - and one in 1958. Doubts about the effect on the foetus of the radiation released during the fire are thus sharpened by the new findings.

Secondly, it is in the model used by the NRPB to calculate risks *in utero* that possibilities for error and uncertainty are at their greatest. There are no generally accepted methods for calculating radiation doses to foetal organs from maternal intakes of radionuclides, so several ad hoc methods were developed specially for the Black Inquiry. The model relies on a tiny handful of animal experiments. Its authors remark that "extreme care is needed in the extrapolation from animals to man." Moreover, the dose - and therefore the risk arising - from alpha emitters in the foetus was taken to *decrease* in proportion to the increasing mass of the growing child. In the light of the preceeding discussion, this fact can be seen to have very little basis in biological reality: the important question is not the quantity of radiation energy deposited per unit tissue mass, but whether or not the leukaemia-sensitive cells are irradiated.

Another recent study claims to "weigh heavily against the hypothesis" of a link between child leukaemia and radiation discharges from nuclear installations. This study reports no discernible increase in national child leukaemia rates following the sharp increase in atmospheric nuclear weapons testing in the late 1950s. Its authors claim that their work puts a tight limit on any possible underestimate by the NRPB of the leukaemia risk per unit dose of radiation.

Their case, however, is somewhat overstated. The study is but one contribution to a long and heated controversy over the magnitude of radiation dose-response at low dose levels. The recent realisation that the dose calculations at Hiroshima and Nagasaki are inaccurate has cast large doubts over current official risk estimates, in particular for alpha radiation. The new study ignores the work of those such as Alice Stewart who have revealed the complex and competing causation factors involved in child leukaemia which might confound a survey of this type. Moreover, the study inexplicably neglects to discuss a report of local exposure to weapons fallout in Utah, USA, which was followed by significantly increased child leukaemia incidence.

There is clearly significant scope for risk estimates to be revised, and all the indications are that the direction will be upwards.

NRPB PARADOX NOW ACUTE

Despite the preceeding arguments, there remain many questions concerning the patterns of child cancer around nuclear installations. By their very nature, some of these questions will never be fully resolved. Nuclear installations in the UK have been discharging a very large number of radionuclides in different quantities over a very long period via both marine and airborne routes; as a result we can expect neither a uniform pattern nor a universal explanation.

All the same, Sir Douglas Black, the NRPB, BNFL, etc are guilty of missing the wood for the trees. It is disingenuous of them to criticise epidemiological studies whilst presenting theoretical calculations as though carved in tablets of stone. In 1984 Robin Russell Jones pointed out the paradox implicit in their position: should the epidemiological evidence grow, the greater would be the disagreement with radiobiological theory, and therefore the *less* likely would be any connection with radiation. Since the Black Inquiry numerous studies have uncovered possible raised leukaemia rates around other nuclear installations. The paradox is now acute.

In conclusion, this article may seen unduly technical, but it is important to remember that we will not close the plants down on the basis of scientific argument alone. The leukaemia issue enjoys a high public profile and awareness, and exposing the refusal of our nuclear masters to acknowledge the fragility of their case is another lever by which we can attempt to lift the lid off the whole can of worms that is nuclear power.

What is needed is to draw out the links between the bias in the technical controversies described above and the existing political-economic system in which nuclear power and nuclear weapons play such a fundamental role. This I shall explore in the second part of this article.

A fuller version of this article can be found in Russel Jones & Southwood (eds), Radiation and Health, Wiley, 1987. (See reviews pages this SCRAM).

Namibia's Nuclear Nightmare

As governments procrastinate over sanctions against the South African apartheid regime, the first brick in the wall to keep southern African uranium out of this country has been put in place through the actions of portworkers in Liverpool. DAVID CLARK argues the case for solidarity action.

In June 1987 workers in the port of Liverpool agreed to respond to calls from SWAPO, the liberation movement of Namibia, and the Mineworkers Union of Namibia (MUN) by refusing to handle shipments of Namibian and South African uranium. Until then it had been exported through the docks as uranium hexafluoride for further processing in the US.

Following a meeting at the docks of shop stewards of the Transport and General Workers Union (TGWU), Docks District Secretary Jimmy Symes announced, "If any more shipments are sent through Liverpool, we will refuse to move them. The uranium will stay there forever."

This stance has profound political implications. For the British Left generally it reasserts the strength and political importance of the trade union movement in the face of the attacks upon them in the current reactionary political climate. For the broad anti-apartheid movement it offers a concrete alternative to the strategy of lobbying the Government and political parties to implement sanctions at governmental level against South Africa. For the peace and anti-nuclear movements it strikes a direct blow against the interlinked civil and military nuclear industries in this country.

And finally it supports the just, anti-colonial struggle of SWAPO and the people of Namibia for independence from the apartheid regime of South Africa, and the fight to prevent the natural resources of their country being stripped from them before they can gain independence.

The portworkers' stand has been supported by statements from SWAPO and the United Nations Council for Namibia, and has been described as "very significant direct action. . . a direct strike against the theft of Namibia's wealth," in a letter from Ben Ulenga, General Secretary of the MUN, to Jimmy Symes.

The workers' decision was taken to their Union's national conference in July 1987. The TGWU endorsed their stand, and called on "trade unionists to boycott all trade in Namibian goods, including uranium, until Namibian independence is achieved in line with UN Security Council Resolution 435." The Liverpool workers are now urging fellow union members in other British ports such as Southampton to spread this action.

In response to the Liverpool action British Nuclear Fuels plc (BNFL) announced they will no longer route uranium products of South African or Namibian origin through Liverpool. Their response underlines the importance of successfully spreading the action.

Apparently no material of southern African origin has passed through Liverpool since June. However, the portworkers have shown that they mean business by holding up suspect consignments until satisfied as to their origin. One such occasion was in August last year.

HEX ALERT

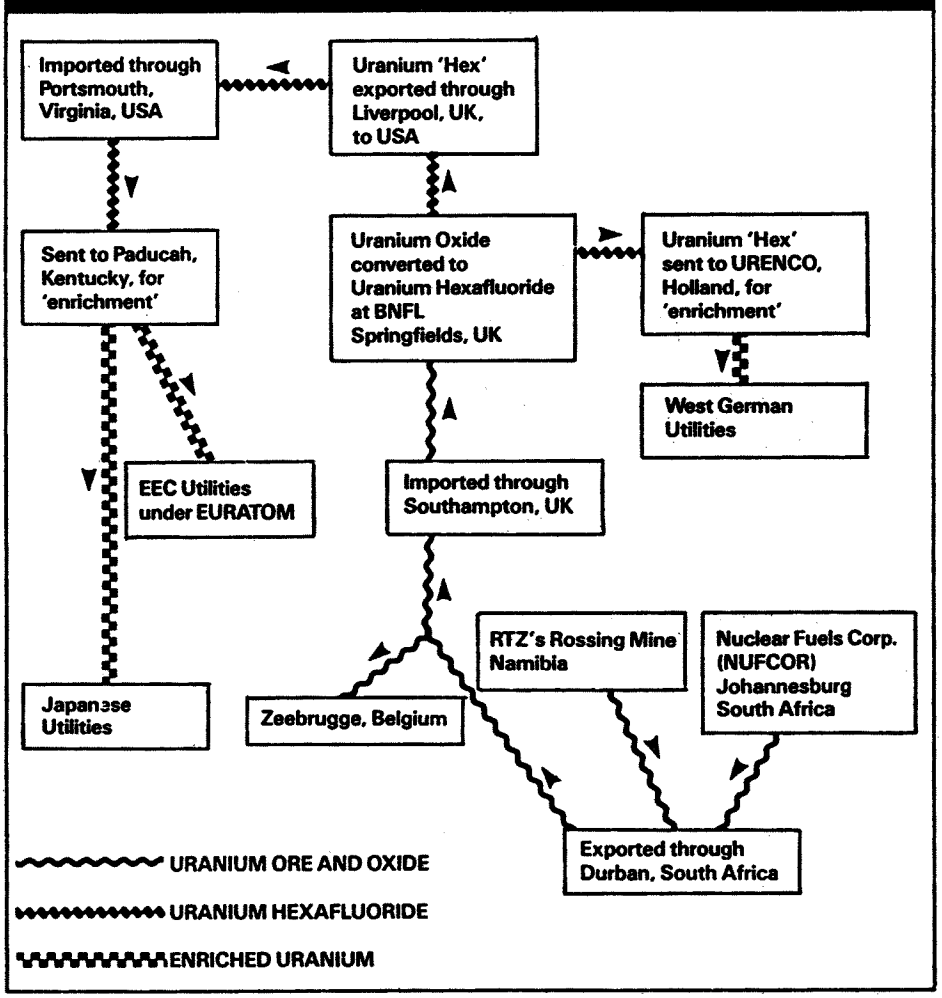
On 11 August, computer clerical staff at the port spotted a consignment of enriched uranium hexafluoride and alerted dock stewards. The cylinders were from the US Department of Energy bound for the BNFL Springfields plant near Preston. The TGWU members and their officials demanded proof that the uranium did not originate in Namibia or South Africa. Merseyside Namibia Support Group, SWAPO and CND members leafletted the docks in support.

The Mersey Docks and Harbour Company and BNFL fell over themselves to convince the workers that the uranium was from Canada. An export licence from the US Nuclear Regulatory Commission appeared on a fax machine and BNFL divulged "confidential" information: the final customer was ENUSA, the Spanish electricity board. The Namibia Support Committee had already proved that ENUSA import large quantities of southern African uranium for initial processing at BNFL.

But after 4 days of meetings and enquiries, it seemed that this consignment was in fact Canadian uranium. The dock company promised to produce documentation on the previous 18 months' worth of nuclear transport through Liverpool and to identify any future shipments as a matter of course. So far these promises have not been kept; but that they were made at all indicates the potential of direct action by workers.

The theft of Namibia's resources by multinational companies, in collaboration with the South African regime, like the issue of Namibia's independence itself, has had a low profile in Britain. This is in spite of the fact that Britain bears a unique responsibility. Among other things, contracts for 7500 tonnes of uranium to supply the British nuclear power programme, signed by a British Labour Government, led to the establishment

THE BRITISH CONNECTION



of the Rossing uranium mine in Namibia. This mine, controlled and operated by the British multinational RTZ, is the largest open-cast uranium mine in the world. Its establishment and continued operation contravene UN Decree No 1.

This is an international issue involving the United Nations (since Namibia is the last UN Trustee Territory) and countries whose governments and corporations are actively engaged in the illegal trade in Namibian resources. The British blockade, begun in Liverpool, is not the only attempt to deal with the plunder of Namibian uranium.

In Canada, during 1986, the Direct Action Network Against Military and Nuclear Racism organised actions to coincide with the arrival of monthly shipments of Namibian uranium at the port of Montreal. These shipments were destined for the Eldorado processing plant in Canada (the counterpart to BNFL Springfields) which was carrying out work on behalf of Japanese buyers. The actions, which included a waterborne blockade of the ship by a flotilla of small boats, attracted a high media profile. Soon afterwards the Canadian Government committed themselves to ending the processing of Namibian uranium at Eldorado.

URENCO ON TRIAL

The United Nations Council for Namibia have, meanwhile, sought a legal route to end the stripping of Namibian resources. This has been a slow, protracted process. The Council adopted Decree No 1, which provides for the protection of Namibia's resources, in 1974. After years of deliberation they inaugurated a test case for the Decree by serving writs on URENCO 14 July 1987.

URENCO, the uranium enrichment consortium, is a tripartite body set up by international treaty between three European governments - the UK, the Netherlands and West Germany - at Almelo in Holland, in order to enrich uranium. URENCO operate two enrichment plants, one at Almelo and the other at Capenhurst near Liverpool.

The defendants in the case are the Dutch partners in URENCO: URENCO Nederland VOF, Ultra Centrifuge Nederland NV (UCN - the state owned managing partner) and the Dutch Government as the 98% shareholder of UCN. The writ alleges violation of Decree No 1, and other UN and International Court of Justice decisions, by the processing of Namibian uranium at the Almelo plant. It demands that the court instructs the defendants to cease violations in the future and claims damages of 2,500 Dfl for each kilogram of separative work carried out on uranium hexafluoride originating in Namibia.

It also proposes that a system of "negative certificate of origin" be adopted to ensure that Namibian uranium is not processed in future without the Council's permission. The August example of the workings of the Liverpool blockade suggest that such a concept has potential in the area of direct action as well as in the legal sphere.

Photo: Smuggled out of Namibia

Rossing Mine

If the workings of the UN are slow, so are the workings of the Dutch legal system. After the serving of the writs in July, there were hearings on 1 September and 1 December. At both hearings the defendants successfully gained an adjournment of three months to prepare the defence. This process is likely to continue for another 12 to 15 months with the Council's lawyers seeking adjournments to prepare counter arguments to the defence and so on. The hearings proper may not begin until sometime in 1989. However, by 1 March 1988 we will know the basic shape of the defence arguments.

BLOCKADE

The immediate tasks for the campaign in this country are to continue the research into contracts and transportation routes, to work at extending the blockade to other ports and other unions, and to mobilise the peace, anti-nuclear and anti-apartheid movements to support the blockade.

BNFL describes its uranium processing contracts as "commercial secrets". Lynda Chalker, Minister of State at the Foreign Office, claimed recently, "the Central Electricity Generating Board contract with the Rossing mine ended in 1984 and has not been renewed. Imports of uranium from Namibia have, therefore, ceased." In 1986, Britain and West Germany forced the EEC to delete Namibia from their sanctions package, and uranium was omitted from the Commonwealth sanctions list.

But confronted by Rob Edwards of the *New Statesman*, a Government spokesperson admitted that "up to one half to two thirds of Springfields' processing for export uses uranium from Namibia or South Africa". Research by the Namibia Support Committee shows that this is probably an understatement. In spite of a glut of uranium on the world market, BNFL is overwhelmingly dependent on processing Namibian and South African uranium for Japanese and European customers.

In contrast to British complicity and duplicity, imports to the USA of uranium ore and uranium oxide from Namibia or South Africa are now barred under the Anti-Apartheid Act. But the Act still allows southern African uranium to arrive in the USA after conversion to hexafluoride elsewhere, such as at BNFL Springfields. The stand taken by the Liverpool workers is a step towards plugging this loophole.

The Canadian and US decisions not to process ore or oxide have led to the possibility of a bottleneck in the production of hex from Namibian ore in the west. Apart from the Canadian and US plants, only BNFL Springfields and Comurhex in France are capable of this processing. Given that a fully fledged, functioning blockade in this country is of limited value if the trade then switches to France the Namibian Support Committee aims to exploit the potential of the bottleneck through co-operation with French AAM and unions.

Some thought must be given to the Eastern Bloc as well. Martin Bailey, writing in *The Observer* (11.10.87) claimed to have seen documentation that a shipment of South African or Namibian uranium was destined for West Germany was enriched in the USSR.

An effective blockade in this country remains the first priority. It is vital that the Liverpool action is spread and supported by the Left in this country. Peace and anti-nuclear groups should discuss and publicise the blockade and send messages of support to the portworkers as, for instance Lancaster CND has done.

More information is available from: The Namibia Support Committee, PO Box 16, London, NW5 2LW. (01 267 1941/2)

NFZs – Posture or Policy?

In the light of the general election result there had to be a reappraisal of the role of Nuclear Free Zone local authorities' activity. MARTIN CALDWELL outlines the priorities agreed.

In the last five years NFZ authorities have ensured that peace issues have remained on the agenda, at least locally, and that the peace aspirations of ordinary folk were aired and promoted. The Government's policies on nuclear hazards, the nuclear state, and on civil defence were put under critical public scrutiny and were found to be fallacious and inadequately thought through.

But the movement itself lacked a cohesive approach to these issues. Moreover some local authorities had brought ridicule on the issue because the initiatives were not fully explained to the public. On top of this the legislative and financial framework since the election have made the work of the NFZ authorities more difficult!

Against this background NFZ local authorities considered what their priorities should be, and brought forward a programme of initiatives and areas of work for the future. A conference took place before the election and outlined the following set of criteria for the work of NFZs:

* policies should be developed in respect of those local authority responsibilities which are affected by the nuclear state, in particular their citizens' safety, general education, livelihood and well-being;
* the impact of the nuclear state on a local authority should be made a matter of mainstream concern;
* the National Steering Committee (NSC) should maximise assistance to supporting authorities, particularly in the production of good public information materials.

The emphasis on policy development was seen as necessary to compensate for the previous over-emphasis on symbolic initiatives such as NFZ road signs, stickers or peace gardens. It was felt that such symbolic initiatives pursued without a complementary policy development, had made NFZ Authorities vulnerable to attack and ridicule, and an over-emphasis on the symbolic may also have limited the number of authorities willing to spend money on NFZ initiatives.

Areas of potentially fruitful policy development included civil defence, nuclear accidents emergency planning, arms and nuclear conversion and peace education. This would involve a range of committees and departments in policy development, thereby helping to take NFZ initiatives into the mainstream of local authority activity.

The conference endorsed a detailed work programme for the NSC, including:

* assistance and guidance on civil defence matters to authorities;
* guidance and information on the road movement of nuclear warheads and components;
* advice and guidance on emergency planning and environmental health initiatives for nuclear accidents;
* information regarding peace education initiatives;
* guidance and information on local authority roles in nuclear and defence industry conversion;
* assistance and guidance on how to produce public information material.

A number of further issues were agreed, but it was recognised that, due to the Secretariat's pressure of work, supporting authorities should be invited to take a 'lead' role in developing these initiatives. This role should include preparing briefing materials and /or organising seminars or conferences. These further issues include:

* alternatives to nuclear power, eg energy conservation and CHP;
* transport of nuclear materials, their routes, frequency of movement, scale of hazard and adequacy of safety and contingency procedures;
* nuclear waste disposal, eg examining the dangers and supporting initiatives against unsatisfactory schemes;
* international initiatives such as 'peace links' and friendship agreements;
* assessment of risks associated with nuclear weapons installations.

With the election over, a further reassessment of our objectives and tactics was undertaken, and at the AGM the following additional comments were made to firm-up our programme of activities.

Civil Defence
The effective pursuance of the NSC policy of 'critical compliance' will require an active and careful consideration of civil defence developments on a local level. For Districts, this will often mean the issue becomes 'real' for the first time. The importance of Planning Assumptions Studies as providing the central component of 'critical compliance' was stressed.

Nuclear Warhead Convoys
The frequency of movements will increase with Trident thereby providing added reason for the pursuance of initiatives on this matter, particularly the adequacy of contingency plans.

Major Nuclear Accidents
Current and expected Government contingency plans for nuclear accidents envisage a role for local authorities, particularly in relation to radiation monitoring during emergencies. NSC work in these areas is likely to become increasingly important.

Peace Education
In the circumstances of the 1986 Education Act and new education proposals, whereby local education authorities' control will be loosened and the core curriculum will take up 90% of the timetable, leaving little time for other activities, the promotion of peace education perspectives will be increasingly difficult. The NSC intend to use materials from individual authorities to promote peace education, and will keep the subject under review.

Conversion
It is intended to maintain liaison between the national secretariat and researchers in the field of alternative product development so that guidance can be circulated as appropriate.

Public Information Material
One of the key tasks of an NFZ authority is to provide information on how the activities of the nuclear state affect the council's services, area and local population, and how the NFZ is responding. In the light of the anticipated amendments to the 1986 Local Government Act, the NSC intends to provide detailed legal guidance to authorities on the production of publicity as a matter of paramount importance.

The net effect of this examination was to highlight for the first time the core of the programme of NFZ local authorities. Moreover, by bringing the work of NFZ committees within Councils into the mainstream of ordinary council work two gains would be achieved:

* reluctant or disinterested councillors would become more involved in the decision-making of an NFZ authority;
* the relevance of initiatives would be made more obvious to the public if they clearly highlight the role of the local authority as a safeguard of the public against the hazards of the nuclear state.

With this programme of work based on a strong policy core, the movement is now in good fettle to take on the attacks by central government which are being prepared. We anticipate continuing success in this field.

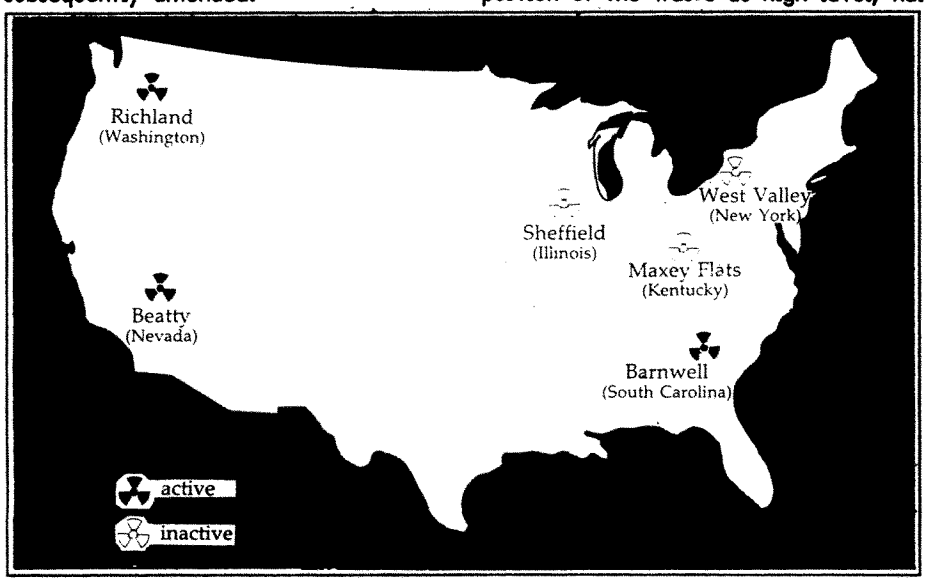
US Dumping Dilemma

Without reprocessing, the volume of "low level" waste produced in the US for every Megawatt of nuclear electricity generated will be much lower than in the UK. However, low level waste is still a political hot potato, and opposition to disposal plans is growing. PETE ROCHE investigates.

The American definition of "low level" waste is rather imprecise. Basically it includes eveything which isn't spent fuel. Materials like ion exchange resins, which would be classified as intermediate level waste in this country, are included. There is no intermediate level category in the US.

Despite the lack of commercial reprocessing in the US, there is still a huge quantity of low level waste to be dealt with. Over the next 30 to 40 years a staggering 500 million curies will have to be managed - an astonishing amount when a billionth of a curie in a hospital or lab is enough to cause alarm.

Following the closure of three of the nation's six radioactive landfills in the late 1970s, the remaining three states began to lobby for a more equitable distribution of the low level waste burden. This lead to the 1980 Nuclear Waste Policy Act, which was subsequently amended.



The Act requires all 50 states, either individually or in regional associations, to develop facilities for managing all commercial low level waste generated within their borders. In other words the Federal Government have transferred their responsibility to the states. States or 'regional compacts' must have a schedule for a siting and licensing application by January 1988. If they don't comply there will be various surcharges and penalties imposed with increasing severity until they do.

Past efforts to manage low level waste have failed. The three closed sites have all had serious problems with water infiltration into the trenches, subsidence of the earthen trench covers, and erosion. Radioactivity has migrated out of the trenches and expensive remedial measures are now required. There have also been problems at the three landfill sites which are still open, and there is every reason to believe that the problem will get worse. In short, none of the landfills has been able to prevent the dumped waste from getting into the environment.

To make matters worse, the Nuclear Regulatory Commission have recently changed their regulations so that some waste can be redefined as 'Below Regulatory Concern', which means that it can be sent to the municipal dump or poured into the sewers.

The US Radioactive Waste Campaign (RWC) have recently published a comprehensive national survey of the low level waste problem. Their report, 'Living Without Landfills', calls on the Federal Government to: reclassify a significant portion of the waste as high level; halt the search for new dump-sites; and it recommends instead that waste should be stored at reactor sites.

At the launch of the report in September, Campaign Director Minard Hamilton, strongly criticised the nuclear industry for deceiving the public about the nature and severity of the low level waste problem. She accused them of carrying out a "sophisticated and deliberate disinformation campaign." The nuclear industry have attempted to foster the idea that most of the low level waste is relatively harmless medical and research waste, whereas, in fact, the vast majority of it comes from nuclear power stations - 99% when decommissioning is taken into account.

Hamilton also attacked the undemocratic nature of decision making on the issue. Most states have joined 'regional compacts' which have appointed commissioners to select dump sites. "Plans that will leave a nuclear legacy to our grandchildren and their grandchildren," she complained, should not be decided by "a handful of gubernatorial appointees."

RWC point out that waste in landfills is never "disposed" of, if the definition is "to get rid of" in some permanent way. An obvious first step, urges the report, is to cease the operation of nuclear power stations. If the sewage system were blocked up, it would make no sense to keep flushing the toilet, but this is exactly what the nuclear industry is doing.

Safe management of existing waste involves separating the waste streams by half-life and storing them while they decay, in containers designed to match the hazardous life of the waste stream. It makes little sense, for example, to keep tritium waste, which has a half-life of 12.3 years, in the same container as reactor components contaminated with nickel-59 with a half-life of 80,000 years. The RWC propose separating the waste into three categories by 'hazardous life': 100 years, 300 years and 10,000+ years. The hazardous life should be matched to the institutional control period and the engineering capabilities of the storage system.

Waste of a 100 year hazardous life should be stored in engineered, above ground structures until it decays. Its volume should be reduced by supercompaction. Waste in the 10,000+ years category should be reclassified as high level waste, and waste in the 300 year category should be stored retrievably in more substantial shielded structures, with leachate collection systems. This waste represents less than 5% of the low level waste volume. All waste management systems must be designed to prevent water infiltration and the leakage of radioactive waste, and to minimise occupational exposure. The tiny percentage of low level waste generated by medical, industrial and institutional users should be transported to reactor sites.

This plan requires eternal vigilance. The waste remains *in* sight and *in* mind. As containers and storage vaults degrade, future generations will need to retrieve, repair and replace them. Whether we like it or not, decisions made in the last 40 years have condemned future generations to eternally safeguard nuclear wastes. There is no short-cut solution - to put it out of mind is only to invite catastrophe.

The new low level waste facilities are certain to provoke fierce opposition, and 'Living Without Landfills' is an invaluable tool, both for US and UK activists.

Living Without Landfills costs $10 + $6 p&p from the Radioactive Waste Campaign, 625 Broadway, 2nd Floor, New York, NY10012.

Tomorrow's Energy Today

Somebody, somewhere, has to get a renewable energy power station up and running in the UK. That's the rationale behind plans for a hybrid energy project designed to utilise derelict industrial land on the old refinery site near Milford Haven in Pembrokeshire. BRIAN JOHN explains.

The idea of the Milford Haven Energy Park was born in August 1986. A Danish windpower export rep asked if I would help him to investigate the suitability of Western Britain for small windfarms. An Esso Refinery site, redundant since 1983, came to mind, and initial approaches to the company and the local authorities were favourably received.

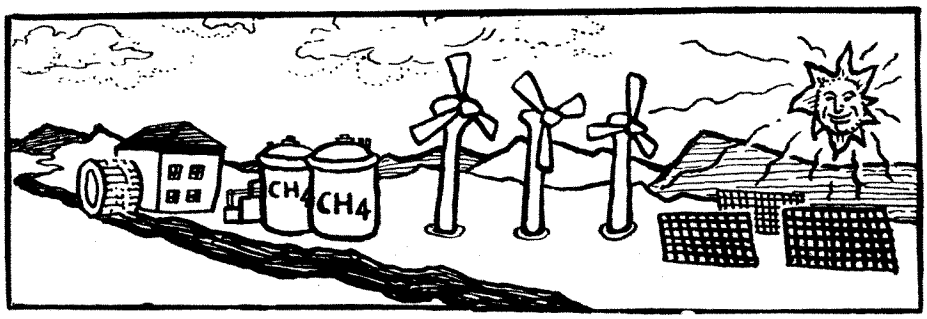
The 150 acres site, on the north side of the Milford Haven waterway is an undulating plateau about 100ft above sea-level, bounded to the south and west by sea-cliffs. The road network, is good and although most of the crude and product tanks have been removed, vast numbers of pipes are still there. There is an electricity substation linked to a 132 kV supply just on the edge of the site. One of the greatest assets is a large Victorian building in need of renovation but still structurally sound.

Having assessed the site, we developed a plan which moved well beyond the original windfarm concept to include the following renewable energy features:

- Twenty medium-scale wind turbines arranged in two clusters and providing an installed capacity of about 5 MW.
- A hybrid sea water pumped-storage scheme utilizing the bunds around 3 demolished crude oil storage tanks about 100 ft above sea-level. Wind-generated electricity will drive a reversible pump-turbine, filling the seawater reservoir at times of low electricity tariffs, and releasing water back to the sea to generate electricity at times of peak tariff.
- Energy crop plantations covering most of the site. (A more acceptable option than attempting to restore the site to agricultural use, since ground surface pollution is so extensive.)
- A methane digester system based on the use of energy crop feedstocks (initially mostly imported).The gas produced will run a micro-CHP plant feeding power to the grid and heat to a greenhouse cultivation enterprise located nearby.
- A small wave-power device just offshore feeding power to the grid.
- Photovoltaic arrays (installed capacity about 30 kW) feeding power to the grid.

Some of the above developments will not be cost-effective according to normal commercial criteria, but the hybrid approach should go some way towards overcoming the 'intermittency' argument against renewable energy resources; should allow us to supply 'firm' power to the grid; and should guarantee instantaneous supply when the area board needs to meet a sudden surge in demand from its consumers.

A key aim of the energy park will be to attract tourists. Although the economics of a renewable energy power station are delicately balanced, this can be transformed through the creation of on-site visitor attractions and through effective marketing. The Victorian building is a godsend for the tourist-related part of the project. It is a listed building, and needs to be restored very sensitively, but it is big enough to contain the power station control centre, monitoring and display equipment, exhibitions, cafeteria, bookshop, conference facilities and even accommodation areas.



After extensive discussions with manufacturers, local authorities and the electricity board we formed a company called Energy Parks (UK) Ltd in March 1987. The company's major objective is to generate electricity for sale to the grid according to the following principles. Each development should:

- utilize the free and continuously renewable energy of the wind, of solar radiation, of running water, of the tides and waves, of biomass and of natural or geothermal energy stores;
- be commercially viable, capable of attracting investment, and of generating reasonable profits for its investors;
- involve community participation and create local jobs;
- involve minimal environmental impact and lead to substantial planning gain in the use of land;
- where possible permit open public access, with visitor centres, exhibition and display areas, and other amenities promoted as tourist and educational attractions.

The company is still very small, and its Board of Directors is still not up to strength, but for the time being the Energy Park project is being handled by a Project Planning Group of about a dozen people, who have a wide range of skills.

The Project Planning Group is sponsoring a £100,000 feasibility study, the most expensive part of which will be the examination of the wind-power resource, since this is the key to commercial success. Research is being 'farmed out' to consultants at universities and research units throughout the UK; and funding is being sought from local authorities, government departments and bodies with particular interests in both the generic and site-specific parts of the study.

Raising the cash we need is proving to be a daunting task. Everybody says that the project is exciting, innovative and deserving of support, but they go on to say that they will defer a decision on funding until they can see what responses we have from elsewhere. We had not previously appreciated the extent of the 'after you' syndrome but we press on undeterred, and are hopeful that by the time this appears in print at least £50,000 will have been raised.

There are many problems still to be solved. We have to convince Esso (the landowners) that the Energy Park will be viable commercially and compatible with their other energy-related activities. We have to sort out the institutional blockages which currently afflict renewable energy developments in the UK, namely heavy rates penalties, unfavourable area board purchase tariffs for privately-produced electricity, planning regulations which pay insufficient regard to the low environmental impact of renewable energy systems, and the lack of any effective central government structure for promoting and funding AT developments.

That having been said, we have encountered great goodwill towards this 'grassroots' project from all sides - and that includes the DoEn, ETSU, the CEGB, South Wales Electricity, our local authorities, the Welsh Development Agency, Wales Tourist Board, the local planners, and even bodies like our local civic trust.

Further goodwill has come from the 7 commercial companies with whom we are doing business. They will provide the wind turbines, methane digester, micro-CHP plant, reversible pump-turbines, photovoltaics etc and share the commercial risks. But after 18 months of hard grind (and that means well over 100 meetings and about £60,000 worth of work by the specialists on our Project Planning Group) we have turned a germ of an idea into a solid and carefully considered project. Starting from a base of nil assets, we are increasingly confident that we will find the £8m needed to get our 6 MW renewable energy power station up and running. If enough people want it to happen, it will happen.

Blue Danube

As countries turn away from nuclear power, environmentalists are being faced with a painful reality - the nuclear barons become non-nuclear barons, with the same environmental and social concern to which we have become accustomed. MIKE TOWNSLEY reports on opposition to recent hydro proposals on the Danube.

In 1978, Austria held a national referendum on nuclear power, which resulted in a complete ban on nuclear power, and the dismantling, in 1986, of Zwentendorf, their only nuclear plant, which had never produced any commercial power.

In order to maintain power supplies, and reduce winter imports of electricity, the Austrian Government proposed to build a dam and hydro-electric power station on the Danube, at Hainburg near Vienna. It was to be the ninth major hydro scheme on the river.

This reasoning is seriously flawed. During the winter less than 15% of Austria's electricity is produced by hydro-electric stations, because most precipitation is trapped on the mountains in snowpacks. And, in the summer when hydro-electric generation accounts for nearly 90%, of the Austrian needs, they export electricity.

The project began in November 1984 with the signing of a contract for the destruction of Auwald, one of Europe's few remaining primal forests. Environmentalists were incensed. The scale and vigour of their protest took the Austrian Government completely by surprise. Victory first came at the beginning of 1985 when, after a bloody confrontation between the police and about 2,000 protesters camped at the site, the Government called a two week halt to the 'arboricide'.

Chancellor Sinowatz later announced his cabinet had decided to postpone the dam, and draw up a new plan giving environmental aspects greater importance.

AUSTRIA/HUNGARY DEAL

Meanwhile, a new Danube controversy was brewing, between Hungary and Czechoslovakia, over a project first suggested in the '50s, involving 3 dams, a huge storage lake, a 20 mile canal re-routing the Danube into Czechoslovakia, and 2 power stations - a 769MW complex at Gabcikovo, and a 120MW one at Nagymaros. In 1977, the two nations finally decided the project would go ahead.

Hungary, although originally enthusiastic because the scheme would create 275,000 acres of farm land, have been dragging their heels ever since. Czechoslovakia, however, have pressed ahead relentlessly, despite an official request from the Hungarian government to reconsider. This left Hungary in an unenviable position - if the Gabcikovo station comes on line before the second dam at Nagymaros is built, the northern Hungarian plain will be flooded.

This is where the Austrians rejoin the story: in May '86, on the rebound from their defeat over the Hainburg dam, they offered to finance the Hungarian side of the project. Taking full advantage of the Hungarian predicament, the Austrians offered Hungary a deal it couldn't afford to refuse. It is riddled with conditions - in return for the £650m to build Nagymaros, construction work on the dam worth £400m would have to go to Austria's Danube Power Station Company, the rest of the money (and interest) is to be paid back over a 20 year period, in electricity. Nagymaros will produce only 133GW a year, 120GW of which Austria will abscond with.

EMBASSY OCCUPIED

The Nagymaros/Gabcikovo scheme gave birth to Europe's largest single issue protest group since the war: the Danube Circle. They have collected over 10,000 signatures and produced a very convincing report on the impact of the project. Their argument is simple; the ecology of the river will be severely damaged; organic and metal pollution currently filtered by the Szigetoz shallows (to be by-passed by the canal) would increase; the river will silt up; an 80 mile river bank stretch of willow trees will be destroyed to make way for concrete banks; drinking water will be polluted . . . Yet the project continues!

Austrian environmentalists, Global 2,000, also joined the fray. In June '87 they occupied their embassy in Budapest, and after only 2 hours they had gained the promise of a meeting with Vice-Chancellor Alois Mock, and Environment Secretary Marlies Fleming who later promised an environmental study into the scheme. But will it be the independent study Global 2,000 demanded?

Verbundgesellschaft (VG), the Austrian state power board, still contend they need more power if they are going to meet Austria's growing needs. Their argument was dependent on an electrical power consumption growth of 4.4% in 1985, but when questioned they later admitted this figure was, in reality, only 3% (a mistake any power board could make, and frequently do). "As far as I am concerned, Hainburg is not yet dead," stated VGs chairman early in 1987.

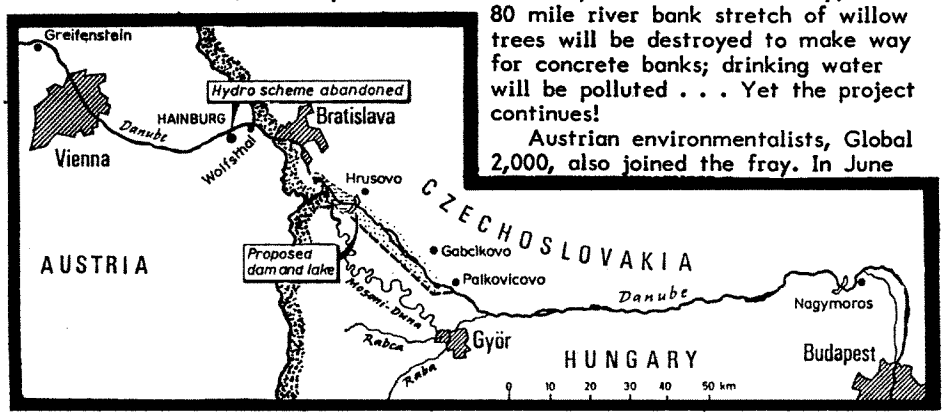
FURTHER PROPOSALS

In 1986 a solution appeared, briefly on the horizon, a dam and hydro-electric station at Straustufe Wien, in Vienna. Many people believed this would not only provide power but could be used to benefit the environment.

At Greifenstein, Austria's most easterly dam, there are serious soil erosion problems and partial stagnation. A dam in Vienna would, theoretically, allow the river flow along this stretch be controlled. Politics once more reared its ugly head: Erhard Busek the, conservative, deputy mayor of Vienna publicly questioned Straustufe Wiens economic and environmental acceptability. This resulted in local conservative party members calling the proposal a socialist plot, courting the construction industry, and threatening to force a referendum if the project wasn't dropped - a referendum which the government would lose, and had no political stomach for. But, even now work on the plans for this scheme is pushing ahead.

Austria's new government, a coalition of conservatives and socialists, have agreed the need for another hydro-electric scheme somewhere on the Danube. And propose a site "east of Greifenstein" an area, between Austria and Czechoslovakia, as yet unspoilt, and environmentalists are adamant that it will remain that way.

VG are still pursuing all of their original plans for the Danube, Hainburg and Vienna have only been reprieved not pardoned. They are now running an advertising campaign, aimed at environmentalists, claiming various species of flora and fauna have been restored as a result of hydro projects. Environmentalists, however, remain unconvinced. And, are steeling themselves for the next attack on the Danube.



Contact: *Global 2000, Hangasse 14/15, A-109 Vienna, Austria.*

Developing World Energy

The Intermediate Technology Development Group are working in developing countries to assist local communities to reduce their dependence on imported technology by designing systems appropriate to their needs. MEGAN JONES describes the work and outlines one project in Nepal.

INTERMEDIATE TECHNOLOGY Development Group

There are millions of people living in remote rural corners of developing countries who have never had to wrestle with the energy questions posed in this Journal - "Where does our energy come from; is it safe; is it cost effective?" These people have no choice and, more often than not, no energy.

The Intermediate Technology Development Group (IT) is a Rugby-based charity working with the rural poor in the Third World to give them an option.

Founded in 1965 by the British economist Dr Fritz Schumacher, author of "Small is Beautiful: A study of economics as if people mattered", IT aims to make technology work for people. Working with Non-Governmental Organisations and other charities in over a dozen countries, the charity looks at the traditional methods of production in the rural areas and improves on them, using modern engineering techniques.

IT emphasise the use of tools and techniques which will take advantage of indigenous knowledge, skills and materials. By reducing a community's dependence on imported expensive technologies, and instead designing technologies which ordinary people can afford, manage and control, the people of that community are given the chance to work themselves out of poverty.

At a time when short-term aid has repeatedly disappointed its donors by providing little more than short-term relief, helping the people to help themselves offers a convincing alternative.

MICRO-HYDRO

The energy needs of the disparate rural populace in Nepal say, are very different from anyone living in this country. In Britain, each person uses on average 4,400 Kilowatt hours of electricity per year - that is each person boiling enough water in a kettle to make 288 cups of tea EVERY DAY. In Nepal, each person uses the energy equivalent of 1½ cups of tea a day.

These people live in isolated pockets of land, accessible only by a network of tracks weaving their way from village to village. The cost of connecting them to the national grid would be about £6,000 per mile of cable - less than 2 million of the country's 16 million people have power at the touch of a button.

What the people do have is an abundant water supply. For thousands of years they have harnessed it to irrigate their crops; for centuries they have used its energy to drive water wheels or ghattas which drive basic corn grinders. But the grinders are inefficient and time consuming. Women wake long before the sun rises to manually grind for hours what an average family of eight will eat for their breakfast. Once the meal is over, she will repeat the process for lunch.

IT have been working in conjunction with Nepali mission groups and British engineering companies to relieve this daily grind. By introducing turbines which are able to drive three or four food processing machines in a village mill at one time, the quality of life for tens of thousands of Nepali women has improved. Released from the constant manual processing of food, women in the 600 villages with micro-hydro schemes can now turn their attention to other income generating processes.

A decade ago, there was one engineering workshop and one manufacturing company capable of servicing the new industry. Today there are 13 manufacturers producing and installing turbines. And the ripple effect of progress doesn't stop there.

In the last decade, thousands of villagers have been given access to an electricity supply through an appropriate, but sophisticated technology. The Electronic Load Controller (ELC), which won the Swedish International Inventors Award in 1986, meets the fluctuating energy needs of a community over 24 hours by automatically converting surplus energy into heat, which can be used in the village bakeries, for heat or for drying crops. It is cheap, easy to maintain and can be fixed on site. The Nepali government is keen for private companies to provide rural electrification and offers financial incentives for them to do so.

After China, a country with some 87,000 micro-hydro plants in operation, Nepal generates more energy this way than any other country. It is a technology which has a spread throughout 20 countries in the developing world, stimulating local manufacturing industry and making the lot of the world's poorest people a little easier.

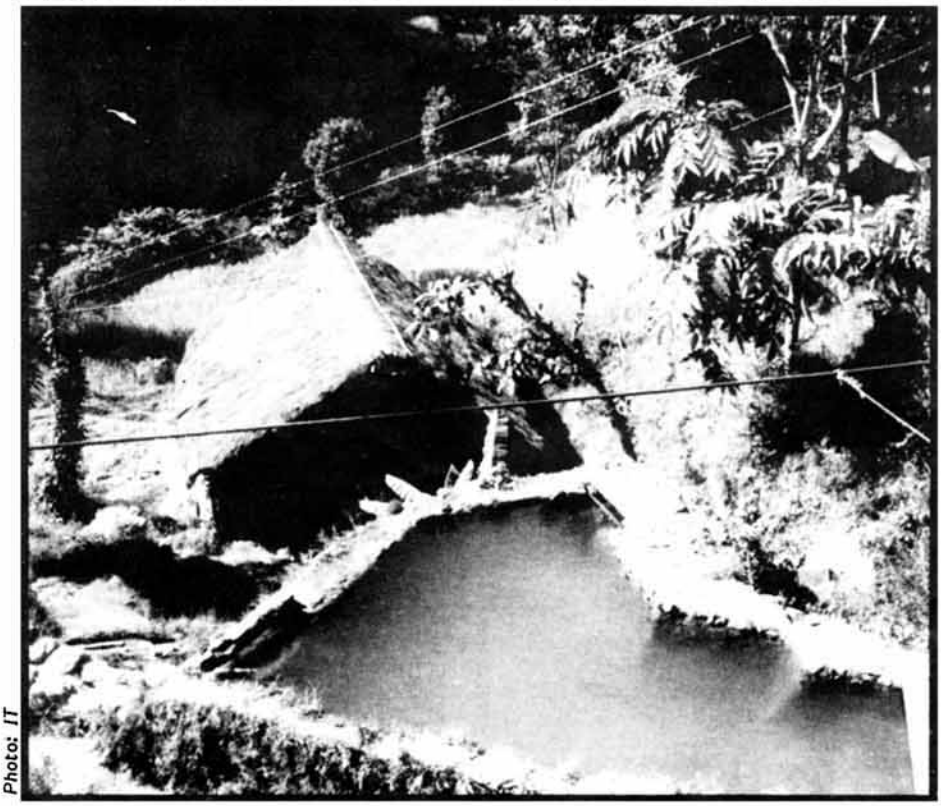


Photo: IT

A Nepali Micro-hydro scheme

Future issues of SCRAM will include occasional articles on other IT projects.

IT is a charity which relies on the generosity of the public to continue their long-term development work overseas. Further information on their projects may be obtained from, and donations sent to:

Intermediate Technology Development Group, Myson House, Railway Terrace, Rugby, CV21 3HJ.

Wind Energy Developments

Energy Secretary Cecil Parkinson, has dismissed wind power as a major source of electricity, only 2 weeks after inaugurating Orkney's 3MW wind turbine, the largest in the UK, and seen by many as the precursor to a UK wind farm.

Contradicting not only himself but also the Energy Technology Support Unit (ETSU), the research branch of the Department of Energy (DoEn), Parkinson told MPs, "I cannot honestly see how we will generate large quantities of electricity from the wind."

Photo: Martin Bond

At the grand opening of Orkney's giant wind turbine, he enthused, "The unique machine I am opening today takes the development a stage further. It could be a major step towards large-scale commercialisation of wind power." And, in the most recent report from ETSU (ETSU-R-43, see SCRAM 61) wind power is seen as "one of the more promising renewable energy sources for electricity generation in the UK." Perhaps a line of communication should be opened between the Department's mouth and the Department's brain?

LS-1, funded entirely by the public sector - 89% by the DoEn and 11% from the NSHEB, is the UK's largest wind turbine and sits on Burgar Hill casting a shadow across the hill's other two tenants, the 250kW (its predecessor) and 300kW machines.

Built by WEG, the Wind Energy Group consortium involving Taylor Woodrow, British Aerospace, and GEC, the wind turbine is expected to supply enough electricity for 2000 homes connected to the Orcadian grid, and operate for at least twenty years before any major replacement of parts is necessary. The DoEn now plan a 2 year period of extensive monitoring and analysis before handing the machine over to the NSHEB, or its private equivalent.

The synchronisation of this machine with the Orcadian grid, represents the culmination of 10 years work for WEG. Looking to the future, Dr David Lindly (general manager of WEG) took the press opportunity to promote the idea of a wind farm in the UK, presumably to be built by WEG. "We now look forward to moving into a commercial phase of wind farm development in this country to assess public acceptability and demonstrate economic viability under conditions prevailing in the UK." He added, "such a development will enhance the opportunities for export sales to electric utilities around the world."

The latest BWEA (British Wind Energy Association) position paper, the 'Red book', calls for a "wind park of say ten to fifteen megawatt-sized wind turbines", to be ordered "immediately on the successful construction of the present large machines"

The preoccupation of the DoEn with this giant wind turbine seems somewhat diversionary, evidence from abroad shows that wind farms consisting of large numbers of smaller machines are more economic.

However, in his speech on Burgar Hill, Mr Parkinson was giving little away - certainly not the bomb-shell he was to drop 2 weeks later. He praised his Department's role in the current success of "promising but uncertain" wind turbines. He reported "£25m has been spent since 1979, lately at a rate of about £4m a year" on wind energy - less than the nuclear industry, which provide under 20% of our electricity requirements, spend in a week. Given the DoEn's admission that 10% of electricity needs could be provided by the wind, it seems clear, there has been a serious misallocation of funds.

SCRAM understands that the DoEn, despite Parkinson's polemic, are looking into the prospect of a wind farm, and we expect an announcement during the first half of next year.

DENMARK

The Danish Energy Ministry have set up a committee to examine the potential of offshore wind farms, with a remit to locate one or two possible sites for trial projects, and develop guidelines for further offshore development.

The site recommendations are to be delivered by 1 April, with the guidelines being published shortly afterwards.

Energy Minister Svend Erik Hovmand believes offshore wind farms offer an exciting prospect, and that every care must be taken, at the development stage to "guarantee a favourable start." Bearing this in mind, he has assembled an impressive team of Governmental officials, from a wide range of Departments: Ministries of Energy, Environment, Fisheries, Defence and Public Works. The committee is chaired by Hans von Bulow, of the Energy Board.

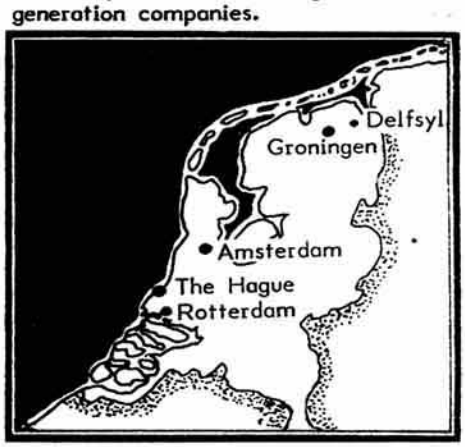
In December 1985 the Ministry made an agreement with power companies for 100MW of onshore wind power by 1990.

The progress being made by Denmark and several other European countries in the field of wind power means if the British wind power industry does not receive the backing they require from the UK Government, we could miss yet another boat, and lose out on the developing wind power technology export market.

THE NETHERLANDS

Meanwhile, near the small town of Delfsyl in the north of the Netherlands, construction of Europe's largest wind park is about to begin.

Ironically the Dutch electricity industry is travelling in the opposite direction from our own - Dutch provincial electricity companies are being forced to close their production facilities, in favour of large generation companies.



The 8.5MW wind park is expected to cost £5m, and will consist of 22 160kW wind turbines and 20 250kW turbines - all of which will be supplied by a local, manufacturer: Bauma Windenergie BV (BW).

BW became dissatisfied with the Dutch electricity authorities attitude to wind power, and decided to take the initiative - they carried out site and environmental studies; sought the necessary permission and certificates, enabling them to present complete wind energy packages, making it difficult for the Authorities to refuse. An idea perhaps for our own wind energy companies, if they can resolve their conflicting interests and decide which type of plant they'd rather build - nuclear or renewable.

Bauma have also set up a foundation to promote wind energy within the Netherlands.

Wind parks with a total capacity of 150MW will be built in the Netherlands over the next 3 years.

Energy Efficiency

The European Commission (EC) are drawing up a programme to improve energy efficiency in the Community by 20%. They intend to submit their proposals, which will involve close consultation with UPIDE (Union of European Electricity Producers and Distributors), by the middle of next year.

The EC have suggested making it compulsory for anyone selling or leasing a house to produce an Energy Audit of the property. They hope to implement legislation in all EEC countries by 1 July 1989.

This, predictably, received a mixed response from the energy ministers; Denmark already operate a similar scheme, and were the most enthusiastic supporters of the proposal; France want it applied only to new homes; Germany fears it will result in unnecessary bureaucracy; and Britain and Holland want it to have recommendation status only.

In the UK, Andrew Warren the director of the Association for the Conservation of energy welcomed the proposal as the "missing link" between the Government advertising campaign, and the £7 billion annual fuel savings still to be achieved. He believes the introduction of such a scheme in Britain could expand the market for energy conservation equipment, like insulation and heating controls, by over £5 billion.

This takes last years decision by the EC to commit themselves "in principle" to a stringent energy efficiency plan - reducing our end use energy demand by at least 20%, before 1995 - into a slightly more practical stage.

Dissemination of information is seen as a prime factor in achieving this goal as well as electricity utilities implementing an "efficiency of electricity use programme", which for some utilities "would be a new departure." The Commission have calculated that a 10% increase in energy efficiency would reduce the community's oil requirement by 1 million barrels per day, negating the need for 40GW of future supply.

The scheme would also have considerable environmental benefits: less generation means less pollution.

Biomass

The European Commission (EC) decided on 11 November not to back a plan to subsidise the deployment of Europe's grain surpluses into the production of bio-ethanol.

The plan's main promoter, Mr Raoul Gardini, head of the Ferruzzi agri-industrial empire, argues that the production of bio-ethanol is an attractive means of cutting the Community's 16m tonne grain surpluses. Gardini believes it would also complement the Community's plans for lead free petrol, under environmental laws to be introduced in the 1990s.

However, the opposition lead by Britains Lord Cockfield, the Competition Commissioner Peter Sutherland, and the Budget Commissioner Henning Christopherson, produced a string of very convincing arguments.

It is estimated that agrofuels would have production costs of Ecu49 per hectolitre compared with Ecu13.7 for petrol; bio-ethanol production would lead to large quantities of by-products (cereal substitutes such as starch and gluten) reducing further the cereal markets; and a Community equalisation subsidy would double the cost of supporting the export of grain at world prices.

Ferruzi are expected to continue with the building of a bio-ethanol plant in France, despite the EC's decision. France backed the proposal to the EC. The Italian Government, however, are divided on the issue. The Italian Agriculture Minister supports the proposal, but the President of the state power company disagrees, argueing that the petrol refining industry can produce lead free petrol far cheaper than the agri-industry could in the foreseeable future.

Combined Heat & Power

An argument is brewing between the CHP industry and the Department of Energy (DoEn) over how much energy be can generated by converting stand-by generators to CHP.

There is little argument over the economics of such conversions: a study conducted by the DoEn at the Perkin Elmer factory in Llantrisant gave typical conversion costs of around £100/kW - Sizewell B will cost £2000/kW.

A recently leaked report, conducted by FEC Consultants, for the DoEn (completed in 1984) concluded that the minimum number of gen-sets with replication "potential" was 5,000, with an average rating of 100kW, giving a potential of 5GW. However, the DoEn say the potential for micro-chp conversion is only 500MW.

Mike Snedker of the Cornwall Health Authority (& Chairman of the National Energy Management Advisory Committee) estimates there is 4.3MW of stand-by generators within the Authority's area - extrapolating this for the whole of the National Health Service gives 1GW, double the DoEn's estimate. Converting all UK hospitals would cost around £10 million, say the Association of Independent Electricity Producers, but would save the nation £150 million a year.

Such considerations are governed by ENCODE: "Encode is a comprehensive guide and reference source to 'Value for Money' energy saving in Health Care Buildings," say the DHSS, adding they are considering the proposal, and will encourage the conversion where applicable.

Hospital stand-by generators were a powerful weapon in Thatcher's arsenel during The Miners Strike, but could now be used as an argument against Hinkly C.

● ● ● ● ● ●

Sheffield Heat and Power Ltd (SHP) - a consortium of the City council and Ekono of Finland - expect to be delivering heat, from a refuse incineration plant with a 30MW capacity, to 1,890 homes by the end of March.

This is the first phase in a city wide scheme, and will involve laying a 10km pipeline; installing three 6MW stand-by boilers; and replacing the present underfloor heating in 15 pairs of tower blocks for new hot water systems. SHP estimate the total cost for this phase will be £10 million.

The pipeline is to be supplied by British Steel, but it must travel to Denmark for a polyurethane insulation sleeve and an external uPVC coat. It is not yet possible to treat large areas of pipeline this way in the UK, say SHP.

Sheffield were among the original 9 city's considered for the Government's 'Lead City Scheme' but failed to be chosen: Edinburgh, Leicester and Belfast were successful. However Sheffield decided to continue regardless.

Realising no funds would be forthcoming from the Government, the Council approached the EEC, who awarded them a £300,000 grant.

Ironically, Sheffield are now poised to become the first UK city to realise the potential of city wide CHP.

David Lawrence, Acting Chief Executive of SHP, told SCRAM of the benefits CHP would bring to the City: "inner city regeneration, employment, a rational use of energy...it makes sense."

As a steel town, Sheffield already stands to gain from the increasing use of CHP. but as pioneers they could attract the embryonic service industry; "...we have the redundant factory space" (not to mention the work force).

If all goes according to plan Sheffield could once again become an industrial heartland.

Private Power

The first tentative steps towards the privatisation of the electricity industry have been taken: Independent Power and Energy (IPE) have signed a deal, costing £100 million, to buy at least 3 disused coal fired power stations from the CEGB.

The three stations, with a combined capacity 420MW, are at Rogerstone, Connah's Quay, and Roosecote. Angelo Casfikis the contract's architect, with interests in private and drift mines in south Wales, says the plant have been in mothballs for several years and will require extensive refitment. He expects it to be about two years before the plants are ready to start generating commercial power.

Casfikis was unable to tell SCRAM which type of combustion technique the refitted stations will incorporate, except that it will be a modern low NOx burner, and have a dry lime flue gas desulphurisation plant. The actual level of emission control is governed by economics, says Casfikis: "the big stations must adhere to the EEC limits, but if you impose such a limit on refurbished stations, you just haven't a hope of starting up." The setting of control limits lies with HM Pollution Inspectorate, and has not yet been set.

IPE have investigated the possibility of a Government subsidy (or tax-relief) for incorporating pollution control plant, but now believe the Government don't understand the concept.

The EEC have also been approached by IPE, who had delusions that they would be eligible for a 'New Technology' grant. However the EEC contend FGD is not a new technology on the continent, and are unwilling to award a grant.

Among the many other problems facing private generators of electricity, is how much they can expect to be paid per kW delivered to the grid, a difficulty Casfikis is all to familiar with: "We are negotiating our own tariff, not the Government tariff, because the Bulk Supply Tariff has been designed by the CEGB and is not bankable, every year it changes - a bank cannot make an investement of this size with yearly changes - maybe its been designed like that to stop independent production."

Several other groups, with proposals to build about 6 new stations with a total output of 4GW, are now watching the progress of the IPE test case.

● ● ● ● ● ●

The Icelandic Government and Northern Venture Associates (NVA) are currently discussing the possibility of importing Icelandic hydro and geothermal electricity to the UK via an undersea cable (SCRAM 61).

Alex Copson and George Pritchard of NVA (aka CET) visited Iceland recently to discuss the proposals with the National Power Company (NPC). George Pritchard told SCRAM, "both the Icelandic Government and NPC are very enthusiastic about the proposal." This is not surprising when you consider they first promoted such a scheme over 30 years ago.

NVA also met with other concerned bodies, including their nature conservency agency who, according to Pritchard are quite happy with the proposal: "Its no good trying to clean up the environment in this country if you are going to create a reciprocal problem in Iceland."

NVA expect the first phase of the proposal to involve laying a 500MW copper transmission cable, which should have a power drop of only 7%, but are unsure of its exact points of departure and arrival. The 1,000 mile cable will be the longest of its kind. The electricity is required in England, but northern Scotland is a more convenient landing point. However, the existing grid in the far north does not have a 500MW capacity, so the cable may have to be taken south anyway.

The first phase is expected to take about 7 years, with the project expanding over 15 years to 2GW. This will not exhaust Iceland's spare capacity, and further imports of electricity (greater than 10GW) are likely if the pilot is successful.

NVA have no doubts about the economics or the feasibility of their plan, but are waiting for a study conducted by Icelandic engineers to be translated before they take their proposal to the City. It is hoped the translation will arrive in January.

Although no longer as grand as the original 10GW reported in the press, NVA's proposal still has significant implications for "Marshall's mad march to five more PWRs."

● The CEGB are increasing the price they pay independent producers for long term power supplies, from £34/kW to £43.5/kw - assuming coal costs of £35/tonne. This reflects the Board not having to build extra plant, to meet peak demand, and privatisation.

Funding

Energy Minister Michael Spicer, speaking at the Watt Committee on Energy's December conference, announced there would be an additional £2.3 million added to the Government's budget for renewable energy sources.

The increase takes the Department of Energy's (DoEn) renewable R & D budget to £16 million. Mr Spicer commented: "I am delighted to be able to announce that I have secured this increased allocation from the treasury - a reflection without doubt of the success we are achieving in developing the renewable technologies in Britain." However, he added, "whatever we do must be economic and it must in addition not cause serious damage to the environment."

Mr Spicer revealed that almost £1m will be spent on a number of passive solar design studies, "exploring its use, performance and cost in a wide range of buildings." Also, a consortium led by Llanelli Borough Council have been awarded £50,000 to conduct a feasibility study for a small scale tidal barrage across the river Loughor in south Wales.

Heralding the publication of a major Governmental strategy document in 1988, he reported: "Much has been learnt over the past ten years, and we have a reasonably clear view on which technologies are likely to be contributing to our future energy supplies in the 21st century."

The conference was the Watt Committee's 23rd. It covered 10 different renewable energy sources, and its findings will be incorporated into a "broad impartial review of the present status of renewable technologies."

In 1986 the DoEn and the Committee agreed the need for an impartial review, and set up a working group chaired by Prof M A Laughton (Queen Mary College, University of London) as chair. A full report will be published in 1988.

LEEN

The London Energy and Employment Network have been forced to shut down because Technet and the London Boroughs Grants Scheme (LBGS) have withdrawn their funding.

LEEN's demise came after a sequence of events that can only be described as classic 'Catch 22'.

In July both organisations had approved grants - LBGS (£45,689) and Technet (£23,404). The grants were meant to ease LEEN into self-sufficiency, yet by October neither organisation had honoured their offer. After four months of LEEN trying to fund themselves from sales and miscellaneous income, LBGS finally came up with some of the money, £23,000. Unfortunately this was accompanied by a statement that no further funds were available in view of Technet rescinding their grant.

Technet, however, claim to have withdrawn their offer because LBGS awarded only half their grant.

LEEN had been in receipt of public funds since 1983, and intended to "become self-financing through the sales of its energy information and training services on a national scale by 1988." Susie Parsons, the Network's development manager, said "They never told us clearly why they were withholding the money or what we would have to do for them to release the money."

David Green, chair of LEEN, said, "...while LEEN will continue to exist as an organisation, we cannot do much to improve energy efficiency in London without staff. London's ratepayers have funded LEEN since 1983 and they have now just lost a source of expertise which will be very difficult to replace."

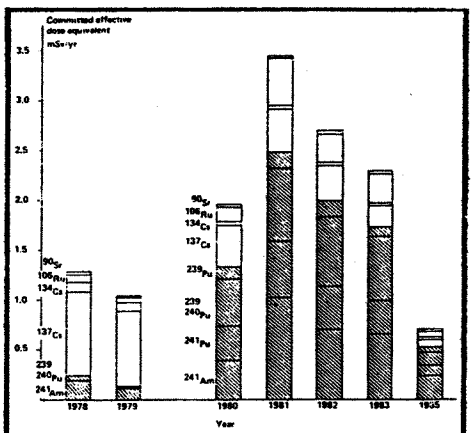
Radiation & Health: The Biological Effects of Low-Level Exposure to Ionizing Radiation, Edited by Russell Jones and Southwood, 1987, Wiley. 292pp £19.95.
Radiation Risks: An evaluation by David Sumner. Tarragon Press. 197pp,£3.95.

The first book is essential reading for all those interested in the rad/health debate. If you ever spend £20 on a book, then now is the time to do it.

It is the edited proceedings of an International conference held in London at the end of 1986. Robin Russell Jones is Chairman of the Pollution Advisory Committee to FoE, and Richard Southwood is the Chairman of the NRPB. The debate about health effects of low level radiation has become increasingly polarised over recent years. The conference enabled all sides to present their case, with different scientific opinions being reflected equally. So the book leaves the reader to make up their own mind.

David Crouch discusses the deficiencies of the NRPB's computer model for calculating the number of cancers expected from a given level of radiation (see page 10). John Urquhart looks at the statistical evidence of leukaemia clusters around nuclear power installations in the UK. (see SCRAM 57).

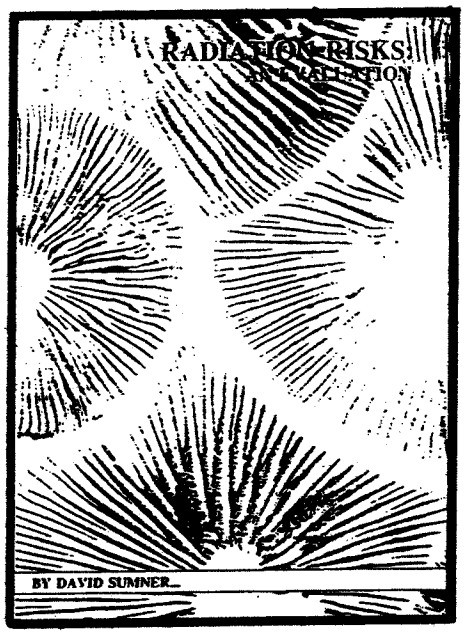
Other chapters include Berry's defence of the ICRP and Karl Morgan's alternative view. David Gee, gives the Trade Union point of view and argues for a five-fold reduction in dose limits. Paul Lewis looks at the variation between individuals and their susceptibility to radiation. He argues that radiation protection advice should take account of those people who are hypersensitive. Evans looks at genetic damage caused by low levels of radiation. Ujeno uses correlation to test the effects of natural background radiation and Stewart and Kneale look at childhood cancers and background radiation. Darby and Doll point out



Source: MAFF FRL.
Figure 8 Individual radiation exposure due to consumption of Irish Sea fish and shellfish: consumers in the local fishing community (critical group).

that the available data weighs heavily against the idea that recent increases in childhood cancers could be accounted for by discharges from Dounreay, unless the dose to the red bone marrow has been grossly underestimated compared with dose received from fallout. There also remains the possibility that leukaemia does not arise in the red bone marrow. Lambert shows that Chernobyl will cause between 400 and 500 extra cancers in the UK, less than half of them fatal. He argues for a consensus on action levels throughout Europe.

Peter Taylor argues that the British approach to radiation has failed to protect the environment. "If this can happen with the most intensively monitored and researched pollutant, then the UK approach does not augur well for other contaminants." It's about time that Britain started to take the precautionary approach - there should be a presumption against toxic discharges, rather than waiting until research following dispersal proves toxicity.



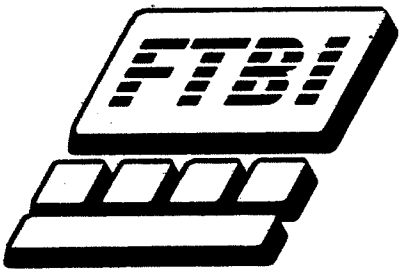
'Radiation Risks' is described by the author as a 'balanced introduction to the evaluation of risks from low level radiation, and extremely handy it is too. Even if you are well versed in the subject, you'll find it useful to have definitions like 'effective dose equivalent' and 'generalised derived limits' altogether in one place. If you need to learn the subject from scratch the book will be invaluable. It starts off with radiation physics and biology, discusses the way risk factors and permissible levels are derived and looks at some of the low level radiation studies. It is extremely well referenced, and the author advises readers to go to the original source material and hopes that his book will facilitate understanding them. I'm sure it will. David Sumner has done those of us interested in the rad/health debate a service by producing this book.

PETE ROCHE

Advanced Coal-Use Technology by Walt C Patterson. FTBI. 123pp, £180.

In this report Walt Patterson explores the many new technologies developed, and being developed, to harness the energy contained within coal cleanly and efficiently.

He argues, "Prices and supplies of petroleum are now unnervingly unpredictable, those of natural gas equally so - particularly when looking to the future. Nuclear power, once so promising, has disappointed all but its most die-hard advocates. In the light of such uncertainties the low cost, world-wide availability and long-term reserves of coal make it look suddenly more attractive to any prudent energy user"



Describing the new era (although many of the technologies have been around for decades) as the "renaissance" of coal, Patterson takes us through the many new designs clearly and methodically, giving many site specific examples.

At times Patterson's treatment of emission control statistics becomes vague, it would have been better if he'd used the same method of quantification each time.

The report makes it quite clear, that despite ministerial boasting, the UK does not lead the world in advanced coal-combustion technology. A great many international power stations use advanced combustion techniques to burn coal more efficiently and cleanly, as illustrated in the site examples. Yet, in the spring of this year the CEGB announced plans to build 2 new coal fired power stations of conventional design with denitrification and desulphurisation accessories: "did anyone consider the possibility of having British Gas, British Coal and the CEGB join forces and build a plant converting British coal in a slagg gasifier, and use its output of fuel gas and steam to power gas and steam turbines in combined cycles?"

Although, essentially a positive report, outlining the advantages of coal as a major fuel, it ends on a realistic note; recommending that in the long term a move away from coal is advisable, unless we want to drown our coastlines and destroy our most productive agricultural land: the Greenhouse effect.

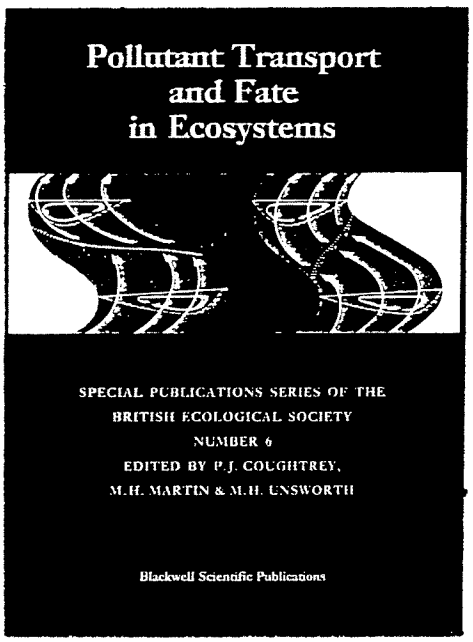
At £180 its not something you'd buy for a personal library, but if you do come across it - read it.

MIKE TOWNSLEY

Pollutant Transport and fate in Ecosystems edited by Coughtrey, Martin & Unsworth. Blackwell Scientific 1987.

This collection of papers from the Ecological Society will not necessarily be of general interest to SCRAM readers, although two of the contributions add significantly to the nuclear debate.

What is important about these two papers is that they examine the transfer of radionuclides, first from



soil to wheat and then from grass to sheep. For anyone interested in the post Chernobyl debacle over sheep restrictions, these are worth reading.

Importantly, they show that the transport of caesium through the ecosystem was fairly well understood at least one year before Chernobyl. A book to borrow from the Library.

THOM DIBDIN

Nuclear Power: More Facts You Should Know. Ecoropa Information Sheet No 16.

Ecoropa have done a good job. Their sixteen page leaflet provides an excellent introduction into the multitude of anti-nuclear arguments.

Using a question and answer format the pamphlet covers:- health and safety, both operational and accidental; economic viability; threatened civil liberties; terrorism and nuclear proliferation.

32 questions are posed in all, then answered in concise and factual manner. The pamphlet is aimed at the relatively uninformed, because of this reader impact is rarely sacrificed for detail. This format lends itself well to readability, whilst covering many issues the leaflet never gets bogged down in detail.

A by-product of the leaflet's factual nature is the need for a bibliography; this unfortunately is not included, but is available for £1.

To summarise, Ecoropa's information sheet is a thorough and comprehensive overview of the nuclear debate. As an introductory document it is indispensable, both for it's detailed and general nature.

Available from Ecoropa, Crickhowell, Powys, Wales, NP8 1TA.

RONNIE MACEWEN

CEGB Research, August 1987. No.20 Acid Rain Special Issue. CEGB Marchwood, Southampton, Hamps. SO4 4ZB.

CEGB Research 'Acid Rain' describes itself as a special issue, published on an occasional basis, available free of charge to suitably qualified individuals and organisations.

Make of that what you will, what it certainly is, is an expensively produced journal-like document handed out widely enough for a copy to have landed on my lap in the small secondary school where I work.

CEGB's Acid Rain Testing Vehicle

Covering in five chapters by different authors, the chemistry and fate of airborne emmissions from power stations and their effect on soils, lochs, farming and buildings, the overall impression is one of a consensus that things are generally quite rosy for the future of fossil fuel power stations.

I'm not suggesting that anyone should be surprised that research paid for by the CEGB should come up with the sort of results that are presented here, but I can't help thinking that my own "Highers" students would be left asking why the CEGB are paying to install flue gas desulphurisation equipment at Drax B and Fiddlers Ferry.

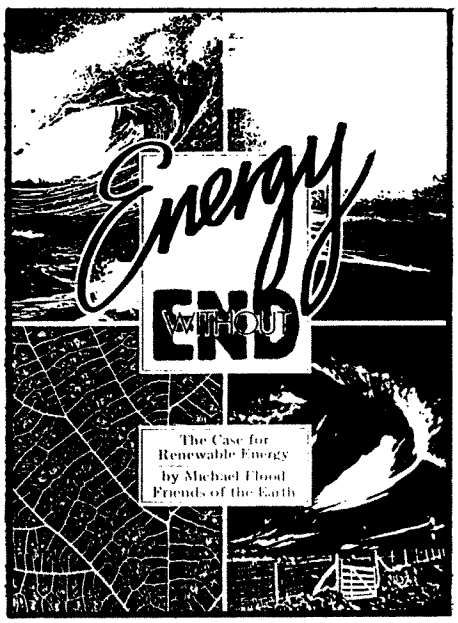
Equivocal and negative findings from research may please the CEGB and satisfy the Tory Government giving both excuses for inaction. I really hope that my students will be more critical and demand that the real issue of cleaning up the environment by all available means be kept more firmly in mind.

TIM PUNTIS

Energy Without End: The Case for Renewable Energy by Michael Flood; Friends of the Earth. 50pp, £3.50

The excellent Energy without End is now back in print. There is only one major change: in the previous edition the back page contained a list of useful addresses, which for some reason excluded both SCRAM and NATTA. I am happy to say, FoE have now corrected this.

Originally published in 1986, it was circulated to about 350 MPs and has since been used in several debates in parliament.



Michael Flood, makes a convincing 'Case for Renewable Energy' arguing for an integrated national energy strategy involving all forms of renewable energy, but he does not make the mistake, of thinking that this can be achieved overnight. He recognises there are "many non-technical barriers that will have to be overcome if the UK is to achieve a more sustainable and more environmentally sympathetic energy policy."

The structure and style of this slim (A4) volume mean it is accessible on a number of different levels - ideal for schools and parliament alike (different levels?). FoE are willing to make concessions for schools.

Perhaps a christmas present for your local school library.

MIKE TOWNSLEY

Little Black Rabbit

Readers may have noticed a news item in the Guardian last year about a proposal by Consolidated Environmental Technologies (CET) to bring up to 10GW of cheap electricity from Iceland to the UK. This scheme is seen by CET as their part in accelerating the introduction of renewable energy systems at the same time as the phase out of nuclear power (they may make a few quid along the way!)

Little Black Rabbit can inform SCRAM readers that the idea for the scheme came from SCRAM - more specifically a short news item in SCRAM 61. However, the powers that be don't think it is such a good idea. Fred Passan of the CEGB, phoned CET and screamed a bit - Walter doesn't like it! CET are not bothered by the prejudices of the nuclear Baron.

LBR understands that Cecil Parkinson thinks it's a great idea; it has all the hallmarks of entrepeneurial genius, which he hopes will make the largest privatisation of them all a sure fire winner.

● ● ● ● ● ● ●

The Nuclear Free Zone movement is still increasing in size, although some councils do little more than pass a resolution and design a logo. However, some councils would like to become nuclear free, but for many reasons aren't able to. One example is Stockport City Council. A few months ago the Council were discussing whether they would pass the resolution, and invited BNFL to participate.

After a long discussion BNFL realised the Council were determined to join the band of local authorities making a stand against the Government's insane nuclear programme. BNFL accepted their decision, but had to warn them that, if they did declare themselves nuclear free, they would no longer place contracts with a long list of local companies.

The Council, recognising a BNFL offer they couldn't refuse when they hear one, decided not to pass the resolution.

Other Council's take a rather NIMBY attitude to becoming a Nuclear Free Zone. Badenoch and Strathspey District Council, in Highland Region, for example, decided to take no action on becoming an NFZ but, should there be any proposal for disposal of nuclear waste in their District, the Council reserves the right to react then.

● ● ● ● ● ● ●

Other local authorities are not above lobbying the NFZ's for support. Nithsdale District Council in Dumfries and Galloway have been asking for support in their campaign to oppose the construction of a dry storage facility for nuclear waste at Chapelcross. When Annandale & Eskdale District Council found out that their neighbours were circularising all Scottish Local Authorities, they decided to do the same. They asked councils to "delay coming to a decision . . . until the views of the possible 'host' district have been brought to your attention". In other words they would quite like it if other councils would pay more attention to "initially extensive construction employment" than the fact that nuclear waste would be transported all over the country, not once, but twice!

● ● ● ● ● ● ●

LBR has discovered by overhearing a conversation in a pub in Vienna that the International Atomic Energy Agency are running out of money. LBR is sure that SCRAM readers wouldn't want this important International organisation to go short of funds. You can't run an organisation on praise alone! SCRAM has agreed to set up an Appeal Fund for the IAEA. Send cheques made out to 'SCRAM', and LBR will put them to good use.

● ● ● ● ● ● ●

Cecil Parkinson was speaking at a conference of estate agents and property developers recently. It was held in the Government's smart new Queen Elizabeth Conference Hall. The subject was 'Energy Efficiency and Marketability of Commercial Properties'. Bearing in mind the 'Monergy' campaign has always been based on the need for better financial rates of return, and estate agents aren't well renowned for their concern for the greater good of mankind, Little Black Rabbit was rather surprised at what Cecil had to say.

He abandoned his standard speech, and began talking about the morality of energy efficiency. "Even though we recognise it is essential to business profits", he said, "I regard energy efficiency as absolutely essential for the conservation of finite resources".

Had Cecil been talking to a 'green' group, the audience would have probably thought he was being duplicitous, but as he said it to an audience of property developers, LBR thinks he might well have been sincere.

● ● ● ● ● ● ●

BNFL have sacked one of their Sellafield workers for allegedly taking radioactive material home. LBR believes that the worker's house was raided, but no trace of radiation was found. The unfortunate man was apparently involved in an accident some 2 or 3 months ago, which BNFL have tried to keep hushed up. This might have more to do with his loss of employment than some curious desire to irradiate his house.

The union were unable to confirm that his house was raided, or that he was involved in an accident. They did, however confirm that the man has been sacked, and that his case is under consideration for appeal.

SUB FORM

I would like to subscribe to SCRAM. I enclose cheque/postal order, payable to SCRAM for:

Concessionary £5
Ordinary £10
Supporting £15
Institutional £25
Life sub. £50

Name . . . . . .
Address. . . . . .
. . . . . .
. . . . . Tel

WAGES FORM

Please fill out the standing order form below and send it to us.

To the Manager:
. . . . . Bank
Address . . . . . .
. . . . . .
. . . . . .

Please pay on . . . . (1st payment) the sum of . . . from my account number . . . . . to the Royal Bank of Scotland, 142 Princes Street, Edinburgh (83-51-00) for the credit of SCRAM number 2 account 258597 and make similar payments monthly/yearly until cancelled.

Signed . . . . . Date . . . . .

Return this form to:
SCRAM, 11 Forth Street, Edinburgh
EH1 3LE. Tel: 031 557 4283/4.