

The Anti Nuclear & Safe Energy Journal

SCRAM



NUCLEAR POWER – OVER THE HILL

SCRAM Journal September/October 1986



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JOHN HOME ROBERSTON is the Labour MP for East Lothian.
 JAMES CUTLER produced Yorkshire TV's "Windscale, the Nuclear Laundry".
 CHARLES SEARLE is the Campaign for Nuclear Disarmament Nuclear Free Zone worker.
 PETE ROCHE is a member of the Edinburgh Draughtproofing Ltd co-operative.
 DAVID ROSS is a freelance writer in the renewable energy field.
 DAVID OLIVIER runs Energy Advisory Associates.
 MIKE MALINA is SERA's campaign co-ordinator.
 YVONNE PETER is the Honorary Secretary of the West Dorset Safe Energy Campaign.

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

Editor: Steve Martin
 News: Thom Dibdin
 Graphics: Wilf Plum

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

ISSN 0140 7340 Bi-monthly

We welcome contributions of articles, news stories and graphics.
 Deadline for the next issue:
 Articles (800 words/page), 17 October
 News & graphics, 24 October.

Comment

Nuclear power is over the hill. Chernobyl has simply accelerated the process that politicians have to go through to fit in with the views held by the majority of the people.

This rethinking process took a great leap forward at the Trade Union Congress in Brighton. The motion for the "phase out", rather than the "freeze", was defeated by only 60,000 votes; a mere finger nail on the hand of a trade union leader as the voting card was held aloft. And we all know that deals were struck in the smoke filled corridors, deals which robbed us of total victory.

The General Council's report to Congress, which was passed, called for a halt to the nuclear power programme pending a full and critical review of the industry. This stance is a change of TUC policy: the next power stations should be coal-fired; Sizewell B should be opposed; the magnox stations should be closed if their safety reviews show they fail to meet up to date standards; a job conversion study, to redeploy nuclear workers, should be initiated; reprocessing should be reviewed; and nuclear health and safety should be critically examined. Very few anti-nuclear campaigners would disagree with that.

What needs to be addressed now, and what we have devoted much of this issue of SCRAM to, is implementation of appropriate alternatives to nuclear power: energy conservation and the renewables. We need to lobby our trade unions and political parties, particularly the Labour Party, to make sure that the promise of energy conservation is not lost in the replacement of nuclear electricity generation with coal or oil. Any new fossil fuelled plants must include both desulphurisation technologies and district heating schemes. But before we build any new generating capacity, we must put a stop to the enormous amount of energy which we waste, in the home and at work.

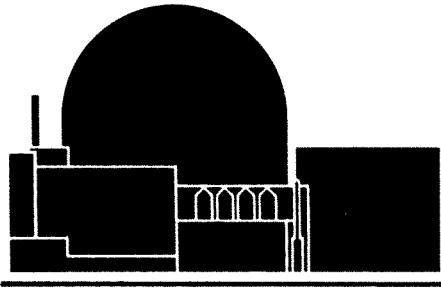
The "North American Experience" (page 15) shows that, in a country dependent on market forces, energy conservation wins through. Surely we can introduce the same ideas into Britain, making us more, rather than less competitive. It is the only way.

Sizewell's Finished

Friends of the Earth's (FoE) Report on the Sizewell Inquiry, "Critical Decision: Should Britain buy the Pressurised Water Reactor?", is finished. While waiting for Sir Frank Layfield to present his Report to the Government, FoE have compiled their own concise record of the Inquiry which provides an outline survey of the major themes and arguments. STEVE MARTIN here summarises the Report.

The Government put forward a plan to order ten American designed nuclear power stations in 1979, and the Central Electricity Generating Board (CEGB) declared its intention to build the first of them at Sizewell in October 1980. A Public Inquiry into the proposal, with Sir Frank Layfield as the Inspector, began at Snape Maltings in Suffolk in January 1983 and finished in March 1985.

The FoE Report covers several headings: the Inquiry process, the CEGB's case, reactor choice, economics, PWR safety, local issues, nuclear waste, low level radiation, nuclear weapons proliferation, and energy conservation and CHP.



The Inquiry Process: FoE believe that the case for funding of objectors is now overwhelming, and would lead to more efficient and speedier inquiries. Witnesses should not be legally represented because this tends to highlight the disparity of resources between proponents and objectors. Future inquiries should not be restricted to site-specific issues only; the merits of government policy should not be exempt from the debate. Serious consideration should be given towards setting up a Standing Commission which would regularly review the relevant issues.

The CEGB's Case: Although their case, was voluminous, it was inadequate. Safety and nuclear weapons proliferation data were missing; the reactor design was unsatisfactory and changed during the inquiry; a nuclear waste policy barely existed; a national energy policy within which Sizewell B could be assessed was not available; and rival energy options were neither fully nor impartially assessed. Unstated arguments, with strong political overtones, were also present.

Reactor Choice: A strong argument which grew out of the inquiry was to delay a fundamental decision on reactor choice until rival assumptions

have been tested. The South of Scotland Electricity Board (SSEB) provided evidence which conflicted with the CEGB's on the relative safety and economic performance of the Advanced Gas-cooled Reactor (AGR) and the PWR. The CEGB suggested a 20% cost advantage for the PWR; the SSEB a 9% advantage for the AGR.

Economics: The CEGB conceded that Sizewell B is not needed to satisfy electricity demand, instead they based the economic case on justifying building ahead of need. The methodology used, Net Effective Cost, balances the lifetime costs of the station against the assumed fuel savings over alternative supplies. FoE estimate that, over the operating life of the plant, it would cost the consumer over £1,000m, whereas the CEGB reckon that it will save over £1,100m.

PWR Safety: Over a third of the Inquiry was taken up with safety. However, much of the design work took place concurrently with, and after the ending of, the Inquiry; the CEGB was ill-prepared and broke promises to Parliament that the Nuclear Installations Inspectorate would wish to enter the Inquiry with a clear view on their ability to licence the PWR. The safety of Sizewell B has not been demonstrated at the Inquiry.

Local Issues: The CEGB failed to adequately assess alternative sites, according to internal development reviews leaked to objectors; Sizewell was chosen because of the need to reduce objections and took advantage of Suffolk County Council's general acceptance. The Emergency Plan limited the evacuation zone to 1½ miles compared with a 10 to 15 mile zone prevailing in the USA. Independent research indicated that only 80 local construction jobs would be created.

Nuclear Waste: The availability of safe nuclear waste disposal routes within the required time raised considerable doubts. The estimated volume of waste arisings was found to be widely off the mark. A national nuclear waste disposal strategy was hastily produced during the Inquiry.

Low Level Radiation: Major differences of opinion on the risks of low level radiation still remain which make conclusions on excess leukaemias



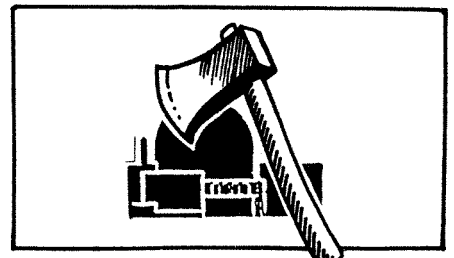
in the area of Sizewell A difficult to draw. The suggested operator exposure rate of 2 man-seiverts per year is half the comparable figure for French PWRs and, as such, seems unlikely to be achievable.

Nuclear Weapons Proliferation: Past experience has shown a desire by certain developing nations to acquire nuclear weapons by the nuclear power route; permission for Sizewell B would be a clear endorsement of nuclear power and could lead to demands from such nations to acquire the technology. The withholding of official information of plutonium stocks and uses from the Inquiry inhibited firm conclusions from being made, but up to 3 tonnes of civil plutonium appears to be unaccounted for in official figures.

Energy Conservation and CHP: Largely neglected as an option in the UK, US utilities have shown that energy conservation can reduce demand and is more cost-effective than new power stations. A large CEGB initiative could reduce consumption by 7% and peak demand by 4,000MW by the year 2000. It could save £2.5-4 billion (1983 prices) worth of fuel. A Combined Heat and Power District Heating scheme for London would have a far superior economic and employment effect than Sizewell B.

Conclusion: The optimism of the CEGB's case for the Sizewell B PWR does not seem to be justified on the basis of their evidence to the most comprehensive public inquiry ever seen in Britain. The Opposition Parties have stated that, should they be returned to power at the next election, Sizewell B will be shelved. But, there is no room for complacency; it is only through sustained, unrelenting pressure from ordinary people that the power of the nuclear industry can be changed.

Keep it up!



Sellafield

Isn't it about time that Sellafield changed its name again? There have been so many accidents, leaks and mishaps since BNFL's exercise in nomenclature that their plan to subtly deceive the unsuspecting public has backfired. August has been no exception.

BNFL paid compensation of £40,000 to the widow of a painter who died from lung cancer after working at the plant. The company have consistently claimed that no one has died as a result of the nuclear industry in this country. They have been equally consistent in paying compensation to the families of workers who have died from cancer related diseases. Despite the current advertising drive, BNFL do not seem very keen to announce the reasons for their beneficence.

On 14 August the New Scientist revealed that post mortems on the bodies of three former Sellafield workers showed concentrations of plutonium in their lungs hundreds, and in one case thousands, of times higher than in the general population. (Perhaps it's because they worked there when it was called Windscale.)

The study also found that concentrations of plutonium in the bodies of Cumbrians who did not work at the plant average between 50% and 250% higher than elsewhere in Britain. (Maybe if we changed the name of plutonium to something innocuous like marigoldium all our problems would be

solved.)

The following week all reprocessing work at Sellafield was halted when it was discovered that a consignment of waste to be discharged into the Irish Sea was more radioactive than is allowed under new limits set by the Government last month.

Under the new regulations, radioactive discharges must be kept within limits defined on a two-day, rather than yearly, basis. This is intended to prevent the kind of concentrated discharge which was discovered in October 1983 by Greenpeace divers. If the effluent had been discharged the Government would have been forced to prosecute again. Of course BNFL is whining that the new limits are too strict and that they cannot operate under such restrictions: is that not an admission that they can't run a safe industry?

Embarrassing perhaps, but not quite as embarrassing as the predicament of the Dutch ambassador. Whilst touring the plant he managed to stray into a contaminated area, and one of his aides was found to have a smidgen of radioactivity on his trousers. The health physicist promptly ordered the removal of the offending item of clothing. Sellafield had some 30,000 visitors last year: it's a good job they don't all get contaminated trousers, otherwise the drycleaning bill could adversely affect the price of nuclear electricity.

Meanwhile, Sellafield could be about to lose the distinction of being next

to the most radioactively polluted sea in the world: the Black Sea could soon claim that dubious distinction after Chernobyl.

KEEP MANN ALIVE Close Sellafield

Since the article in SCRAM 54 about the Isle of Man's fight to close Sellafield, the campaign has gone from strength to strength, with the Manx Government coming out strongly in support of the campaign.

On 7 July, Tynwald Day, two women used the ancient Manx right to present a "petition for redress of grievance" to the open-air parliament, presided over by Prince Edward. Wearing specially designed dresses in the Manx colours of red and yellow, decorated with the campaign's symbol, they walked up the long path to the assembled politicians, supported all the way by applause from the watching crowd. The politicians could hardly ignore this public show of solidarity for the campaign against Sellafield.

After four hours of well informed debate from Tynwald members, who largely recognised the necessity of closure for the Island's future, a motion was passed by 22 votes to 9. Points included in the motion were:

- * A call for the complete closure of Sellafield;
- * Tynwald accepts the lack of success of the Isle of Man government's current policy to obtain zero emissions by December 1986;
- * Compensation should be sought from the UK Government against damage by implication to the 'basic industries of the Isle of Man;
- * Consultation should be instituted with regional authorities around the Irish Sea to co-ordinate future policy; and
- * Advice should be sought from the European Atomic Energy Commission concerning the standards of operation at Sellafield.

BNFL has dismissed the call as "totally irrational" and ask "if Sellafield is not affecting the Isle of Man, why do they want us to close it?" The Manx argue that the plant IS affecting their island; people don't want to take holidays in the middle of the world's most radioactive sea, or eat the fish caught in it.

Radhealth

In SCRAM 52 we carried a story about a successful law suit brought in Malaysia against the construction of a toxic and radioactive waste dump. The dump was to take waste from an Asian Rare Earth factory which processes monazite rock to produce Yttrium.

The litigants claimed that the wastes could cause cancer and genetic disorders. Recent evidence published by a team of Indian researchers confirm the Malaysian fears.

A factory in the Ernakulam district of India, run by a company called Indian Rare Earths, part of the government's Department of Atomic Energy, appears to be associated with high rates of cancer and heart disease.

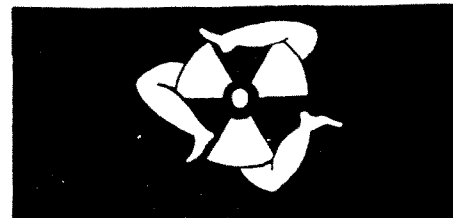
The researchers, who work with Kerala Sashtira Sahitya Parishat, a voluntary organisation in the Indian "people's science" movement, discovered that the death rate from cancer at the Rare Earths plant is FOUR times higher than at a neighbouring caustic soda factory and almost SEVEN times as high as the national average for workers. The heart disease rate is about twice normal, and there is a "high incidence of genetic disorders among Indian Rare Earths' workers" and there is evidence of "widespread infertility

among workers" according to the study.

The factory processes monazite rock to produce thorium for the fuel for India's fast reactor programme, and zirconium for fuel cladding. Both materials are radioactive.

No data have yet been officially published on the health of India's 20,000 nuclear industry workers and the study published by the group "was undertaken in contravention of the Indian Atomic Energy Act of 1962, which prohibits any independent inquiry into the affairs, including health and safety of employees," according to Gyanesh Kudaisya, one of the scientists who worked on the study.

The study also uncovered disturbing examples of waste disposal: 600 tonnes of radioactive uranium and mesothorium is buried close to the banks of the Periyas river; and 5,000 tonnes of thorium powder is stored in a silo a few metres from the river bank. "In the event of a high tide, water can enter the silo and contaminate the source of drinking water five kilometres downstream," says Kudaisya.



Coal

At about the same time as the Sizewell report will be landing on the desks of Whitehall, the Central Electricity Generating Board (CEGB) will be examining a detailed study into a new generation of coal-fired power stations. The CEGB's evidence to the Sizewell Inquiry on the cost of coal was based on Drax, the design of which is nearly 25 years old.

The main debate about any future coal programme centres on whether new plant should have sub or supercritical steam cycles. Without going into too much technical detail, supercritical plant use higher steam pressures and, as a consequence, are more efficient. Supercritical stations are operating in the US and Japan, and both countries plan to stay with this technology.

Whichever option the CEGB chooses, new coal-fired stations will have to emit fewer pollutants, and designs are being prepared on the basis of having to meet draft EEC regulations for new fossil-fuelled stations completed in or after 1996.

By the turn of the century coal-burning should be in pressurised fluidised beds, in which tiny coal particles are mixed with sand and ash at high pressure. Forced air makes the particles act like a fluid. The technology is being developed at Grimethorpe in South Yorkshire, and £25 million has been spent in the past two years. The Electrical Power Research Institute and the US Department of Energy are to give £8 million towards the research, which should bring the day closer when a prototype plant with an output of 100MW is built.

Yet, the outlook for Scottish coal looks bleak. At the beginning of 1982, when the Invergordon aluminium smelter closed, the South of Scotland Electricity Board's (SSEB) annual coal consumption fell from 8.3 million tonnes to 7.5 million tonnes. Since then the price of oil has fallen, which has allowed the electricity boards in Scotland to burn that as a cheap alternative. Between them, the Inverkip and Peterhead power stations burn the coal equivalent of 2.5 million tonnes a year.

The SSEB has now announced that it will buy only 3.6 million tonnes of Scottish coal during 1986/7. Such a substantial cut in income - selling less coal at a lower price - must have a direct effect on the viability of the Scottish pits.

But as far as deep mines are concerned, the situation is even worse. British Coal are being secretive about plans for opencast coal, but more than half could be produced in this way. They are also planning to extend opencast operations at Coalburn in Lanarkshire to serve the Kilroot power station in Northern Ireland.

If Torness comes on stream in 1987, and the price of oil is still low,

the situation will get much worse. There are fears now that this new deal between the SSEB and British Coal could seal the fate of the 950 jobs remaining at Monktonhall, and perhaps 350 of the 1,400 jobs at Bilston Glen - even without Torness.

It seems clear that the Government are quite happy to sit back and see the Scottish coalfield close down.

Druridge

The Druridge Bay Campaign (DBC) is forging links with campaigners in India. Mr Kulothungan, an Indian nuclear physicist, is in this country to glean information about safety in India's nuclear plants, which is not available in that country due to official secrecy.

He told a meeting organised by the DBC on 2 August that despite claims by the Indian Government that a Chernobyl-type accident couldn't happen in India, "the first thing that is cut back on when costs rise is safety."

Mr Kulothungan expressed the opinion that despite the claims of

Lord Marshall, nuclear power is the last form of energy that developing countries need. He pointed out that nuclear generation was introduced to India to entice the multi-national corporations who need it in their own industries. The benefits to the people of India are minimal.



After a hard day at the Stop Torness rally, the Druridge Bay Campaigners pack up their stall.

Accidents Will Happen

● A missing screw was responsible for the delayed restart of the Gundremmigen reactor in Bavaria. After being shutdown for maintenance work, the loss of loss of five screws from a shut-off valve was discovered; four were found but the last one continues to elude the operators. The owners, RWE and Beyerwerk, who are said to have lost millions of Marks because of the delay, have cut their losses and reopened the reactor although the offending screw is still at large. *EUROPEAN ENERGY*, 22 Aug.

● Hinkley Point B has been restarted despite cracks being found in the base of the fuel rod liners. Similar faults, which are due to thermal stress during refuelling, have been found at Hunterston B, Hinkley's sister station.

● The Cattenom nuclear plant on the Moselle river, the natural border between France and Luxembourg, which has been targeted by protesters (see SCRAM 52), has been leaking cooling water into its basement. The flooding happened while the reactor was on precommissioning trials and running at zero power. The loss of coolant would have been very serious if the accident had occurred after commissioning. The most disturbing feature of the leak was that the fault was not signalled in the control room.

● The American Fermi-2 reactor suffered an electrical fire in the distribution system to the flow valve in early August. The reactor which

was shut in July last year after an "inadvertant criticality", has not been in commercial operation since then.

● The failure of a valve in the steam generator system of the Asco 2 Westinghouse PWR in Spain has forced its closure. The plant started up last October.

● CEGB officials have denied that pressure was put on the Italian government to keep the twenty year old Latina Magnox station open. The plant, which has a design life of twenty years, was supplied by Britain. The Italians feel that it is the reactor most similar in design to Chernobyl, and hence would like to close it down. But, its closure could adversely affect the UK Magnox stations.

● Since the commissioning of the French Superphenix fast reactor in January this year there have been more than twenty emergency shutdowns. One of the most notable occurred when it was discovered that one of the fuel assemblies was overheating because of a "lost" rubber bung.

● The Finns, who were the first to detect the radioactive cloud from Chernobyl, but not the first to announce its coming, suffered a loss of coolant accident (LOCA) in early September. The country has four Soviet built reactors but has recently shelved plans to order a fifth. The LOCA occurred during refuelling.

SCRAM, in conjunction with East Lothian District Council, has just completed a highly successful information tour around nine villages in East Lothian.

The object of the tour was to provide information on nuclear power and the alternatives to areas of small population that are usually missed out during public meetings, rallies and exhibitions. This objective was achieved with a good deal of success and much interest was evident in both the information stall and the specially prepared five board exhibition.

The initiative for the tour came as a result of a major public meeting organised jointly by East Lothian District and Lothian Regional Councils in June following the local concern felt after Chernobyl and the apparently imminent fuel loading at Torness.

The overwhelming feeling of the meeting was that there was still not enough information being made available by the South of Scotland Electricity Board. Dr Preston, the Board's deputy chairman, admitted that there had been a "serious deterioration of public confidence," but that they could not hold up the commissioning of Torness: that was for the Government to decide, although Malcolm Rifkind, the Scottish Secretary has gone on record as saying that the decision is the Board's. Dr Preston promised a bigger effort to "allay public fears," but this was met by jeers from the 500 people present: they saw it as a euphemism for more propaganda.

The SCRAM tour was inaugurated by Lord Provost John McKay of Edinburgh District Council in the City's Princes Street Gardens during

the Edinburgh Festival, and took the line that this year could be the last "Nuclear Free Festival" if Torness goes ahead on schedule. Many visitors to the information bus were Festival patrons and expressed concern at the proximity of a nuclear power station to the Festival City. The tour showed vividly that there is still a lot of confusion on the issue of Torness, even after 12 years of campaigning.

The tour was staffed by one full time project co-ordinator and several volunteers, including one woman from Boston USA. Everybody involved learned a lot from the experience and the feedback from East Lothian has been excellent.

The SCRAM "Stop Torness Rally" was also very successful and attracted nearly 3,000 people who were predominantly local, which is very different to the make-up of the crowds which came to previous rallies

at the site. The people heard stirring speeches from MPs, councillors, trade union leaders and environmental groups.

SCRAM and Geenpeace, who jointly organised the rally, are particularly grateful to BEN ELTON who agreed to attend the rally at very short notice and filled in for Billy Connolly who was unable to come because Pamela Stephenson had just given birth to a baby daughter. We wish Billy, Pamela and their daughter every happiness in the future.

We would also like to thank the Councils of East Lothian, West Lothian, Midlothian, Edinburgh, Lothian Region and Dumfries and Galloway for the kind support given to the rally; and also to our supporters and the people of Edinburgh and East Lothian who donated an enormous amount of cash to allow the event to take place. Without this financial help we could never have done it.



Following the information tour we feel that we can provide a valuable contribution to the ongoing energy debate by compiling exhibitions for groups throughout the country. We are contacting local authorities over the next few weeks to offer them exhibition material, and we can provide the basic Tour Exhibition or specially prepared boards to any group which may wish them.

Each board is 40" x 30" and is laminated, although we are looking at the costs of producing printed paper exhibitions which can be pinned onto boards. For further details contact the SCRAM office for a descriptive leaflet.

Dounreay

The controversial public inquiry into plans to build a plant at Dounreay to reprocess spent fuel from a doubtful future European fast reactor programme adjourned for the summer on 16 July. It will reconvene on 22 September, and evidence on the health implications will be heard from 6 October.

Throughout the inquiry one view prevailed: the application is premature in that much of the essential detailed information is not yet available, but this has been repeatedly excused because the application is only for outline planning permission. It is on record at the inquiry that the intention is to achieve the necessary planning permission at an early stage so that the UK can bid for the reprocessing plant against the other European members of the fast reactor collaboration, particularly the French who have expressed an interest in building the plant.

For most of the time the inquiry was held in Thurso Town Hall with a brief sojourn to Orkney from 21-23

May and a further session in Invergordon on 23 and 24 June. The Orkney session took place because parts of Orkney are closer to Dounreay than parts of Caithness. The Inquiry went to Invergordon after persistent complaints that the Reporter, Alexander Bell, was gagging the local people: they object to their town being used as a "port of entry" for the spent fuel from abroad. Rumour has it that this favour was offered only if a request to convene in Shetland was dropped.

A special plea from Shetland Islands Council was heard at the Inquiry on 10 July when Convenor Thomason urged the Reporter, to hold a session in Shetland. Mr Bell refused the request but offered to "investigate if any assistance can be given in transporting at least a group of islanders to Thurso" to be heard. However, on 16 July Mr Bell informed the Inquiry that "the Scottish Office feels unable to give any assistance towards the transport of the witnesses from Shetland" because they are

"unwilling to breach the long-established practice of not providing funding for parties to attend public inquiries."

Shetland Islands Council are now discussing alternative methods of having their voice heard. Mr Thomason has suggested calling a North Sea Nations' conference on the issue because "we are all living around the same pond, earning our livings from the fish."

Other ideas include an alternative Peoples' Inquiry, a referendum and using oil money to help people get to Thurso to put their case. Every household on Shetland is to receive a leaflet with a tear-off strip which people can use to register their feelings on the issue.

One other point of interest is that the Government has restated its intention to "rate cap" the Orkney and Shetland Councils if the Inquiry expenditure takes them over the Government guidelines: there would be no "disregard" of Dounreay expenditure as far as guidelines were concerned.

Torness: The Case Against

Nearly fifteen years ago, only a very small minority of people in this country were against nuclear power. Since then the tide has turned, and the anti-nuclear view is in the majority. In 1978 JOHN HOME ROBERTSON won a by-election for Labour in the Berwickshire and East Lothian constituency. He was then in favour of Torness; he is now against. In July this year he spoke at the SCRAM Stop Torness Rally. The following is an edited version of his speech.



I think to start with I probably owe you an explanation. The first time I was at a rally at Torness was about 7 years ago, and I was on the other side of the fence at that time. In common, I think with most local people, I honestly could not understand why people were coming from far away places to campaign against jobs for East Lothian; to campaign against the system of electricity generation which appeared to be safer, and to be cleaner than anything that had gone before.

There were a lot of very impressive and very plausible people telling us that it was absolutely inconceivable that there could be a serious nuclear accident at a modern power station. And similarly we were persuaded that Torness was part of a balanced energy strategy which would go hand in hand with coal and conventional fuel sources.

ACCIDENTS HAVE HAPPENED

That was back in 1978. A lot of things have happened since then to make many of us change our minds. We began to have some of those "inconceivable accidents". The first one that we heard about was at Three Mile Island, and then the information leaked out, 20 years late, about the major fire at Windscale in 1957. And finally we had that most inconceivable accident of all, on 26 April this year at Chernobyl. It was so inconceivable that nobody had even bothered to make any contingency plans to deal with the fall-out on this country, or anywhere else.

What did I do? I asked the Prime Minister if she would tell me what would happen if there were to be similar accident at Torness. And she told me, in a written Parliamentary Reply (which is a masterpiece of complacency): "The Chernobyl design is different from that of any UK reactors." She went on to refer me to a nice little booklet, published by the Health and Safety Executive, on

Emergency Plans for Civil Nuclear Installations, a copy of which is available in the Library of the House of Commons.

I found that the booklet only provides for precautions up to a maximum of 40km away from a nuclear power station. We have a ban on the movement of contaminated lamb from parts of Scotland which are a great deal more than 40km from Chernobyl; we are in fact 2,200km away. That surely gives us a message.

Of course, we had another hand-out from the South of Scotland Electricity Board saying that a serious nuclear accident at Torness is, guess what, "inconceivable".

I have hundreds of letters from local people which demonstrates that nobody in this neighbourhood believes those assurances any more. The overwhelming majority of people in East Lothian and Berwickshire are very worried indeed about the possibility of an accident on this site; and I am bound to say that I share that concern because I live with my family, only 20 miles, as the becquerel flies, from Torness.

EMPLOYMENT LIES

That's one reason why I've been thinking again about nuclear power, but there other reasons too. They told us a lot of things about Torness. It would cure East Lothian's unemployment problems. Back in 1982, when we had 4,000 local people on the dole, including 700 construction workers, 78% of the Torness workforce was coming from outside the area; people from East Lothian have never made up more than 27% of the construction workforce on the site.

Any short term benefit to the economy of Dunbar has to be set against the disruption of the local tourist industry; and we are still waiting for the SSEB to give practical backing to East Lothian District Council's "Dunbar initiative" to try and develop this area.

And what about the coal industry? What about Cockerzie power station? Back in '78 there was growing demand for electricity in Scotland, and that was the case for building a new power station. Since 1979 we've had a mad Government in Westminster, one which has gone out of its way to strangle our industry and to impoverish our people. They closed down the Invergordon Aluminium Smelter which consumed almost enough electricity to keep one whole power station going.

COALBURN SLASHED

The net result of all that is that we now have in Scotland 11,219MW worth of generating capacity, but the peak demand last winter was only 5,688MW: we've got 100% more generating capacity than we need at the moment of peak demand. We don't need to be very clever to tell that if we commission another 1,400MW at Torness something else is likely to be closed.

We got the answer to that question when the SSEB and British Coal announced in July that the coal burn in Scottish power stations was to be slashed by maybe as much as two million tonnes a year. The fight is now on to save the Lothian coal field and Cockerzie power station. And make no mistake, this nation is going to need these coal reserves sooner rather than later: it would be madness to allow our local collieries to close.

Government Ministers, and the people in the Electricity Board, keep telling us that it would be a waste of money not to take advantage of the investment that's gone into Torness. I would like to stand the argument on its head: there would be a far bigger waste of resources, and money, and skills, and jobs if we were to allow Monktonhall and Bilston Glen and Cockerzie to close.

CLEAR COMMITMENT

I've had a lot to say about Torness in recent months, both in Parliament and within the Labour Party, and I can tell you with complete confidence that if Labour was in power today there would be no question of commissioning Torness now.

Our commitment is now clear enough, our commitment is to begin the task of phasing out nuclear power. The demand that I put to Mr. Rifkind on behalf of the people of East Lothian, and the demand which must be pressed by this Rally and by all possible means in the coming weeks, is that those reactors should not be loaded.

Circumstances have changed in the past seven years; we do not need this extra generating capacity; we do not want another nuclear site; and we demand a halt to the loading of Torness now.

Leukaemia Black Spots

After Sir Douglas Black reported the results of his study into the apparent excess of childhood leukaemias around Sellafield, the low level radiation debate moved into a higher gear. More areas of higher than average childhood leukaemia have been discovered, and further studies have been undertaken. But, as JAMES CUTLER reports, the authorities are thinking up new excuses to explain away the statistics.

Driving out of Seascale on a Spring day in 1983, I sensed that I had come across some tragic evidence that, if substantiated, could turn out to be an important contribution to the whole nuclear safety debate. I hardly realised that the repercussions of that evidence would be felt for years afterwards; would lead to a Government inquiry and the creation of a new committee on radiation in the environment; and keep several medical and statistical research projects funded for years to come.

Alerted by a local farmer, I had seen the mother of a young leukaemia victim who told me of at least three other cases that she knew of in the village over the years. After months of further investigation with colleague Michael Burke and statistical substantiation from John Urquhart of Newcastle University and other experts, we were able to reveal in our Documentary "Windscale, the Nuclear Laundry", that Seascale, 1½ miles from the largest source of routine radioactive pollution in the world, had a childhood leukaemia rate ten times the national average, with seven cases diagnosed since 1955.

THE BLACK INQUIRY

This prompted the inquiry under Sir Douglas Black whose report, published in July 1984, was designed to look comprehensive, fair and independent, but was in fact an exercise in statistical manipulation and deliberate ambiguity designed primarily to reassure. "Your job is to stir things up," Sir Douglas told me when I gave evidence, "Mine is to cool things down."

Thus the Report's statement that the inquiry team had found no evidence of a general risk to health near Sellafield was widely quoted despite the fact that a general health risk had never been the issue, but rather a specific risk of childhood leukaemia.

On this issue Black confirmed our findings, as we knew he would, and because he was using a shorter time period, and comparing Seascale with the regional rather than national average, came up with an even more pronounced excess of childhood leukaemia than we did (sixteen times the regional average between 1968 and 1982). However, the Report played this down by listing other areas with high leukaemia rates and deliberately chose not to mention that Seascale's excess was by far the

most statistically significant.

Even more shockingly, it left out two more cases in Seascale in 1983 which would have put the village's leukaemia excess at twenty four times the regional average.

TWISTS OF LOGIC

With this sleight of hand, reinforced by the pronouncement that Seascale was "unusual but not unique", Black gave British Nuclear Fuels and the rest of the industry an argument with which to escape their predicament. That argument goes like this:

- 1) There is a leukaemia excess near Sellafield,
- 2) There are other "similar" excesses which are nowhere near nuclear installations,
- 3) Therefore the excess at Sellafield has nothing to do with the nuclear plant here.

Leaving aside the fact that Seascale's childhood leukaemia rate is higher than any other village in Britain, this argument is patently daft because the other areas with high leukaemia rates could well contain other causes of leukaemia. Like other forms of cancer, leukaemia can be caused by several factors: microwave radiation, benzene and other chemicals

have all been implicated in the past.

The researchers who gave evidence to the Black Inquiry knew very well that some of the areas other than Seascale, with high cancer and leukaemia rates, had chemical plants and military microwave installations in them, but this also escaped mention in the final Report. At Seascale, however, the only possible cause of leukaemia found by Black was the radioactive discharges from Sellafield.

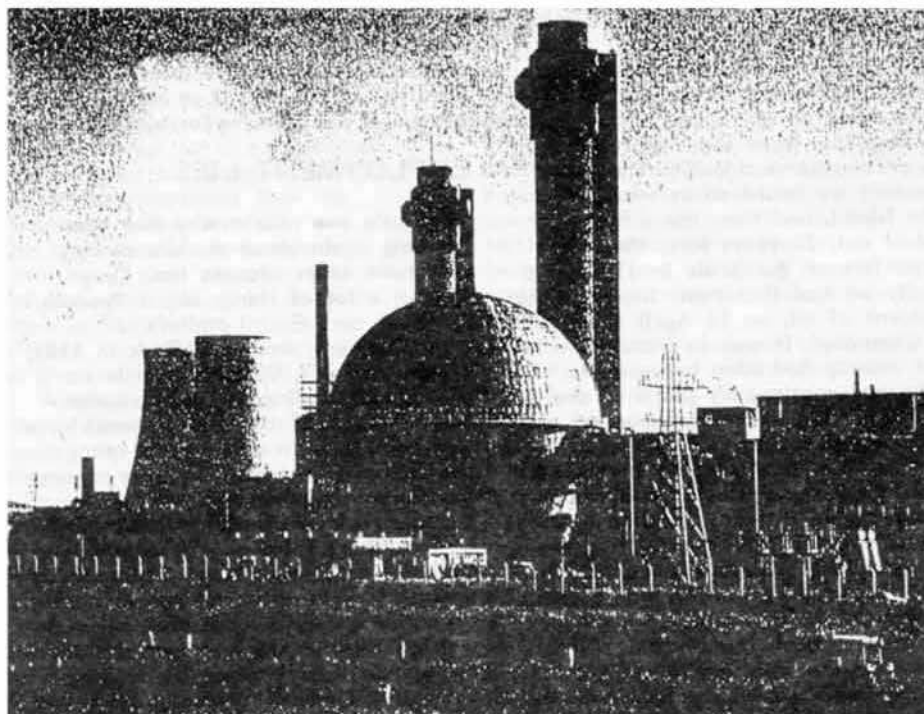
Despite the obvious illogicality of this argument, it has been used by the nuclear lobby and Government Ministers everytime another leukaemia excess is reported near a nuclear site: the village of Wool near the Winfrith reactor; at Lydney near Berkeley and Oldbury; at Leiston near Sizewell; at Springfields uranium plant; at Aldermaston and Burghfield nuclear weapons factories; at Hunterston and Chapelcross nuclear power stations; and at Rosyth and Holy Loch nuclear submarines bases in Scotland.

FURTHER STUDIES

The latest report, carried out by the Scottish Health Department, pinpoints West Thurso near Dounreay as the area in Scotland with the most significant excess of leukaemia. But more important was what the report did not find:

"The analysis has shown that there does not appear to be any evidence of natural clustering on any scale within postcode sectors. It seems unlikely that different methods of analyses would produce a substantially different result."

In other words, leukaemia excesses are



not common all over the country as the nuclear lobby would have us believe.

Meanwhile, the Committee on Medical Aspects of radiation in the Environment (COMARE), set up after the Black Report, together with the Census Office, have been busy studying leukaemia rates in people under 25 around all nuclear installations in England and Wales. The researcher who is supervising this work at Oxford told me this month that she is under pressure to report before the end of this year. Amazingly, she has found yet more leukaemia excesses near Amersham (where radioactive isotopes are made) and near Hinkley Point power station

as well as at all the locations listed above.

Despite the fact that her crude data shows a definite correlation between under 25 leukaemia mortality and living within ten miles of a nuclear installation, and despite the fact that the Scottish evidence would also confirm this, the final COMARE/OPCAS report will probably try to explain the phenomenon away by relating it to social class.

The areas in question have populations which tend to be better off than say inner city areas; leukaemia is more common in higher social classes hence the leukaemia excesses near nuclear plants. But of course there is a simple way to test

this new escape argument for the nuclear lobby: check the parents' occupations listed on the death certificates of the actual victims. I have my own collection of these sad documents from around Sellafield, Springfields, Aldermaston, Burghfield, Rosyth and Holy Loch, and there is no evidence that the bereaved parents tend to be professional types.

The COMARE/OPCAS researchers could easily check this themselves but I predict that they will not bother, and that when their report is published we will hear a new cry from the nuclear apologists: "It's not our radioactive discharges that are causing the leukaemias nearby, but the fact that too many posh people live here."

Barrie Walker is a General Practitioner working in Seascale. A leading light in the Round Table, and a fund-raiser for many a worthy local cause, he bears all the hallmarks of respectability, yet, for daring to be less than reassured by the findings of the Black Inquiry he has been labelled a meddling medic and "an enemy of the nuclear industry". CHARLES SEARLE spoke to him at the Low Level Radiation Conference in Barrow this June.

Barrie Walker is particularly well qualified to speak about the special health problems of the area: around 90% of the patients on the books of his group's Seascale practice, are either BNFL employees, or relatives of employees.

His concern predated the Yorkshire TV film:

"We knew the company was compensating people for leukaemia, but when we approached the senior medical officer at Sellafield about it, he said he was studying local cancers and could find no problem as far as he could see, and we had no reason to disbelieve him.

"There was, in fact, a reference in the Flowers Report to a visit to the area by an epidemiologist from Oxford, but he was also told that there was nothing to worry about - but on what basis I don't know as the studies hadn't been done then."

Barrie was one of the few local people to publicly question Black's findings. Listening to him explain why radiation has been singled out as the prime candidate behind the cancers at Seascale, it becomes increasingly difficult to see how scientific obfuscation has been allowed to override plain common sense in the search for a solution to the supposed "chance" occurrence of the leukaemia clusters:

"The nuclear industry and its supporters have sought desperately for alternative causal agents for the cancers. Some have said that they could have been caused by viral infections from the sewage on Seascale's beach, but this sewage is common to other villages on the coast. Others have looked to the water supply from the braken infested hills, but again all of the communities

round here rely on this source for their water, and yet it is Seascale which has the excess cancers.

"Ionising radiation is the only known cause of the cancer and there are a number of possible pathways for it to have reached the children. There are the above average emissions of low level radiation from the plant. The NRPB published a study of house dust samples in 1984, for example, which showed that the levels of plutonium and americium in Seascale were a thousand times higher than those found in houses in the south.

"Then there is what is known as the 'dirty worker effect'. Sellafield is at the muckier end of the industry, and workers exposed in the factory can take radionuclides back into their homes.

"Finally, there is the 1/2 tonne of plutonium which has been pumped into the Irish Sea. This is now finding its way back onto land via the waves and as sea-spray. Clearly, when you have such a known cancer causing agent in your environment you ought to err on the side of caution until someone comes up with another agent. That's why discharges from Sellafield should be stopped now."

The burden for the people of West Cumbria of playing enforced hosts to BNFL may not just be limited to the silent culling of their children through cancer. Over the last few years there has been an increasing number of adult cancers passing through the surgery at Seascale. There have been seven cases diagnosed in the first half of 1986 alone. This compares with the expected rate of 5-6 a year.

One ovarian cancer would be predicted every five or six years; there have been four in Seascale since 1980. The usual rate of colon cancer is one every two to three years; three have already been

diagnosed during this year.

These figures, of course, cannot be made to carry too much significance given the small numbers involved. But, as Barrie is quick to point out, if there are to be ill effects from working in the nuclear industry, then they would only arise after twenty to thirty years. The Calder Hall plutonium-producing reactors were opened in 1956.

With all of these anxieties about being exposed to the invisible and insidious dangers of radiation, it is hardly surprising that some of Barrie's patients display symptoms of mental stress:

"Like any other big organisation with a competitive promotions structure, there are the usual worries about getting on. However, the nuclear industry is special because of the blanket enforcement of the Official Secrets Act and the general rule of a "need to know" basis for passing on information, which means that the workforce feels that it has very little control over what goes on. Then there are the obvious divided loyalties over holding down a job and ensuring the safety of one's children."

In years to come Sellafield workers might appreciate the efforts of those like Barrie Walker who are attempting to secure a safe environment for them and their children:

"I think it is important for a GP to be responsible for their patients' health on a wider scale than the minor ailments they present. If I feel that a factor in the local community, be it bad housing, unemployment, or radiation, is affecting the health of my patients then as a doctor I think I have the right to speak out on the issue. It is essential that doctors everywhere get involved in these issues."

The Radon Gas Problem

There has recently been a spate of articles appearing in the Press about the hazards of radon gas in the home. This is the latest weapon in the nuclear industry's armoury of lies and misinformation, we need to be equipped with the facts. PETE ROCHE has been digging out the facts.

"It has been estimated that draught-proofing leads to an extra 100 cancer deaths per year per 100 megawatts saved, due to the greater concentrations of natural radioactivity (radon) thus retained within buildings."

This outrageous assertion appeared in the *Scotsman* in a letter from a J R Thompson at the end of June.

The "radon scandal" debate began over three years ago. Building scientists in Scandinavia and North America carried out research to determine the extent of the problem and then tried to solve it.

Radon is a radioactive gas found in trace amounts almost everywhere. It is a product of the radioactive decay of radium - a decay product of uranium - and occurs naturally in extremely low concentrations in soil, rock and groundwater. Radon undergoes radioactive decay, emitting radiation, to produce "radon daughters". These daughters attach themselves to dust or smoke particles in the air which, if inhaled, can increase the risk of lung cancer.

Radon is usually measured in picocuries per litre of air (pCi/l), while radon daughters concentration is expressed in Working Levels (WL), a unit designed to indicate the relative health hazard of each daughter product.

SOURCES OF RADON

Radon can come from several sources. Levels are higher in areas of radioactive rock, such as granite, and where the rocks are cracked and fissured, allowing the gas to escape easily. Parts of Cornwall fit these conditions; levels are lower in London, which stands on clay, and Aberdeen, built on solid granite.

Radon may enter the indoor environment via several pathways. Building materials may emit the gas, as they do in Sweden and the USA where radioactive shales or mine tailings have been used in construction materials. It can enter through leaks in a basement floor, originating as soil gas from beneath the building. Radon is much heavier than air so the concentration is usually highest in basements. It can also enter as groundwater. The radon "outgases" as the water is exposed to air during normal household use, such as showering.

LIMITS & SAFETY

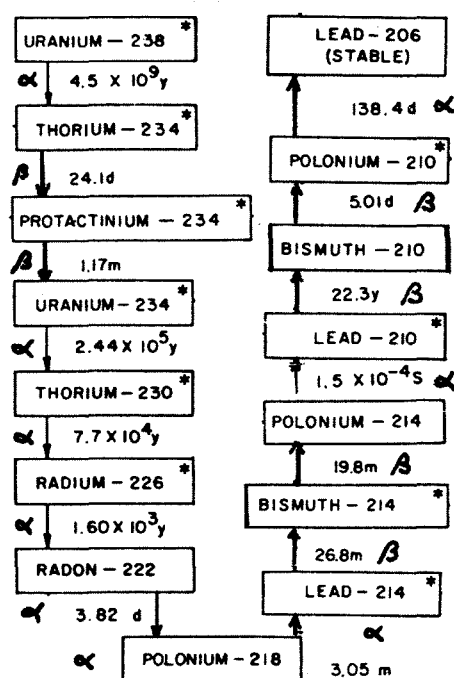
Discussions of safe levels are confused by the hazards of smoking. As long as people smoke it is

difficult to isolate the effects of smoking from radon exposure. The smoke particles act as "magnets" for radon daughters present in the air. This will increase the lung cancer risk of anyone inhaling the smoke.

The Atomic Energy Control Board of Canada has adopted an average annual action level of 0.02WL. (Depending on the source-strength of the radon and the supply of fresh air to the house, this corresponds to 3-5pCi/l). The American Society of Heating, Refrigerating and Air Conditioning Engineers says the safe level is 0.01WL.

Britain has yet to set a limit, but the National Radiological Protection Board (NRPB) is expected to propose to the Department of the Environment later this year a level at which most observed measurements appear safe.

RADIOACTIVE DECAY SERIES OF URANIUM 238



* ALSO GAMMA EMITTERS

REMEDIES

Fortunately it is not too difficult to deal with radon inside a house. It is important to point out that protecting a house does not mean removing the draughtproofing, but involves a series of more sophisticated measures. The main defence is to cut off the radon entering the house, and ventilating as near to the source as possible. In a basement, for example,

you would block possible entry points and then vent the gas to the outside by directing the soil gas from beneath the basement floor. These techniques have been well developed in Scandinavia and North America.

It is not surprising that builders of superinsulated houses have been concerned that they may have been adding to the radon problem unwittingly. However, a study by the Bonneville Power Administration (BPA), comparing airtight houses equipped with mechanical ventilation and air-to-air heat exchangers with conventionally built houses, found that building location is a more important determinant of indoor radon concentration than the method of construction.

Unfortunately, the BPA have not yet finished their work on airtight houses without mechanical ventilation. These findings will be published at the end of 1986.

SCALE OF THE PROBLEM

The NRPB estimates that there may be up to 100,000 houses in Britain which may cause a dose of over 5 millisieverts per year (mSv/yr). (1mSv/yr is the maximum permissible dose to the public from the nuclear industry). To put it into perspective, there are 20 million homes in Britain and 2.5 million suffer from serious condensation and mould growth.

Therefore, an extremely small proportion suffer from radon. Combustion fumes from flueless heaters and cigarette smoke are much more serious indoor pollutants.

An old draughty house in a region with uranium rich soil can be full of radon if it has a basement or its flooring is laid directly on the ground. Even then, the Building Research Establishment suggests that draught-proofing measures, while dramatically improving comfort levels, only reduce the air infiltration by a small amount. Neighbourhood Energy Action's ventilation guidelines stress the importance of adequate combustion air for flueless heaters and the removal of water vapour. So long as these guidelines are adhered to, draught-proofing is unlikely to affect the concentration of radon in a house.

If we recognise radon as a problem, and we use some of the remedial techniques that are being developed elsewhere, it can easily be eliminated without affecting our energy conservation efforts.

However, the Government is unwilling to name the areas which are most affected for fear that it could cause a drop in house prices. They are also unlikely to provide any money to deal with the problem. So we must keep the issue in perspective, otherwise there is a danger that people living in areas not affected by radon will be afraid to draughtproof their home for fear of increased exposure to radiation.

Renewable Energy Scandal

Stephen Salter, Britain's leading wave power pioneer, has always predicted that wave power would come into its own five years after a serious nuclear accident. After Chernobyl everyone agrees that the text books need to be rewritten; nuclear power is in its death throes. In this major article DAVID ROSS looks at the renewables, how they have been treated in the past, and what they hold for the future.

When Peter Walker, the Energy Secretary, was presented with the Report of the Severn Tidal Power Group (STPG) earlier this year he enthused: "There is excitement about the potential of harnessing the tides." Then he proceeded to kill off any prospect of doing so in the foreseeable future.

The Report stated that the STPG members, Britain's biggest construction companies plus GEC and two banks, believed that a barrage could and should be built. After three years' study they want further detailed study of the riverbed and the Government to underwrite the investment.

They need £10 billion for capital, £7.6 billion for interest on the capital and a further £13 billion for interest during the 17 year opening operational phase - a total of £30.6 billion. As this figure is well outside the norm for potential lenders they want the Government to act as "a guarantor of last resort."

The barrage could generate electricity at 3p a unit, a sliver above the CEBG figure of 2.94p for Sizewell B and much less than their estimates for a coal-fired station.

Mr Walker considered the proposal for three months. It was a sensitive one: could the Government commit huge sums for a barrage capable of generating as much as two large

nuclear power stations when they insist there is no alternative to nuclear? And what would be the reaction in the sensitive areas on both sides of the Severn in the run-up to a General Election?

Clearly we had now reached a stage where the Government was being asked to approve basic engineering work which would indicate that it had decided to go ahead. It was a delicate issue, but not beyond the political dexterity of Mr Walker.

He had already fudged the issue by asking the STPG to add another route to their study, two years after they had started. That helped to reduce his commitment to the favoured route. Then he played another card: engineering studies were agreed, but a requirement for a study of a Mersey barrage was added. In this way, the Government has indicated that it is not committed even by implication to a Severn barrage. And when the Report comes in about the Mersey, there are plenty of other sites to be studied - Solway, Humber, Thames ... there are ten known sites around the coast.

But the money, what about the money? Mr Walker would not soil his hands with talk of such a sordid subject when we are considering such a great ideal as harnessing the tides of the moon. He just ignored the point.

TIDAL POWER

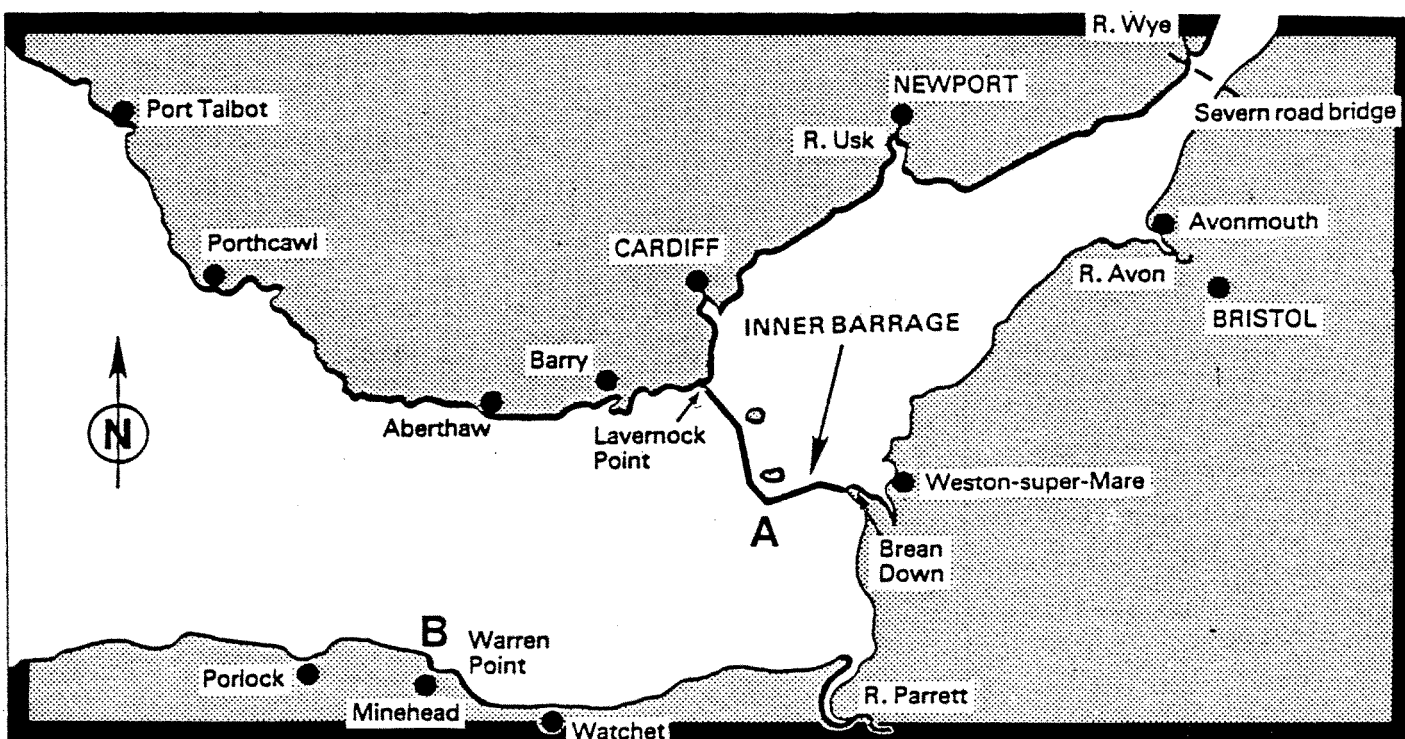
Professor W M Wilson, Head of the Hydraulic and Civil Engineering Departments at Salford University, and one of Britain's most respected authorities on tidal power, denounced the Government's Severn barrage move in unusually bitter terms.

He said: "It is the usual dribble of support that the Government and its advisers, the Oxbridge classicists, give to pay lip service to renewable energy. I think that they are simply buying time. They are going to say, given the electoral process, that they are supporting renewable energy. These faceless mandarins in the Department of Energy ..."

He did give a cautious word on behalf of the Mersey barrage: "It would be about 10% of the cost of the Severn and it could be a sensible thing in my judgement to go for a pilot plan before you went for the main thing. I don't think it is necessary but the rest of the world think it is. So there might be some mileage in the Mersey - it is a disaster area. It might just have the germ of a real interest. It is probably the best prospect."

He clearly sees little hope of the much bigger Severn barrage ever being built.

The Professor has had 16 years' industrial experience in the UK and abroad, including Agent for the main contractors for the construction of Berkeley nuclear power station. He was one of the objectors at the Sizewell Inquiry.



SEVERN BARRAGE HISTORY

Is this a severe description of the conduct of the Secretary of State? Consider the way a Severn barrage has been dealt with in the past.

The first study was set up in the pregnant year of 1925: Margaret Thatcher was about to be born. There have been numerous studies since. All agree that tidal energy can be captured: the Romans used it here; tide mills still stand around the coasts; in more modern times the French have built a barrage across the Rance in Brittany, and electricity flows. But in the UK it is regarded cautiously; for one thing it would detract from the argument for nuclear expansion. Also, the politicians believe it is divisive electorally.

There are environmentalists worried about the mudflats, and the effects on the eels, salmon fishing and shelduck. Rural Somerset is concerned about the impact of construction traffic and perhaps quarrying in the Mendips for the stone needed for a barrage. Against this there are plenty of people, particularly in South Wales, who think of a barrage in terms of jobs. It is not clear cut, and when elections have approached decisive avoiding action has been taken - a committee has been set up.

I was present in 1978 when Tony Benn, the then Energy Secretary, was questioned by the Science and Technology Select Committee. Mr Benn let it be known that a new study, under Sir Hermann Bondi, the Chief scientist, was to be carried

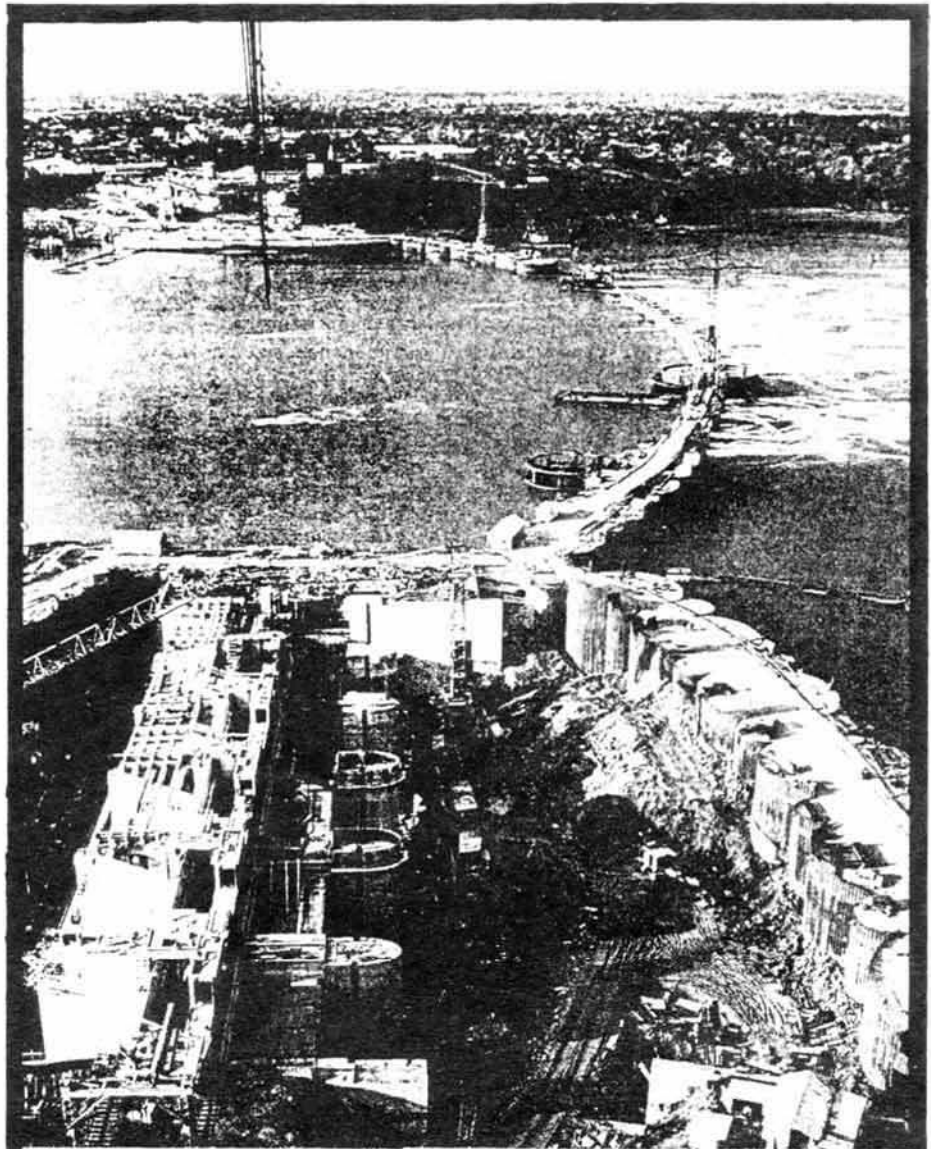
NUCLEAR POWER

Do we need nuclear energy? The figures make it plain that if we shut down every nuclear power station tomorrow, and had nothing available from other sources, we could still get by, even at the time of peak demand.

The CEBG has a "Declared Net Capacity" (total generating capacity) of 52,101MW. The maximum demand was 45,185MW; an overcapacity of 6,916MW. The nuclear output was only 5,029MW. So, even without nuclear, there was 1,887MW of extra capacity.

In Scotland, the SSEB has a maximum capacity of 6,230MW. The peak demand is 4,536MW, leaving 1,694MW spare. The nuclear capacity is 1,450MW (Hunterston A & B). So, once again, there is spare capacity - 244MW in this case.

In both cases, the spare capacity would be uncomfortably small. We would need to improve it by energy conservation, increasing the coal and oil burn, and investing in the renewables. But in the meantime we could get by, just as we did during the coal strike, without so much as a flicker of the lights.



Construction work on the Rance tidal power station

out. The Tory energy spokesman, Tom King, indicated his approval. The whole operation was conducted in a nudge-nudge, wink-wink atmosphere.

The Committee chairman, Arthur Palmer, and Tony Benn were both Bristol MPs; Tom King was and is MP for Bridgwater. All three had good reason to prefer that the barrage should not figure in a General Election, with candidates taking sides. And so, in 1979 it was not an issue.

The Bondi Committee reported in March 1981, in favour of a barrage. Over two years later, two days before Parliament rose for the 1983 Election, Nigel Lawson announced the setting up of the STPG. Mr Walker's announcement of a further study has been misrepresented: the Department of Energy (DoE) calls it a £5.5 million research extension; in reality the Department offered £1.4 million, the rest will come from the STPG and the CEBG.

The truth is that there will never be a Severn barrage while government and the generating boards are

committed to nuclear power. Why should they spend money on an alternative if nuclear power is as safe, as cheap, and as reliable as they claim?

The energy establishment has gone through the motions, with other alternatives as well as tidal, of study with a view to an informed rejection. This was spelt out in an internal CEBG memorandum in 1978:

"Studies have shown that apart from limited special applications, the use of renewable energy sources for electricity generation is likely to be less economic than nuclear power. Nevertheless, it is important to explore these alternatives in order to both satisfy ourselves that nuclear power is fully justified, and to demonstrate this to others, since groups opposing nuclear expansion have made substantial progress in the past few years."

(Note the word "satisfy")

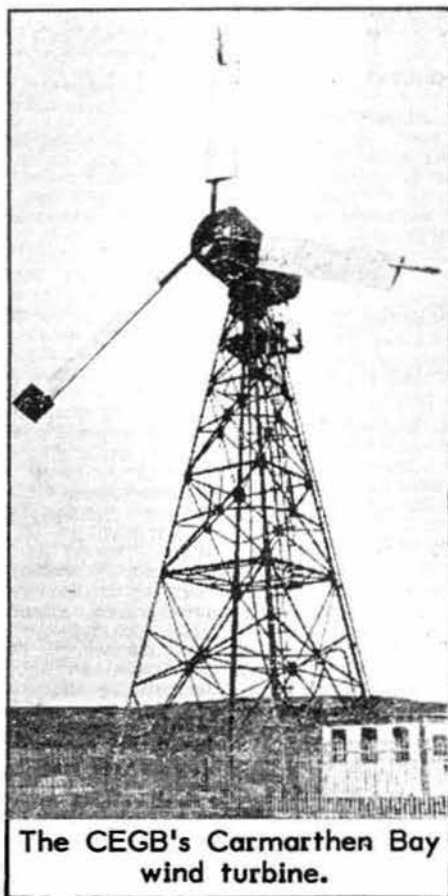
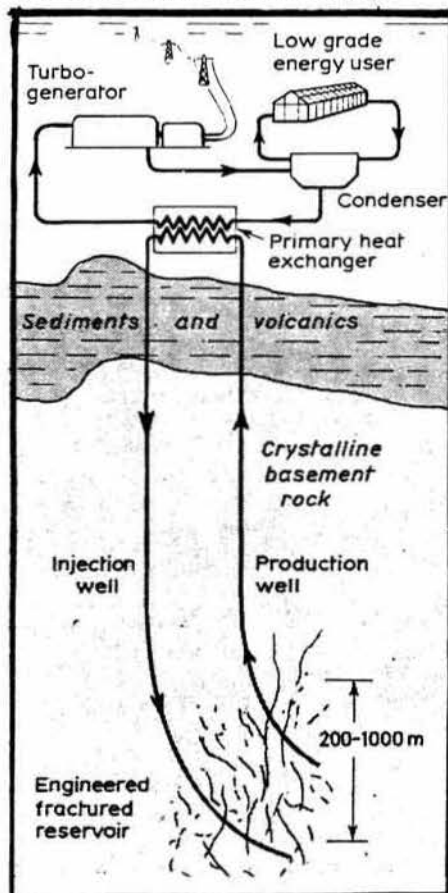
GEOHERMAL ENERGY

Consider what has happened to the other alternatives: first, one source which has not had much public attention - geothermal.

In 1979 tests began to investigate the hot water which circulates beneath southern England, in the Hampshire basin: could it be used to provide feed-water for power station boilers? The CEBG offered a site and invited the DoEn to drill in the grounds of the oil-fired Marchwood power station. Hot water was found nearer the surface than expected; conditions were the same as in the Paris basin, reported the Energy Technology Support Unit (ETSU), where 600 hot water aquifers have been used for over 30 years. So were we on to a good thing? Well, no, because the CEBG announced it was closing down Marchwood because the price of oil was rising, so it would have no use for the "free" hot water.

You might think if oil was getting more expensive the hot water would be more useful. But the CEBG economists argued that it was not so. They were not to know, of course, that they would be needing oil more than ever during the coal strike; nor could they have anticipated the drop in oil price from \$30 a barrel to below \$10 this year.

The rejection was also convenient. The idea of "free" hot water is particularly attractive for those stations burning coal or oil because the fuel is a major item of expenditure and anything which reduces it makes them look more



The CEBG's Carmarthen Bay wind turbine.

WIND ENERGY

David Hunt, the junior Minister in charge of what is left of the renewables, has been to California to inspect and exult over the Altamont Pass wind park which was supplied with 75 330kW wind generators by Howden of Glasgow. But Mr Hunt forgets that the DoEn's job is to provide the UK with energy, not to build up an export trade. Howden was left to cope alone, but the Minister graciously accepted the acclaim of the crowd.

Mr Walker does not share his junior's enthusiasm. In his speech to the engineering employers on 26 June, he said the typical "windmill" designed to "harness electricity ... has a noise equivalent to a helicopter." In fact, it is designed to harness the wind and produce electricity; it sounds like a helicopter without an engine, which is roughly what it is. He also said that "after 40 years of successful exploitation, they might contribute 2% of our electricity supply."

Lord Marshall, chairman of the CEBG, is also sceptical. When his wife opened the Carmarthen Bay wind turbine in 1982 he said "it was by no means certain" that wind power would be environmentally acceptable on lowland sites: it would need 1000 large machines over 300 square miles to match Sizewell's output. This is not acceptable so wind power based on land cannot become a major supplier of electricity; but off-shore it is a different story.

attractive. But with nuclear power, the uranium is not the big item, so it would be of little advantage.

Norman Lamont, when he was a DoEn junior Minister, visited Marchwood and was told that it was the site of geothermal exploration which had come to nothing. He was told that it had cost £2 million. "Dear me," he said, "and so you lost all that money." The CEBG officials made "Yes Minister" noises but did not mention that it was actually the Department's money they had spent. Nor did they mention that the dig had been embarrassingly successful, producing 2.5MW.

But the hot water remains, and it may be used for district heating in Southampton, launched by a French company because the DoEn has refused support. The critical use, feed-water for power stations capable of changing the CEBG's economics, has been crushed.

The Department maintains support for a revolutionary scheme at Camborne in Cornwall, called Hot Dry Rock geothermal energy. Cold water is forced down a well and emerges from another borehole after being heated by hot rocks thousands of feet below ground. But it will soon require much more money than the Government has been ready to invest so far in any of the renewables. It is then that the Government can be expected to abandon the scheme.

It is also noteworthy that it cannot produce electricity until the end of the century, so it never rivalled the Government's nuclear plans.

NUCLEAR SAFETY

The CEBG is claiming that the Soviet style reactor could not have been licensed here because of our safety standards. They quote a 1976 report by the National Nuclear Corporation which expressed disquiet but was kept secret.

What, at the time, was being said in public? At an International Symposium in Zurich in 1976, Dr Walter Marshall (as he then was) said: "Various thermal reactor systems working on the once-through fuel cycle will soon be made to work reliably and with high reliability. These include the PWR, the BWR, the Candu, the Magnox, the SGHWR and the Russian pressure tube reactors."

Challenged about this at the presentation of the CEBG's Annual report on 31 July this year, Lord Marshall said: "I don't recollect the quote. I don't dispute what you have said. I managed to mention everything. I am glad that I put the tube reactor at the bottom."

Fine, but it is still the fact that public statements expressed confidence; private statements expressed doubts.

What is being said in private now?

The CEBG's own scientists maintain that the wind resource from the "best" off-shore areas is 230TWh (terrawatt-hours, ie 230 thousand million units) and the CEBG has said that it is "similar to the total UK electricity demand." That means that wind power could replace coal as well as nuclear. And, if you add to that the "possible" areas, then there is an extra 130TWh.

So how are we harnessing this goldmine? Not a single pound has been committed by the DoEn or the CEBG to so much as a pre-feasibility study of the seabed. Instead, the CEBG has embarked on a joint, paper study with the International Energy Agency, a body which has never generated a single watt of electricity; it generates only paper.

WAVE ENERGY

Finally, to wave power: in the opinion of this writer, the most fruitful source of power for the UK. The story of our virtual "discovery" of this technology, and then its abandonment, is a disgrace.

We led the world with the help of such talented inventors as Stephen Salter (Edinburgh University), Sir Christopher Cockerell (of the hovercraft), A N Walton Bott (a hydro power pioneer in Scotland) and the National Engineering Laboratory at East Kilbride. And, it must be said, ETSU at Harwell. In 1982, when a full-scale prototype was ready, Nigel Lawson as Energy Secretary stopped the funding and the programme shut

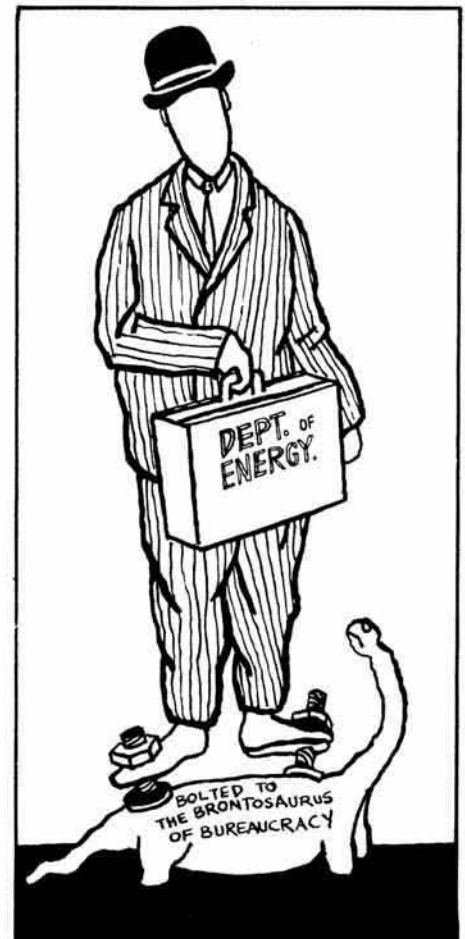
down. Even the CEBG was shocked, and has continued with its own small-scale research.

Norway took over from where we left off and is now generating electricity from two power stations at 3-4p a unit. They chose the site because it is close to an airport for the convenience of overseas buyers; it is not especially fruitful for wave power, and they estimate that the cost could go down to 2p from better locations.

The best estimate of the resource came from the former CEBG chairman, Glyn England: it could "supply the whole of Britain with electricity at the present rate of consumption." Other estimates from official sources range from 60TWh to 81TWh; the lower figure is still 50% more than present nuclear output.

But, when we don't have a single wind or wave generator in the sea or even planned, to argue about the potential is academic. All we need to establish is that the energy is there, waiting to be harvested, and more than sufficient to replace everything we now obtain from nuclear energy, or indeed that the generating authorities expect to obtain in the future.

At this point, our nuclear enthusiast talks about the cost of alternative sources. We can now point to Norway and the privately-owned utilities in California. And we can remind them that nobody has begun to calculate the cost of cleaning up after Chernobyl.



INSTITUTIONAL INERTIA

Why is there so much reluctance to invest in alternatives?

We are up against Newton's First Law of Motion which states: Every body continues in its state of rest, or of uniform motion in a straight line, unless compelled by some external force to act otherwise.

It is the Law of Inertia. It is a Law that has been institutionalised by the energy establishment.

We are in the hands of a generation which has grown up believing in the nuclear miracle, and it does not like to be told by barefoot scientists and engineers with different skills that it has made a mistake. And its sullen inertia is supported by a nuclear lobby with financial, industrial, political, academic and scientific sway.

We are at a point similar to that of the late 18th century, when James Watt's steam engines were producing only 11kW (and the word "watt" was not used because his genius had still to be recognised). At that time, textile factories were being built driven by as much as 190kW of water power. Who could have anticipated such power would be overtaken by the force which made the lid of a kettle bob up and down?

But steam did win through, and now it is the turn of the natural, renewable, benign sources of power. The nuclear lobby know in their hearts that they have lost. We have to make it real, in the power stations.



The North American Experience

In the 1970s the USA and Canada funded non-nuclear energy research and development hundreds of times more generously than the UK. They have reaped rich rewards, making more progress with energy efficiency and renewables over the last 2-3 years than the UK has made in the last decade.

This article, by DAVID OLIVIER, gives an outline of the far-reaching work under way, and is based on the recently published report (*) of his 1985 fact finding visit to North America.

SUPERINSULATED HOUSES Near-zero space heating costs

Standard new North American dwellings are 2-3 times better insulated than British homes, and there are now some 30,000 "superinsulated" houses, pioneered in the 1970s. These houses are revolutionary in performance (See table 1 for typical features.)

TABLE 1

Thick insulation, typically 200-400mm glass fibre or equivalent.

High performance windows, usually at least triple-glazed, and mostly facing south to capture winter solar gains.

Tightly sealed construction, often 25-100 times more draughtproof than UK homes.

Mechanical ventilation system for winter use, usually with an air-to-air heat exchanger to recover heat from the outgoing stale air.

Many firms who pioneered this approach now build only superinsulated homes, at a rate of hundreds a year. The result is that the cost of keeping warm all winter ceases to be of much concern. Even in severe northern climates, leading superinsulated homes have space heating bills of a trivial £0-10/year, plus £20-30/year for the mechanical ventilation system.

Some superinsulated homes now cost little more than a standard home of the same size and quality. There are few cold or temperate American regions where superinsulating a new house does not reduce householders' outgoings; ie. mortgage or rent plus energy. Certainly, in climates like the UK's, it has been found worthwhile.

Such homes may be healthier than conventional houses. The energy saving was the original reason for building superinsulated houses, but their comfort, possible health benefits, and cleanliness (the ventilation system controls humidity and filters out dust from incoming air) seem to be significant.

A superinsulated house near Victoria, British Columbia, which was finished in 1983, is almost a direct

copy of over 5,000 such houses built since 1977 in central Canada. Experience shows that what works well in the prairies' severe cold also works superbly in temperate regions (Victoria's climate is almost identical to southern England's).

The house has 320m² of floor space. The western half is 1-storey, above a cellar; the eastern half is 1½-storey, and has a crawl space, plus a lean-to greenhouse on the south side for food production. Several other features, eg a Clivus composting toilet, reduce resource wastage.

The house's timber-frame walls have 300mm mineral fibre insulation, the roof has 400mm and the floor above the crawl space has 250mm. Windows are triple-glazed with 20mm airspaces on the north side, and double on the south, all with insulating shutters. The exterior doors are steel, filled with polyurethane foam.

The entire house has a tightly sealed, continuous polyethylene vapour barrier. Air infiltration, with doors and windows shut, is 0.03 air changes per hour (compared with 2/hr in the UK). An air-to-air heat exchanger ventilates the house, keeping the air extremely fresh.

No central heating system is needed; in 1984/5, which was typical, 500kWh of electricity from a wall mounted radiator - £12 worth - kept the whole house at 18-19°C all winter.

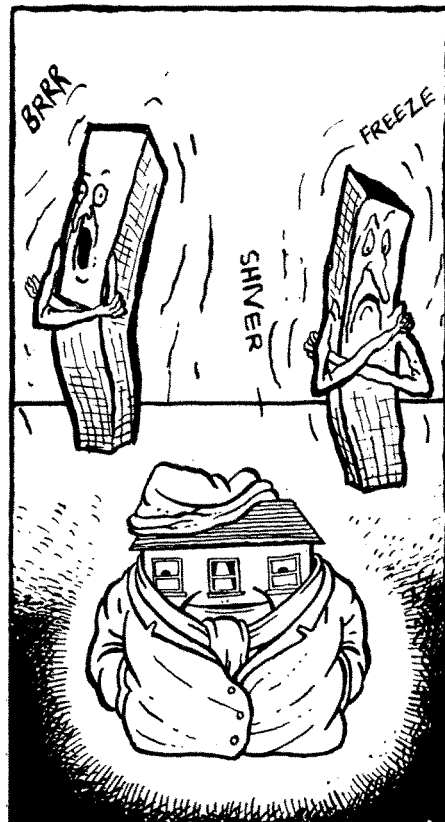
Under Canada's much stricter local building regulations a quotation of £3,000-4,500 was originally given for a conventional central heating system for the house, which is four times larger than many new UK homes. Even at £3,000, omitting the space heating system paid for the new features, so the house cost the same as a standard British Columbia "building code" house.

The builder of the house found lots of demand for highly energy-efficient houses. From these initiatives alone, the 500,000 people on Vancouver Island have more superinsulated homes than the whole of the UK.

THE RETROFIT Applying superinsulation to existing homes

To superinsulate old homes is proving feasible. Combined with normal improvements, the energy

related work on a large detached house of 150-200m² can cost only £3,000-4,000. Space heating costs fall by 80-95%, from £500-1,000 to £50-150/year. Costs in smaller homes are nearly pro rata. Projects are spreading across the continent from very cold climates to those resembling southern England.



In 1982 the provincial government sponsored an energy-efficient renovation of a 19th century Toronto semi-detached brick house, 300m² in floor area. Despite some technical problems, the annual space heating bill fell by 95%, from £1,000 to £50. (This in a house 3-4 times larger than most UK homes, in a climate as cold on average as the Orkneys, and with a more severe winter.)

The work demonstrated a vast number of techniques worth considering when renovating an old house. It also proved that the draughty old brick houses of eastern Canada can be turned into high quality, energy-efficient homes more cheaply than by demolishing and building anew.

Work involved doubling the loft insulation from 150mm to 300mm, insulating the sloping upstairs ceiling between the rafters and internally, and insulating the solid exterior walls with 150-200mm glass fibre above ground, and with 100mm expanded polystyrene in the basement. New triple windows, insulated exterior doors and porches were also fitted.

continued over

from page 15

A mechanical ventilation system, with air-to-air heat exchanger, and an efficient hot water system were included; and a new room was added, to show how the details common in new construction could be incorporated into a renovation project.

Superinsulated retrofit is almost unknown in Europe. Experiments in the UK, where such standards have never been reached or even thought possible will be interesting.

HOT WATER EFFICIENCY

Innovations are leading to extremely efficient use of hot water in North American households. The best single measure is low flow, air entraining taps and showerheads. Low flow showerheads give a high quality shower with about 60% less water than conventional fittings.

A compressed air shower reduces shower energy use by 90%. Using high volume, low pressure compressed air, it effectively substitutes 0.42kW of electricity for 60kW of low temperature heat. In an average household, return on investment is 20-250% a year.

ENERGY-EFFICIENT ELECTRICAL APPLIANCES

Cost less than operating existing nuclear power plants

If all of the above improvements have been made, then electrical appliances can become the largest single domestic energy cost. (Table 2 indicates the 1985/6 "state of the art" in energy-efficient appliances.)

Overall, the best appliances use six times less electricity than present ones. If UK households had energy-efficient refrigeration equipment, consuming 60kWh/yr instead of the present 600kWh/yr (our fridges are smaller than North America's), the energy saving would displace the output of a 2,000MW base load power station. If all UK domestic and commercial electrical appliances were replaced with the most energy-efficient models, the electricity saved would be similar to the output of the whole nuclear programme.

The extra cost of most energy-efficient appliances is modest: considered as a utility investment, they save electricity for £2-3/GJ, about five times cheaper than competing projects, such as Sizewell B or Torness. Just fuelling and operating present US nuclear plants, and apparently UK plants, costs £4/GJ.

Most US utilities are privately owned but strongly regulated by state commissions which can force them to

Appliance

TABLE 2

Electricity Consumption (kWh/yr)

Saving (%)

1984 North American Stock

Best Available Technology

Fridge/freezer	1,727	184	89
Freezer	789	91	89
Clothes dryer	786	264	67
Colour TV	339	113	67
Dishwasher	249	0	100
Washing machine	70	35	50
Total	3,960	687	83

act in consumer interests by investing in the cheapest options, which are generally more efficient electricity users. Hence, 60% of all US utilities now give financial incentives to consumers to buy energy-efficient appliances; many give help to low income households, and the number and sophistication of their efforts is constantly growing.

North American progress has been helped by mandatory "energy labels". In the UK, unless one buys from the one department store with its own labelling scheme, one cannot tell whether a fridge costs £10/yr or £40/yr to run.

building fabric, the systems yield heat at costs similar to conventional sources, eg. natural gas.

In the USA's "sunbelt", with only twice as much solar energy as in the UK (not ten times more), solar thermal electricity is already being sold to electric utilities for less than electricity from coal. Of five solar power stations recently completed in California, the latest cost is under £3,000/kW installed. This is rather less in capital cost than the US nuclear power stations ordered in the 1970s and nearing completion!

CONCLUSIONS

SOLAR HEATING & POWER GENERATION

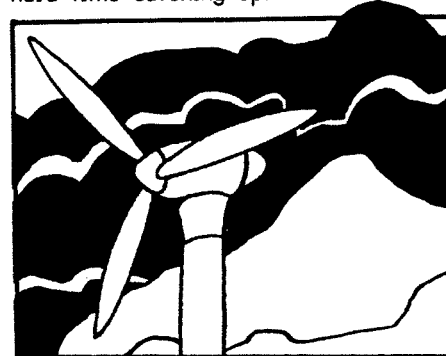
Solar power stations costing less than nuclear ones

After over 10 years' development and experimentation, solar water heating has progressed well beyond its status in the UK. In "state of the art" systems, 6-8m² of solar collectors and short term heat storage costing £600-700 provide 60-80% of a North American household's hot water. Despite the UK Government abandoning most R&D on solar in 1982, claiming that it could not become economic, these systems are cheaper than conventional energy sources, even in cloudy climates.

In numerous houses in the north east USA (with only slightly more winter sunshine than the southern UK), 100% solar space heating is operating. The first such homes have now stayed comfortable for four successive winters with no backup heat. With clever design and integration into the

The USA and Canada have taken a world lead in many energy-efficient building technologies, along with the Scandinavian countries. The USA has a considerable lead with renewables, especially solar cells, solar thermal electricity generation and innovative technologies in the passive and active solar fields.

To put it most charitably, UK government institutions seem oblivious to this phenomenal progress with safer energy options. The UK will have a hard time catching up.



***ENERGY EFFICIENCY AND RENEWABLES: RECENT NORTH AMERICAN EXPERIENCE.** David Olivier, May 1986. Available from Energy Advisory Associates, 15B Bradwell Road, Bradville, Milton Keynes, Bucks MK13 7AX. Tel: 0908 314381. Cost £45 incl postage; prepaid orders only. Please ask your library to stock it. An accompanying slide set is also available.

Socialism & Energy

The nuclear power debate within the Labour Party reaches a climax at this year's Conference in Blackpool. Chernobyl will certainly have played a part if the Party ends up committed to the "phase out" option, but credit should be given to the Socialist Environment and Resources Association (SERA). MIKE MALINA here gives the background to the Energy Group and suggests how its work could progress in the future.

The SERA Energy Group was formed in 1978 and initially focussed on alerting the Trade Union and Labour Movement to the problems of nuclear power and the technical and political advantages of alternative energy.

The Group consisted of a dozen or so people with technical expertise in the energy field (who then went on to submit evidence to various Select Committees on CHP, conservation, etc.). We had an active speakers panel and various technical sub-groups, fielding speakers at many Labour Party and Trade Union conferences and courses.

An inner core of mainly London based activists worked, for example, on evidence to the Sizewell Inquiry, communicated by phone and face to face working meetings. By 1984, group activities had diminished considerably, although a useful file on nuclear waste was produced (which the NUS used), and individuals became heavily involved with support work for the NUM (eg. producing and distributing the "Future of Coal" file).

At this point the Group Newsletter was replaced by a Column in the NATTA Newsletter which aimed to draw NATTA members into SERA and provide Energy Group members with a point of contact.

RELAUNCH

The remaining core group had all but exhausted itself on the mining dispute. But new blood, and new ideas, emerged: we got a radical anti-nuclear motion on the agenda at the 1985 Labour Party Conference and, with the TGWU having come out anti-nuclear, it got through!



Suddenly the Energy Group was re-energised!

A relaunch meeting in December 1985 drew in people from FoE and Greenpeace, and we worked together on publications and a joint SERA/NATTA conference in April this year. Lobbying activity on the Labour Party was stepped up, with some effect.

After Chernobyl we moved into top gear, lobbying the Labour Leadership and building up pressure

for the adoption of a fully non-nuclear energy policy. A TUCND leaflet was produced for the Trade Union conferences, and SERA activists attended many of them.

THE CURRENT PHASE

The last six months have been spent working on specific projects rather than formal meetings, using the NATTA Newsletter to report on progress. But, clearly, we need a formal meeting soon to take stock. After all, this activity has sucked in a lot of new people.

Recently nearly all of our efforts have been geared to the TUC and Labour conferences. But we need to start thinking about the next phase. NATTA has produced a "forward ordering programme" for renewables while FoE, with SERA, has been sorting out the fine details of the nuclear phase-out.



So, where next? The Energy Group may be offered a slot on the BBC "Open Space" community access programme ... But beyond that we need to plan our strategy and organisation.

THE NEXT PHASE

A viable, politically attractive Labour policy is now emerging. Obviously it will need to be consolidated and developed in the run up to the General Election. There must be no backsliding on nuclear power, with a proper commitment to renewables.

To do this we've got to involve more people. To get some idea of where we are headed we plan to organise a full open Energy Group meeting in the autumn, a sort of annual meeting.

Key tasks ahead:

- 1) To consolidate and develop the nuclear phase-out programme;
- 2) To ensure resources are redeployed on job creating alternatives - conservation, CHP and renewables.

Methods:

- 1) Continued lobbying of Unions and the Labour Party;
- 2) "Outreach" publicity work;
- 3) New campaigns.

Specific roles:

In addition to a Group convenor, we need a campaign co-ordinator and a Group secretary (unfilled at present) to keep members informed, perhaps by a newsletter, and generally co-ordinate the Group's activities.

Sub groups on special topics might also be appropriate.



ECO SOCIALIST PERSPECTIVE

It may be well to remember why we are intervening in the nuclear debate. It's not just because we are "anti-nuclear" or "pro-alternative" or "concerned environmentalists". We are all of these things. But we are also radical socialists who believe that decisions about how energy technologies are developed are political decisions.

We believe that the nuclear issue in particular opens up key trade union and labour movement issues, not just employment and health and safety, but also broader questions which transcend the nuclear context concerning what sort of social and technological advance we want, and whose interests will and should dominate in the decision making process.

The new Pluto book "The Energy Fix" explores many of these issues well, in terms that most trade union and labour movement people will connect to. But underlying the analysis is a much more radical approach to socialism than we get

"decisions about how energy technologies are developed are political decisions."

from the traditional Labour Party or even from the so-called Left. It amounts to an eco-socialist perspective.

In the end it is our task to develop this set of ideas, apply them to current policy issues and disseminate them widely. And we've only just started that job.

CONTACT: SERA, 9 Poland Street, London W1V 3DG. Tel: 01 439 3749.

West Dorset Safe Energy

Over the past few issues of SCRAM we have been printing articles about local energy initiatives, from co-operatives making or installing appropriate technology, to local groups. This article, by YVONNE PETER, tells how the West Dorset Safe Energy Campaign was set up and how it has continued, even after the Herbury nuclear power station they fought against was abandoned. It demonstrates that if you keep at it long enough anything is possible.

We started with a flourish in June 1980 when a handful of concerned people met to oppose the Central Electricity Generating Board's (CEGB) plans to build a Pressurised Water Reactor (PWR) at Herbury on a sensitive part of the Dorset coast. We leafleted Bridport using material from Ecoropa and Friends of the Earth, following up with a well attended public meeting.

Dr Ken Penney of Exeter University spoke at the meeting and gave us chapter and verse on nuclear power and particularly the PWR.

Many people were already protesting against the CEGB's plans, and "Hands off Herbury" and "Chase 'Em off the Chesil" were the slogans of the day. It was feared that radioactive effluent from the station would harm the waters of the inland Fleet, threaten local fishing and damage the Abbotsbury bird reserve. Others in the audience were learning disturbing facts about nuclear power for the first time. They added their names to a list of those wanting more information, or willing to help the campaign.

EVENTS PLANNED

At the same time an umbrella organisation - Dorset Anti-Nuclear Alliance (DANA) - was set up to co-ordinate the work of the various groups. We wanted to cast our net over West Dorset as a whole and decided that it was no use being against nuclear power without having something constructive, like safe, alternative energy, to put in its place.

So we decided to adopt the name West Dorset Safe Energy Campaign. Our logo embodies that aim.

An energetic committee planned publicity events. The first was a picnic, with the co-operation of the land owner, on power station's the proposed site and it was a great success. Folk came from far and near and had fun; some joined in a balloon race to demonstrate how far airborne radiation might spread after an accident at the plant. The winning balloon was recovered from West Germany: something to ponder now, after Chernobyl has spread its poisonous cloud.

Our next step was the Safe Energy Show. A great deal of hard work went into it but it brought our campaign and aims to a wider public and, although it drew fire from the pro-nuclear brigade who did their best to rubbish it, it also earned us praise from many who felt we had done a good job.

We repeated it the following year, this time letting space to firms promoting products in the alternative energy field. We were also lucky enough to get David Ross down to talk on the Wave Energy programme which had just been hit below the belt by Government funding cuts. Once again we had to counter arguments from the opposition, but we felt we were getting the message across.

WEST DORSET "NIMBYS"

Unfortunately, all our efforts failed in one respect: they didn't bring in much cash. In fact some



events left us in the red and without financial support from loyal committee members we would have been in difficulties.

Rightly or wrongly, we had decided that information should be free so, from the outset, we asked for no subs. When we did ask for minimal contributions to cover production and distribution costs for our regular newsletter, which had been free, we received a poor response.

West Dorset is a hard nut to crack. Perhaps the climate and the scenery take people's mind off unpleasant things! But once the threat to Herbury was defeated some of our support fell away. The NIMBY (Not In My Back Yard) factor certainly operates here.

DANA faded away through lack of support, although it has been revitalised lately and works closely with the Dorset Green Party. Our own faithful few didn't give up. We closed ranks, set ourselves to create an information base and badgered MPs, government departments and the CEGB, as well as writing letters to the local press.

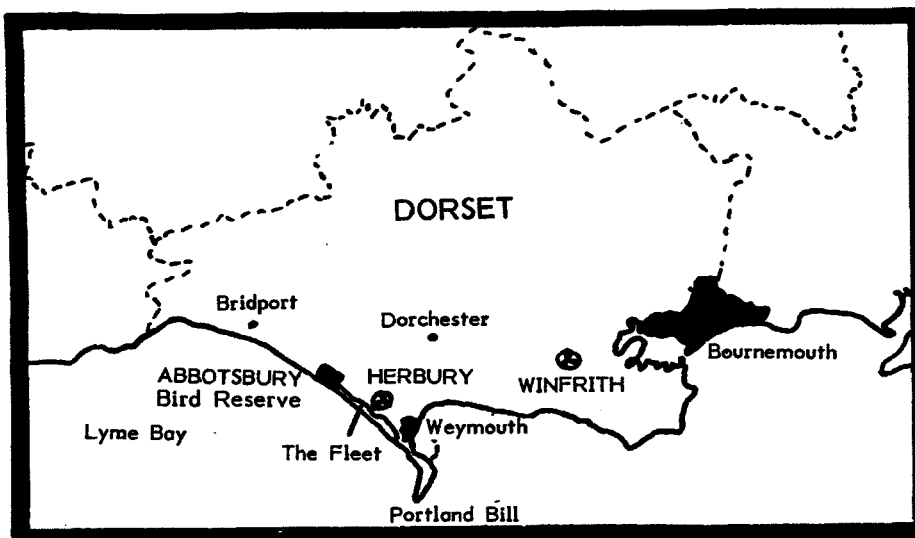
"CLIMATE HAS CHANGED"

At times it seems that banging your head against a wall is a stupid game; then something turns up, someone phones for information or you chat to someone in the street, and you discover there is still a lot of sympathy out there. That comes over strongly each year when we set up an information stall and exhibition at the Melpash Agricultural Show. That gives us a chance to talk to people from further afield and put our case for renewable energy.

Once people came to scoff, now the climate has changed. We find visitors are better informed every year, and alive to the risks.

Has banging our heads against a wall been worth while? We think so. Who knows, one day it might give way!

CONTACT: Cairn O' Mount, Grove Road, Burton Bradstock, Dorset DT6 4QT. Tel: 0308 897396



The UK tidal power research programme has received another setback from Peter Walker, the Energy Secretary, despite his labelling it "one of our most promising renewable energy sources."

He has pledged £5.5 million of private and government money towards advanced investigations into the Severn barrage scheme, and a contribution towards studies into a Mersey barrage. The Government's contribution to a further feasibility study is only £1.4 million, with the rest expected to come from the private sector. (See article on page 11 of this SCRAM).

As reported in SCRAM 53, the Mersey barrage has received support from local authorities, but there were worries about the project's future after the abolition of the metropolitan councils in April. However, the consortium of companies proposing the scheme seems to have survived and they are now hopeful that it will go ahead.

The likelihood of a Mersey project has been increased by a novel method of barrage building, known as Diaphragm Walling. This is a technique pioneered on the Mersey in the '70s during the construction of the Royal Seaforth Dock.

A vast island of sand is created in the water and a trench the width of the barrage is dug into it. The trench is then filled with a thixotropic mud slurry which thickens when it remains undisturbed but returns to a more liquid state if it is agitated. This property enables the mud to hold up the walls of the trench as it is being dug and strengthening steel bars are inserted. Huge pipes are then pushed down through the mud, and concrete forced through them to the bottom of the trench. The concrete disturbs the mud and makes it flow over the top.

The novelty of the scheme is to use two supertankers, as movable coffer dams to protect the sand from the river's currents. The proponents,

the Mersey Barrage Company, claim that this approach will be 20% cheaper than conventional techniques.

The Severn barrage proposal is a larger and altogether more conventional affair. It could generate 7,200MW (about 6% of England and Wales' electricity needs), will cost more than £5.5 billion and will be 16.3km long. The proposers are a group of companies known as the Severn Tidal Power Group (STPG). Readers will know the Group's main partners - GEC, Taylor Woodrow and McAlpines - as major partners in Britain's nuclear reactor building consortium, the National Nuclear Corporation. The STPG hopes to build the barrage between Weston-super-Mare and Cardiff, although the Government funding of the next study is dependent on the inclusion of a cheaper and smaller scheme known as the English Stones plan.

The Severn barrage is not without its opponents, from environmental groups to political parties. One of the main objectors is Plaid Cymru who are urging the Welsh Secretary, Nicholas Edwards, to hold a public inquiry into the scheme because they feel it will threaten the Welsh coalfield, the identity and economic future of south Wales and cause environmental damage.

Other opponents are particularly worried about the privatisation of the electricity supply and its concentration in the hands of a small number of companies with vested interests. The construction of a small number of large generating stations, be they nuclear, coal or tidal, tends to decrease the number of jobs and increase the political power of the companies involved. The enormous construction and interest costs of such a project could increase the cost of electricity as the private companies try to recoup their outlay in the shortest possible time. A similar argument has been levelled against the Channel tunnel with toll charges perhaps being inordinately high.

Wave

Norway plans to expand its commitment to wave power following the successful completion of two demonstration schemes near Bergen (see SCRAM 51).

Suitable sites for the construction of a system of Multiresonant Oscillating Water Columns (MOWC) are being investigated by the designers, Kvaerner Brug. Of the two demonstration plants, the MOWC has been the most successful, as the Tapchan (Tapered Channel) system has suffered from problems with clearing away rubble from the channel blasted in the cliff.

It is hoped that the new MOWC scheme will produce "significant" amounts of electricity from a series of columns installed along a stretch of coast. The demonstration plant consists of a single column generating only about 500kW. The building of the new installation is expected to create a large number of construction jobs, although once in place it will be operated by only a small number of workers.

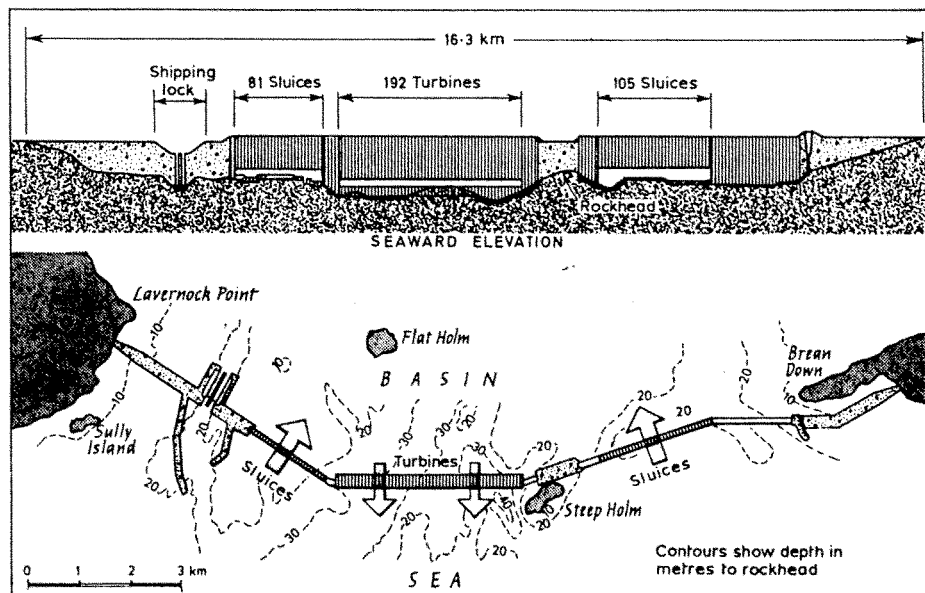
Debris is not the only problem to affect the Tapchan system: a seagull was killed when it flew into the water spout caused when the waves spill into the central reservoir.

Wave Power Industries, an American company, is trying to raise Wall Street backing for its plans to build a commercial wave power station. The company hopes to recruit scientists from Europe, particularly from Britain where wave power research has been shelved. They believe that an off-shore design will be particularly attractive in remote island communities, where generating costs are especially high.

Biomass

Europe's grain surplus may be turned into tomorrow's fuel. Research scientists in the US have apparently isolated a new fungus in a Denver dungheap, which is especially efficient at converting biological material into ethanol. The importance of the new fungus is that it can convert a large proportion of hydrolised biomeass into the alcohol in conditions more extreme than those tolerated by known microorganisms.

Ethanol is one of the most useful of the organic fuels. Unlike methanol it is not corrosive, although until now it has been more expensive to make. It is a rival to petrol because it can be used in blends of up to 20% in modern car engines and can improve the octane rating of the fuel.



■ Geothermal ■

Scientists in California have recovered samples from what they say is the hottest and most corrosive environment yet explored when investigating the geothermal potential of the Salton Sea area on the San Andreas fault. And, in New Mexico, Los Alamos National Laboratory researchers are looking at ways of heating water by pumping it through hot dry rocks in a project similar to that being carried out at the Camborne School of Mines in Cornwall.

In March, the Californian scientists obtained fluid samples from the bottom of a 3km deep hole where the temperature reached 355°C. Brine and steam flowed at a rate of 350 tonnes an hour, which is more than enough for the production of geothermal power. Wilfred Elders, the chief scientist on the project, said that "the high temperatures suggest that it would be worth drilling deeper for geothermal power than is done currently."

The project has received an

additional \$1.3 million from the US Department of Energy to do more tests. It involves scientists from 35 organisations in five countries.

In New Mexico, 40 million litres of water were heated under pressure to 190°C in tests which lasted one month. Enough energy was extracted to be able to provide electricity for a town of 2,000 people. A year long test is now planned to demonstrate the commercial feasibility. Japan has provided part of the funding.

A geothermal power plant has been developed in another project in California, in the Imperial Valley. The plant makes use of lower temperature brine than is normally required for geothermal power and is already producing 24MW of electricity.

The new approach is called "binary" technology and consists of pumping the hot water from 13 wells to the plant and extracting the heat by a heat exchange process. The secondary fluid, which accepts the heat, is 90% isobutane and 10% isopentane. This fluid vaporises and the vapour turns a turbine to generate the electricity. Conventional geothermal systems harness the steam from extremely hot water, without the use of a secondary fluid.

While France is closing down its 2.5MW solar research project in the Pyrenees, the West Germans are planning to start a 1MW project next year.

The Pyrenees project closed after three years, with the plant working for only two of them due to breakdowns in the conventional equipment. The French electricity utility claims that the electricity produced was too costly, although the project's director, Michael Rolant, points out that the pilot fast reactor produced electricity that was more expensive, and nobody complained then.

The West German project will only go ahead if the Federal Research Ministry commits itself financially to RWE who are promoting the venture. RWE plans to locate the project in three different areas in order to take variations of climate into consideration. The main objective of the research is to examine the conversion of the direct current produced by solar power into three phase current suitable for commercial use.

■ Hydro ■

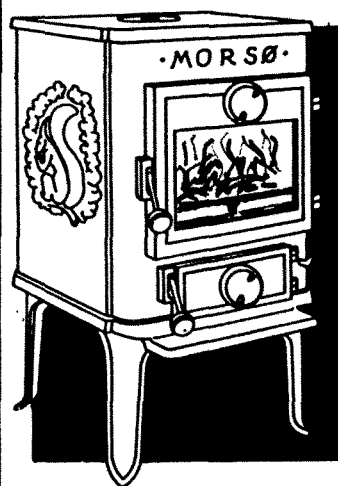
The Canadian Government is to fund a \$7 million feasibility study into building a major hydro-electric scheme on the upper reaches of the Yangtze river in China. If the scheme goes ahead it is expected to cost \$20 billion, could take up to 17 years to complete and will be the largest dam in the world rising to some 80m high.

The idea of damming the Yangtze at the Three Gorges has been around for the last 30 years, but it is a controversial one. If it were to go ahead it would obviate the need for an increase in China's nuclear capacity, but the opponents of the plan say that it would be an environmental disaster.

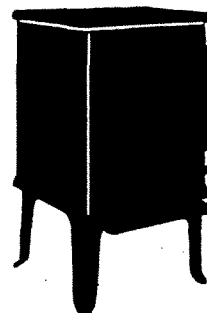
If the study proves the scheme viable, and the opposition is overcome, then Canada would expect to receive the major part of the contracts. Even if the contracts do materialise then the funds already sunk into the study would seem to be a very long term investment, as the dam is unlikely to be started before the beginning of China's next 5 year plan in 1991.

On the other side of the world, the Dutch have started the construction of a hydro scheme on the Nederign river in Mauric. The 10MW plant is expected to come "on stream" in 1988. The Netherlands may not be the first place one would consider siting hydro-electric stations but the Dutch electricity producers' association, VEEN, claim that the country's rivers could sustain some 75MW of capacity, about 0.75% of total Dutch electricity consumption.

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Renewable Energy: Towards a Renewable Energy Programme for the UK; NATTA £2.

Despite the Labour Leadership's failure to capitalise on the anti-nuclear feeling aroused by Chernobyl, we mustn't forget that they have actually said that they will not build any more nuclear power stations, at least for the time being. In 1984 NATTA (Network for Alternative Technology and Technology Assessment) outlined a programme for the renewable energy research. Alex Eadie, one of Labour's front bench energy team, has said that this is the sort of programme that they should adopt.

The £150m per annum programme is included in this pamphlet, and is worth reproducing here:-

1) Continued and expanding support for the large scale on-land wind, including vertical axis machines: £15m per annum.

2) A crash programme of offshore

wind development: £30m p.a.

3) Serious support for small scale wind turbine development including preferential subsidies to relevant small firms: £15m p.a.

4) A commitment to a series of tidal barrages, possibly starting with the Severn mini-barrage or Mersey barrage: £20m p.a.

5) Refunding the UK wave power programme: £30m p.a.

6) A major commitment to biofuel research and development: £30m p.a.

7) Continued commitment to geothermal: £15m p.a.

8) Programme administration: £10m p.a.

The pamphlet shows how a rapid programme of research and development into renewables is feasible, and is an attempt to start convincing politicians and the public of the merits of a renewable energy strategy. Coal would remain the main

energy source far into the future, but renewables should be seen as the next generation.

It is annoying that it is not easy to compare some of the tables with each other, or see the contributions as a percentage of total electricity demand. It is a short pamphlet and doesn't attempt to quantify jobs or lay out a strict programme. What it does attempt to do is give renewables a sense of purpose and set some realistic targets.

A firm commitment to renewables must be the central thrust of Labour's energy policy, whatever the outcome of the nuclear row. It is ironic that whilst writing this review I am listening to news of yet more closures in the shipbuilding industry, which could benefit greatly from such a programme. Get your copy of this document now, and use it to write to your MP or to get your local authority to start thinking about the contribution they are going to make to a non-nuclear Britain - before any proposals to dump nuclear waste in your area.

PETE ROCHE

Red and Green: The New Politics of the Environment by Joe Weston (ed); Pluto, 181pp, £4.95.

"Under the flats, beneath the projecting balconies, most of the garages are unused, the doors twisted and buckled. The sheltered walkway at this level is unused, because it is unsafe. It leaves the apertures of the garages as a shelter for brief sexual encounters, for the homeless to sleep in, for kids who run away from home, and as a haven for ... glue sniffing parties."

The thesis of this book is that environmental campaigning has placed too much emphasis on a concern for "nature" and ignored the social environment which Jeremy Seabrook graphically describes in the above quote. The failure of modern environmentalism to become anything more than a reflection of wealthy society's concern for wildlife has meant that it is not the radical force for change that it could be. Environmentalists should recognise that it is capitalism, and the transference of wealth from the many to the few, which lies behind the problems which the greens now address.

This book looks critically at Green politics, and the favourite eco-sport of rubbishing all the established parties. The idea that green politics is a brand new product in the political market place is also criticised. Greens are trying to mislead us into forgetting a whole lineage of socialist and populist thinkers who emphasised decentralisation and internationalism: Kropotkin, Proudhon and Godwin, the

RED AND GREEN

The New Politics of the Environment

Edited by Joe Weston



PLUTO
P 12-13

anarchists; and utopian socialists like William Morris and Robert Owen; not to mention the Diggers and the Levellers. This lack of historical insight is really a lack of political insight.

This is not to say that the Labour Party does not have major shortcomings. Green socialists within and outside the Labour movement are only too aware of this. But the libertarian tradition is certainly gaining strength, and decentralisation is back on the agenda.

The book attempts to set us on the right road to build a radical campaigning environmentalism. Green ideals, the authors insist, cannot be

divorced from socialist ideals. Greens, therefore, should not be divorced from the Labour movement. They would be foolish to continue the pretence that they are about a "new" politics; rather they lend a new perspective to issues that are as old as the hills. There are real political battles which need to be won, both within and by the Labour movement. For greens to refuse to join these battles in defence of some higher ecological principle is a dereliction of duty.

I hope that all environmentalists, whether they consider themselves to be socialists or not, will read this book with an open mind. It can only help the greens to move away from their middle class image and towards a radical campaigning strategy.

PETE ROCHE

Hot News: A Documentary on Combined Heat & Power; Parallax Pictures/Trade Films. 20 min, colour.

Suitable for any age, this video will be an instant hit with secondary school pupils. Its style is a combination of "Nationwide" and "Not the Nine O'Clock News". Definitely an equal opportunity production, it may not go deep enough into technical details for an engineering audience.

I would recommend it for OAP Associations, Women's studies classes and anywhere else with a slot for a not-too-serious video on CHP (and incidentally fuel poverty) and to get a discussion going on energy or energy policy.

SCRAM has a copy and we can show it to your local group.

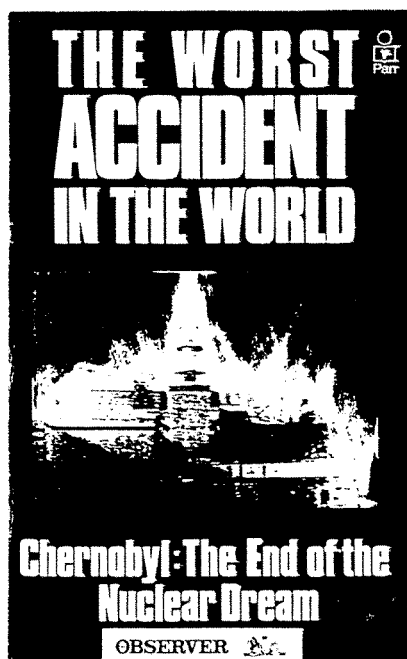
LINDA HENDRY

The Worst Accident in the World, Chernobyl: the End of the Nuclear Dream; Observer. 246pp, £2.95.

That "The Worst Accident" is written by a team of journalists, reacting hastily to the latest nuclear calamity, is evident, not just from the credits, but also from the book's form and content. There are five different writing styles and problems with syntax remain, and the book's strongest chapter is the one dealing with the post-Chernobyl journalistic experience. The authors are an efficient team of good writers which is what maintains the book's credibility, where it could well have become an unco-ordinated collection of essays.

The book starts out with a scene setting chapter about the Ukraine, using low key tension techniques, more commonly associated with disaster novels. As is fitting with the genre, it cuts between the placid tranquility of a community preparing for a spring weekend in the country, and the tensions on the reactor floor as the operators go about their jobs happily unaware of the impending doom ...

The following three chapters outline the history of radioactivity and its applications, both "peaceful" and otherwise, and the history of nuclear power in the Soviet Union. They are clear, concise and informative. As such they provide a useful introduction to nuclear power politics for the reader, although hardened campaigners will have read



it all before. The highlight of these chapters is a series of one page summaries of the various aspects of the nuclear cycle; the lowpoint is the boring but lucid graphics which, although they add to the text, are too dull to interpret. Perhaps there is a job for our Oberon at the Observer.

The fifteen pages that deal with the accident itself are, by necessity skimpy, as they were written before the "official" report came out. But they are interesting, as they are written with a full understanding of

the background to the accident. What is more interesting however, is the following chapter, in which the authors indulge in every hack's favourite pastime: mocking their colleagues' work. "How the world found out" is both pungent and witty, and should be recommended reading for every budding newshound.

From this chapter on, the book slides down hill. What should be the core of the whole project: the reactions to, and effects of, the radioactive cloud over Europe, is a perfunctory addendum to the reactions of the Soviet hierarchy. Not that the chapter on the Cloud's spread isn't interesting, it is, but I for one have had my fill of the anti-Soviet propaganda that has surrounded the whole grisly accident. Conversely, the next two chapters about the clean-up and evacuation are fair. No doubt this has something to do with the fact that they are straight reportage of ascertainable fact.

The joy of good journalism is that it is instantly responsive, clear and objective. "The Worst Accident" is all of these, and more, that is apart from the final chapter: the future of nuclear power. According to the authors, it has no future, but neither do they credit any future to the alternative energy forms. It is as classic a case of fence sitting as any SDP hack could dream up. Journalists who write for the "quality press" should know better than to call wave power an "unproven technology".

A good book but lacking finish.

THOM DIBDIN

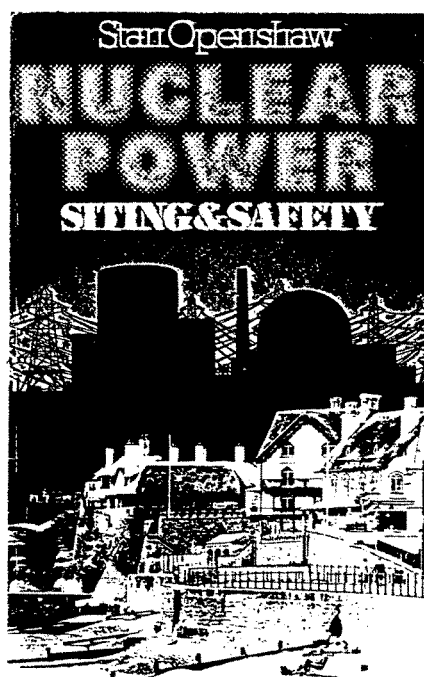
Nuclear Power: Siting and Safety by Stan Openshaw; Routledge & Kegan Paul. 349pp, £9.95

By accident Chernobyl has made "Nuclear Power: Siting and Safety" a timely book as it foresees the post-Chernobyl world: "a major reactor accident anywhere in the world would result in the majority of the UK population feeling themselves to be at risk" (p307).

Stan Openshaw puts the case that if the world economy is to continue at present, nuclear power will be an important energy source. To avoid safety problems he suggests that sites, once chosen, will be in use for a few centuries, and that remote siting adds an important independent safety threshold over and above technological and managerial safety strategies. He concludes that these sites are likely to be chosen during the next couple of decades.

He is concerned with how to improve the choosing of sites. His analysis of the CEBG's "relaxed siting criteria" shows that little account is taken of population distribution, but that, if it were, there would be no shortage of sites, contrary to the CEBG's claims. He suggests, that as

the UK uses US technology, it should also choose its sites by US methods, away from areas of high population density. Suitable areas would be in the Highlands and Southern Uplands of Scotland, Cumbria, Western Wales,



Cornwall and the shores of the Wash.

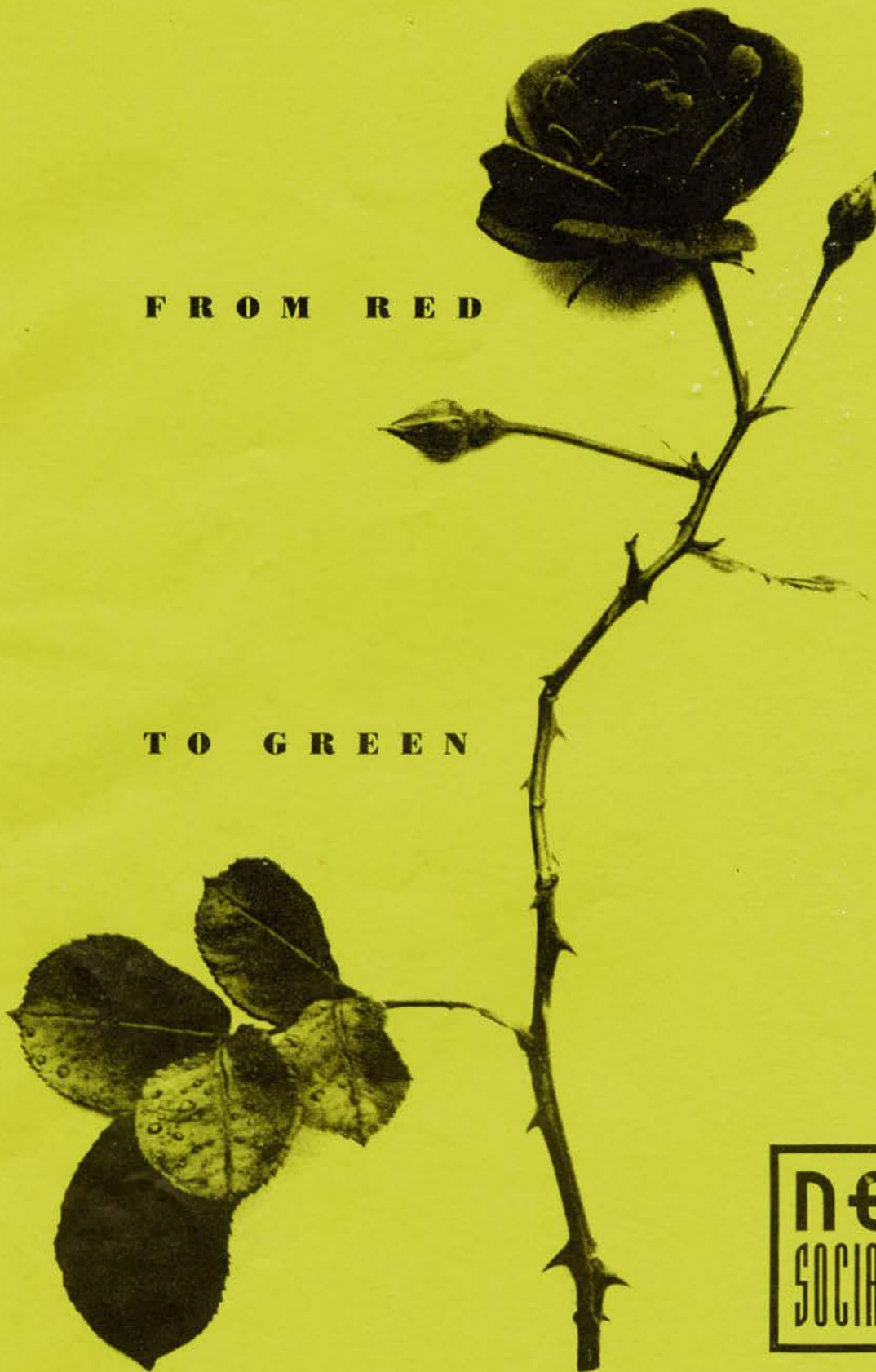
However he ignores local and continental weather patterns in assessing areas affected by fallout from catastrophic accidents (as seen after Chernobyl). This restricts "remote" sites in the UK to the East Coast fringes of the Scottish Highlands. He pays little attention to low level radiation, and how discharges accumulate in the food-chain, and spread beyond the remotely sited plants; also such areas often produce food for the densely populated areas. And he does not consider siting criteria for the fuel services for nuclear power stations.

For all its urgings of responsible decision making Nuclear Power does not face up to the question of how democratic processes can cope with decisions concerning time scales greater than a century. Although it is pro-nuclear, it makes a very strong case for nuclear power being inappropriate in the British context. The feeling is that the author wants nuclear power, but in another part of the world, with the UK importing energy derivatives of such nuclear sites. This will not suit the national elite's present strategy of independence in energy.

IAN LEVESON

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TO GREEN



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Little Black Rabbit has been out and about a lot lately and has come across a few snippets which should be passed on the SCRAM readers.

● According to the Scottish Sunday Mail the Government is set to carry out "secret radiation tests" in response to Chernobyl. Patients will be chosen at random from three hospitals in Edinburgh and Glasgow and the tests will be performed by the Scottish Universities Research and Reactor Centre at East Kilbride. The Scottish Office has allocated £20,000 for the study.

The role of the Director of the East Kilbride Centre, Professor Murdoch Baxter, is interesting. Prof Baxter has said that the Scottish Office had played down the Chernobyl hazard and that Scotland had "just missed a major nuclear emergency." He discouraged people from drinking milk during the crisis because his Centre had detected significant levels of radioactivity in people. This was one reason for urging the Scottish Office to sponsor a national monitoring exercise.

Frances McKie of the Campaign Against the Dounreay Expansion phoned Prof Baxter and asked if he would be willing to contribute to the Dounreay Inquiry. He apparently tacitly agreed to help but later, replied by letter to decline the invitation, because he now feels "that the post-Chernobyl monitoring effort was not sufficiently deficient." He emphasised that the Scottish

Office funding for his laboratories to carry out the monitoring "in no way compromises the objectivity or independence of our stance here."

He closed his letter with: "I believe that the activities of pressure groups have ... led to major improvements in practices within the nuclear industry."

● Steven Grist, the Secretary of the Glasgow branch of the Scottish Green Party works in an Unemployment Benefit Office where a new computer system is to replace the old clerical system. Comments from the staff were requested.

Steven used the article on VDUs and health in SCRAM 52 to draw up his objection to the introduction of the system. Other members of staff responded encouragingly to his comments, especially the women. Management replied with NRPB documents which played down the hazard.

One question which he put to management was whether compensation would be paid if members of staff or their wives gave birth to an abnormal baby. They were unable to answer and referred him to Head Office in Edinburgh. He has received no reply.

● Good news for Philips, the light bulb manufacturers. When we moved into our present offices four years ago one of their SL-9 low energy light bulbs was installed as a security lamp for the Lavender Menace Bookshop downstairs. The bulb failed

in mid August!

The 9 watt bulb ran for over 20,000 hours; it used about 200 units which cost about £16. A conventional 40W bulb would have used 880 units; about £70 worth. This more than compensates for the £5 cost of the bulb.

● Britain is set to join the "30% Club", the group of nations which are committed to cut sulphur dioxide emissions by that amount by 1993. This compromise probably has nothing to do with Norway toning down its criticism of the proposed EDRP at Dounreay!

● Nuclear fusion is this year's hot news, if temperatures at the USA's Princetown University fusion research centre are anything to go by.

For 0.3 seconds in early August, the scientists there managed to produce a temperature ten times hotter than the Sun's core. The heat was not, however, for investigating the properties of the latest advances in sun tan lotion. It was used to fuse 10 million billion hydrogen atoms, and generate a massive 10kW of power; more than 17MW of electricity were used to produce this momentous breakthrough.

So, 17MW of electricity is required to produce enough power to heat ten one bar electric fires for 0.3 seconds: not, one would have thought, a highly productive process!

● Tourists have been voting with their feet and staying away from the Black Sea's "hot spots" in their droves this year. This has drawn the envy of Basque separatists who have been using their explosive methods of coercion to try and achieve the same results on the Spanish beaches for years. It appears that while your average punter is quite content to bask on the bombed out beaches of Benidorm, they aren't so keen on glowing on the golden sands of Odessa.

● SCRAM is not very impressed by Greenpeace's plan to shut down all Britain's nuclear reactors within four years. Part of the plan requires "reinforcing the transmission link to export surplus Scottish electricity to England." A line of gigantic pylons striding their way through the Scottish borders?

Think again, Greenpeace!

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