

SCRAM

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INSIDE - THE ALTERNATIVES TO NUCLEAR POWER

'SCRAM' MEANS TO SHUT DOWN A NUCLEAR REACTOR

Safety or deaths? The NRPB compares costs

SCRAP ICRP 26!

The issues at stake over the health effects of radiation are both scientific and political. Consider the National Radiological Protection Board's recent document 'Application of cost-benefit analysis to the radiological protection of the public.'

It has been issued as part of the 'consultation' process on proposals outlined in ICRP 26. Published in 1977 by the International Commission on Radiological Protection, it fully endorsed for the first time the principle of social cost benefit analysis in setting limits on radiation exposure. Its recommendations have been accepted by the relevant national body, the NRPB, but have yet to be ratified by parliament.

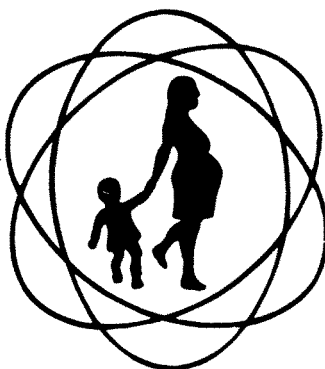
COSTING RADIATION DISEASES

The problem facing the ICRP and NRPB is how to draw a limit when they know that no level of radiation exposure is safe, and any amount can produce health effects. They balance the cost of technology to control radioactive releases against the costs of labour lost through sickness, and the cost of treatment. This has been justified by recourse to scientific analysis, but the essence of the radiation protection programme is still that limits are set where 'acceptable' to the nuclear industry, not to the people exposed.

ICRP 26 has recalculated permitted doses to different parts of the body.

Every organ dose is converted into a notional 'whole body dose' whereas previously each organ had a separate standard. This will raise permitted exposure to organs by up to 8 times.

ICRP estimate the risk from radiation exposure to be 100-150 cancer deaths in every million people exposed to 1 Rem. (Background radiation is 0.1 Rem on average). Several recent studies (see SCRAM Energy Bulletins 11 and 15) suggest a cancer risk up to 20 times



STOP THE NUCLEAR PROGRAMME

higher than the ICRP estimates, especially for workers in the nuclear industry.

The increases recommended in ICRP 26 are therefore unjustified in their own scientific terms, and are morally and politically indefensible.

Plutonium cancer rates soar

Plutonium is the most toxic substance known. Just how dangerous it can be was described at recent seminars in Edinburgh and London by Dr. Carl Johnson, Health Director of Jefferson County, Colorado, USA.

Releases of plutonium, he says, from the Rocky Flats weapons factory, 16 miles upwind from Denver, have caused large numbers of unexpected cancers.

There have been several fires at Rocky Flats. The most serious was in 1957 when 20kg of plutonium burned for 12 hours. Yet no measurements were taken for the first week due to 'broken' instruments. When the instruments were finally fixed the amount of Plutonium-239 measured on one day exceeded 50 years worth of permitted releases.

Alpha emitter releases from all nuclear installations are being seriously underestimated, he said. Monitoring filters are assumed to trap all particles. Studies showing that this does not happen were kept secret by the Atomic Energy Commission until someone leaked them.

There has been a long history of cover-ups of the fact that the area is contaminated. Dr. Johnson collected dust samples and found that the concentrations exceed official estimates by 285 times. In one sample the concentration was 3920 times higher than fall-out levels.

CANCER INCREASES

He then studied cancer deaths and found a 24% excess in leukaemia and lung cancer rates for men within 13km of Rocky Flats. There was a 140% excess in testicular cancer. Cancer rates decreased with distance from the plant.

Estimates of health risks from Plutonium should be revised upwards. Dr. Johnson's figures coincide with Professor Karl Morgan's view (see SCRAM Bulletin 15) that airborne exposure should be decreased by 240 times the present standard. Just one 2 micron particle would then exceed the public dose limit.

This has important consequences for installations such as Windscale which in 1978 released 1223 curies of Plutonium -239 and -240.

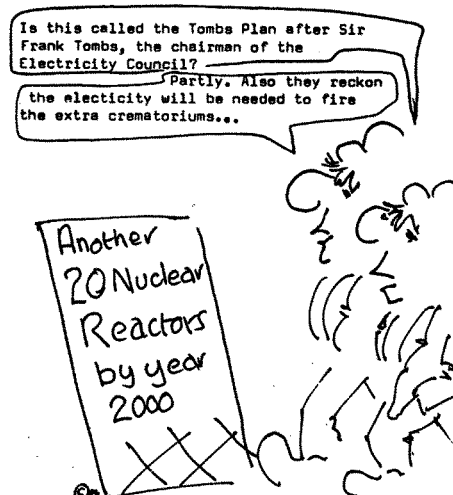
And it makes a nonsense of official British estimates of the minimal hazard posed by an accident involving spent

CAMPAIGN

A campaign has been launched to raise awareness of the implications of ICRP 26, and of the health hazards of low-level radiation. The involvement of every interested group and individual in this campaign is needed: Trade Unions, health councils, M.P.s etc., all need to be approached.

The next meeting of the Rad Health group will be in Birmingham on the 17th May. All wishing to be active in the campaign are welcome to attend.

For information, help or speakers, contact: Radiation and Health Information Service, c/o Claire Ryle, 9 Marion Close, Cambridge; SCRAM (contact Sheila Durie), the ANC (contact Tony Webb): 27, Clerkenwell Close, London, EC4; BSSRS Hazards Group (contact Dave Rosenfeld), 9 Poland St., London W1.



nuclear fuel.

Dr. Johnson's paper is available from SCRAM, 70p + 20p postage.

The Radiation and Health Information Service have published a book 'Your Health at Risk - some facts about radiation and the nuclear industry'. It's a vital source document - the first to put the information together in readable language. Available from RHIS in Cambridge or SCRAM Mail Order Service, price 50p + 20p postage.

STOP PRESS

A recent independent study by German scientists reveals that the US Nuclear Regulatory Commission used fraudulent research to justify its claims that emissions from reactors are safe.

Drs. Franke and Teugel say that NRC judgements on how much plutonium, caesium and strontium is picked up by crops from the soil are "between 10 and 1000 times too low."

By feeding figures from independent scientists into the NRC's computer model, they found that the PWR planned for Wyhl could expose people to 1071 millirems - 10 times the background level.

More details available from SCRAM Edinburgh soon, c/o Sheila Durie.

NEWS ROUND-UP

RADIOACTIVE LAME DUCK

The CEBG dramatically revised downwards their estimates of future electricity demand, and have told the government there may be no need for one of the new AGR power plants proposed for Heysham and Torness.

The central Policy Review Committee was ordered by a furious government to produce an urgent report on the need. They have reported no need, but have recommended that they both be built purely to keep Britain's ailing nuclear construction industry going. The cabinet has not yet made a decision, an indication of a fierce argument on whether to completely reverse government policy on aid to 'lame ducks'.

Whatever happens there is to be another 6 month delay in signing contracts for the hard-ware components. The SSEB have said that this is because of reorganisations within the National Nuclear Corporation. Other sources have said that MacAlpine's (the main contractors) have not yet produced a final design, which has to be submitted to the Nuclear Installations Inspectorate to get a safety licence.

A third reason has been suggested by East Lothian MP John Home Robertson. He has written to Mrs. Thatcher to ask if the delay is because of a decision to switch to a PWR. This could be done without a public inquiry.

The new CEBG forecasts have reduced the estimated demand in 1986 by 8%. Demand estimates for the year 2000 have already been revised downwards by 27% since 1977.

Dounreay Plutonium Run

Early this year the UKAEA conducted secret salvage tests off the western Coast of Scotland. The recent Nuclear Installations Inspectorate report on the safety of plutonium nitrate in transport is obviously based on the results of these trials.

The report rubber stamps the UKAEA's proposal to take spent FBR fuel to Workington by sea and then to Windscale by road. It concludes that the chance of a breach of containment where members of the public might be harmed is one in a million a year.

In the true tradition of reports on nuclear safeguards, it gives very little raw data and therefore an independent review of their risk estimates is well-nigh impossible. Confidence in the report must plummet when faced with statements like: 'In carrying out a safety assessment... reliance had to be placed on the information made available by the designers and operators'.

Assessment of the risk of terrorist intervention is excluded because the NII does not consider itself 'expert' in this field, and passes the buck on this one without saying who to.

NO NUCLEAR POWER

The Danish parliament voted on Feb. 13th to put off any nuclear power plans, and their proposed referendum on the subject indefinitely. It is reported that many people in government circles regard this postponement as the death blow to nuclear power in Denmark.

INSULATION SLASHED

Environment Minister, Michael Heseltine, has slashed home insulation grants, and appears to be trying to dismantle the energy conservation programme. He has also halved the budget for insulating private homes to £12.5 million over the next year, abolished the £23 million a year set aside for councils to insulate their housing.

These moves were started by Sir Keith Joseph, who, at the end of last year, abolished a £12.5 million per annum grant for encouraging firms to invest in more energy efficient equipment.

[Sunday Times 2.3.80]



On Saturday February 9th, members of Half Life performed a street theatre in Lancaster's pedestrian shopping precinct to show the hazards of nuclear waste transport.

An old ammunition box, dressed up as a waste container, was carried through the streets by a group of white coated radiation workers accompanied by an 'independent' police escort. During its journey the ammunition box narrowly escaped being stolen and blown up by terrorists. Unfortunately it didn't stand up to the incompetence of its bearers. After being accidentally dropped the ammunition box sprang a leak. Those in charge of it appeared not to hear members of the public who tried to tell them. The result was a trail of contamination through the town centre which necessitated a mock evacuation and clean up operation.

Leaflets outlining the dangers of waste transport, and the fact that Lancaster has the highest frequency of waste movements, were handed out by other members of the group.

HARRISBURG

"The Earth is Dead"

An abnormally high number of children were born with serious thyroid defects in 3 counties surrounding the Harrisburg reactor in the nine months after its accident.

From April to December 13 hypothyroid babies were born in an area that might normally expect 3 such births. The condition can lead to severe mental retardation and stunted growth.

Government radiation experts have - of course - dismissed any connection with the accident, saying 'For thyroid effects, the doses would have to have been thousands of times higher'. But local groups have said that insufficient monitoring was operating at the time of the accident. Wind currents could have carried radioactive particles over nearby monitors and deposited them in faraway areas without the normal dispersal effect. It also begs the question as to whether their estimates of the effects of low-level radiation are correct.

The 'Daily Record' newspaper has reported a local farmer saying: 'since that nuclear reactor went through the roof, all life has gone from my land, just vanished; no toads, no small life, no worms, no quail. The earth is dead.'

The newspaper reports that the town is like a ghost town. 'Windows are kept closed. Gardens are unattended and clothes are not put out to dry. A much beloved baseball park where radiation levels have soared has been abandoned.'

A monitoring device in a school in Pennsylvania has shown that radiation readings in classrooms are still many times higher than 'safe'. And a local resident told the newspaper that out of 17 young couples on her block, 12 have reported miscarriages since the accident. The American epidemiologist, Dr. Ernest Sternglass, has estimated that the accident has caused a 50% rise in infant mortalities.

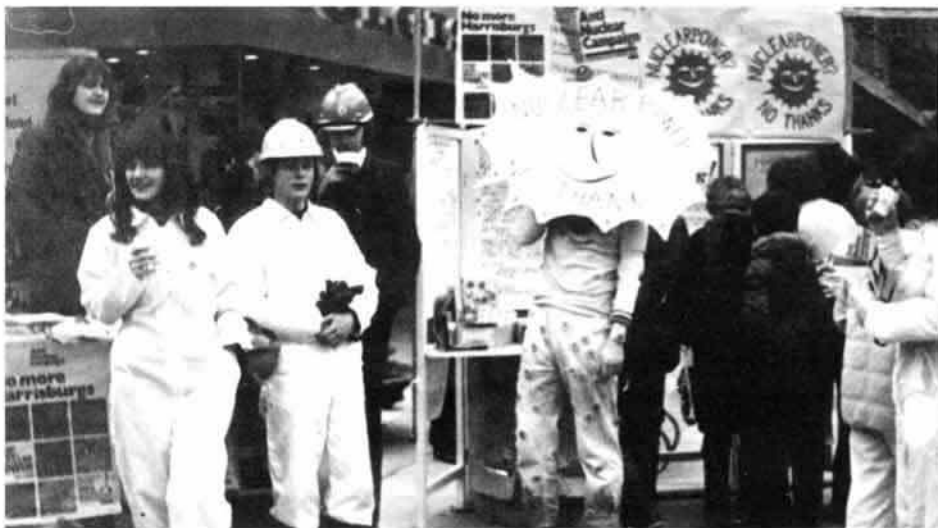
Worried residents in Goldsboro, across the river from Harrisburg, have started buying their own radiation measuring equipment. Their meters have been showing doses of up to .1 Rem per hour - the official permitted exposure from a nuclear plant is .5 Rem per year. NRC officials have said the residents' equipment must be faulty.

The leaks from the reactor continue. It had 3 in February.

On 20th February the 92 electricians working there went on strike after 2 workers were suspended for refusing to enter and work in the 'hot area' because of poor safety.

The American industry is beginning to wonder whether it will survive the crash in confidence caused by Harrisburg. Last year it had no new orders at all - compared to 38 in the nuclear peak year of 1973.

COVENTRY CAMPAIGN STARTS



A broad-based anti-nuclear campaign has been launched in Coventry, with the support of local Trade Unionists, church leaders, and pressure groups such as CND and FoE. In its first event, shoppers in the city centre were treated to a nuclear waste spill, as attendants in white radition suits carried a dustbin of plutonium through the main precinct. A human smiling sun was on hand to portray the positive alternatives to nuclear power.

Contact - Nigel Hicks, 51 Kensington Rd., Coventry. Tel. 77700

NO URANIUM

The government of the Canadian province of British Columbia has banned all uranium mining and exploration for 7 years.

The surprise decision seems to be largely as a result of opposition amongst local people. Earlier this year three people who were arrested for sitting in front of a bull-dozer which was attempting explorations, were given an absolute discharge; the judge told them 'civil disobedience has proved a benefit to society in the past.'

[Peace News 21.3.80]

SWEDEN

Sweden has voted to continue its nuclear power programme for up to 30 years while researching into alternative sources of supply.

The Swedish referendum had 3 options. Firstly to expand to 12 nuclear plants with no constraints about public ownership. Secondly, to expand to 12 plants under public control, while researching the alternatives, and to build no more when these reach the end of their 25 year working life. Finally, to phase out all nuclear power within 10 years.

Results were option 1: 19%, option 2: 39%, option 3: 39%.

The closeness of the vote has, if anything, complicated the situation. The Prime Minister, Mr. Fälldin, is a convinced anti-nuclear campaigner, and any energy strategy is likely to take anti-nuclear views into account.

[Financial Times 25.3.80]

NNN

The American magazine 'No Nuclear News' has cited no less than 17 accidents at nuclear sites in the USA in February.

CEGB PROPOSALS

The CEGB have named 5 potential sites for a nuclear power station in the South-West of England. 3 are in Cornwall — at Nancekuke, Bugle and Gwithian, near St. Ives — and 2 in Dorset — Herbury and Winfrith Heath. Opposition groups are being formed in these areas.

The nuclear industry are to spend at least £ ½ million on a propaganda campaign which will involve the distribution of over 50,000 'explanatory leaflets', lectures, meetings and exhibitions.

Other CEGB proposals in the area are to extend the present Hinkley Point power station and build a second transmission cable between Hinkley Point and Taunton.

Members of South-West anti-nuclear groups were removed from in front of Prince Charles' car when he went to be shown round the Hinkley Point nuclear site. They had asked to give him a letter, but were told by his equerry that there would not be time in his schedule for him to meet anyone outside the plant.

[Glasgow Herald 5.3.80]

RUBBER-STAMP SAFETY

The Institution of Professional Civil Servants has accused the government of so weakening the Nuclear Installations Inspectorate (NII) that there is concern that it may not be able to fulfil its duty of checking the safety of Britain's nuclear sites.

The Government neglect, they say, perhaps implies 'an insidious move to lower the status of the NII to a rubber-stamping outfit.'

The NII is at present 18 inspectors short of its complement of 122.

The Swedish NII have already admitted that they are too short-staffed to ensure the safety of Swedish nuclear reactors.

ACCIDENT NEWS

FLORIDA

43,000 gallons of radioactive water spilled into the container of a PWR nuclear power station in Florida in February.

The Crystal River plant was built by Babcock and Wilcox, manufacturers of the Harrisburg PWR. The accident was caused by a design flaw that caused the improper opening of the same valve which stuck open causing the start of the Harrisburg accident. The Nuclear Regulatory Commission (NRC) is now examining whether the accident has generic implications for all B. & W. systems.

The accident came only hours after the chairperson of the NRC had said that it was now ready to start licensing US reactors again for operation or construction. (No new stations have been licensed since Harrisburg).

The Florida incident, which has been played down by the press, was not as serious as Harrisburg. But it forced the NRC to put its emergency monitoring procedures into operation.

[Boston Globe 5.3.80]

INDIA

A primary coolant pipe at one of India's nuclear power stations had a severe leak in February. Fortunately, the reactor was not working at the time, but experts said that if it had been, a core melt-down would have been a 'distinct possibility'.

The Indian Department of Atomic Energy hushed the accident up for a week.

[Scotsman 3.3.80]

ESSEX

A second Magnox reactor — the first generation of British nuclear reactors — at Bradwell, Essex, has had to be shut down for safety reasons.

Cracks in the welds, and oxidation of mild steel, have also been found at Chapelcross and other Magnox reactors. Dungeness A was closed down for the same reasons at the end of last year.

Tests were made during 1977 and 1978, but the discoveries were not reported until last month.

RISKS TO DOCTORS

Scientists at John Hopkins University, Baltimore, have found additional evidence that doctors who are regularly exposed to low-level radiation have an increased chance of death from strokes and heart disease.

The study is part of continuing research which began in 1920. It also found that doctors stand a greater risk of premature ageing, and that radiologists have a high death risk from multiple myeloma. It supports earlier evidence in this field.

[International Herald Tribune 17.3.80]

RENEWABLE ENERGY SOURCES

Even if nuclear power could be proved completely safe, even if it produced no radioactive waste, even if its armed police force could be dispensed with, it would still be unnecessary

At present almost all our energy comes from fossil fuels — like oil, gas and coal. All of these will eventually run out. Supplies of uranium, the fuel for nuclear power stations, are even more limited — a fact people tend to forget.

For some 30 years the nuclear lobby have tried to persuade us that their way is the only way. But even the limited amount of research that has been financed into energy from renewable resources has shown that alternatives are feasible.

Renewable energy sources have two important advantages; firstly they harness energy from the sun, wind and water, and this will never run out. Secondly, their fuel costs will always be zero, while the price of oil and uranium will rise by several times the rate of inflation as their supplies dwindle.

In 1979 nuclear power provided just 3.7% of the total UK primary energy consumption (13% of electricity consumption). This broadsheet outlines some of the energy sources which can provide a substantial part of our long-term needs and make nuclear power unnecessary.

Large amounts of energy can be saved immediately by concentrating finances on Conservation, Coal and Combined Heat and Power. SCRAM's booklet of the same name investigates these possibilities, and SCRAM Energy Bulletin issue 18 will have a special feature on them. The energy sources described here can be researched and gradually phased in over the next 20 years.

A renewable energy strategy for Britain would concentrate on the four main sources; the sun and wind, and the sea and rivers. Other possibilities exist for further research and development. Here we examine their potential, and report on the stage of development they have reached.

Solar Power

Solar energy can be trapped in three ways. Firstly by the orientation and location of buildings to maximise solar intake. This is called "passive" collection.

Secondly, by using solar collectors — i.e. solar panels — to heat water and possibly to provide space heating of rooms as well.

Solar panels are shaped like radiators, and mounted on rooftops; the water is warmed by the sun, and circulated into the hot water tanks. Heat from the water can be stored to give space heating for buildings. It can also be employed as an air-conditioning and cooling medium using the 'absorption' principle (similar to the working principle of a gas fridge).

Solar panels are already coming into widespread use in the USA and on the continent where many new office blocks and commercial developments are installing them. In Britain several housing associations and local authorities have installed them on their houses (e.g. council houses in Dulwich, London).



MINIMAL VISUAL INTRUSION
Solar panels being fitted to housing in Edinburgh.

A typical system with a collector size of about 6 square metres can provide almost 50% of a home's hot water needs over a year in the British climate. A back-up energy supply is used to heat water to high temperatures when the sun is not powerful enough. In fact, most of the energy comes from light filtering through clouds on cloudy days — only 40% of the energy collected comes from direct sunlight.

This might not seem like a large contribution to our energy needs. But some 40% of the UK primary energy consumption (that's ten times the UK nuclear generating capacity) is used for water and space heating for buildings. About one-third of this goes on water heating.

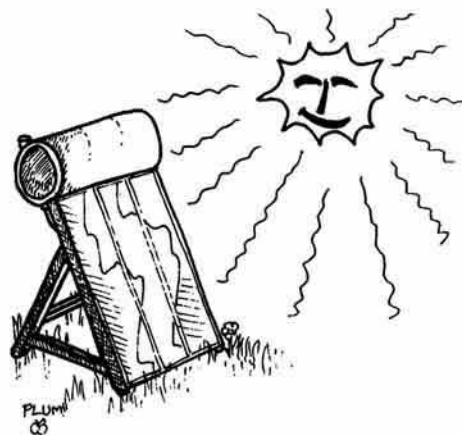
In addition, solar collectors can be used to heat buildings. 80% of the total space heating needs of a well insulated building can be provided by a collector of about 30% of the floor area. Buildings have been designed which can provide all their space heating from solar energy (even in British weather), due to the development of successful heat storage systems and good insulation.

The Department of Energy estimates that by the year 2030, solar panels could provide 170 million Megawatt hours (MWh) of energy in the domestic sector alone. The National Centre for Alternative Technology (NCAT) estimate a total overall saving of 198 million MWh. The International Solar Energy Society (UK division) estimate that 297 million MWh could be provided by solar by 2020.

Solar Cells were developed in the space programme to convert sunlight into electricity, and initial costs were — suitably enough — astronomical. But earth-bound technology does not need to be so complex, and recent developments have brought costs down to about twice those for conventional generation. It is reasonable to expect that as these improvements continue, and as the price of fuels goes up, the cost differences will eventually even out.

Already, the American firm, Texas Instruments, are investing \$4 million into

— the plain FACTS

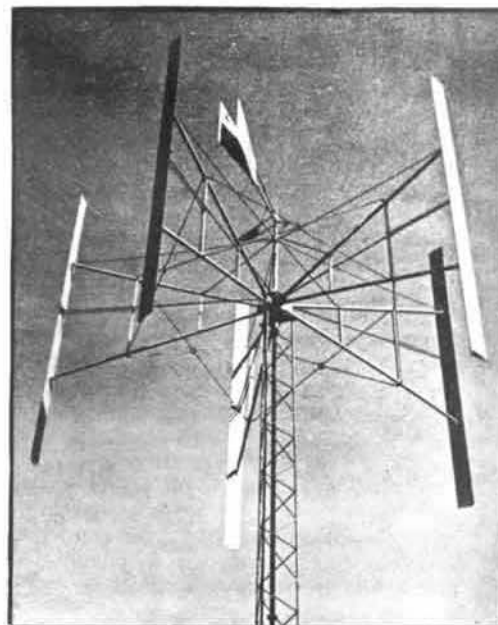


a solar cell programme which they hope will be commercially viable and generating a profit for them by 1983. Their scheme uses a slightly cheaper form of silicon chip to convert the sun's energy into electricity, and also provides heating as a by-product.

A 350 KW system — the world's biggest so far — will be switched on in Saudi Arabia in mid 1981. At a cost of £8 million it will provide the electricity needs of two villages with a total population of 3,000.

But it will be some time before solar cell technology is likely to make any significant contribution to energy supplies in Britain. Solar cells are discussed in detail in the June 1979 issue of SCRAM Energy Bulletin.

Wind Power



Dansk Vindkraft rotor — esthetic as well as functional.

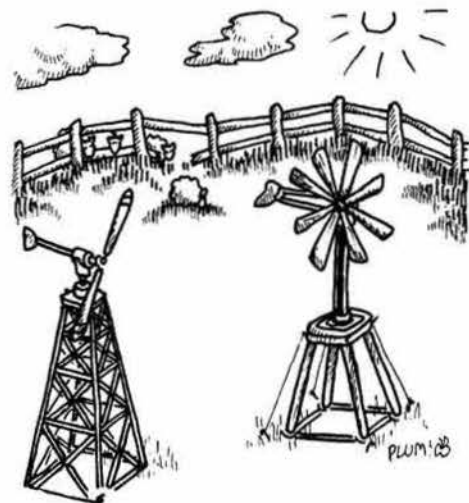
WIND POWER

Solar power is most effective during the summer. But wind (and wave) power is strongest in the winter when energy demand is highest.

The power of the wind has been harnessed to provide energy for thousands of years. Until relatively recently there were thousands of windmills scattered throughout Britain. But because of their variable output their use declined dramatically with the introduction of more controllable types of power, using cheap fuels.

Recently, however, with the rapid rise in the cost of fuel there has been renewed interest in windmills as a free-fuel source of power.

Individual windmills can have a generating capacity of from 30 kilowatts (kW) to the 54 metre high windmill at Tvind in Denmark, which is expected to produce 2 MW (2000 kW) - at a cost of about half that of the commercial cost of electricity in Denmark.



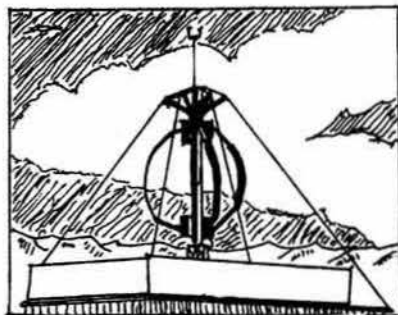
The latest in windmill technology is the development of the 'vertical axis' machine. A Canadian company has developed a machine with a diameter of only 14 ft and an output of 8kW in a 30 m.p.h. wind.

Inland windmills can be developed in either of two ways. The Electrical Research Association has pointed to some 1,500 hill-top sites with average wind speeds of 20 m.p.h. 3 1MW windmills on each of these sites would provide approximately 8% of current electricity demands.

An alternative scheme would focus on a much larger number of windmills, but smaller and on less optimum sites. This would provide decentralised power, and the environmental impact would be much less. It is worth remembering that the environmental effect of windmills is limited solely to their visual effect - they produce no pollution or waste. And a windmill is considerably easier to dismantle than a nuclear plant.

Windmills can also be built offshore, to provide large generating stations with less visual impact. One proposal has been to site them on rigs in clusters of about 400, between 10 and 50 km. offshore in the shallow windy waters around our coast.

These would have a rated output of 1000 MW per cluster, and would occupy



A vertical axis wind machine.

Dr. Kerr McGregor of Napier College, Edinburgh, has estimated from government and SSEB figures that 345 windmills, each 150ft high, and with a maximum rated output of 3.7 MW would cost £460 million, and could produce the same output as Torness (estimated cost £750 million). Their visual impact would be less than that of the 415 166ft high pylons which would be needed to transmit power from Torness.

an area of about 6 by 6 miles. Power would be brought to land by submarine cable. 25 of these clusters could provide 40% of our present electricity consumption.

The CEBG have estimated a cost of £170 (1975 price) per installed kW for onshore windmill. The offshore system described above could cost around £440 per installed kW (1978 price), providing electricity at costs comparable to coal.

The technology for these developments is available now, and building could start by 1985, giving a welcome boost of orders for shipyards and rig construction firms. 30 years ago Britain was among the world's leaders in wind technology - an advance now could make the UK the world's prime exporter of wind equipment, and bring in valuable foreign earnings.

At the moment the SSEB are looking for a spot to site one giant windmill, but there are no other plans to develop energy from the wind.

Water Power

THE SEA

Energy can be extracted from the motion of the sea in two ways - from the

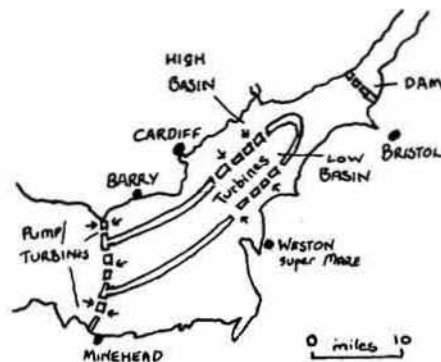
energy of the waves and from tidal power.

Tidal Power

Most tidal systems consist of a barrage across a natural estuary, with a row of water turbines mounted in ducts passing through the barrage. Water rises on one side of the barrage above the other, and creates pressure to drive the turbines. As the tide falls the process is reversed (see diagram).

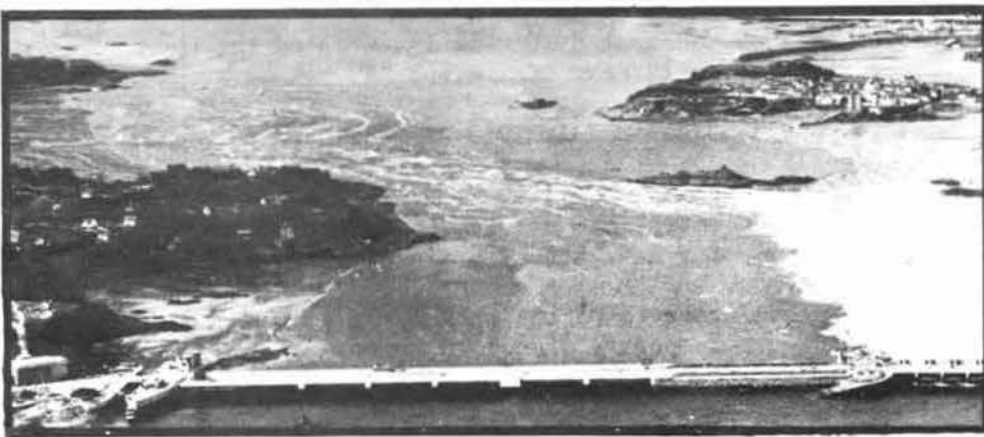
An experimental 240 MW station at La Rance in France has been successfully in operation for 14 years (see photo). The CEBG themselves have admitted that the Severn Estuary is 'one of the most attractive sites in the world for a tidal power scheme'.

In 1975 the CEBG Research Department proposed a very large plant in the Severn Estuary. It would have a capacity of around 5500 MW at spring tides (equivalent to 8 nuclear reactors) and construction costs would be around £2,500 million. This would be about the same price as the construction costs for nuclear power (free fuel, again, though). These costings were based on a sophisticated scheme designed to minimise environmental impact.



This one scheme would provide 13% of the current CEBG output - roughly equal to the entire nuclear contribution at the moment in Britain. A £2.5 M. feasibility study reported in March that the scheme is technically feasible and is likely to be economically competitive. The study continues.

There is also potential for smaller schemes in other areas (e.g. the Solway Firth), but these are not being investigated at the moment.



The small 240 MW tidal barrage at La Rance, near St. Malo, France. Photo courtesy French Embassy

Wave Power

Waves are second-hand wind power. Winds blowing across the sea transfer energy into the surface of the water and usually it's only when these waves reach shore that the energy is released.

If you live as we do, at the edge of a big ocean with the prevailing wind toward you, it looks a promising source of energy. The Atlantic approaches to the Hebrides are in fact one of the best areas in the world for wave energy. But you've got to make it into electricity first.

The problem is that nobody has done it yet on a big scale. All the wave-power inventions are still models, so it's difficult to say how much they will cost and when they will be ready.

But it is clear that waves won't be attractive for small scale power. All of the dozen or so designs being studied in the U.K. with Department of Energy money involve large and sometimes surprisingly complex apparatus, and in estimating the costs of full-scale equipment, mass production processes have usually been assumed.

The designs can be split into 'Floaters' and 'Sitters' depending on whether they live on the surface of the sea or attached to the bottom, and into 'Oily' and 'Airys' depending on how the wave action is transformed into electricity.

Two of the best known devices, Salter's Ducks and Cockerell's Rafts, are 'Oily Floaters'. They would be made in ship yards, towed on-site and hooked up to moorings with underwater electric cables to shore.

Oil inside hydraulic pumps and motors would convert the slow wave-induced oscillations of the raft or duck to the high-speed drive needed by electric generators.



Cockerell's rafts

Compare these with the 'Oscillating Water Column'. The current design looks like a hollow concrete breakwater with underwater slots on one side. Wave action makes the water inside slosh up and down like a giant piston. Air above the water is forced through an air-turbine connected to a generator. This 'Airy Sitter' sounds simple but gets more complicated when you have to rectify air going through the turbine.

Just now the air is thick with arguments over the relative merits of these and other devices (a new one is invented every other week), but there is some

agreement on probable cost. It's still too high but coming down, as designers get more experienced. Recently quoted costs per kilowatt-hour are between 5 and 10 pence for the cheapest designs. Research continues.



The 2MW Kilmelfort Hydro-Electric power station. Loch Awe.

Photo courtesy of N.S.H.E.B.

HYDRO-ELECTRICITY

Hydro-electricity is obtained by damming a stream or river at a high level, and letting it flow under gravity to drive turbines lower down.

Its great advantage is that the reservoir is a natural and highly efficient energy store, and thus power production can be increased or decreased immediately according to demand.

The North of Scotland Hydro-Electric Board (HEB) was formed in 1943 to generate hydro-electricity for the Highlands. At present almost 90% of its installed capacity of 2110 MW comes from water - 1052 MW from conventional hydro schemes, and 700 MW from pumped storage schemes. But this situation will be changing dramatically at the end of 1980 when the 1320 MW power station at Boddam, Peterhead, comes on stream using North Sea Oil. (It is also equipped to burn gas).

It has been suggested that suitable sites exist in the HEB's area to generate 1000 MW extra of hydro-electric power, mainly by developing many smaller schemes. It is possible to generate power from a head of approximately one metre (Fish Farmer March, 1980).

The HEB's hydro stations range from 130 MW down to 500 kW. But they say they are wary of the economics of developing small-scale water power for local communities. And government taxation pol-

icies make it uneconomic for individual initiatives - if you install a water wheel you are liable for a large water tax, even if your waterwheel has no detrimental effect on the water.

As an example of what can be done on a small-scale, a recent survey in Wales has shown that the river Dyfi valley alone was generating around 1½ MW 20 years ago, and shown that it could be capable of generating 33 MW of power through small-scale schemes. (Pandora's Box No.2). Some 30% of China's hydro power comes from 87,000 small-scale schemes, mainly producing about 57 kW, but going down as small as 400 watts.

NATTA — the Network for Alternative Technology and Technology Assessment — is an umbrella organisation aiming to promote and support alternative technology at the national level.

It aims also to initiate and support small-scale local level research projects within the AT field by providing a national level organisation capable of attracting and co-ordinating funding.

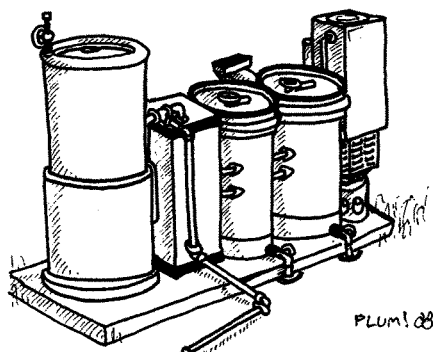
NATTA produces a quarterly newsletter, and it asks to be kept informed of all news and opinions.

Contact NATTA, AT Group, Faculty of Technology, Open University, Milton Keynes, Bucks.

Together, these energy sources could be providing a very significant contribution to electricity generation by the year 2000; at least equivalent to the proposed nuclear power programme.

But if these are not enough, other energy sources exist as well and look promising for research and development.

Biofuels



Methane digesters, which extract gas for burning from toilet effluent and other household organic waste may sound like ecological pipe dreams - but the owners of the 7 million digesters in China (figures for Aug. 1978) would point out that they're highly practical, particularly for rural areas. So practical, in fact, that in 1978 China was planning to have 20 million digesters by 1980 - or one per ten rural families.

Closer to home, a monastery and farm in Bavaria has been running on methane since 1955. It provides gas for heating and cooking and also drives a small electric generator. It uses the manure from the farm's cows, and produces a high quality odourless fertiliser at the end of the process.

Organic waste can also be used to produce methanol (methyl alcohol). The Canadian Ministry of Fisheries and the Environment has reported that 15% of Canada's petrol demands could be met by methanol by the year 2000. This would be produced by a mixture of municipal waste, wood rejected during forestry operations and straw (1 ton of straw can produce 80 gallons of methanol). In 1975 about half of the UK straw yield of 13 million tonnes was not utilised.

The National Centre for Alternative Technology (NCAT) is sited in an old slate quarry overlooking the Snowdonia National Park. It exists independently of mains services, showing the possibilities of living with only a small share of the earth's dwindling resources.

It gets its energy from solar panels, water turbines and windmills. NCAT has produced a wide range of publications, including comprehensive guides for DIY Alternative Technology. Its income comes from entrance charges (80p adults) to the centre, booksales and week-end courses.

Details (SAE please) from NCAT, Machynlleth, Powys, Wales. Tel. 0654-2400.

Crops can be grown specifically to create energy. The obvious example of wood; Finland obtains 14% of its energy from wood, Sweden 7% and the USA 2%. But other crops can be grown as well - Brazil hopes shortly to be replacing 20% of its petrol consumption with ethanol derived from sugar cane - requiring a growing area of about 1/2% of the total land area of the country.

The UK Department of Energy (Energy Paper 39) has said that 'Crops obtainable from little or no disruption of present land use (such as forests on unused land and natural vegetation) might raise the maximum useful energy recoverable by up to 20 million tons coal equivalent a year'.

GEOTHERMAL

Geothermal energy is obtained from hot regions in the earth, usually by using it to heat water circulated down. Hot water springs are naturally occurring examples of the technique. The energy is generally only suited to heat generation.

The Department of Energy has said that prospects are good enough to warrant more study in certain locations. Costs appear to be similar to those for fossil fuels. The most promising 'hot rocks' are in the granite spine of Cornwall.

Conclusion

This factsheet has looked at the potential for maximum development of renewable energy. But in practice, maximum development will not be necessary in the foreseeable future to offset increases in demand and future shortfalls in oil, natural gas and nuclear power.

Electricity production in 1978 consumed 115.2 million tons coal equivalent (mtce). Of this, oil and natural gas accounted for 20.5 mtce. Nuclear accounted for a further 11.9 mtce. Assuming a 2% per annum growth in demand, by the year 2000 electricity would be using 178 mtce. (Official SSEB forecasts are 1.9% domestic growth and 3% industrial growth, and these are expected shortly to be downgraded again). If oil, gas and nuclear are not available for electricity production then there is a shortfall of 95.2 mtce.

The National Coal Board hope to be producing 170 million tons of coal per year by 2000. (At that rate reserves would last for over 300 years). Assuming that this is optimistic and that the real figure turns out to be 150 mtce and that - as at present - three-quarters of this is used to produce electricity, then we would be getting an extra 17.2 mtce of coal fired electricity by the year 2000. (This takes no account of the more efficient technologies being currently developed for coal-fired power stations).

Thus we would require a maximum of around 78 mtce from renewable energy sources by the year 2000. The maximum development of wind power outlined above could alone provide 53 mtce.

"There is no need for either nuclear power or hypothermia."

Renewable energy sources can be providing a significant amount of our energy

production by the year 2000. With adequate conservation/insulation, and the use of Combined Heat and Power, there is no need for either nuclear power or hypothermia.

We need a government initiative now to fund the development of these technologies adequately. Some, like wave power, are at the stage where the next step is a large investment to provide a full-scale working model, as soon as possible. In 1978-79 the government gave the UK Atomic Energy Authority £131.9 million for research alone, while spending £2.4 million on alternative energy research. The nuclear industry also receives large grants from the EEC.

"Once installed, renewable energy production with its free fuel becomes absolutely inflation proof."

It is certain that fossil fuels will continue to rise in price, as their supplies run out. But meanwhile, the development of new technologies in the field of renewable energy, and the mass-production of items like solar collectors will tend to bring their prices down. And most important of all is that once installed, renewable energy production with its free fuel becomes absolutely inflation-proof.

There would be advantages for the rest of the economy too. The introduction of many small-scale power schemes would offer huge employment possibilities - not just skilled work for former nuclear scientists, but unskilled work as well - particularly in conjunction with a conservation programme.

But, as said before, it cannot happen on its own. Independent researchers into alternative energy have no particular axe to grind, and no lobby working for them, as the nuclear industry has. For a safe and sane energy future we must press for the abolition of the UK Atomic Energy Authority, and its replacement by a general Energy Authority.

This would examine all energy uses, and have an overview of the entire energy situation, and would work towards one energy policy for the UK. At present this does not exist - in an evening's t.v. viewing one can see the Gas Board telling us to use gas, the Coal Board telling us to come home to a coal fire, the Electricity Boards telling us to think electric, and the Department of Energy telling us to save it all (all the adverts being paid ultimately by us, the consumers). This is rampant lunacy. Only by having one energy supply authority, ensuring the most efficient use of all our fuels, can we salvage the situation.

At best, the nuclear option, supplying as it does at the moment, only 3% of our total energy consumption, is but a highly perilous and unpleasant stop-gap.

For further reading:

A Low Energy Strategy for the U.K. - Gerald Leach, (IIED 1979).

An Alternative Energy Strategy for the U.K. - NCAT (1978).

Potential of Natural Energy Sources - CEBG (1975).

Soft Energy Notes (1979 issues).

Energy - FoE, Birmingham.

Renewable Energy - EGIS Information Service (1977).

Energy Statistics 1979 - HMSO.

To find out more contact:

SCRAM,
2A Ainslie Place, Edinburgh 3.

IRELAND

Local people say NO to uranium mining

The search for uranium in Ireland seems to have begun in about 1976. This report, compiled for SCRAM by the Nuclear Opposition Group of Cork University, looks at the current situation.



E.E.C. grants are available for uranium exploration, and multi-national companies operating in Ireland have been only too willing to avail themselves of the hand-outs. They have received around £1 million so far. The E.E.C.'s Commission's total spending on uranium exploration to date is almost 13 million. This indicates that it is serious about finding deposits in member states so as to reduce its massive dependence on unstable foreign imports.

Prospecting is taking place in several areas in Ireland, the furthest advanced being around Finntown, Co. Donegal, where Anglo-United, Irish Base Metals (a subsidiary of Northgate of Canada) and Maugh Ltd. (a subsidiary of Minatome of France) are operating. Other areas include Thomastown (Co. Kilkenny), Tullow (Co. Carlow), Fintona (Co. Tyrone), and Allihies (Co. Cork). It is believed that preliminary drilling is also beginning in several other areas. The prospecting has included surveys from the air, sampling, trenching, blasting and drilling. Almost total secrecy surrounds the whole operation, despite repeated requests for information by local people.

SELF-EDUCATION

The Irish Anti-nuclear Movement, preoccupied with opposition to the proposed nuclear plant at Carnsore Point (Co. Wexford), realised the implications of uranium exploration only about 12 months ago. Even at the Carnsore Demonstration in August '79 it was clear that most people knew little about the dangers of uranium extraction. But contacts were very quickly made right across the world with peoples opposed to uranium mining. A process of self-education began, and information was collected and is being made available to the various groups around the country.

The prospecting is taking place in rural areas, almost totally dependent on agriculture, fishing and tourism. These areas would suffer environmental damage which would affect the health of the local people and destroy their livelihoods, should uranium mining take place. Radiation would increase in the surrounding region, the tailings will have to be managed for thousands of years, and local water supplies would be contaminated by radioactivity, toxic metals and chemicals used in milling.

In December the Donegal Uranium Committee was set up to inform people of the basic facts about uranium mining and its effects, and to make contact with concerned people and groups all over Ireland and beyond.

Questions have been raised as to the lack of monitoring of the exploration activities, and calls have been made by some local people for a complete ban on further exploration until a radiological survey has been done.

At Thomastown a Mining Investigation Group has been formed.

At the Allihies in West Cork, concerned individuals have formed a group to enquire into uranium exploration in the area. This followed a visit by members of the Cork anti-nuclear groups in early January. It is not clear how much exploration has been done in the area since it is the site of huge old copper mines.

NATIONAL

The issue is now becoming a national one, and public awareness is growing all the time. While the anti-nuclear groups are demanding an end to exploration now, local people in some areas are still unsure of the effects - and the lure of employment is strong in areas where unemployment is high. A lot of work remains to be done to provide information for people.

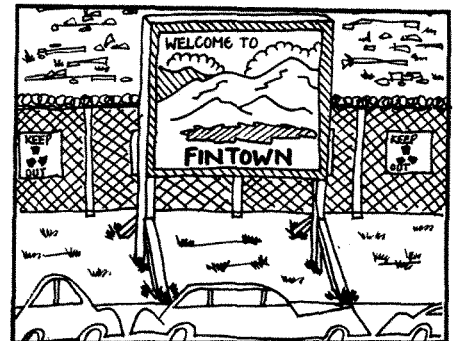
LATE NEWS The 'Donegal Democrat' newspaper has reported that the mining company in the Finntown area of Donegal may cease operations as a result of confrontations with local people.

Drilling in uranium-bearing rocks releases radioactivity into the water. The company refused to provide an alternative water supply during prospecting, and so inhabitants prevented drilling by physically occupying the site. The drilling equipment has now been removed - for the time being, anyway.

The SW Donegal group is planning a rally in Finntown in April.

Contact: D.J. Stockdale, Drim, Glencolumcille, Co. Donegal, Ireland.
Allihies Uranium Group, c/o Post Office, Allihies, Co. Cork.

Thomastown Mining Investigations Group, c/o the Library, Thomastown, Co. Kilkenny.
Donegal Uranium Action Committee, Brian Flannely, Glenties, Co. Donegal.



Cartoons from the booklet "Uranium Mining in Donegal" - 30p inc. postage from SCRAM

PLOGOFF:

The people of Plogoff, a tiny community on an isolated peninsula in the Finistère, Brittany, have been fighting an amazing battle to stop any advance by the authorities towards establishing a site for a nuclear power station. Well aware of the fate of so many other communities faced with a nuclear threat, the Plogoff people knew they had to start at the very beginning.

French law requires the Regional Council to display plans of any nuclear development to the public for 5 weeks, before going forward with construction. In Plogoff they turned this obligatory "display" into a complete shambles.

They began by burning the files sent by the Electricity Board on 30 January, 1980, outside the town hall, fully supported by the district councils in the area.

BARRICADES OF BURNING CARS

On 31 January the first attempt to arrange the 'display' took place. Some caravans were due to be set up in the village, since the local councils had refused access to the town halls. But the police towing the caravans met with barricades made from burning cars, carts and old farm machinery. These took hours to clear, and day after day they reappeared.

Crowds of women (Plogoff has many seamen who are seldom at home) taunted

the police, and succeeded in removing parts of the files used as a record of the 'display'. This had been done in Golfech, in France, and made nonsense of the display's legality. Every evening the villagers confronted the police as they left, towing their sham show with them. The 800 police specially drafted in were made to feel very uncomfortable, as they were attacked by showers of stones from the angry population. The riot police used armoured vehicles, and a lot of tear gas.

Yet every morning, new obstacles appeared in the path of the caravans. The road was dug up, telegraph poles were laid in the way, and concrete was poured where the caravans usually stood!

NUCLEAR-FREE FUTURE

The proposed reactor site itself has been acquired by thousands of people to make it difficult for the Electricity Board to seize it. On 3rd February, 20,000 people gathered to lead a flock of sheep onto the land. This gesture of confidence in the future is backed up by employing a shepherd on a contract which lasts until 1987.

On 16 March, a huge demonstration was called in Quimper to protest at the trial of 9 local people, arrested during the hectic events of those five weeks. 40,000 local people filled the town.

The effect of this demonstration was immediate. The 9 prisoners were released after 17 days in prison, with minimal suspended sentences. The state was not prepared to provoke the anger of the Bretons any further.

GLASGOW ANTI-NUCLEAR RALLY

In Glasgow on May 31st the Anti-Nuclear groups of Scotland will march along the route to the South of Scotland Electricity Board Headquarters, the main nuclear operators in Scotland. Invitations are also being sent to groups all over England and Wales to join the event.

JOIN THE GANG! MAY 31st

Glasgow Anti Nuclear Groups was formed in October 1979, to plan the MAY RALLY and to organise an information campaign in the city preceding it.

Planning meetings are held every Thursday at Friends of the Earth Glasgow, 16 Newton Terrace, Glasgow 3, 041-221-6727. All welcome.



1. The March

As in previous years the MARCH will have a symbolic tone. Leaving Blythswood Square (11.00a.m.), it will pass the SSEB H.Q., the organisation that is trying to push forward with the Torness Plant despite the concern of the majority of the Scottish people. A stunt is planned with dustbins at this point of the march — details will follow. The march will be a FUN EVENT with street theatre and entertainers along the route. In case things get out of hand we'll need each group to supply a marshal.

Glasgow FoE bikes group are organising a sponsored cycle on 27th April to raise money for the event — all anti nuclear cyclists invited. The cycle starts from George Sq. at 10a.m. to Craighroyston on Loch Lomond, stopping for a (lengthy) pub lunch at Rowardennan, and back again to George Sq. Although the trip is some 50 miles, it is intended to make a day's outing of it, and less enthusiastic cyclists will be able to get the train back to Queen St. station.

An information sheet and sponsorship forms are available from the bikes group at 16 Newton Terrace, G3.

2. The Rally

Is in Queens Park and will begin at about 2 o'clock. Among those confirmed, or intending, to be present are Margo MacDonald, George Foulkes, M.P., Monsignor Bruce Kent (CND), Petra Kelly (German Green Party), Tom Burke (FoE London) and a representative of the Trade Union movement.

The intention is to have an enjoyable afternoon in the park. We are hoping to have entertainments for the kids, and there are swings, roundabouts and plenty of open space for play.

**JOIN THE
G.A.N.G.**

3. The Public Meeting

Will be held in the Assembly Hall of Holyrood Secondary School, near Queen's Park. It will begin at 4p.m. and end around 6.15p.m.

The planned programme is:-
Walter Patterson on 'The problems of the present Energy Policy'

Dr. Robert Blacklith (Trinity College Dublin) on 'Low Level Radiation — is there proof of a safe level?'

Dr. Ulrich Loening (Edinburgh University) on 'Towards a Rational Energy Policy'

Dr. Malcolm Slessor (Strathclyde University) on 'The Politics of Energy policy-making'.

In view of the expected heavy demand for this meeting, seats are bookable. Booking forms available from 16 Newton Terrace.

4. May Rally Ceilidh

Begins at 8p.m. in the Scottish National Orchestra (not being cut!) Rehearsal Halls, Clairmont St., Glasgow. Come along and dance, sleep or whatever.....!

5. Overnight Accommodation

For help in arranging overnight accommodation, contact Ian Davison (tel. 041-942-1099), 24 Campbell Drive, Bearsden, Glasgow. Please indicate the type of accommodation wanted



POPULAR EVENT

The MAY RALLY will be a popular event. Already support has been offered from trade unionists, members of all political parties and the Public At Large. The trade union contacts have been particularly helpful and as a result we in G.A.N.G. hope to stage a conference on energy conservation in the autumn for trade unionists.

Glasgow Anti Nuclear Groups and the Scottish Anti Nuclear Movement will demonstrate to the government on May 31st that their energy programme has taken a violent turn in the wrong direction. **Come along** with plenty of friends! Dress up — gas masks, security uniforms, smiling suns, windmills, tea cosies..... Bring nuclear dustbins, effigies and any old cracked up magnox reactors. Very important, make your own banner with the name of your group and area clearly identified.

DON'T FORGET — THE GOVERNMENT WON'T GIVE UP ITS NUCLEAR MADNESS WITHOUT A FIGHT!

How to get there — Transport

Please start organising your transport. Brian Heffron, 8 Queensborough Gdns., Glasgow (041-339-8534) has details of parking sites, bus schedules and general travel news. Glasgow has good road and rail links and Blythswood Square is near the centre of the city and rail and bus terminals.

Remember you'll still be able to use 'Persil' rail vouchers to help with finance (2 people travel for the price of 1 — wash and travel with a friend) until the end of June.

Posters, leaflets and info. available from Glasgow office. Donations appreciated to help with costs.

JOIN THE G.A.N.G. AND SCOTTISH ANTI NUCLEAR GROUPS!

JOIN SCRAM!

SCRAM Edinburgh consists of a small group of campaign workers supported by a wider group. All important decisions are taken at our weekly open meetings on Monday evenings. We try to work in ways which don't rely on 'Leaders' and we aim to share and exchange skills inside and outside the group. We work with a wide range of anti-nuclear and safe energy groups throughout Britain. Recently, after a series of regional meetings of Scottish groups, we have been asked to take on a liaison role serving the Scottish groups, meantime.

We have enclosed with this issue SCRAM Edinburgh's appeal/membership leaflet. It contains the usual **SCRAM Energy Bulletin** subscription form. So, if you wish to receive the magazine regularly, please complete and return the form.

We plan to expand and develop the magazine to serve the growing anti-nuclear movement in Britain. **More subscribers** and more people sending us news, articles and pictures will make the magazine more valuable for activists and local groups up and down the country.

Please subscribe — or give a sub to a friend, your local group, or public library!

Subscribers should receive with this issue a page from a new press monitoring service, **All-Atomic Times**. The magazine provides a digest of nuclear news appearing in the main newspapers, and its intention is to remove the need for all local groups to do their own monitoring.

Subscriptions cost 20p inc. postage per issue.

Edinburgh subscribers will also receive a copy of the Edinburgh Newsletter, to which subscriptions are invited.

Copydate next issue — May 19th.

GROUPS NEWS

The East Anglian Alliance against Nuclear Power has recently been formed. Contact address is Jennifer Armstrong, Old Post Office, Higham, Colchester. Tel. Higham 241.

The Denver Alliance (Kings Lynn) have noticed a disturbing increase in the number of booklets entitled 'The Need for Nuclear Power' being distributed in their area by the electricity council. The Alliance would like to hear from people who have been driven nuts by this wonderful leaflet, and would like to share the cost of an alternative leaflet.

The Denver Alliance contact address is now c/o Ralph Pryke, 63 High St., Holbeach, Lincolnshire, and not as reported in the last issue. The Kings Lynn CANE contact is c/o Tom Coy — 0553-673696.

"ALAN IRVINE: WHERE ARE YOU! HOW ARE YOU? SOME EDINBURGH FRIENDS WOULD LIKE TO KNOW. ANY INFORMATION PLEASE 'PHONE (REVERSE CHARGE) 031-228-1339 EVENINGS AND WEEKENDS.... OR WRITE TO CAROLINE.... 207, FOUNTAINBRIDGE, EDINBURGH".

MEMBERSHIP

This Spring we have decided to invite supporters to **Join SCRAM Edinburgh**. This is a move we have put off for years because of the extra work it means for a very pressed office group. But so many people have asked to 'join' that we have finally capitulated.

There is an extra reason — we urgently need a regular income to finance our campaign work. We literally survive on a shoe-string, with campaign workers only getting their expenses for an exhausting full-time job. Our tasks multiply every day, yet obviously we need to do more.

So help us now and **JOIN SCRAM** (Edinburgh). This can be in addition to or separate from the magazine sub — again use the form on the red and yellow leaflet. We ask a membership fee of £2, for which members will receive an introduction to the campaign and a six monthly review. To become a supporting member, send us £5, and you will receive the **SCRAM Energy Bulletin** as well.

BANKERS ORDER

We must stress that these are minimum subs. If you are able to give more, please do. Best of all for us if you use the **Bankers Order** form on the leaflet. You can use it just to pay your sub, but many generous friends give more. Some give £5 a month, some 50p a month. This helps reduce the office work immensely and lets us plan ahead more confidently.

JOIN SCRAM EDINBURGH NOW!



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I want to subscribe to **SCRAM** for a year (6 issues), starting with

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Reductions for 2 or more at one address.

Mail Order Changes

Unfortunately the anti-nuclear movement has been hit below the belt by a string of unscrupulous publishers who are conspiring to stop printing our reading matter. Seriously, though, folks, please note that the following books are currently out of print;

Nuclear Power No Thanks (Cambridge FoE) reprint expected May.

Nuclear Disaster (CIS report) reprinting May.
Nuclear Madness (Helen Caldicott) reprinting July.

Nuclear Power for Beginners (cartoon book) reprinting June.

The following are out of print, and will not be reprinted: **Radiation**: the side effect of nuclear power (SCRAM), **Leveller** Killer Watts edition, and the **Plumbat Affair** (Davenport).

Additions to the Mail Order list are:

Community Heating Projects (SERA 1980) 30p + 10p p.&p. An outline of the benefits of Combined Heat and Power.

Trade Unions and Nuclear Power an international survey (Dalton 1980) 50p + 10p. Trade Unions all over the world are beginning to see nuclear power as a threat to the environment and world peace. This book surveys worldwide trade union opinion.

Energy Comics No.1 (Rifas) 45p + 15p. Another lively comic from Rifas (of All-Atomic Comix) including his mini comic **Hard vs Soft**. **Workers Power not Nuclear Power** The Socialist Workers Party view includes a disturbing story about a laggar working at Winfrith.

Radiation: your health at risk (Radiation and Health Information Service). Facts about radiation and the nuclear industry. 50p + 20p.

CUMHACHD NIUCLACH?
CHA GHABH IDIR.

At last, the Gaelic smiling sun badge has arrived. We now have stocks of badges in Arabic, Basque, Breton, Danish, Dutch, Czech, Finnish, French, Frisian, German, Italian, Japanese, Luxembourg, Norwegian, Portuguese, Russian, Serbo-Croatian, Spanish, Swedish, Welsh. (But not very large stocks of some of these languages). Oh, and English. "So please give a second preference

Scotland's radical quarterly CRANN-tara

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TOP RIGHT, 47 ASHVALE PLACE,
ABERDEEN, SCOTLAND.

REVIEWS

Windscale

Such is the nature of the historical process, that the Windscale Inquiry, which occupied the minds of so many of us, to the exclusion of all else, for a hundred days or more in 1977, is just one more tedious chapter in the text books of science studies students. The battle against Nuclear Power has moved on, become more diverse, more grass-roots orientated, and certainly more political. What use then is one more book about the Whitehaven fiasco?

Scott and Taylor have made no overt attempt to provide explanations, or alternatives à la Pearce. Instead, after a clear, concise outline of the run-up to, and participants in, the proceedings, they provide an issue by issue index to the inquiry documentation, with just enough detail to give an idea of the thrust of each case. For anybody having access to the full inquiry transcripts, etc, and with a need or desire to study them, this work will save hours of tedium. There is however more to be got from this book than a simple source of references, as one would perhaps expect from these authors.

In their introduction, Scott and Taylor acknowledge that they have perhaps overemphasised the areas of the debate, which received inadequate consideration by Parker — the areas which were of prime importance to PERG. When one reads these sections in particular, and then reads the comments and observations made by the learned judge, one becomes acutely aware of the gulf between

Wave Energy

The abundant free energy of the waves around Britain's coasts can, and should, be harnessed to supply a sizeable proportion of our annual electricity demand. This is the contention of David Ross' excellent book 'Energy from the Waves'.

The book covers the intriguing history of oceanographic study, demonstrating that waves are subtler than appearances might suggest. It describes in detail the evolution of the various devices, clearly showing the financial and political difficulties of tapping an energy source with a huge potential. And, of course, an account of the pros and cons of each type of generator.

The converters of wave energy described are all shown to be eminently feasible techniques of utilising the sea's power, and the various designs show themselves suitable to the variety of sea conditions around British coasts.

It is, in the main, an absorbing and objective account of what appears to be a very exciting scheme for energy production, particularly relevant to the British Isles.

In all, highly recommended as essential reading for those interested in energy topics.

Energy from the Waves is published by Pergamon Press.



the worlds of the political/judiciary and the scientific. Now the farce of Mulwharchar is upon us, all our illusions about meaningful public participation have been shattered. In 1977 some of us still believed we could win by rational argument and by democratic process. It is now becoming clear that this is not enough. Nuclear Power is a political tool, and the politicians are tools of the vested interests. The seeds of that understanding were laid for me in the Whitehaven Civic Halls.

The high cost of this book goes in part towards subsidising the activities of this voluntary organisation.

The Nuclear Controversy by Martin Scott and Peter Taylor. TCPA in Association with PERG. £6.95 post free.

Magazine Review: 'Energy Manager' and 'Energy Management'.

The first of these monthlies tells how good industry can be at saving energy (and money), the second how the Dept. of Energy has helped. They are both very much 'establishment', yet 'radical' in their own right — the successful case histories cited would have been dismissed as heresy by the Dept. of Energy a few years ago.

Energy Manager is an IPC glossy, free to "UK executives involved in energy management". The latest issue takes a scathing look at Energy Paper 39 — "If you believe that you'll believe anything" — and carries a hilarious editorial, starting: "When I order a nuclear reactor" said Humpty Dumpty 'it costs exactly what I choose it to cost — neither more nor less.'"

Energy Management is a free newspaper from DEN, and the January issue describes how an electricity board office is knocking 34% off its own bill by a conservation investment with a pay-back time of under a year. The biggest solar scheme in the UK public sector is also described: £75,000 of solar water heaters for Torbay Hospital.

The message is clear: 'watt-watching' pays handsomely, but has a vast potential as yet largely untapped.

LITTLE BLACK RABBIT

In the warm recesses of her burrow, Little Black Rabbit sat back to watch her colour TV. She was very interested in a debate about nuclear power, compered by that intrepid rabbit hunter Robin Day. She pricked up her ears when the Under Secretary of State for Energy assured everyone that his advisors knew of studies which showed that the radioactivity released from coal-fired power stations was greater than from nuclear ones.

So she wrote to the Under Secretary to ask for them. A few weeks later she

For your Diary

April 12th. Lothian Groups meeting 2-5p.m. SCRAM Office.

Torness Alliance meeting - Lancaster.
April 15th. The War Game and Schumacher's 'The Other Way' films at George Square Theatre, Edinburgh.

April 19th. Scottish Groups meeting - Inverness.

April 26th. RALLY and march at Hartlepool Contact Carrie or Peter - Darlington 82842.

May 1st. Atoms for Energy exhibition opens - Aberdeen.

May 10th. Students Against Nuclear Energy vigil at Torness. Contact NUS Scotland.

May 24th. Rally and march at Dungeness and bicycle rally from London to Dungeness. Contact Brighton 690469.

Printing and publishing workshop - SCRAM Office. And layout of next Bulletin. All welcome.

May 31st. Glasgow rally.

June 8th. Mullwharchar gathering.

Boring News

As we go to press, a Scottish office employee is writing a report for the state to tell it whether it can test-bore for a nuclear dump in SW Scotland. This exercise in democracy is the culmination of the public inquiry into the local council's refusal to allow the UK AEA to drill at Mullwharchar, at the heart of S. Scotland's largest remaining wilderness area.

The reporter is constricted by Catch 22. Catch 22 is that government policy cannot be questioned at public inquiries. Thus the AEA could produce evidence that it is policy that it is in the 'national interest' that the research to find a nuclear dump should go ahead urgently, and this could not be challenged by objectors.

The AEA said planning applications are 'a matter of balance' and the extent of public need — which cannot be questioned — can over-rule local objections.

The AEA claimed to be surprised at the connection made between test drilling and the possibility of a nuclear dump at Mullwharchar — their interest was said to be purely 'general research'.

Several witnesses claimed to be unable to say when the Cheviots' waste dumping inquiry would be; it was announced for 28th October on the day after the inquiry ended.

The Cheviots Defence Action group contact is Joanne Lowes, 62 Main St., Lowick, Berwick-on-Tweed.

happened to be at a public meeting addressed by him, and having had no reply, she asked why. Well, he said to her, with a glint in his eye that reminded her of a fox she had once met on a dark night, "my advisors must have forgotten. What's your name dear, and I'll see you get them?"

A month later and Little Black Rabbit has heard nothing.

If his advisors pursue the same policies as for energy conservation, then these coal-burning studies must be non-existent.

Never mind Robin. You can catch the fox out the next time.