SCRAM
ENERGY BULLETIN

NUCLEAR POWER? NO THANKS

SPECIAL
TORNESS FEATURE

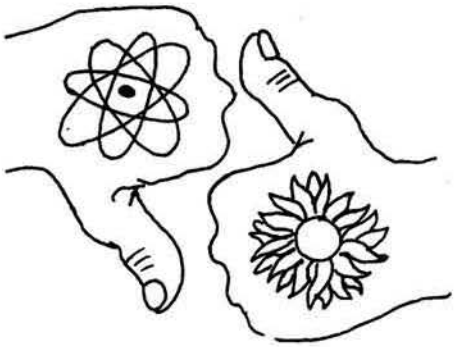
NO. 21

30p

contents

credits

This issue is mainly the work of Claire, Deirdre, Duncan, Marion, Mary, Pete, Rob and Sheila.

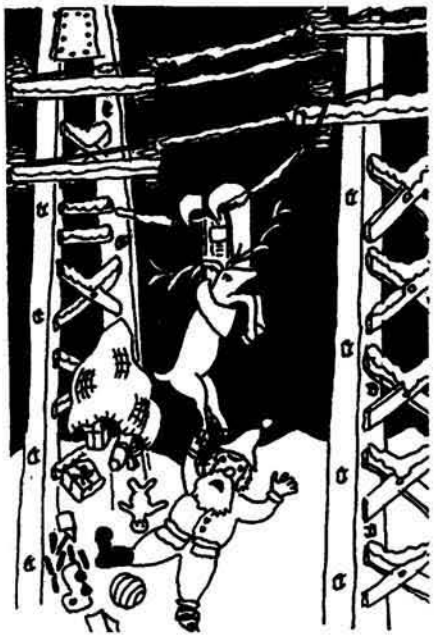


ISSN 0140 7340

Copy date for the next issue: 20th January 1981.

This magazine is produced for the British anti-nuclear movement by the **Scottish Campaign to Resist the Atomic Menace**, 2a Ainslie Place, Edinburgh 3. We welcome contributions from anyone on local issue, although we cannot guarantee publication.

Printed by Aberdeen Peoples Press, 163 King Street, Aberdeen (0224-29669).
Typesetting by Joy Rice at S.C.P., 30 Grindlay Street, Edinburgh 3. (031-229-3574).
Distribution by Full Time Distribution, 27 Clerkenwell Close, London EC1. (01-251-4976), and by Scottish and Northern Books Distribution Co-op, 47 Niddry Street, Edinburgh 1. (031-557-0133).
Subscriptions - see inside back cover.



comment

Firstly, we would like to wish all our readers a Merry Christmas, and a Happy Campaigning New Year (if such a thing is possible!).

In this issue we have re-stated our case against the nuclear developments of Torness, and brought it up to date. Although we are becoming increasingly frustrated at the lack of official response to our call for a halt of the construction, we believe that it is important to continue to put forward a rational argument in support of our campaign. As more and more people become aware of our side of the story, so the anti-nuclear movement in Britain continues to expand.

In the next issue of the SCRAM Energy Bulletin there will be a special article on a very effective way of showing the Electricity Generating Boards that we care about their use of nuclear power - by withholding the 'nuclear' portion of our electricity bills. Consumer campaigns are being organised to cover the whole of Britain - more details in the next issue.

Electricity Bill

On Wednesday October 13th, a robot Friend of the Earth from Glasgow challenged the SSEB's P.R. robot at the Living Ideas exhibition at the Kelvin Hall, Glasgow. The environmentalist robot, who closely resembled Dr. Who's old foe, the cybermen, introduced himself as Electricity Bill, 'because I'm so big'. The SSEB's robot, called Alpha, claimed that he was just like electricity 'always there when you wanted him'. But when Electricity Bill wanted him, he refused to answer the 'contentious' questions and retired to 'recharge his batteries!'

plutonium at sea

On 27th August, anti-nuclear groups and the press were alerted that the first shipment of plutonium nitrate solution from Dounreay to Windscale would take place that day.

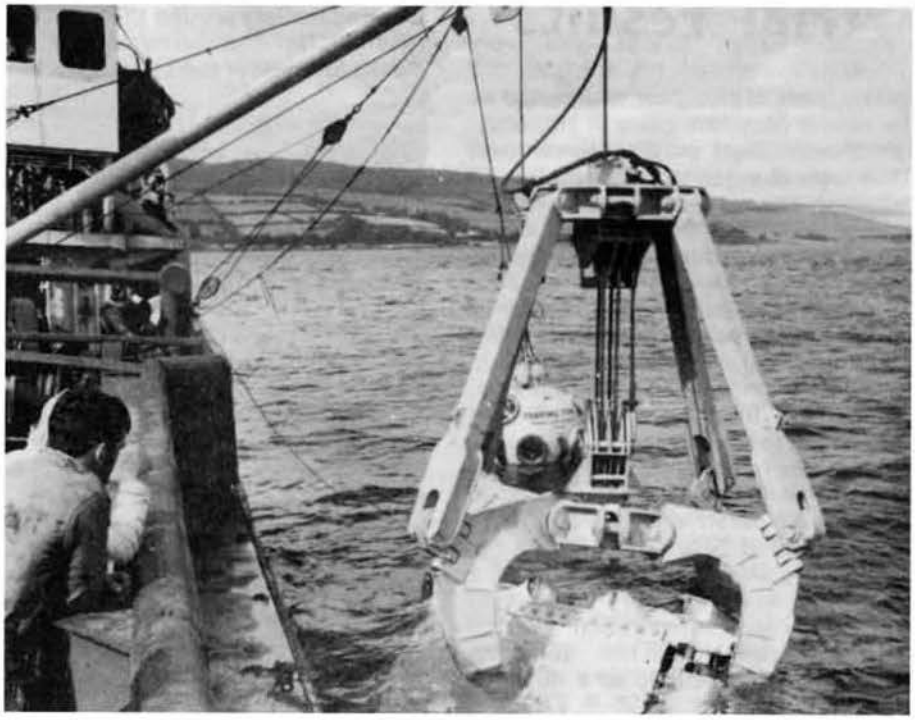
In the event it appears to have been a 'dummy run' with empty packages. A rehearsal for the real thing - transport of one of the most deadly substances known on some of the most unpredictable and dangerous shipping routes round the coast of Britain. At least one country (Canada) has banned transport of liquid plutonium nitrate and most countries transport it in oxide form.

Closing the Fuel Cycle

To complete the Fast Breeder fuel cycle, and hence to justify claims that the Fast Breeder Reactor (FBR) can solve the imminent 'energy crisis', plutonium from the irradiated fuel and the 'blanket' around the core (in which the plutonium is bred) must be removed for further use in new or existing reactors. After chemical separation, the plutonium is dissolved in nitric acid, to form plutonium nitrate solution. In order to make new fuel pins, this solution must be converted into solid plutonium oxide. No plant exists at Dounreay to do this, so the plutonium nitrate is transported to Windscale, where the FBR fuel elements are also manufactured. The provision of such a plant at Dounreay would involve considerable time and expense. Shipping plutonium nitrate by the sea is therefore a cost-cutting exercise.

Secrecy

Two packages of 250 litres capacity will be shipped about seven times a year according to the Health and Safety Executive report which approved the shipments in March 1980. For the art of saying nothing while appearing technical, this particular report is highly recommended. Closer scrutiny reveals several areas requiring further clarification and information. Take just one example. The International Atomic Energy Agency sets out regulations for the testing procedures of transport packages. For the type that will be used in these shipments, **cumulative** drop tests punch tests and fire tests are required. But in the case of the fire tests this was done on a model one-third of the actual size, and the effect on a full-sized prototype was assessed by computer modelling. In this 'hypothetical' test, it was noted that the radiation shielding fractured, however, the H&SE concluded that 'the test combination is an adequate demonstration'!



Recovery from the seabed of an empty plutonium nitrate container during tests. Normally it will hold 250 litres of plutonium nitrate solution, containing 7.5 kg of plutonium.

There are many similar instances in the report of 'estimates' being presented as hard data. When the report was written, the essential 'Design Safety Manual' was not available, and one questions whether the approval for the shipments should have been given without it.

If the technical data does exist, it is not being made available for independent assessment, and requests by groups such as SCRAM and the Highland group have not been answered satisfactorily.

What would be the consequences of a loss of plutonium nitrate at sea? The H&SE assert with confidence that the risk of such an accident is minute, and the consequences would be negligible. As usual, the figures are not available for scrutiny.

Stornoway Pier and Harbour Commission has agreed to refuse entry to the Kingsnorth Fisher, which will be making the shipments. They have been approached to provide refuge in bad weather. This is very important as the Minches is notorious for the unpredictability of its weather. Surely this affects the safety of the shipments. Will the ship carry on regardless?

Stop Press

It seems likely that the first shipment will in fact take place in January.

How to avoid FBR Inquiry

Sir John Hill is in favour of developing the commercial demonstration fast reactor in co-operation with France and Germany, in order to spread the £2000 million expense of the project, or so he told the audience at a public lecture in Edinburgh on the 25th of November.

Another reason, however, for favouring this course of action is that it might well avoid having to put the decision to a Public Inquiry. Indeed, Sir John was extremely evasive in his answer to this point, and would not commit himself to saying there would be a Public Inquiry if the co-operative development took place in France.

One is tempted to ask whether buying a share of a Franco-German fast reactor project might in fact be a deliberate tactic to avoid a Public Inquiry, but who knows?

New boss

Walter Marshall is to succeed John Hill as UKAEA's chairperson on February 22nd 1981 when Hill reaches retirement age. This does not mean that he will stop being chairperson of BNFL and of the Radiochemical Centre Ltd.

home

Trial results

The trials of five people arrested at Torness in May took place in Haddington Sheriff Court on 20th November. They were charged with 'attempting to rescue a prisoner' after a black ballcock with 'BOMB' written on it and a string 'fuse' was thrown over a line of police.

Neither the police nor the Sheriff saw the funny side of it, and when the 40 anti-nuclear protestors who packed the court room, after a picket outside, laughed at the farce, the Sheriff threatened to clear the court.

The four who pleaded not guilty were all found to have 'attempted to rescue a prisoner' and the **five were fined a total of £450.** Three of the defendents gave statements from the dock emphasising the non-violent nature of the demonstration and the excessive police reaction to what could only be described as a humourous incident.

Ironically, there are no signs of Jeremy Millar, who threw the 'bomb' and who the five were 'attemping to rescue' being brought to court.

Occupation

In protest at the verdict a group of 25 people occupied the electricity showrooms in nearby Dunbar, and distributed leaflets around the town. This resulted in the showrooms being closed for most of the afternoon.

Super-glue

An action in solidarity of the defendents took place the night before the trials when a group in Glasgow used 'super-glue' to prevent the SSEB entering one of their properties.

Stoke Newington Action

Another action in support of the defendents occurred on the day of the trials; in Stoke Newington. Five barrels symbolising containers of nuclear waste were deposited outside the local electricity showroom by residents along the North London Railway line, in protest against the transportation of radioactive waste through London, and the nuclear power programme.

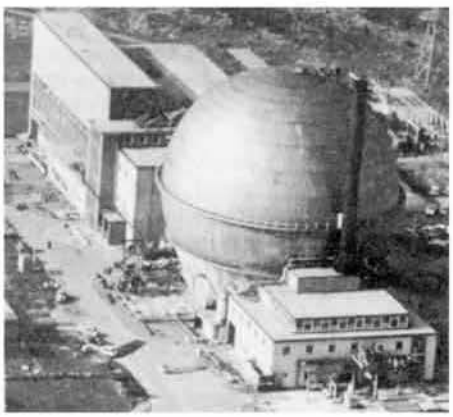
The date has been set for the next trial resulting from the May action at Torness. One person is to appear at Haddington on January 9th. There is to be some form of anti-nuclear protest. For details, please write c/o Box 23, 163 King St., Aberdeen. Also, please send donations to help pay the fines from the last trial to this address, cheques, etc., payable to 'Torness Charges Fund'.

Another PWR?

The CEGB, after announcing the siting of Britain's first PWR at Sizewell in Suffolk have said that it is likely to seek still further development of the site, with another 1200 MW of capacity.

BNFL News, November 1980

WAGR



The Windscale experimental AGR is to cease continuous operation and electricity generation in March 1981. The reactor will then be run intermittently at low power before the start of decommissioning in order to carry out a final test programme of safety experiments.

Atom, November 1980

End of Harvest

In mid November the Windscale Local Liaison Committee heard that the British 'Harvest' vitrification research programme is to be abandoned. This programme is well behind the French programme. Harvest is still using only simulated waste while the French have been vitrifying the real stuff in commercial quantities since 1969.

Nature, 21st November 1980

LAWD Festival

On the last weekend of January 1981 L.A.W.D. are organising a **"Festival Against the War Drive"** in association with C.N.D. who are convening a large rally with E.P. Thompson and other speakers on Saturday, 31 January in the Usher Hall.

Please spread the word around and come yourself. If you feel you can help, suggest or donate; please contact: **Dave Smith or Carol Tansley on 031-667-0100 Ext. 6791.**

No Entry

On 22nd November the U.K.A.E.A. in conjunction with the Highland Region Education department held a seminar on nuclear power for teachers, in Inverness. The local anti-nuclear group offered to participate to provide "balance" but were refused entry. The Education department claimed that this was "only" a public relations event, and it seems certain they will refuse the Inverness group their offer of organising a seminar also. Although the seminar was supposedly just for teachers, ten sixth form Gordonstoun pupils were present.

Nuke firms

There are no less than 225 firms and organisations throughout Britain which promote nuclear power. Contact **SCRAM** or **ANC** for details of the culprits in your area.

abroad

U.S. Scene

Ronald Reagan's election as the next President of U.S.A. has been seen as a great blow to the anti-nuclear movement. The results of the election in the U.S. will have ramifications for the entire world in terms of nuclear power.

Under the new Reagan Administration there is expected to be an acceleration in the construction and licensing of nuclear power stations, a demonstration project for the liquid metal fast breeder reactor, and new policies on reprocessing and other issues relating to international non-proliferation efforts.

It appears likely that Reagan will surround himself with pro-nuclear advisors as opposed to the Carter Administration of anti-nuclear - or at least anti-breeder and anti-reprocessing advisors.

Polls

In a recent opinion poll conducted amongst the civilian population of 18 years of age and older in America only 28% of those interviewed would accept the siting of a nuclear power station within 14 miles of their homes. On the other hand 63% would accept a coal fired station within the same distance. The poll found that the majority of people prefer a distance of 100 miles between the nearest nuclear power station or waste dump from their homes.

Votes

In several of the American states voters have been given the chance to air their opinions on nuclear issues. Oregan voters have passed a measure that will effectively prohibit the construction of new nuclear power stations in the state. In Washington 70% of the voters approved a measure to prohibit the importation of non-medical radioactive waste after 30th June next year (1981).

However, not all the results were as promising. in Missouri a vote on the prohibition of operation of nuclear power stations in the state was defeated 61-39%. And in Montana an initiative to prohibit most radioactive waste disposal in the state, including waste generated by uranium mining and milling was defeated as well.

WISE, 11th November 1980

Dodewaard

On October 19th over 15,000 people participated in a blockade of the Dodewaard nuclear power station in the Netherlands. The tree roads leading to the plant were blocked from early Sunday morning until Monday afternoon. The entire action took place without any violence in spite of heavy security by the police.

WISE, 11th November 1980

Missile

An unarmed Polaris missile, fitted with new top-secret improvements to its warhead system, was fired from the nuclear submarine HMS Renown. It submerged 30 miles off the Florida coast.

Scotsman, 14th November 1980

Siting

The U.S. National Regulatory Commission have recently revised their reactor siting criteria which will require new plants to be sited only in low-density population areas. If these regulations were applied to other countries most nuclear sites would be ruled out, especially in Japan, Italy and probably here in Britain.

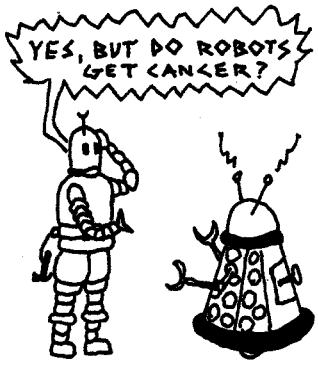
Dutch drilling

The Netherlands has suspended plans for experimental drilling in the Northern part of the country that was intended to show if the salt formation there could be safely used for permanent storage of nuclear waste. The project has been stopped because of the pending two-year national debate on nuclear energy.

India

Two nuclear reactors which are under construction on the banks of the Ganges in India are in a high seismic zone, only 50km from the active Moradabad earthquake fault. India's National Academy of Sciences were warned in October that an accident that resulted in a spillage of radioactivity into the river would be disastrous as the river flows 1,000km into the Bay of Bengal through three of India's most populous states.

Robots



Rumour has it that the operating utility at Three Mile Island are so concerned about the cleaning up problems that they are thinking of putting out a contract for the development of robots to do the job. Money is no object! Fairey Engineering are apparently interested.

Plebiscite

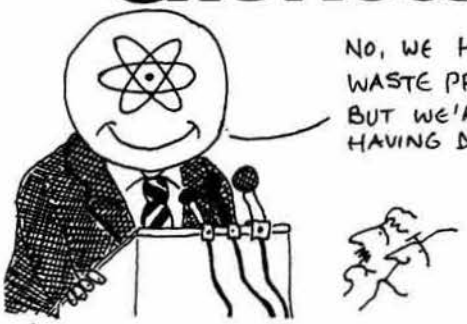
Some disappointing news from Austria. Supporters of nuclear power won a victory in the recent plebiscite to abolish the ban on nukes. If the reversal of the ban is supported by two-thirds of the members of parliament a second referendum will be held in the spring.

WISE, 11th November 1980

France

According to the French union, Confederation Francaise Democratique du Travail (CDFT) the primary cooling system failure which occurred at the St. Laurent-des-Eaux nuclear power station last March could have been avoided. The CDFT claim that certain "anomalies" had occurred before the incident concerning the gas pressure and both operational and technical personnel at the plant had suggested that "it would be a good idea to look inside"!

waste dumping Cheviots Inquiry



The public inquiry into nuclear test drilling in the Cheviots - a national park - started on October 28th in Newcastle. This inquiry lasted four weeks, and included local sessions at Wooler and Rothbury.

Opening Picket

On the opening day Tyneside Anti-Nuclear Campaign had a picket outside; and came into the hall, sang a song about the inquiry being a farce, and left. There were similar lively protests by various people, weekly, during the inquiry.

"Audience"

The attitude of the inquiry inspector Mr. Richard Spain was revealed early on, when he referred to the general public and objectors as "the audience". The U.K.A.E.A. witnesses and their evidence were largely the same as at the Ayr inquiry earlier this year.

Lessons Learned

It is clear that the U.K.A.E.A. and government have learned a lot from their experience of the Ayr inquiry. For instance, at the Cheviot inquiry they did not make the "mistake" they made before of actually spelling out that the remit was restricted. The inspector claimed that it was not restricted, as the application was only to test drill, and the inquiry referred to the application.

Medium Level

The Department of the Environment witness, Mr. Wedd admitted during questioning that repositories intended for high level waste could also be used for medium level waste, of which there is a much greater amount. No reasonable explanation was given for why the recent Somerset/Leicestershire/Nottinghamshire test bore applications were each for only one borehole, contrasted with previous applications in granite areas, which have all been for over twenty boreholes.

Test-drill only

Although the U.K.A.E.A. claimed that the application was only to "test drill" and that a nuclear waste repository would be subject to a future planning inquiry, they refused to answer when asked if there could be any guarantee that this would in fact happen, if a repository was planned.

Death of democracy

The local sessions were very lively and well attended. A Northumberland piper accompanied the presentation of petitions at Wooler. Dr. Roberts for the U.K.A.E.A. caused an outcry when he mentioned the reason there had not been an application for test drilling in the Lake District, was they did not want to make applications in two national parks. He implied that they chose the Cheviots as it is not such a nice area.

On the final day of the inquiry there was a picket and wreath laying event for the "death of Democracy".

Mullwharchar Latest

The result of the Mullwharchar inquiry is due any time now. Local groups are planning a demonstration for shortly after the announcement is made. For details telephone **Noel Charlton at 09887 442.**

Test Results

The only nuclear test drilling in granite so far completed in Britain has been at Altnabreac in Caithness. Highland Regional Council gave planning permission for this, and the twenty seven boreholes were drilled between November 1978 and May 1979.

Glossy reports

After a long silence, the results of this drilling are now being released as a series of twenty glossy reports. The Inverness branch of the Highland Anti-Nuclear Group, on hearing this news, contacted the Highland Regional Council who said that they had been told that they had the first reports, but they had been told that the results were confidential, and therefore they would not let the group see them.

This is surprising considering the I.G.S. seem quite happy to send groups the reports on request. Incidentally one of the conditions of permission being given to drill at Altnabreac, was that the results were to be made public!

Incomprehensible

The reports are incomprehensible to the layperson, and so far they do not state what we actually want to know. That is, Is the rock "suitable" for waste dumping or not? We have waited long enough for this result!

The contact for **Inverness H.A.N.G. is c/o 1 Attadale Road, Inverness. Tel. 0463 38349.**

Invisible Radiators

On 20th November, three "invisible radiators" in radiation suits (cunningly contrived from gas masks, boiler suits and white plastic bags) walked into the Cheviot Hills Public Inquiry and emptied foam chips from a "radioactive" plastic dustbin over the inspector's desk. They then distributed leaflets explaining their action to the sparse and unresponsive audience. After that, they stood behind the inspector's chair in silence (except for the wheezing of gas masks!) while Denis Murphy from the N.U.M. finished reading his submission. They then sat cross legged on the inspector's long desk and the inspector adjourned the inquiry. Dustpans, brushes and the police were fetched. The police reasoned with the still silent radiators and finally arrested them. After four hours in a cell together, which wasn't too harrowing, the radiators were released. They still do not know what charges, if any, will be pressed.

TORNESS - why it should be stopped

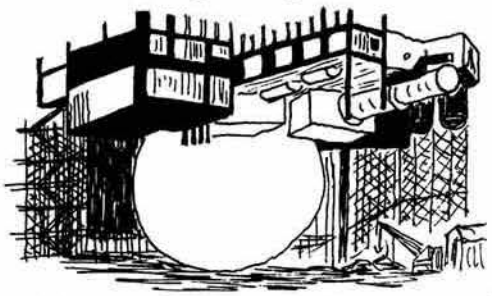
It is extraordinary to realise that there is now nothing within the local planning process that can prevent Torness from expanding into one of Europe's largest nuclear complexes. The 1974 inquiry in a few days settled the fate of East Lothian and Scotland for the next few generations; the recommendations made six years ago by the inquiry Reporter, Mr. Alexander Bell, have meant that the democratic options open to citizens concerned about Torness have since, frighteningly, almost vanished. In spite of constant calls in Parliament, by Lothian Regional Council, and others, including SCRAM, for a new and proper inquiry; in spite of the increasingly large manifestations of public opposition, both locally and nationally; in spite of the growing number of informed and rational critiques of the need for Torness, there has never been any real opportunity for the case against Torness to even be heard. Is it any wonder responsible citizens are at their wit's end? Is it any wonder that more and more people are deciding to withhold a proportion of their electricity bill in protest [see the next issue of SCRAM Energy Bulletin]? Is it any wonder that Torness is coming constantly under seige? Is it any wonder that we are angry?

In this article we are re-stating our case against the nuclear developments at Torness, by revealing the SSEB's plans for the site, and their peculiar reasoning behind their plans. Also we show why the development will not benefit the locality.

SSEB's plans

Few people realise just how massive Torness could eventually become. The South of Scotland Electricity Board (SSEB) are currently building two 660 megawatt (MW) Advanced Gas-cooled Reactor (AGR) units — a power station of a total of 1,320MW. In addition they already have planning permission for another six 660MW reactor units — a further 3 whole power stations.

This arises from the completely inadequate local planning inquiry into Torness in 1974, where not only was permission requested (and granted) for the eight reactor units, but also for any of four different types of reactor (the Steam Generating Heavy Water Reactor, the Advanced Gas-cooled Reactor, the Pressurised Water Reactor and the High Temperature Gas-cooled Reactor). **This means that the SSEB have planning permission for 5,280MW of virtually any type of reactor** other than the Fast Breeder at Torness — a nuclear complex so huge that if built it could supply the equivalent of almost all of Scotland's current electricity consumption on its own.



In December 1979, the Government announced a £15 billion plan to build 10-12 new nuclear power stations in Britain over the next ten years. The SSEB's own programme is rather less specific:

> "... the Board expects to be able to meet all requirements for further nuclear stations in the South of Scotland until the year 2000 by a combination of further developments at the Torness site and in the vicinity of Hunterston. The two Scottish Boards operate joint planning arrangements for their generating capacity and the NSHEB have identified a suitable site for nuclear development at Stakeness on the Moray Firth... The equivalent of two more 2 x 660MW stations would be required by the end of the century but the choice of plant, nuclear coal or pumped storage will not be determined until nearer the dates of commitment."

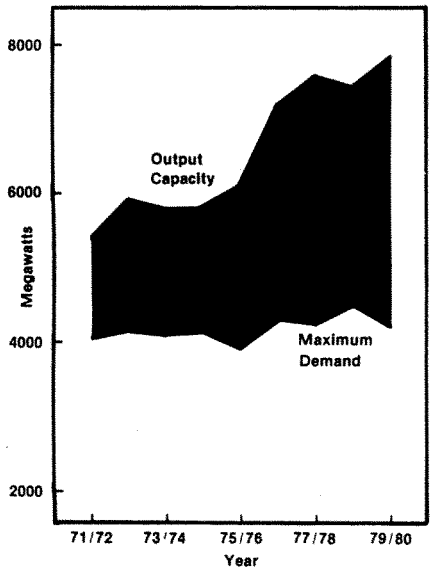
Torness & Craigroyston

The NSHEB of course already have plans for a large £300 million pumped storage scheme at Ben Lomond on the shores of Loch Lomond, known as Craigroyston — a project that was recently postponed due to lower demand forecasts. Pumped storage — which involves using off-peak electricity to pump water uphill into a reservoir and then using the accumulated hydropower to generate electricity at times of peak demand — is a perfect match for large clumsy base-load nuclear plant which is best run at full power all the time regardless of demand: **Craigroyston and Torness are integral developments**. Thus it is likely that, of the suggested two, 1,320MW stations, one could well be the Craigroyston scheme. The other, given that the planning permission already exists (unlike at Hunterston), is likely to be a second nuclear station at Torness. After the year 2000, the SSEB forsee "a build-up in the requirement for new plants in Scotland". We can then look forward to Torness 'C' and 'D', as well as Hunterston 'C' and 'D' — **eventually the great majority of Scotland's electricity will depend on just two vast nuclear parks** at these sites.

No need for it!

Recently the SSEB have abandoned the pretence that Torness is being built to meet forecast electricity demand in Scotland. Their Chairman, Mr. Roy Berridge, has admitted that **the station will not in fact be 'needed' until 1992-93** and that the case for going ahead with Torness now is based firstly on a supposedly "robust economic case" (critically examined later in this article) and secondly on the 'need' for a "substantial nuclear power capacity by the end of the century". More candidly, he has stated that "because of the maior uncertainties which are developing in the basic criteria upon which any demand forecast must be based, we are currently having to place relatively low confidence in such forecasts in the future". In other words, "we don't really know what the hell we are doing!"

Demand for SSEB's Electricity



Overcapacity

The extent of Scotland's electricity supply overcapacity is hard to grasp. They use a 'planning margin' of 28% excess capacity supposedly enabling them to meet demand in the event of plant failure. (This margin has recently been increased mainly because plant reliability is so poor and the growing size of individual plants put larger amounts of supply at risk in the event of a breakdown.) The SSEB admit to a **35% current overcapacity in excess of the planning margin:** Berridge has in fact admitted that between 1988 and 1993, Torness will actually **increase** the Board's already ludicrous spare capacity.

Premature Closures

To put it another way, at 5.00 p.m. on 21st January 1980, electricity demand in Scotland reached a winter peak at 5,861MW. On the same day both Scottish Electricity Boards possessed 10,227MW of net generating capacity — almost twice as much as was actually required. The SSEB's new oil-fired power station at Inverkip, the development of which is now officially "regretted", operated at less than 5% load factor over the winter months. Workers at Kincardine Power Station, through no fault of their own have been obliged to pass the day polishing the plant in order to qualify for the Board's productivity bonus. The news that the SSEB intend mothballing two-thirds of both Inverkip and Kincardine, revealed as this article was going to press, confirms critics worst fears: in order to justify the expansion of nuclear power, the SSEB are actually prepared to shut down perfectly good plants early, in spite of the fact that 80% of present Scottish plants are less than 15 years old.

Unemployment

It is not as though the development of the Torness site will benefit the local people. The **long term prospects for the area are grim**, if we look at other sites which have had nuclear developments.

In 1978, Gwynedd County Council adopted a policy against using any further sites in the area for nuclear power stations. This was based on the experience of high unemployment following the construction of two nuclear power stations in the county; Wylfa and Transfynedd, during the 1960s. The workers who moved into the area during construction did not all leave, but stayed on, even though the permanent jobs at the station were for skilled technicians. The permanent jobs were taken by yet more incomers.

Sizewell, the nuclear power station in Suffolk, has caused Leiston, the town only two miles away, to have an **unemployment rate twice the local average.**

No new industry has come to the town since the nuclear power station was completed in 1962. It seems likely that new enterprises have been put off by the possibility of an accident, and by the easy availability of other sites with no special planning restrictions.

At Torness, we have all been assured by the SSEB that the construction will mean jobs for all in the area. However Dunbar and Haddington, like the rest of East Lothian are facing a **36% increase in unemployment.** Construction work at Torness has done nothing to help the loss of jobs in manufacturing industries.

Not 'Local'

The workers at Torness are not 'local', in spite of recent protestations to the contrary. Men come from Livingston, Edinburgh, Berwick; in fact from all over the Lothians, each day. Every hotel and boardinghouse in Dunbar is permanently filled with workers from further afield. How will Dunbar's tourist industry survive when there is no place for a tourist to stay?

This is before the workcamp at Innerwick is properly used. It seems that there will be yet more workers moving into the area who will fill the 500 or more places at this camp. The workcamp possesses facilities which Dunbar as a social centre still lacks. So the residents lose out again.

New houses are being built for the engineers and foremen by the Scottish Special Housing Association (SSHA). In other areas, this type of housing has been empty for years as the incomers have found their own, private and more distant homes. But the SSHA houses will still remain out of the reach of the local people patiently waiting on the East Lothian District Council waiting list.

In the end a few canteen and cleaning jobs will be the best Torness can offer the local area to replace the tourist industry.

Safety unknown

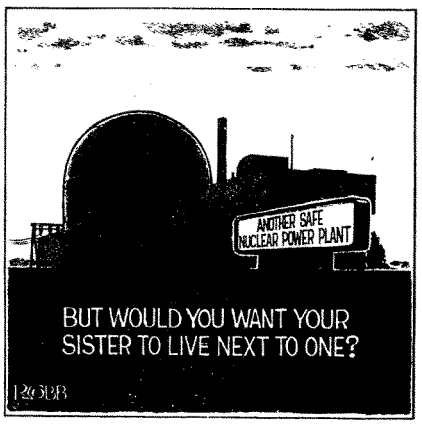
A catastrophic accident at Torness (if it is built) could **kill up to 25,000 people** from long term cancer, and nearly 4 million people might have to be evacuated from Glasgow and Edinburgh, due to ground contamination, if the wind was blowing in that direction. These are the predictions of a computer simulation of a catastrophic accident at Torness, performed recently by the Political Ecology Research Group at Oxford.

This report was the first independent analysis of the safety of AGRs. It examines how a catastrophic accident might happen and concludes that the AGR is potentially as dangerous as the American Pressurised Water Reactor.

Secrecy

It is accepted that the system is engineered to the highest available standards but the report also points out that the operating history of the AGR does not inspire confidence (see later in this article). Further conclusions are that the Nuclear Installations Inspectorate has problems controlling the industry and perhaps more importantly, the whole matter is surrounded in secrecy.

When starting on the report the authors approached the industry for information to allow them to perform a proper analysis. **They received little in the way of co-operation.** In particular, the Central Electricity Generating Board refused to release their detailed safety report for independent analysis. They have, nevertheless, since agreed to produce an edited version of the AGR safety report. But despite promises of early release, it has still not appeared.



Torness in April 1980 Photo The Scotsman

Halt Called For

The Torness Consultative Committee have asked the EEC to fund an independent safety study (see the last SCRAM Energy Bulletin), but have decided, in spite of the EEC's willingness to do so, not to pursue the matter because of the two "impossible" conditions requested — namely the halting of construction, and the need for the request for the study to be submitted via the British Government.

The PERG report went a long way towards an independent safety study, but was hampered by official secrecy. Although the EEC are willing to fund an independent safety study themselves, the Government will not comply and request such a study. It is about time we had all the facts to back up the official assertions that nuclear power and, in particular, the AGR, is safe. There are many indications though that nuclear power is not as safe as it is made out to be.

Mad economics

Ever since Britain first embarked upon a nuclear programme, we have been promised that one day it would be cheap. In the early days, some enthusiasts were so carried away that they predicted that nuclear electricity would be 'too cheap to meter': the same stary-eyed futuristic mentality still afflicts many present day nuclear enthusiasts. The harsh economic realisites are brushed aside with an almost god-like belief that **this time** they've at last got it right. In fact the evidence suggests that this time, yet again, they've got it wrong.

Increasing Construction Costs

The SSEB's original estimated capital cost of the AGR at Hunterston was £97 million: when built it actually cost £143 million. In 1978 the capital cost of Torness was being estimated as £600 million: now (1980) it is put at a staggering £1,100 million. The SSEB point out, correctly, that this increase is to some extent inevitably due to inflation, but they also admit that nuclear plant costs rise by about 8% per year **over and above** the rate of inflation. No-one yet appears to have even attempted to estimate the likely outturn (i.e. full eventual cost after actual completion) cost of Torness, although the SSEB have admitted that it could be as high as £2,000 million.

Nuclear is Not Cheaper!

There is also every reason to question the SSEB's automatic assumption that electricity from Torness will be cheaper than electricity from coal or oil fired stations. In the last two years the SSEB's Annual accounts reveal that when allowance is made for future decommissioning the cost of electricity from nucear power was actually higher than the average cost of electricity generated from coal and oil stations (see table below). Of course the cost of decommissioning is somewhat uncertain as no-one really knows how we are going to dismantle the 1,500 tons of highly radioactive metal that will constitute a reactor at the end of its useful life.

The SSEB point out that the price of nuclear electricity has been artificially high in recent years because of the 'unfortunate' closure of Hunterston B due to a large leak of seawater. They blythly assume that the 'teething' problems encountered at Hunterston will not in any way be repeated at Torness. The past record of AGR reliability does not justify such supreme confidence. In addition there is evidence that the fuel costs of nuclear power - originally assumed to be one of its greatest competitive assets - are rising much faster than that of fossil fuels. According to the Central Electricity Generating Board's Statistical Yearbook, between 1973-4 and 1979-80 the fuel costs per unit of output in nuclear stations increased sixfold — twice as fast as the increase in fuel costs of coal fired stations, and faster even than the rise in oil costs.

"A Robust Economic Case?"

In an attempt to justify such massive public expenditure, the SSEB have resorted to the economics of the madhouse. They admit that the electricity from Torness **won't actually be needed** until at least 1992-3, but purport to be able to prove "a robust economic case" for commissioning Torness five years too soon. The detailed calculations behind this argument have not been published, but it is possible to glean some idea of their sums. Assuming a constant 5% per annum increase in the real price of oil and a 2% per annum increase in the real price of coal up to the year 2000, the SSEB claim that by the early commissioning of Torness they will be able to save money by not using coal or oil fired plant, giving them a "discounted cash flow advantage of something like £400 million". In other words, based on a series of necessarily speculative assumptions, not all of which have been revealed (e.g. the future cost of nuclear fuel), the Board are suggesting that they could save as much as £400 million and that this is their best option for "containing price increases".

Cost of SSEB Electricity

Fuel	Cost in pence per unit 1978-79	1979-80
Hydro	0.303	0.263
Coal, Oil & Gas	1.429	1.717
Nuclear	1.624	1.755

AGR problems

The first nuclear power station planned for Torness is to be based on a technology which has yet to prove itself. The AGR programme was described as **"a catastrophe we must not repeat"** by Arthur Hawkins in 1973, when he was chairperson of the CEGB. The situation has not improved since then, with only two out of the five stations begun between 1965 and 1970 having produced any electricity. All five stations were downrated by 10% (and one by almost 20%) during the design stages. This illustrates the problems incurred when scaling up twenty-fold from the experimental AGR at Windscale, based on just three years operating experience.

The first AGR contract was issued in 1965 to Atomic Power Construction to build a station at Dungeness. Although originally due to be commissioned in 1970, this station is still under construction. Such incidents as the boilers having to be redesigned **not once but twice** can account for some of this delay.

Three separate consortium began constructing AGRs to their own design, resulting in **three 'prototypes'** being built at the same time, and before any of them had proved to work. In 1969 Atomic Power Construction collapsed, and in 1973, the two remaining consortium were combined into the National Nuclear Corporation.

Of the three designs, the Nuclear Power Group's proved to be the most 'successful' in that both Hinkley Point and Hunterston began to produce electricity in 1976 - **just four years late.** However, neither of these have been without their problems.

Hinkley Point Incident

In June 1977 a watermain supplying the Number 1 reactor at Hinkley Point fractured, and flooded part of the pumphouse, forcing a shutdown of the reactor. The incident put out of action the emergency back-up system which kept the gas circulators cool.

Hunterston Incident

In October 1977, 2,000 gallons of corrosive sea water from the Clyde seeped into the primary pressure vessel of Hunterston's Number 2 reactor. At the time the reactor was shut down for repairs.

The affected parts of the reactor had to be cut out and replaced. The presence of high levels of radiation beneath the core turned the repair job into a major operation. The reactor was out of operation for over two years, and the cost of repair was £15 million. The SSEB have estimated that the cost of replacing the electricity that

History of the Developments of Torness

19th December 1973	SSEB submitted planning application for 5280MW of nuclear capacity, using any one of four reactor types; AGR, SGHWR, PWR, & HTR*.
18-27th June & 23rd July 1974	Public Inquiry
12th November 1974	Public Inquiry Report published, recommending the granting of permission for 5280MW and all four types of reactor.
5th February 1975	Secretary of State for Scotland granted conditional consent to the SSEB, specific to the SGHWR.
30th September 1975	Secretary of State for Scotland authorised the capital investment for an SGHWR at Torness.
9th November 1975	SCRAM formed.
25th January	Secretary of State for Energy authorised the SSEB to discontinue work on the SGHWR, and to begin work on the AGR.
6-7th May 1978	4,000 people marched from Dunbar to Torness and occupied the site.
24th May 1978	Secretary of State for Scotland issued consent to the SSEB for the construction of an AGR at Torness, and dismissed calls for a new Public Inquiry.
13th November 1978	The contractors began work on the approach roads.
30th November 1978	Opinion poll results showed 42% of the local population against Torness, 34% in favour, and that 73% wanted a new Public Inquiry.
4-7th May 1979	10,000 people attended the Torness Gathering, and 3,000 occupied the site.
March - April 1980	Contracts at Torness were delayed as a result of the CEGB's revised estimates of electricity demands.
15th April 1980	The Cabinet announced the go ahead for Torness.
23rd June 1980	The Health and Safety Executive granted a license to the SSEB for Torness.
1987	The first reactor at Torness is scheduled to be commissioned. The other reactor, a year later.

*AGR - Advanced Gas Cooled Reactor; SGHWR - Steam Generating Heavy Water Reactor; PWR - Pressurised Water Reactor and HTR - High Temperature Gas Cooled Reactor.

the reactor would have produced is about £42 million.

Refuelling

When the AGR was originally designed, one of its strongest selling points was that it should be able to be refueled on stream, hence avoiding shutting down the reactor, and having to supply the replacement electricity from another source. This has proved more difficult than originally envisaged, with refuelling only having been carried out on stream experimentally at Hinkley Point, and then at considerably reduced power. The Nuclear Installation Inspectorate have yet to give permission for this operation to be carried out routinely on safety grounds.

Torness AGR

The SSEB plan to build Torness based on the design of Hinkley Point 'B', but according to a report by the National Nuclear Corporation — The Choice of a Thermal Reactor — published in 1977, there will be a "reasonable compromise" between "making a great many changes in an attempt to achieve an ideal design but risking many unknown problems, and making only the mandatory changes for safety reasons". Torness will be yet another prototype.

So far the AGR programme has seen considerable delays, new designs during construction, and failure of the two stations that have got as far as being commissioned. With three different basic designs and modifications for each of the five stations, it cannot be said that the AGR technology has been proven. Yet still the Government continue to order new nuclear power stations based on this technology, which so far has been shown to be very unreliable.

~

Sources

Much of the information in this article comes from the following sources:-

1. SSEB and Scottish Office, Minutes of Evidence to the House of Commons Select Committee on Energy, May 19th 1980.
2. SSEB - Price Increases in the Supply of Electricity, Price Commission, July 1978.
3. Letter from Mr. Berridge to Robin Cook M.P. and Jeremy Bray M.P., 28th March 1980.
4. The Impact of a Power Station on Gwynedd, Part 1, 1976, and Part 2, 1978.
5. Power Stations Impacts: Socio-Economic Effects of Power Stations on their Localities, Oxford Polytechnic.
6. Safety Aspects of the AGR, PERG, 24th April 1980.
7. "Torness: Keep It Green", Mike Flood, Friends of the Earth, 1979.

a decade of energy

or what you can make of statistics

Britain used 8.8% more energy in 1979 than in the year 1969, an average growth of less than 1% per annum. But most of this increase took place before 1973.

Indeed, energy consumption (demand!) only rose from 61.0 to 61.7 thousand million therms between 1973 and 1979.

What's more, there is still no sign of a rapid take off in energy consumption to justify the Government's forecasts. Consumption so far this year is running 6% lower than in 1979.

Nuclear Insignificant

In 1969 nuclear power provided 11.1% of the UK's electricity. By 1979 this had risen to 11.7%! - a reflection of the problems with the new AGR nuclear power stations.

But nuclear power still only supplies about 1½% of the energy used in the UK, despite 25 years of commercial production. This insignificant position is due to problems in the industry and not to the opposition to nuclear power, which has only developed in the last 5 years.

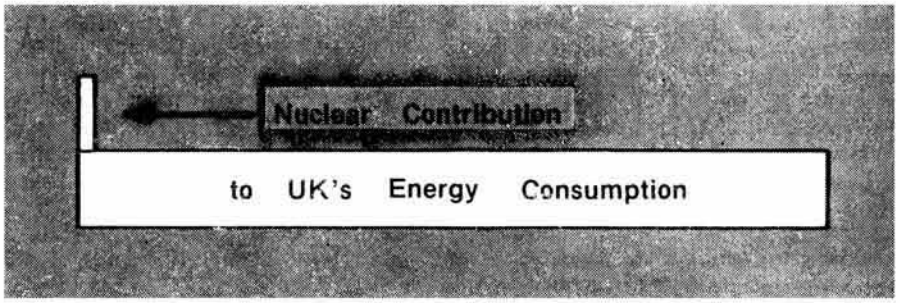
All for a Matter of Minutes

Maximum electricity demand was 50.75 giga watts (thousand million watts) in 1979. **A demand that probably only lasted for a matter of a few minutes on the coldest day of the year!** At this time the electricity boards had enough power stations to generate 68.88GW. That is, they could produce 36% more electricity than the maximum demand. The electricity boards claim a 28% excess capacity is necessary to allow for breakdowns etc., although other countries usually have a 20% margin.

Furthermore, this 36% excess capacity does not include quite a few large stations that will start operation in the next few years. No wonder they are shutting down power stations early to try to reduce their embarassing excess.

*Information from **'United Kingdom Energy Statistics 1980'** and **'Energy Trends'**.

Both available free from Circulation Section (H), Central Office of Information, Hercules Road, London SE1 7DU.

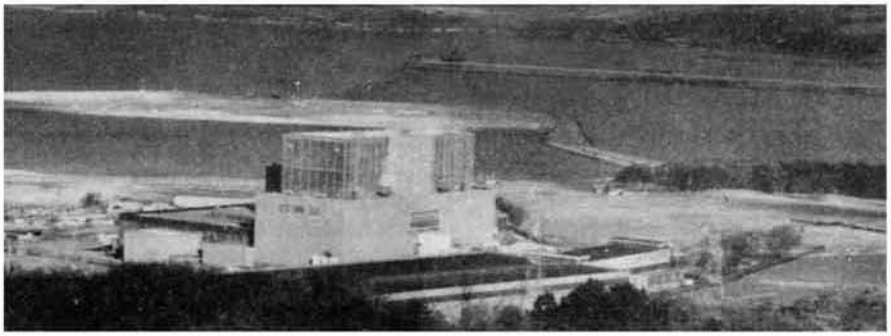


Hunterston

Hunterston 'B' nuclear power station is another example of the 'success' of the AGR programme! The station has been downrated since it was first commissioned in 1976. This was because it was thought necessary to restrict the operating temperatures of the reactors to reduce the risk of corrosion of the boiler tubes. However it was subsequently found that the 9% chrome steel tubes will in fact withstand high operating temperatures.

But this did not mean that the station could be uprated. It has been found that there is a design limitation associated with the fuel pins that made up the initial charge of the reactors. Although the design of the fuel pins have now been modified to overcome the problem, some of the original fuel pins will remain in the reactors until at least 1983. Until all of the initial charge has been replaced it will be necessary for maximum fuel ratings and temperature to continue to be restricted.

The board has had some success in increasing output now that the corrosion problem has been shown not to exist. The two reactors are now regularly generating 550MW, with an output of 570MW being achieved from time to time for short periods. They are however designed to generate 650MW each.

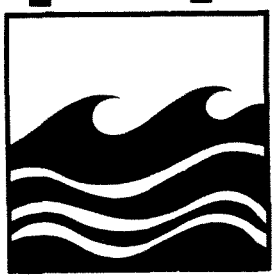


Learn all about it!

Lothian Regional Council's Community Education Service are trying again with an evening course on nuclear power. The one planned for the autumn term was cancelled due to lack of support.

The Spring course will begin on 28th January and last nine weeks. It will examine different aspects of nuclear power, with the contributions coming from both the SSEB and from those critical of nuclear power. For more information contact the Community Education Service, tel. no. 031-441-1031.

appropriate



Severn Barrage

The Severn Barrage could be providing Britain with 10,000 MW of power by the year 2,000.

This project, which could provide more than 7 times as much power as Torness, has been under consideration, on and off, since 1933. In 1977, the Select Committee on Science and Technology of the House of Commons recommended that the Severn Barrage Committee (SBC) be re-established to look at much larger schemes than had been proposed in 1933. A year later the Government allocated £1.6m to the committee.

The £1.6m has now all been committed to a wide range of studies and the committee hopes to be able to make recommendations on the next stage, a full scale design study, by the end of 1980.

Cycles

We live on a solar cycle, while the tides move on a lunar cycle. The simplest form of barrage would make power available twice a day on the ebb and flood, but these times advance about 50 minutes each day. Thus the time of maximum output changes and does not easily fit with the times of maximum demand. Not surprisingly the CEGB have been rather cool in their attitude to a barrage. There are, however, a number of ways of designing the barrage to provide better control of power availability. Interestingly, CEGB studies so far have come to the tentative conclusion that there is little to choose in economic terms between a simple scheme which provides power according to the tides and a more expensive scheme which provides power when demand is at its maximum.

La Rance Barrage

Some useful experience has been gained from the only other barrage in the world at La Rance near St. Malo in France. This was completed in 1967, but it only provides 240MW. Studies are in progress throughout the world, but the Severn barrage is much larger than anything else being planned. Installed capacity will be about 10,000MW i.e. 3 times larger than the largest station on the CEGB system.

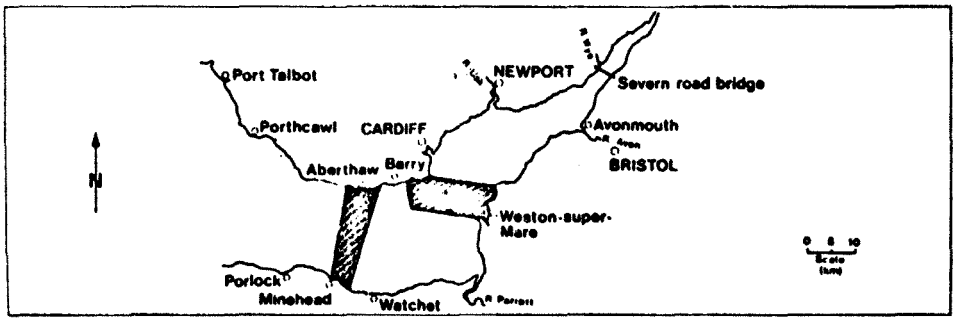
There are, of course, many problems which need to be worked out, from the size of the turbines to land drainage. Nevertheless it seems quite likely that a barrage will be built. Such a huge source of renewable energy is too attractive to leave untapped for much longer.

THIS IS AN extract from an article by John Quicke on the Severn Barrage in **"NATURAL ENERGY & LIVING"** which is published four times a year by **The Natural Energy Association, 2 York Street, London W1.** The magazine costs 75p per issue including postage. Annual membership of the Natural Energy Association is £9. Issue Number Eight of "Natural Energy and Living" also includes articles on Neil Wates' experimental Methane digester in Kent, The National Centre for Alternative Technology in Machynlleth, the history of windpower, recycling waste paper and a plan to submerge windmills in tidal streams and rivers to provide energy.

£s R&D

Out of the £314 million a year currently being spent on civil energy research and development, some £159 million is not spent on nuclear energy. This may seem to be good news until it is realised that most of the £159 million is related to coal and oil. The renewable energy sources receive peanuts in comparison.

Guardian, 20th November 1980



Possible Testing sites

Biomass

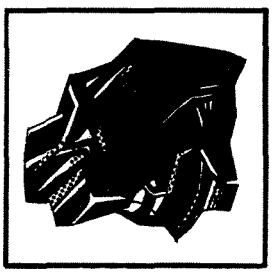
'Biomass can probably meet 5-10% of the total European energy demand by the year 2000 without trying too hard' was the promising news from the first EEC Conference on biomass.

If by then nuclear power is supplying 20% of the country's electricity, which is roughly 3% or 8%, depending on how you use the statistics (assuming that electricity demand is the same proportion of total demand as at present), then we could produce an equivalent amount by biomass. However this seems to be unlikely to happen given the Government's meaness when it comes to financing alternative energy sources.

Current spending on research and development of civil nuclear power is £215 million a year, while biomass is to get the total sum of £2 million over the next four years!

Guardian, 20th November 1980

~



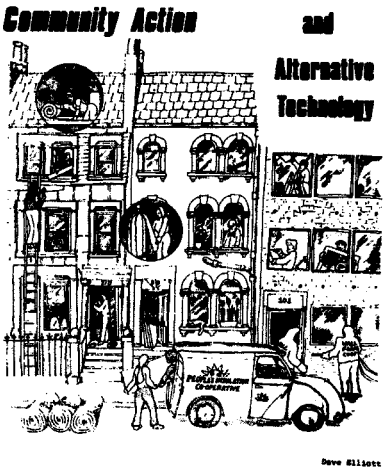
NCB Leads

'Britain is a world leader in fluidised bed combustion technology', says Sir Derek Ezra, chairperson of the National Coal Board [NCB]. The NCB have over the past few years been looking at more efficient ways of using coal, and have recently completed a prototype pressurised fluidised bed power station at Grimethorpe in South Yorkshire.

The major advantage of the pressurises system is that the exhaust gases can be used to drive gas turbines in addition to the conventional steam turbines. This results in a higher conversion efficiency.

In this country there are already 14 coal fluidised bed systems in operation, although not of the pressurised type. They are being used in industry, agriculture, horticulture and for district heating. An additional 12 systems are being installed or have been ordered. An additional 21 systems based on NCB technology have been ordered for overseas.

technology



Dave Elliott

Heat Pumps

The electricity council have recently estimated that heat pumps could save Britain more than £250 million, or 1.25% of our current energy consumption if they were used in industrial drying processes. This could be important for such diverse industries as the timber and paper trades, sugar refineries, chemical plants and brick works.

Energy Management, October 1980

Save 25%

By the year 2000, the world's buildings could consume 25% less energy than they do now is the conclusion of a recently published report from the Worldwatch Institute.

At the moment buildings account for about one-third of most developed nation's energy bills. Savings could come from the installation of devices such as solar panels, heat pumps and wind generators to provide either heat or electricity from natural sources. Also with appropriate conservation techniques householders could cut their fuel bills by 50%.

However, in order for this to come about architects must be encouraged to adopt proven methods of saving energy in new buildings, and governments must encourage householders to cut energy consumption in their homes.

New Scientist, 20th November 1980

Waste

The Electricity Council have calculated that one-third of the total fuel consumption of this country is being wasted in lost 'comfort' heating, and process heating at a total annual cost of around £2,500 million.

For more information on heat recovery and heat pumps, write to the Electricity Council, and ask for their free booklets at 30 Millbank, London SW1P 4RD.

CHP

Combined Heat and Power/District Heating (CHP/DH) schemes could eventually provide 30% of Britain's space heating and hot water needs, and save up to the equivalent of 30 million tonnes of coal a year.

This was the principle conclusion of a Government report published last year by the working group set up to look at CHP/DH by the Secretary of State for Energy in 1974.

In Britain there has been relatively little use of combined generation for domestic and commercial space and water heating using district heating schemes. This contrasts with several other European countries.

In response to this report, the Government announced in April 1980 that a programme of work on the feasibility of CHP/DH in the UK would begin. The initial stage will involve indentifying possible sites, and then making a full examination of one or two of them with a view to using them as lead city schemes.

So far, eighteen local authorities have expressed interest. These are listed below.

Greater London Council
London Borough of Southwark
London Borough of Croydon
London Borough of Barking and Dagenham
City of Westminster
City of Belfast
City of Liverpool
City of Manchester
City of Newcastle-upon-Tyne
City of Sheffield
Sity of Southampton
Glasgow District and Strathclyde Regional Council (Glasgow).
Lothian Regional Council (Edinburgh).
South Glamorgan County Council (Cardiff)
Tyne and Wear County Council
Wakefield Metropolitan District Council.
Milton Keynes Development Corporation.
Metropolitan Borough of Rochdale.

Solar Organisation

We've all got used to the 'double glazing' leaflets dropping on the mat, promising great energy savings, but recently selected areas have been treated to 'solar panel' leaflets of a remarkably similar form. While not all the sales merchants are sharks, the solar panel success story is heavily coloured by tales of bad installations and ill conceived plumbing systems, all of which can give a new technology a bad name.

Fortunately the Scottish Branch of the International Solar Energy Society (I.S.E.S.), has recently taken a tentative step into the limelight, by replacing its informal structure of several years with a formal structure; elected committee office bearers etc, and its stated aim is to promote the use of, and research into direct solar energy in Scotland. The members of ISES are an interestina collection of professionals, trade reps., and non-alligned enthusiasts of solar energy. The society's interests cover all aspects of direct solar technology; active, passive and photovoltaics. Surprisingly to some, there is at least one example of all of these systems working in Scotland today. The Post Office are using solar cells to maintain the island phone link to Soay, off the west coast of Scotland and are planning more; there are many active solar water heating installations, one of the latest is on a hall of residence in Kirkcaldy; the most recent example of passive collection is to be an experiment in fitting a transparent skin on the south wall of an Edinburgh multi-storey block using the principles of trombe wall heating.

All this sustained activity has produced not a sign of interest from central government agencies with responsibility for energy. Some local authorities and agencies such as the GPO, and Civil Aviation Authority, have working experience of solar technology, but it is still rather from enthusiastic individuals there and at university level that the impetus to develop and research solar projects comes. Central government is stonily silent, even on occasions actively opposed, and as a result research is starved of funds and important co-ordination. As evidence of the level of activity generated by enthusiasm alone Scottish ISES maintains a register of Solar Projects in Scotland which runs to upwards of twenty projects, and includes such fundamental research as work on the freezing of solar collective fluid, solar crop dryer, and solar space heating as well as many installed systems.

The Scottish Branch of ISES formally adopted a constitution, to actively lobby for support for solar energy activities in Scotland, Department of Energy please note.

book reviews

Nuclear Lessons

NUCLEAR LESSONS: An Examination of Nuclear Power's Safety, Economic & Political Record. R. Curls, E. Hogan, S. Horowitz & R.E. Webb. Turnstone Press Ltd., Wellingborough, Northamptonshire, U.S.A.

The accident at Three Mile Island is used as a jumping off point for an examination of the development of the American nuclear programme. Into this examination are placed, seemingly at random, various arguments against nuclear power. Sadly this detracts from the books powerful impression of the inter-relatedness of all the parts of the nuclear fuel cycle in terms of radiological hazards, hidden subsidies and energy sinks.

The presentation also breaks up the otherwise adequate account of the development of the various U.S. regulatory bodies. Despite this the contradictory role of the Atomic Energy Commission as both promoter and regulator of nuclear power and the way in which the advent of the Nuclear Regulatory Commission resulted in 'business as usual' rather than stricter enforcement comes across clearly and is referenced to many individual siting decisions. The book's other major strong point is the vivid, and simply presented, picture of ecological complexity leading to the accumulation and concentration of radioactivity. The idea that there is a 'global radiation budget' which is steadily being eroded by running releases and accidents is used to some effect.

The factual accuracy of the book leaves much to be desired, for example the plutonium producing piles built at Windscale in the 1950's are described as 'a breeder reactor' and boron is said to add to criticality problems when in fact it acts as a neutron absorber. The book also suffers from an over-use of terminology like - "seething cesspit of radioactivity" - "rabid expansion & imminent catastrophe". Such verbiage tends to occur in close proximity to graphic descriptions of the effects of low level radiation and detracts from the presentation of the anti-case. The attempt to validate the case by recourse to scientific evidence produces the presentation of material which is regarded by many anti-nuclear scientists as dubious at the very best.

A more careful selection of scientific evidence upon which to base the arguments contained in this book would have increased its value enormously. As it is the many technical slips, over-use of sensationalist presentation and the weak science based arguments mean that this book will never become 'the Bible of the No Nukes Malitia' as its jackets states.

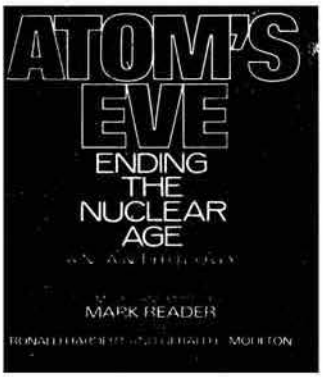
Ecoropa's Book

Nuclear Power: What It Means To You, by Peter Bunyard and Gerard Morgan Grenville, Ecoropa, costs 90p.

This booklet is an enlarged and vastly more detailed version of Ecoropa's leaflet '**Nuclear Power: the Facts they don't want you to know**'. The format is the same with 47 questions and answers, and is aimed at both those who are as yet undecided on the issue of nuclear power, and those who wish to be able to argue about it from an informed viewpoint.

The booklet covers all the issues including the necessity for nuclear power, fusion power and proliferation, with references to most of the information, although some of the them are incomplete. The text is broken up with some interesting quotations, but the booklet is sadly lacking any graphics, making it rather uninviting.

For those who are interested in the issue, but have not made up their minds, Ecoropa's booklet presents a persuasive case against nuclear power. However, for those wishing to participate in informed debate '**Nuclear Power: what it means to you** lacks the details of some of the existing 'primers' on nuclear power and which are a necessity of a good understanding of the issues.



Atom's Eve

Atom's Eve: Ending the Nuclear Age. An Anthology - compiled and edited by Mark Reader with Ronald Hardert and Gerald Moulton.

This is a remarkable anthology including pieces by Michael Flood, Jacques Cousteau, Helen Caldicott and E.F. Schumacher. If these names don't mean anything to you, they soon will, and these are only four of an impressive array of doctors, scientists, and well-informed laymen who contribute to this collection.

The first section, called 'The Perils of the Nuclear Fuel Cycle' concentrates to a great extent on the near meltdown in Harrisburg. It begins with a very followable (even for me) explanation of what actually happened in the reactor itself, and a report on the hesitancy of the authorities to evacuate what could have been a lethally dangerous area. This piece by Howard Morland sets a standard for factual, clear, though not over-simplified explanations which continues throughout the anthology.

The work is divided into sections, each covering one aspect of the nuclear debate - health hazards, environmental dangers, political implications, the increased probability of nulcear war and alternative energy possibilities. Although no volume of this size could adequately cover the history of the world anti-nuclear movement to date, this anthology seems to cover all the most important landmarks of the struggle. In the first section Andrew Cockburn reports on the Russian disaster at Kyshtym in 1957, 'the world's first great nuclear accident' with some alarming descriptions of a vast cordoned-off area, 'graveyards of the earth' and women advised to abort because of the high probability of malformed babies. Jeff Stein writes about Karen Silkwood in the sixth section, which concentrates on the secrecy surrounding the nuclear industry, and those who seek to penetrate the lead curtain.

At the end of this anthology is an index where you can look up anybody from Sam Lovejoy to Mao Tse-Tung. I feel this book could be very useful as a reference work for those who don't have the history of the anti-nuclear movement at their fingertips - who does? Or simply as a source of basic information on important names and organisations. This anthology is, however, a work which compells you to read it straight through, and I suppose the only thing I really couldn't bear was the way they spelt 'skepticism'!

Nuclear Ireland?

A Nuclear Ireland? John Carrol and Petra Kelly, Editors. 1979.

Proceedings of an Energy Symposium organised by the Irish Transport and General Workers Union in May 1978.

As might be expected, jobs and energy are a theme of this book, but by no means the main one. That distinction goes to the arguement over the health effects of radiation. Drs. Stewart, Bertell and Sternglass all presented papers on their research, which has been reported in previous Energy Bulletins, and there are very useful lists of references.

Although some of the papers relate to Ireland's energy policy, the book covers international aspects, and there are fascinating papers on trade union opposition to nuclear power in Austria and Australia.

There are lots of interesting bits of information which have not previously been reported in accessible form, but it is unclear just who the book is aimed at. If you are already convinced, then it is a useful book, but one has to get through a lot of polemic to find the good bits.

Intriguingly enough, there are three statements from pro-nuclear speakers: chief executive of the Irish Electricity Supply Board, the Irish Minister for Industry and a member of the Energy Research and Technology Division of the EEC. All carry the stamp of bland assertion and unsubstantiated argument. But then I found much of the anti-nuclear speeches to be rhetoric. The juxtaposition made it clear that this debate on nuclear power is not about facts, but about values.

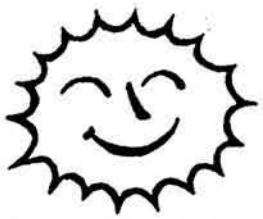
Available from John Carrol, Irish T&G, Liberty Hall, Dublin 1. Price £4.50 plus postage.

Atomic Times

Atomic Times is a comprehensive monthly meltdown of nuclear news from dozens of general, alternative, specialised and obscure sources. News and developments are arranged thematically, and there is a guide to recent articles and a special **'thrills and spills'** section. No anti-nuclear or CND group should be without it. Sample issue 25p; **subscription £1.50 + 10 SAEs** (or £1.50 in lieu if you must) from **120 Main St., Warton, Nr. Carnforth, Lancs.** All contributions of news are welcome any time.

Dundee SCRAM

Meetings every Wednesday at 7.30 p.m. Contact **Dundee SCRAM**, c/o D.A.S.S. Castlehill House, High St., Dundee.



SUBSCRIBE TO THIS MAGAZINE

THE SMILING SUN

37 West Nicolson Street Edinburgh

Come to our shop for information on energy. We stock a wide variety of books, magazines, badges and stickers.

MONDAY TO SATURDAY, 11 a.m. - 6 p.m.

Help SCRAM now!

As regular readers of the **SCRAM Energy Bulletin** will know, **SCRAM** is always short of money. This issue we will keep our plea short by simply saying that if you support the anti-nuclear movement, please support us in our work by either contributing regularly to our wages fund, or by subscribing to the **SCRAM Energy Bulletin** (and if you already do so, how about encouraging a friend to subscribe?). Your group can buy the **SCRAM Energy Bulletin** at a special reduced bulk rate and raise funds for your own activities. For details, please write to **SCRAM, 2a Ainslie Place, Edinburgh 3.**

If you wish to join **SCRAM** you can become an ordinary member for which you will receive a newsletter every six months, or a supporting member which entitles you to both the newsletter and six issues of the **SCRAM Energy Bulletin.**

BANKERS ORDER PAYMENT TO SCRAM WAGES FUND

Your Name:.....

Address:.....

..... Tel:.....

To the Manager.....Bank,

Address .....

..... A/C No:.....

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

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

BANKERS ORDER PAYMENT SCRAM CAMPAIGN FUNDS

Your Name:.....

Address:.....

..... Tel:.....

To the Manager.....Bank,

Address.....

..... A/C No:.....

Please pay on .....(1st payment) to Royal Bank of Scotland, 142 Princes Street, Edinburgh (83-51-00) the sum of for the credit of SCRAM CAMPAIGN FUND 262721 and make similar payments monthly/yearly until cancelled.

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

SUBSCRIPTION FORM /SCRAM MEMBERSHIP

Your Name.....

Address.....

..... Tel:.....

SCRAM Energy Bulletin Subscription only.
Annual sub for 6 issues:- Ordinary £4☐; Foreign £6 money order☐; Institutions £9.50☐;

SCRAM Membership only.
Members receive a 6-monthly review of the campaign. Annual membership:- Minimum £2 ☐.

Supporting Membership [Combined].
SCRAM Energy Bulletin **and** the 6-monthly review. Supporting memberships:- Ordinary £6☐; Foreign £7 money order☐; Life(!) Membership £30☐; Household £50☐.

Affiliation. Groups and organisations are invited to send for an Affiliation form ☐.

Namibian uranium demo

On Saturday, 8th November, over 300 anti-nuclear, anti-apartheid and trade union activists gathered in the centre of Preston, Lancashire to march to the BNFL plant at Springfields, in opposition to the Namibian Uranium contract. The contract is worth £150 million to the RTZ company and because of the low wages paid to the miners at the Rossing mine, RTZ has been able to sell the uranium to BNFL at half the world market price.

Speakers at the rally outside the plant laid emphasis on the situation in Namibia, where the black majority are held in check by 60,000 South African troops. John Parkinson, Secretary of the Preston Trades Council set the Rossing contract in the context of workers' lives and livelihoods in this country. He pointed out that Margaret Thatcher's 'nuclear future' spelt increasing unemployment for workers because of its capital intensive nature. John finally said how the complicity of BNFL and Edmondsons, the non-unionised firm whose lorries transport the uranium from the Channel ports, with RTZ and, indirectly, the racist South African regime, needs to be publicised as widely as possible.

Close to the gates of Springfields

On November 11th Little Black Rabbit suddenly realised that the Remembrance Day two minute silence doesn't happen any more. She pondered on this for a while, but still could not think of why this should be. So Little Black Rabbit picked up her phone to ask her friends if they had any ideas.

Eventually she discovered that the two minute silence resulted in a very sudden dramatic fall in electricity demand, which the electricity supply boards could not cope with. Hence the abolition of the annual silence.

Little Black Rabbit is now wondering what else is controlled by the electricity industry.

Stop Press:

Harrisburg Day

East Anglian Alliance would like other anti-nuclear groups to take part in a **co-ordinated action** on Harrisburg Day - 28th March. Actions could be based on your local Electricity showroom, perhaps leafletting outside (a leaflet is due to be produced), and possibly combined with publicity for the consumer campaign. Ideas, suggestions, plans, to be passed to Alan Hines, Cambridge 314024, either before or after the next Alliance meeting on the 10th January. Let's make this Harrisburg anniversary something which catches people's attention, locally and nationally!

GLASGOW BOOKSHOP COLLECTIVE

NOW OPEN - Selling anti-nuclear, feminist, socialist, anarchist, gay, third world and children's books, pamphlets and periodicals at De Courcy's Arcade, Cresswell Lane (off Byres Road nr. Hillhead tube. Open 10.00 - 5.45 p.m. Monday - Saturday; 12.00 - 6.00 p.m. on Sunday.

NUCLEAR POWER

– the plain FACTS

1. What is a nuclear reactor?

A nuclear reactor is a machine for producing heat. The heat is used to turn water into steam and the steam, at high temperature and pressure, turns the blades of a turbine which drives a generator to produce electricity.

2. Where does the heat come from?

The heat is generated during the breaking apart (fissioning) of atoms of uranium. The 'bits' produced are called 'fission products'. There are many different kinds of fission products with exotic and unusual names – Krypton, strontium, tritium, caesium. Some are very toxic, others less so. Some remain radioactive for thousands of years, others decay in a fraction of a second.

3. What happens to the waste?

The 'spent' fuel is discharged from the reactor after a year or so and stored in cooling ponds. Spent fuel contains unburnt uranium, radioactive waste and a small quantity of plutonium. Plutonium is generated in **all** nuclear reactors and is **not** a fission product.

At the Windscale reprocessing plant the radioactive waste is separated out and the plutonium and unburnt uranium recovered. The waste is stored in liquid form in double walled stainless steel tanks. The tanks must be continually cooled to remove the heat generated by radioactive decay. Heat will continue to be generated for 4 or 5 centuries, although the heat output declines over the years.

4. Is any radioactivity released to the environment?

During reprocessing some radioactivity is released to the environment. Gases are discharged directly and liquids are pumped down a long pipe under the Irish Sea. These releases are known as low-level releases (High level waste is the stuff stored in tanks.) Considerable quantities of contaminated solid wastes are buried at Drigg, a site down the coast from Windscale.

5. Can waste be destroyed?

No. Radioactive wastes take their own time to decay away. The short-lived species (radio-isotopes) soon decay, the longer-lived ones may be around for centuries or milenia. Radioactivity cannot be destroyed except in trivial quantities in a particle accelerator.

6. Can the wastes be stored safely?

Nuclear scientists are trying to develop methods of making to liquid waste into glass blocks – "vitrification". This would not stop the radioactivity but management would be easier in a solid form. A pilot vitrification plant is currently being built at Windscale. The glass blocks would be disposed of in hard rock, clay, salt mines, or under the sea. They will need to be places that are geologically stable and will remain stable for many centuries.

7. What is plutonium?

Plutonium is a very heavy material. Like most other heavy metals it is chemically very poisonous. It is also radioactive. The radiation it emits is very short range which can easily be stopped by a layer of skin or a sheet of paper or plastic. It could therefore be handled safely. If, however, plutonium is dispersed as dust it is lethal. A speck of plutonium little bigger than a pollen grain would cause cancer if inhaled. Dispersed plutonium is **extremely** expensive to clean up. Besides being toxic, plutonium is also an explosive. It was first separated at Windscale for Britain's atomic bombs.

8. How much plutonium is there is Britain?

How much military plutonium exists is not known. However, there are between 5 and 10 tons of plutonium from our civil nuclear programme. Most of this is stored at Windscale. By 1995 there could be as much as 55 tons of separated plutonium from our existing reactors.

9. What can plutonium be used for?

Besides being an explosive, plutonium can also be 'burnt' in "fast breeder reactors" in the same way as uranium. Fast breeder reactors are so called because as well as burning plutonium they can produce more from otherwise useless uranium placed in a "blanket" region around the core. There is a prototype fast breeder reactor in Scotland at Dounreay which has operated for about 3 years.

10. How much plutonium is produced in a nuclear reactor?

A large nuclear reactor can produce several hundred kilograms of plutonium per year. The precise quantities produced depend on the type of nuclear reactor. Magnox reactors, the predominant British reactor, are particularly good plutonium producers.

11. How much plutonium do you need to make a nuclear bomb?

It takes 6 to 8 kilograms of plutonium to make a bomb with considerable destructive force. If you're bright, you can do it with half the quantity.

12. Can plutonium generated in civil power reactors be used for bombs?

Yes. The Americans tested a bomb made from 'reactor-grade' plutonium in 1962. It is not possible to 'denature' plutonium and make it totally unsuitable for bombs. The more impure it is, however, the more difficult it is to make a **reliable** bomb.

13. Could a nuclear power reactor explode like an atomic bomb?

The present generation of thermal nuclear reactors **cannot** explode like an atomic bomb. However, there is still considerable doubt about the explosive potential for a fast breeder reactor. Fast reactor fuel is far more concentrated and the core of the reactor highly compact. The subject is now under study.

14. *What would happen if there was a serious accident at a nuclear reactor?*

The chances of a major accident at a nuclear power station are **remote**. However, the chances are not **zero**. There is a small possibility that radioactivity could be released following some 'incident', or perhaps an act of sabotage. In the core of an operating nuclear reactor there is a phenomenal quantity of radioactivity — several hundred times as much as would be released in a nuclear bomb exploding. If a small quantity were to be released it could be very serious; in the worst case people would have to be evacuated from down-wind, or anywhere where particles of radioactivity had settled in sufficient quantity. It is generally agreed that the dangers of accidents vary with reactor type, fast breeder reactors are potentially the most dangerous.

15. *How many reactors are there in Britain?*

The first 2 nuclear stations, Calder Hall and Chapelcross (8 reactors), are operated by British Nuclear Fuels Ltd. They are quasi-military machines although they run today as electricity generators. Subsequently the Electricity Generating Boards built 9 stations (18 reactors) of the Magnox design. There are also 10 AGRs (Advanced Gas-cooled Reactors) either under construction or operating. There are 3 prototype reactors generating electricity and a number of research reactors.

16. *How many countries have nuclear power and reprocessing facilities.*

Over 20 countries now have operating nuclear power reactors. Several more have small experimental or research facilities. Very few countries have the capability to reprocess their own nuclear fuel on a commercial basis. Britain, France, the USA and the USSR all have reprocessing plants, although President Carter last year banned commercial reprocessing in the US because of his fears about nuclear weapons proliferation.

17. *What is nuclear weapons proliferation?*

Nuclear weapons proliferation is the spread of nuclear weapons capability to more and more countries. At present there are 6 nuclear weapons countries — US, USSR, UK, France, China and India. Several other countries probably have, or could soon manufacture nuclear bombs, eg Israel and South Africa. Brazil and Pakistan are arranging to purchase reprocessing plants from Germany and France respectively. With such facilities both countries will be able to separate plutonium from their nuclear reactors. They will thus be able to manufacture bombs should they decide to do so. Both countries are military dictatorships — it is not sensible, therefore, to talk about them having a 'civil' nuclear programme.

18. *How does reprocessing exacerbate the problem of proliferation?*

Any country has the potential to make nuclear bombs, but it must first build the reactors and reprocessing plant to obtain the necessary plutonium. This takes time and considerable expense, it is also a highly visible activity and therefore politically risky. If on the other hand, a country arranges to have its spent fuel reprocessed abroad and to have its plutonium extracted and returned, it would then be able to manufacture bombs. It could short-circuit the procedures under the guise of a civilian cover. If the decision were taken, at some later date, to go for the bomb then this could be done almost in a matter of days.

19. *Why is radioactivity so dangerous?*

When radioactive substances decay, they give off energy in the form of invisible rays. Like X-rays, radioactive emissions can penetrate substances and the human body. Radiation can disrupt the molecules within living body cells, killing the cells completely, or altering their pattern of behaviour. A large dose of radiation will kill a person, either outright or within days or weeks from 'radiation sickness'. The effects of lower radiation doses may remain hidden for several years, when cancer or leukaemia may develop. It is therefore very difficult to link the illness with the cause. Radiation can also disrupt reproductive cells, causing 'genetic damage' to babies born of that person.

20. *Will nuclear energy last for ever?*

It is important to distinguish between 'nuclear fission' and 'nuclear fusion'. Nuclear fusion is a different process from that described here, and although in theory it might be possible to harness large amounts of energy, a practical scheme is still a very long way off.

Nuclear fission as described here relies on a supply of uranium ore, reserves of which may only last for 30 years. In theory, fast reactors might extend the supply some ten to fifty times, assuming the accompanying risks were acceptable.

21. *Why are nuclear power stations being built?*

Nuclear power stations got off to a head start in the 1950s because of the demand for plutonium for weapons. Because of this tie-up it is often difficult to obtain information about the nuclear industry. The nuclear industry says that nuclear power will be needed to supply electricity when oil runs out, but it is extremely doubtful whether nuclear power could be developed quickly enough to contribute very much — at present it only supplies about 3 per cent of Britain's overall energy demand. Two things are certain:

- Britain has about 1 ½ times the power station capacity that is actually needed just now
- and the nuclear industry is short of orders and is pressurising the Government.

22. *Can we do without nuclear power?*

The question is:Which will alter our way of life more, nuclear or not? We presently waste a vast amount of our energy, at least half, through inefficiency, poor building insulation and outdated technology. Although electricity can be used very conveniently, a power station wastes about 70 per cent of the energy available in the fuel. Scandinavian countries reclaim this waste heat and use it to heat surrounding buildings, in 'District Heating' schemes. A recent detailed study has shown quite clearly that energy conservation could cut Britain's energy demand without affecting rising living standards. In the long term, we can rely on the renewable sources of energy such as solar, wind and water power. Several methods of harnessing these sources are already proven, but British development is being held back by a shortage of funds — the nuclear research programme at present consumes forty times the annual budget of the renewable sources.

BOOKS TO READ

'Nuclear Power', Patterson, Pelican Books, price £1 - an introduction written specially for the layperson.

'Windscale Fallout', Breach, Penguin Special, price 90p - a review of the controversial Windscale Public Inquiry, plus an up to date report on the main nuclear issues — for the layperson.

This factsheet was prepared by the **Scottish Campaign to Resist the Atomic Menace**, based on an original published by Redbridge Friends of the Earth.

FOR MORE INFORMATION, contact: SCRAM, 2A Ainslie Place, Edinburgh 3. Tel: 031-225 7752