

SCREAM ENERGY BULLETIN



No 26

30p



CLOUDS OF DEATH

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Copy date for next issue: 2nd November, 1981.



New sticker: Nuclear Disarmament 4" car sticker, 25p + p&p. Available from the Smiling Sun Shop.

Credits

This magazine is produced for the British Anti-Nuclear campaign by the Scottish Campaign to Resist the Atomic Menace, 30 Frederick Street, Edinburgh EH2 2JR. [031-225-7752]. We welcome contributions.

ISSN 0140 7340

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

Since 1945 the nuclear industry has been trying to establish a division in the public mind between "civil" and military nuclear technology. The slogan "Atoms for Peace" was launched by US President Eisenhower as a Cold War public relations exercise... and to provide cover for the building of reactors to produce plutonium for nuclear weapons. Three years later, in 1956, the British authorities opened the Calder Hall reactors next to Windscale in Cumberland. They were hailed as "the world's first commercial nuclear power station" — effectively concealing their designed purpose which was, and still is, to make plutonium for British Bombs.

Only in the 1970s did the exposure of this con-trick begin in earnest. Many people were drawn into opposing nuclear power developments because of their role in nuclear weapons production. As the movement broadened and looked at a wider range of arguments against nuclear power, opposition to nuclear weapons continued to be a priority.

Now, with the threat from nuclear weapons much more urgently apparent, opposition to nuclear power developments could seem to be a "local issue" for people whose areas are directly threatened. But those threatened areas cover large parts of these islands.

On pages 9 and 10, Jane Bowers looks at the radiation hazards of nuclear technology — and at the frightening prospect of a nuclear power plant being used as a "radiation amplifier" in war.

Nuclear power and nuclear weapons are STILL inseparably linked. In the end, people opposing nuclear power and nuclear weapons are engaged in the same struggle — the struggle for survival. In this issue of the Energy Bulletin we look at the development of Nuclear-Free Zones and their contribution to the overall campaign [on p.3].

Letter

Electricity Consultative Councils

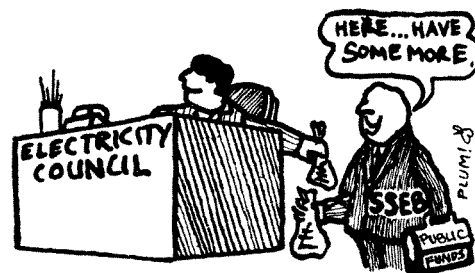
The article, 'Consumer Protection?' in Bulletin 25 was both interesting and timely. However, the Eastern Electricity Consultative Council has a long way to travel before it becomes an ally in the fight against Sizewell B, as suggested in the article.

The Council's annual report is featured in the regional paper today (10th September). The report states: "The (ECC) makes it clear that it does not intend to become involved in the Sizewell debate. But it says it remains 'firmly convinced' of the increasing role that nuclear power must play as supplies of fossil fuels dwindle." No doubt these sentiments are the result of the member education programme which the Council referred to in last year's report, where the CEBG was gratefully thanked for arranging member's site visits etc., to nuclear installations.

Earlier this year we took up, with the Council's Secretary, highly pro-nuclear remarks delivered by the Council's Chairperson. This occurred when the Council adjudicated upon a consumer independently withholding payment as a protest against nuclear generation.

Inevitably, the remarks were explained away as 'the personal views of the Chairman' (Mrs Kathleen Moody BA) and 'distorted by the Press'. Is it so inevitable that these things will happen? Whatever the difficulties with Lay Councillors, lack of research facilities and domination by the supply industry, there has to be the will to act judicially and independently on every issue brought before the Council. The Western Consultative Council has shown that it can be done with the nuclear issue. We shall continue to make sure that the Eastern Consultative Council does not allow itself to become part of the CEBG's Sizewell publicity machine. It seems this is the best we can hope at the moment.

John Dearnley, Clerk of the East Anglian Alliance Against Nuclear Power.



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Price of single issue (including p. & p.):	£0.75	£1.50
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Nuclear-Free Zones

By September this year over 100 local authorities in the UK had declared their areas to be Nuclear-Free Zones. These expressions of "official" opposition to nuclear weapons [and in some cases nuclear power] at local government level are in themselves politically exciting, and they are encouraging tokens, at least, of the breadth of potential support for our movement. But how can these tokens be turned into more directly effective opposition?

Occasionally, talk of Nuclear-Free Zones provokes accusations of parochialism. When an area — district, town, or even street — declares that it wants no part in the nuclear game, opponents may make comparisons with the "not in our valley" approach to opposing motorways.

But the Nuclear-Free Zone idea is, in its origins and its implications, essentially internationalist. It appeared as the focus of a campaign by the Pacific island nations against French weapons testing and American military bases. Currently, the concept of a Nuclear Free Europe opens the possibility of breaking down the East/West division imposed by the power blocs.

However, this ultimate aim can only be achieved by the coming together of local initiatives. Up to now, local authority declarations have often arisen from the personal concerns of individual councillors. In many cases, the first that local anti-nuclear groups have known of the existence of a Nuclear-Free Zone motion was reading about its being passed. Co-operation and co-ordination are the steps needed now, and these are beginning to be taken.

Keeping Count

At the time of writing, over 100 UK local authorities had passed anti-nuclear motions, usually based on a model motion circulated in Scotland by Glasgow and in Wales and England by City of Manchester. This motion simply objects to the "manufacture or siting" of nuclear weapons in the area. The National Executive Committee of the Labour Party has called on all councils to support this motion, and to go beyond it in refusing to co-operate with all but the bare legal minimum of "Civil Defence" preparations. This call has not deterred Conservative-controlled Cleethorpes from passing the motion.

Some authorities have expressed opposition to all local nuclear developments, whether weapons, power stations, waste dumping or transport. These include Tyne and Wear, South Yorkshire, Sheffield, West Midlands and Gwent. Another group, including 13 London Boroughs, have also called for an inquiry into the transport of nuclear waste.



Local councils stress that they have scarcely any legal powers over nuclear developments in their areas. Indeed, powers over expenditure of any kind have been virtually removed from Scottish authorities, and the Government is threatening a similar takeover in Wales and England. For councils opposed to wide areas of Government policy, declaring a Nuclear-Free Zone can mean an important and powerful symbol of their total opposition.

Councils have used the propaganda value of Nuclear-Free Zone declarations to arrange showings of *The War Game*, and to hold joint public meetings with local anti-nuclear groups. South Yorkshire and the GLC have set up working groups to explore means of directly pressuring the military and nuclear power authorities.

At least four councils — South Yorkshire, Doncaster, Barnsley and Watford — have entered objections to the Sizewell reactor inquiry, and more are being encouraged to follow suit. Twelve Scottish authorities have so far joined the call for an inquiry into the proposed Coulport Trident submarine base.

Some councils (e.g. Lothian Region) have said that they will refuse to co-operate at all in "Civil Defence" planning and in war games. These authorities risk being charged the cost of central government's doing their war planning for them, but it would be foolish of the Government to enforce this, given the publicity its absurd plans would receive as a result. Some authorities — e.g. Islington — have in any case published their previous War Plans.

Moving Forward

Further ideas will be developed at a conference organised by Manchester City Council in October, for which, by mid-August, over 100 local authorities had indicated support.

Thus far, many more councils have adopted anti-weapons policies than have opposed the whole nuclear industry. Reasons for this include the influence of "Atoms for Peace" propaganda and nuclear industry claims about job creation. Many councils have limited themselves to weapons-only motions on tactical grounds, in the knowledge that they will be passed rapidly. But, as South Yorkshire council hope to argue at the Manchester conference, Nuclear-Free Zone policies should include opposition to all aspects of the nuclear chain. True effectiveness will lie in stopping weapons material production at source.

Making Connections

A strange reversal seems to have taken place — two years ago, anti-nuclear power groups were pressing the "weapons connection" and doing a great deal to keep opposition to nuclear weapons alive. Now, when the blatant horror of the Bomb is much more in the public eye, we must keep reminding people that the threat from nuclear technology is wider than the risk of war — it is imposed on us through the very existence of the nuclear chain, whose links are spread all over these islands. Comprehensive opposition by local authorities will play a crucial part in building effective locally-based opposition to further nuclear developments.

SCRAM has produced information sheets on Nuclear-Free Zone policies. Both CND and the ANC are preparing larger briefing packs on the subject which should be available soon.

Luxulyan

The occupation of the reactor test site at Luxulyan, Cornwall continues, despite the efforts of the CEBG, who took the Chief Constable of Devon and Cornwall to court on July 28, requesting to comply with the request, stating that the demonstrators were not breaking the law as the occupation had the consent of the landowner.

At the time we went to press the Appeal Court was still considering its decision on the case against the Devon and Cornwall police. During the hearing the police lawyer said that in their opinion the Luxulyan occupiers were within the law and that their "passive resistance" could not be construed as a breach of the peace.

The occupiers urgently need physical, material and financial support, and have produced a badge showing a drilling shaft with a red X across it and a choice of slogans — "Nuclear Power at Luxulyan/Waste Dumping?/Uranium Mining?/Stop It Before It Starts". 25p each or 15p for orders of 10 or more. Cheques/PO's etc. to N.J. Usher, The People's Anti-Nuclear Information Caravan, Luxulyan, Cornwall.



Bomb Hold-up

Leeds Other Paper sleuths were rewarded for their vigilance on the night of Tuesday, September 8th, when they managed to bag some remarkable close-ups of an MOD-escorted, Windscale-bound train carrying a nuclear weapon (possibly the top end of a Polaris missile, they speculate). The bomb carrier, flanked by carriages with barred windows and containing armed guards, was held up at Leeds for 20 minutes — due to a foul-up on the line. The intrepid reporter managed to chat to the driver, but enthusiasm for his/her presence was distinctly lacking. Another railway worker reported that "There's always trouble when they get into this area".

Grants Given

A scientific study into the suitability of embedding medium-level nuclear waste in cement as a means of containing it prior to disposal is being carried out at Aberdeen University.

The Department of the Environment has awarded £49,308 to Dr. F.P. Glasser of the University's Chemistry Department — to undertake research work on the potential of cement matrices for the immobilisation of the waste. The work will continue for at least 5 years.

The North Atlantic Treaty Organisation have given £17,500 towards the running of an advanced study institute for scientists at Stirling University next summer. Delegates will discuss "The Multi-nuclear Approach to Magnetic Resonance".

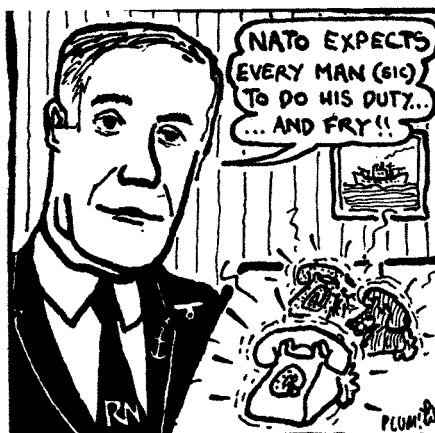
Radiation Hazards

A recent study by Dr. Monty Charles, CEBG's Berkely Laboratories and Professor Patricia Lindop, Bart's Medical College, London, published in the Journal of Radiological Protection, claims that internationally accepted values for radiation risks are too low, particularly high Linear Energy Transfer (LET) types of radiation — such as neutrons from nuclear reactions and alpha particles found in waste. The risk, they state, is probably four times higher than indicated by the International Commission on Radiological Protection (ICRP), the internationally accepted authority. The study excludes data from Hiroshima and Nagasaki victims, since these data are increasingly being shown to be unreliable and are being reassessed. The writers stress that their findings are themselves fraught with uncertainty, and may underestimate the danger levels, but they have no hesitation in emphasising the need for revised programmes for assessing risks.

Guardian, 24.8.81

Coulport Extra

By the time you read this South Yorkshire County Council will almost certainly have joined the list of local authorities objecting to the Coulport Trident base (see page 3). The Scottish Council for Civil Liberties have entered a formal planning application to build a centre for the study of civil liberties questions in rural areas — issues such as those raised by the imposition of large industrial or military developments. The proposed centre would be in the middle of the area the military wants. Dumbarton District Council planning committee is likely to view the SCCL application "very favourably". The Navy Commander on the Clyde (Commodore George Vallings, tel. Helensburgh 4321) has responded with the "assurance" that "When the war starts, all the submarines will be out at sea"....!



Disconnections

In February of this year, in their report "Living in the Dark Ages", the Scottish Fuel Poverty Action Group presented a chilling analysis of the SSEB's harsh treatment of customers who found themselves in difficulties over paying their bills. In August, a second report has backed up their findings. The Policy Studies Institute, an independent body, points out that the number of disconnections routinely carried out by the SSEB — 13,650 in the last year — is very high compared with those of all other boards except London. The report recommends improvements in the voluntary code of practice designed to protect especially vulnerable groups, such as children, the disabled, old and ill. One Health and Social Security Under Secretary was so concerned about SSEB's attitude to supplementary benefit claimants that she arranged talks with SSEB Chairman Roy Berridge in July, and subsequently reported to the Commons her hope for future improvements.

Permission Refused

Caithness District Council have refused the UKAEA permission to dump refuse from Dounreay on local authority tips.

A local Councillor, who works at Dounreay, proposed that the Council take no action on the application, accusing the UKAEA of 'complacency and carelessness'.

In one case of waste management breakdown recently, there had been "a hue and cry" over the contamination of a carpet in a tea-bar at the site. On another occasion, contaminated material had been deposited in a skip designed to hold only non active waste. It is understood that on both occasions, amounts of radiation well in excess of recommended safety levels were recorded.

Secret Crash

On August 20 a nuclear waste flask was tilted over in a collision with a shunting engine at Bescot yards near Birmingham. Councillors and residents in the West Midlands — recently declared a Nuclear-Free Zone — are angry that results of the British Rail enquiry into the accident are being kept secret.

Closures

The CEBG plan to shut 21 power stations in England and Wales in 1982, in addition to 20 stations to be closed in October 1981. Up to 1700 jobs will be lost. The CEBG hope to save £150 million through the closures — which will also, of course, pave the way for the opening of nuclear plants at Dungeness, Hartlepool and Heysham as well as the Drax coal-fired station and the pumped-storage facility at Dinorwic, Wales. Total capacity shed will be 6700MW — more than twice that shed in the previous four years.



'Devil' Stopped

On September 13th nearly 3000 members of the Abalone Alliance gathered for a blockade of the nearly-completed Diablo Canyon reactor in California. After briefing and non-violence training sessions, about 600 people set off for the site entrances early on the morning of the 15th. Some groups blockaded the gates from outside, while others carried specially-built ladders to climb over the fences and obstruct the gates from the inside.

Meanwhile, about 50 people tried to get onto the site from boats — some getting stranded on an isolated beach by the tide!

The combined activities stopped most work on the site for two days — though the construction company went to the trouble of bringing some workers in by helicopter. It was learnt that some uranium fuel for the reactor was already on site, thus frustrating the original objective of preventing fuelling and warm-up testing of the plant, which lies on a major geological fault.

The action continued for a fortnight. It stopped on September 29 because 1,900 protestors had been arrested and numbers were getting low — although many had come prepared to stay for a month.

The following day it was announced — only hours before low-power testing was due to start — that the reactor was to be shut down "indefinitely". The reason given was a "design fault".

Plus ça change

Despite the victory at Plogoff, and the freeze on development of 18 reactors at 5 sites until the energy debate in October, French environmentalists are coming to the conclusion that the Mitterand government is essentially uninterested in radically transforming energy policy in France. Four 1300MW reactors planned for Chooz, on the border between France and Belgium are affected by the freeze, as are two at Cattenhom and Golfech and four each at Le Pellerin and Civaux. However, three of the five sites are either greenfield or hardly developed, so that the effect of delay will be minimal. In addition, the moratorium includes the month of August, during which all of France is on holiday anyway. The October date for the energy debate practically guarantees shallow discussion, since there will not have been enough time to prepare adequate arguments.

The French energy minister has stated

recently that energy policy is a central government concern. Preparations will have to be made for local discussions and referenda — but local communities will not have the right to veto government decisions. Pro-nuclear forces complain that the government is shilly-shallying, but anti-nukers fear that what the Socialists intend is a continuation of a full steam ahead programme — with popular assent this time.

France already derives 40% of its electricity from nuclear power. Twenty-nine reactors are already linked to the grid, and 24 others have reached an advanced stage of construction. None of these are affected by the moratorium.

WISE, 20.8.81;
Electrical Review, 7/14.8.81

Unholy Alliances

Some US Intelligence and State Department officials are convinced that South Africa, Israel and Taiwan are co-operating on developing nuclear weapons production and delivery systems. Over the last few years, South Africa has been supplying increasing amounts of uranium to the other two, whilst Taiwan works on enrichment techniques and Israel works with Taiwan on rocket design. In addition, the Soviet news agency, TASS, claims that the People's republic of China is also involved in enrichment of South African uranium.

New York Times, 28.6.81;
Soviet News, 28.7.81

Canada

Atomic Energy of Canada Ltd., are planning to develop small, unattended water-heating reactors designed "for heating large institutional, commercial and industrial buildings".

The mini-monsters are based on existing unmanned "Slowpoke" reactors currently running in research establishments. A prototype is planned for mid-1983, full production for the 1990's.

Japan

Due to opposition from the Northern Marianas islanders, Japan's application for permission for "experimental" waste dumping in the Pacific (900km in south-east of Tokyo) has been deferred.

South Korea

Certain statements from the President of South Korea this summer have given rise to speculation as to whether that country has developed nuclear weapons capability. The President has declared that his country has the means to reduce North Korea to ashes, and would be prepared to do so if attacked. Following cancellation of contracts with Canada, South Korea has entered into agreements with France to produce two reactors, and there is fear that the deal includes plans for reprocessing facilities. South Korea plans to build 44 plants by the year 2000, and international competition for contracts is very hot.

No Nuclear News, Summer 1981

China

China is planning to build six 900MW nuclear power stations as part of her "modernisation" programme. The present plan is to build two each in South China, East China and the North-East. They are expected to be commissioned between 1988 and 1991.

Manufacturers of nuclear equipment from the U.S., France, Britain and West Germany are bidding for orders on the new project. The Chinese Government has reached agreement in principle with the French Government on the purchase of two 920MW power stations and on co-operation in nuclear technology. Also China and the United States are expected to sign a protocol on scientific and technical co-operation in nuclear physics and controlled nuclear fusion.

European Developments

Italy's new energy plan aims for 24 power plants, eight nuclear (1000MW each), four to be ready by 1990 — total capacity 34,000MW... Yugoslavia's first 668MW plant went critical on August 15th; a second is planned... In Portugal groups are objecting to the Spanish Sayago reactor, under construction near the border. Domo valley residents fear for the water supplies and the grape harvest. The Portuguese government refuses to intervene, claiming this would constitute interference in the internal affairs of another country. However, the grids of the two countries are completely integrated... Following the refusal of the Netherlands government to discuss energy policy with them, the Dutch anti-nuclear movement is holding a national week of action, September 19-26 to attempt to force closure of the Dodewaard plant...

The September 19th blockade of the Dodewaard reactor lasted three days.

Reasons for shortening it from the planned week-long action included a large number of people being injured in clashes with riot police and, according to "organisers" quoted in the press, some complaints by local farmers. The blockaders included several busloads of members of the Dutch 50-plus organisation. Anti-nuclear members of the organisation also called on members to donate to the campaign and for similar co-operation across "age-gaps" in other countries. Netherlands again — Dutch Greenpeace have failed in an attempt to halt waste dumping in the Atlantic through court action. They are going to present their anti-dumping case to the London Convention on Marine Pollution in October. The Netherlands plans to dump 350 1,000 litre drums and 3,000 200 litre drums of low and medium level waste.

WISE, 20.8.81

Uranium Mining in Europe

Europe's uranium for its civil and military nuclear programmes has come mainly from Canada, Africa (especially Namibia, Niger and Gabon), and Australia. However, since the late 1940's, small quantities have been mined and milled in W. Europe, especially France. As overseas sources become less secure due to political factors; as world supplies dwindle, and as nuclear arsenals and power programmes expand, Europe is looking much more to its own indigenous reserves.

The EEC and Uranium

The EEC is based on 3 treaties; one of which relates to nuclear power, known as the Euratom treaty. This treaty states that "special fissile material (uranium and its derivative plutonium) shall be the property of the Community". It also declares that any member state that does not adequately exploit its own uranium reserves will be cut off from access to other sources of supply within the EEC. So the EEC has direct control over uranium resources in its member states, and can exert pressure on them to exploit their uranium. There is no mention of the interests of the local population, or even of the countries themselves. **The declared aim of the EEC is to be as self-sufficient in uranium as possible.** At present it imports about two-thirds of its annual uranium requirement of 6,600 tons. Total estimated reserves stand at 241,000 tons uranium (excluding Ireland).

Britain: Orkney has an estimated several thousand tons uranium, probably the largest deposit in the country. However, overwhelming local opposition stopped any test-drilling in 1979. The current Government line is that uranium exploitation in Britain would not be economic. EEC prospecting is planning in Cornwall, and is at present underway in Ulster (near Fintona, in the West).

Non-EEC Countries

Czechoslovakia: Very little concrete information on this country's uranium deposits and mines is available, but it seems that it is the most important uranium supplier in the Eastern Bloc. The biggest mining area is around the town of Pribram, about 50 miles S.W. of Prague. There, large signs proclaim that 'Our Uranium is for Peace'; and villages nestle directly at the feet of huge tailings piles from the mines. Any analysis of the 1968 invasion by USSR should take these important uranium reserves into account.

Finland has 4 nuclear power stations; uranium was mined till 1962 in small quantities. Recent plans for developing a mine in Lapland have been delayed for at least a year due to grass-roots opposition.

Portugal began mining in 1945; in 1980 it sold 102 tons of uranium to Iraq. By 1985 it is expected that 270 tons will be exploited annually.

Spain has 4 nuclear plants on stream with another 11 on order. Much prospecting is now in progress, and 4 mines and 4 mills are producing 350 tons of uranium a year. The milling facilities are in the process of being expanded on a large scale. In Catalonia, however, organised opposition has brought uranium prospecting by the U.S. based multinational Chevron to a halt.

Sweden has 9 reactors in operation, with another 3 planned. They will need ca. 30,000 tons of uranium till 2010. There are plans to mine in the far north, where an estimated 4,000 tons have been found in high-grade ore. The local community is fairly evenly divided over the mine, and the final decision will be taken by the Swedish Parliament this autumn.

The experimental mine at Ranstad in Central Sweden has now been finally closed.

Denmark has control over the mineral rights of Greenland, where there is about one sixth of the total estimated amount of uranium in the EEC. Denmark so far has no nuclear programme, but research into extracting the uranium from the low-grade Greenland ore is proceeding at the Riso Research Laboratory. Mining has not yet started, and opposition in Greenland is strong, with 3 of the 4 political parties, including the ruling one, against the mining. In 1982 Greenland will vote in a referendum on whether or not to stay in the EEC.

France is the largest uranium producing country in W. Europe. It has been mining since the late 1940's, and now gets almost half its uranium from domestic sources, mainly from Limousin, the area around Limoges. A great uranium rush is now underway, with 15,000 square kilometres officially earmarked for prospecting, to meet more of the needs of its huge and ever-expanding nuclear programme from domestic sources. Last October a national anti-uranium network (Reseau Uranium) was set up to co-ordinate the many groups opposing uranium developments throughout the country. See Energy Bulletin No.19 P.6 for more details.

German Federal Republic has no uranium mines at present but prospecting is in full swing in the South. In the forefront of the prospecting companies is ESSO in N.E. Bavaria, where uranium was mined during the 1950's. Opposition is also strongest in this area, and the second European Uranium Conference was held here in June this year. See Energy Bulletin No.25, p.5 for more details.

Ireland has no nuclear power stations, and no uranium mines, but there are large uranium deposits which the EEC is very interested in, as are several mining multinationals, including Rio Tinto Zinc. Exploration is going on all over Ireland (both in the Republic and in Ulster). Drilling has been suspended temporarily in Donegal, where the largest deposits appear to be, and where opposition is most organised. The new coalition Government, made up of two parties both of which opposed uranium exploration and mining when in opposition, have still not made any statement on the subject since coming to power in June this year.

Italy: Although prospecting has been going on since the 1950's it appears that there are no large deposits. In 1977 an attempt was made to open a small mine in N. Italy, but local opposition prevented it. However, Italy will mine 120 tons uranium in 1981.

For further reading see P.15

FIGURES IN TONNES URANIUM

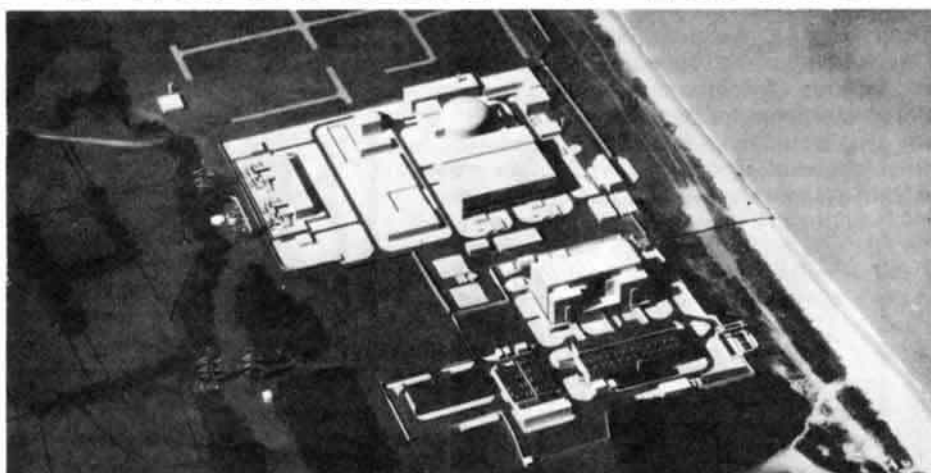
Country	Total Production to 1980	Reasonably Assured @ \$80/Kg [1]	Total Reserves [2]	Attainable Max Production Capability/Yr.	Year Max Production Achieved
Austria	-	2000	4000		
Britain	<100 (3)	-	7000		
Finland	<100	-	3-4000		
France	29600	38000	164000	4500	1986
W. Germany	200	4000	24000	200	1984
Greenland	-	-	43000		
Ireland (4)	-	-			
Italy	-	-	3000	<100	1981
Portugal	2200	7000	21000	300	1984
Spain	1200	10000	38000	1300	1985
Sweden	200	-	304000	400	1983

1. This price refers to the maximum cost of extracting the Uranium per Kilogramme in US Dollars.
2. These include reasonably assured reserves extractable at a cost up to \$80/Kg and between \$80 and \$130/Kg, as well as estimated additional reserves extractable at a maximum cost of \$130.
In considering this figure, it must be borne in mind that at current market prices, probably only 10-20% of the \$80/Kg reserves could actually be produced economically.
3. From 1845 for glass and ceramic colouring.
4. No figures available.

Data from **Uranium Resources, Production and Demand** (OECD, Dec. 1979).

NB: In 1979 and 1980 the "Western" world produced 38000 and 41000 tons of Uranium respectively. The largest producer was USA with 19000 and 20900 for the 2 years.

Nuclear Plans



CEGB mock-up of the Sizewell PWR

Sizewell

The Secretary of State for Energy, Mr. Howell, has promised that the Sizewell inquiry will take into account the economic, environmental and safety aspects of the development as well as planning aspects. Among the things to be considered are:-

1. The CEGB's requirement for the power station in terms of the need for secure and economic electricity supply taking account of the Government's long-term energy policy;
2. The safety features relevant to the design, construction and operation of the station and in particular the views of the Nuclear Installations Inspectorate as the licensing authority;
3. The arrangements for waste management, in the light of the views of the authorising Departments; and
4. Implications of the proposed development (including both construction and operation) for agriculture and fisheries, local employment, water supply and disposal, transport requirements, coast protection, housing and public services, and local amenities.

A group of anti-nuclear organisations recently wrote to Mr. Howell with a series of demands about the forthcoming public enquiry. The demands in the letter, which was sent without any consultation with SCRAM, included that there should be at least a year between the publication of the PWR safety report and the inquiry, that

there should be public funding for objectors, and that the groups should be consulted about the appointment of the 'expert assessors'.

The Minister rejected these demands out of hand. As a result, at least one of the groups, the Political Ecology Research Group, will boycott the inquiry. It also looks increasingly unlikely that another of the groups, FoE Ltd., will attend.

Part of the inquiry's remit is to consider the application in the light of the Government's energy policy. The Minister's refusal simply confirms that the inquiry will be a farce.

Corporate Plan

Depleted Uranium from the present thermal reactor programme, if used in fast reactors, could provide as much energy as all the proven coal reserves, according to the 'Medium Term Development Plan' of the Electricity Council. Regular orders for fast reactors, however, are unlikely until after the end of the century. But the introduction of commercial fast reactors in the UK would be 'facilitated by international co-operation'.

The Medium Term Plan proposes several courses of action to maintain supplies of electricity and limit price increases. These include the placing of new orders for nuclear plant 'consistent with the CEGB's thermal reactor strategy' and... "... assisting customers in the smooth transition of energy demand towards electricity produced from the more plentiful resources of coal and nuclear power."

The report is vaguely enthusiastic about CHP schemes, but doesn't say how much energy they are expected to contribute. The industry is said to 'strongly support' the investigations into CHP which should be completed by the end of 1982.

Conservation is expected to save 20% of expected energy demand by 2000, but the report is less enthusiastic about renewable sources which are not expected to make a significant contribution by the end of the century. Of the renewable sources the industry is most enthusiastic about wind-power. Detailed investigations at three sites will begin soon to assess their potential for 1MW windmills. Further developments would involve the installation of a cluster of perhaps 10 windmills.

Despite their lack of enthusiasm for renewable energy sources, the Electricity Council appear to have an even lower opinion of their customers; 'increased resistance to large-scale industrial developments, including new power stations or coal mines, could extend further timescales for the introduction of such projects. Because of further increases in the price of electricity the extent of fraud, or at least reluctance to pay bills, is expected to grow, exacerbating cash flow problems.'

* - Medium Term Development Plan, 1981-88.

The Electricity Council, 30 Millbank, London SW1P 4RD.

White Paper

The most recent White Paper*, produced by the Government in response to the Select Committee on Energy's report on Nuclear Power, was published in July.

The report reaffirms the Government's commitment to a programme of P.W.R. stations but they do say that:- "The Government will keep its strategy under review and does not propose to authorise specific new nuclear power station orders until it is fully satisfied that each is justified".

Robin Cook M.P. writing in the 'New Statesman' (21st Aug. 1981) believes that this statement reveals signs of retreat. The White Paper fails to commit the Government to one power station a year for a decade. The Government's original nuclear commitment was based on the need to build 15 Gigawatts over the next decade but the White Paper's forecasts are based on a need for 20 Gigawatts by the end of the century.

The Government also seem to be hedging their bets on economics, saying that:- "... if the nuclear industry can build competitively there is the prospect of continuing substantial work load for it." Robin Cook may be rather optimistic in seeing signs of retreat in the White Paper. It could be that this is merely the Government's 'low profile' approach.

The Government were clearly upset by the Select Committee's criticism of their analysis of the costs and benefits of Energy Conservation. The White Paper assumes that conservation will save 20% of demand by the end of the century. The impact of conservation, says the Government, is difficult to assess. It is difficult to allocate the savings from most types of conservation to specific fuels. Fuel substitution makes the situation more complicated, and many consumers may choose to take some of the benefits in increased comfort. The Department of Energy is commissioning further research into this area.

A recent study by Gerald Leach points out that although 90% of domestic energy demand is met by fossil fuels, it is ultimately the most expensive fuels which are saved. Electricity is the most expensive, followed by oil (See Energy Manager May 1981).

Surely the best way for the Department of Energy to further its research is to try an experimental energy conservation programme.

* - 'Nuclear Power: The Government's Response to the Select Committee on Energy's Report on the Nuclear Power Programme'. Cmnd. 8317, £2.30.



Keep It In The Ground

An excellent monthly newsletter with uranium news and information from all over the world.

Published by WISE in Amsterdam, it is available from WISE-Oxford, 34 Cowley Road, Oxford or The Smiling Sun Shop, 37 West Nicolson Street, Edinburgh. Price 25p; annual subscription £4 (only from Oxford).

Besides their historical and political connections, nuclear weapons and nuclear power have one very obvious common factor; they both expose the public — us — to radiation. This could happen catastrophically, in war or after an accident at a nuclear power station or weapons storage site. It has recently become apparent that military planners see nuclear power sites as "weapons" of a kind. In last September's Square Leg war-game a mock-bomb was dropped on the Windscale plutonium factory/reprocessing plant. An area of Scotland extending through Clydeside to the North-East was declared sterilised for over a century. With a different wind direction, the "poisoned" area would have extended to London.

We are already exposed to "routine low-level releases" of radiation from power stations, weapons factories and from Windscale. It should be obvious that the struggle against the nuclear threat is about the quality of our lives now, as well as about averting catastrophe. To work on either front, we need to inform ourselves: here JANE BOWERS of the Medical Campaign Against Nuclear Weapons outlines what is known - and the arguments - about the effects of radiation.

Recently, the public in Europe and the USA has become increasingly aware of the danger of emissions of radioactivity from nuclear power stations. The major accident at the Three Mile Island reactor has brought home the reality of the danger, and information about other accidents which have occurred since the beginning of nuclear power electricity generation has been widely publicised. The continued building of nuclear power stations, and the steady increase in nuclear weapon arsenals, increases the most catastrophic possibility that a nuclear power station could be hit by a nuclear weapon.

Recently published figures show that an attack on a reactor in the Rhine-Neckar valley, when the wind was coming from the south-east, would render uninhabitable one third of the area of West Germany. This implies a very pessimistic outcome for densely-populated Europe from even a very limited nuclear exchange between the USSR and NATO. This contrasts with the picture currently painted by British Government publications, which claim that a high proportion of the population of Britain would survive an all out nuclear war, and be able to rebuild a decent society on the ruins.

The measurement of radiation effects on humans.

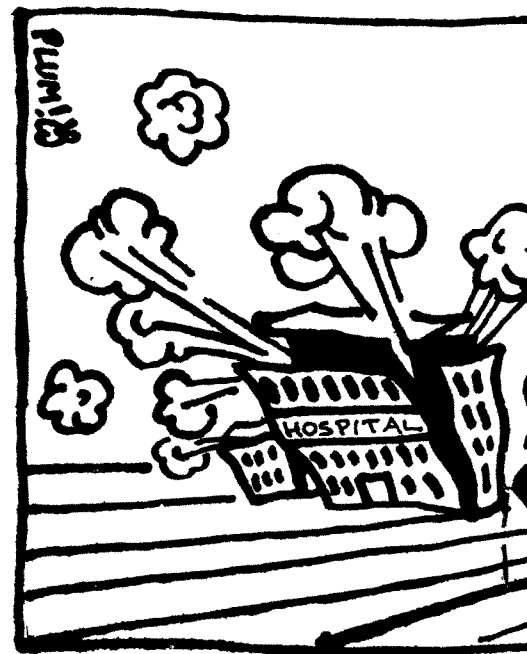
Making detailed calculations of the effects of radiation requires consideration of many complex factors, some of them interactive. Conclusions are based on the results of previous studies of radiation effect; these studies have inevitably been limited by events. For instance, the bombings of Hiroshima and Nagasaki are the only occasions which have caused very large scale exposure of humans to very heavy doses of radiation. The results of these events have been studied very intensively by the Japanese for 35 years. Recently, however these studies have been shown to rest on seriously erroneous estimates of radiation dose. It will take several years' work to correct the Japanese calculations. In the meantime, there is a severe shortage of accurate data on the effects of radiation.

Studying the effects of low-level radiation on the human body is made difficult by the statistical requirement for large numbers of subjects when the incidence of an abnormality is low. To detect a tenfold increase in childhood cancer, i.e. 5 per 1000, a test population of 10 million is required. As evidence accumulates, however, each revision of the calculations of radiation effects has tended to show that they were more dangerous than previously believed. For instance, until recently it was believed that low-level radiation was harmless, at the dose levels permitted for workers with radioactive materials; now it is generally believed that any level of dose carries some risk.

Radiation is measured in several ways. The curie is the unit of activity, defined as 37 million emissions per second. It does not tell what type of radiation or the amount of energy involved. The rad is the unit of dose which measures the energy absorbed per unit mass. One rad is the absorption of 100 ergs by a gram of matter e.g. living tissue.



The most significant measure, from the point of view of damage to living organisms, is the rem (Roentgen Equivalent Man), which is equal to a dose in rads multiplied by a factor called the relative biological effectiveness (RBE). This takes into account the greater effectiveness of some types of radiation in producing biological effects. Different types of radiation which deposit the same energy in the tissue can produce different damage.



Clou

This is due to factors such as their different depth of penetration of the tissue. For beta and gamma radiation, the RBE is approximately 1. For high energy neutrons, which are also emitted by a nuclear explosion, it is about 10.

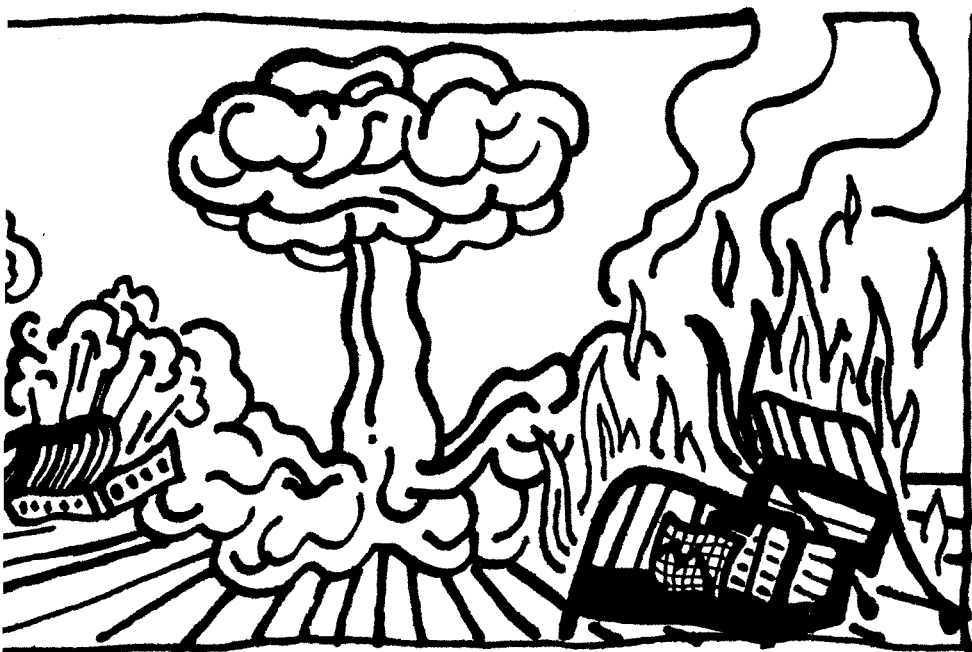
Short term radiation effects.

The effects vary considerably from one person to another, depending, for example, on age and health, but for a group subjected to a dose of 600 rem delivered over a day or two, survival is almost impossible. 400 rem delivered over the same period would kill about 50%. Exposure to 100 rem for the same period of time would cause sickness and some deaths. The symptoms of radiation sickness are loss of hair, vomiting, diarrhoea and internal bleeding. Some types of cells stop dividing and in some tissues this causes a rapid decline in their number. One cell type affected is the white cells in the blood, which are essential for the body's ability to resist infection, so that deaths can result from infections which would normally be trivial.

Long term radiation effects.

The survivors of Hiroshima and Nagasaki have shown an increased incidence of several types of cancer including leukaemia, cancer of the thyroid, breast, bone, lung, oesophagus, stomach, urinary organs and lymph glands.

Reports indicate a high incidence of microcephalia and other abnormalities among infants born after the bombs, but there has not been enough systematic study to give firm conclusions.



ds of Death

The long term effects of a release of a given quantity of radiation depend very much on the specific isotopes present. The half-life of the isotope is the amount of time required for its rate of emission of radioactivity to fall to half of what it was initially. The half-life of Strontium-90 is 28 years, of Caesium-137 30 years, of Plutonium-239 24,000 years. Other isotopes have half-lives of seconds or days. Thus some emissions cause a longer-lasting radiation hazard than others which have the same initial activity. Another important factor is that some isotopes are actually stored by the body. Heavy metals are deposited in the skeleton, nearest the blood supply, where they can steadily irradiate the bone marrow, causing a risk of leukaemia. Even very small quantities of Caesium-137 or Strontium-90, which are present in nuclear reactors, can deliver a high local dose when stored in the skeleton.

A clinical follow-up of a group of people treated with radioactive Thorium for one ailment, found that 60% developed liver cancer over 20 years. Thorium is concentrated in the liver and they had received a cumulative and highly localised dose of 20,000 rads.

The radiation hazard caused by a nuclear weapon hitting a nuclear power station.

Consider the radiation effects caused by a one megaton weapon exploding at ground level. Given a steady wind speed of 15 miles per hour, the lethal zone is about 400 square miles. Taking a maximum acceptable dose of 2 rem per year (the current maximum accepted radiation

dose to civilians in the USA), 12,000 square miles would be unuseable for a year. More than 20,000 square miles would be uninhabitable for one month. Let us compare this with the radioactivity which would be released if a one megaton weapon was exploded on a 1000 megawatt nuclear reactor. Assuming that the radioactive material in the core is vaporised, it would combine with the radioactivity of the weapon. Both would rise into the characteristic mushroom cloud and spread in the same way as fallout from a nuclear weapon alone.

Long-lasting Danger

For the first week the effects would be much the same as for the weapon alone. Its initial level of radioactivity is much higher than that of the power station. But the average half-life of isotopes released by the nuclear power station is much longer than the average half-life of isotopes released by the weapon alone. Thus the level of radioactivity in the affected zone remains high for much longer. The lethal zone would be more than 500 square miles. An area of 64,000 square miles would suffer a cumulative dose of 2 rems per year for a month. This is three times larger than the area affected by a nuclear weapon alone. An area of 25,000 square miles would suffer a dose of 2 rems per year for a full year. This is twenty times larger than the zone of equal devastation by a nuclear weapon.

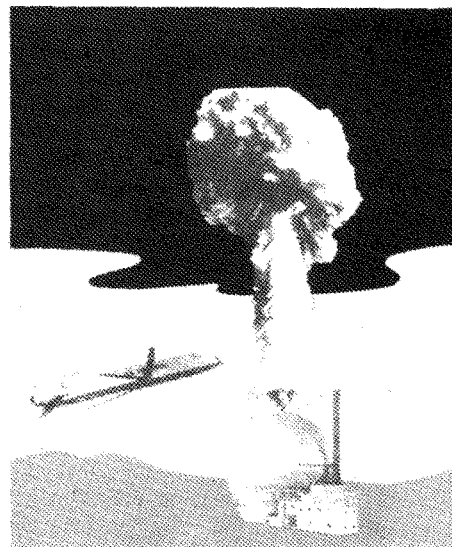
In Britain and Europe, increasing numbers of nuclear power stations are being built near centres of population and heavily cultivated land.

Probably many of these power stations are also near military installations which would be targets in a war. It is difficult to believe that a power station might not be hit accidentally, by a missile aimed at a military target.

Unknown Risks

The figures given above for the radiation dose rates following such a catastrophe do not allow for the fact that radioactive wastes are usually stored initially at the reactor site. Nor does it allow for the fact that many reactors are built in pairs within a hundred yards of each other. Allowing for these facts, it has been recently suggested that dose rates following the destruction of a nuclear reactor by a nuclear weapon could be two to six times greater than those given here.

The British Government has been publishing optimistic estimates of the country's capacity to recover from a nuclear war. None of these estimates have made allowance for the fact that Britain is littered with targets which, if hit, would enormously exacerbate the effects of the nuclear weapons themselves. This omission may be due to mere carelessness; or it may be due to the Government's apparent desire to persuade us that a nuclear war would not be an unspeakably dreadful disaster. It cannot be reiterated too often, nuclear war would cause devastation and suffering on a scale beyond our powers of imagination, far beyond anything ever seen on this planet before.



Further Reading

'Catastrophic Releases of Radioactivity', Fetter, S.A. and Tsipis, K., Scientific American, April 1981.

'Nuclear War — Prevention is Better' published by the Edinburgh branch of the Medical Campaign against Nuclear Weapons, obtainable from the Human Ecology Centre, 15 Buccleuch Place, Edinburgh, 50p.

'Radiation, Your Health at Risk' published by the Radiation and Health Information Service, 9 Marion Close, Cambridge, 50p.

Waste Dumping

Nuclear waste is hotting up—or rather the issue of waste dumping is, despite government attempts to quieten it down. Two enquiries have been held into proposed "experimental" drilling at Mullwharchar in South-West Scotland and in the Cheviots, Northumberland. Publication of the reports on these enquiries has been held off so long that the only explanation possible is that the government hopes that the objectors will somehow fade away.

But now a new enquiry has been announced — in Somerset in January/February 1982. Dates for enquiries in Nottinghamshire, Avon, and Leicestershire are due to be announced soon. Here Mary Scott describes the state of play with waste dumping proposals and opposition in the UK.

Events in Britain 1978-81

In connection with the high level nuclear waste disposal programme, the UKAEA made planning applications in 1978 for test drilling at Altnabreac in Caithness, Mullwharchar in Galloway and the Cheviots in a Northumberland National Park. Planning permission was given for Altnabreac, and drilling began in winter 1978. Permission was refused for the other two sites, and Local Public Enquiries followed — into Mullwharchar in February-March 1980 and into the Cheviots in November-December of the same year. The results have still to be announced.

In 1980, responsibility for waste disposal research was transferred from the UKAEA to the Natural Environment Research Council (NERC). Last October, NERC submitted four planning applications to drill at: Puriton in Somerset, Wymeswold airfield in Leicestershire, Brent Knoll service area south of Bristol and Ratcliffe on Soar in Nottinghamshire. None of these applications was accepted. NERC has appealed, and consequently a series of local planning inquiries now seems likely.

Waste disposal is clearly not just a local but a national issue, a fact highlighted by the handling of the Somerset case. In refusing NERC's drilling application, the County Council did not cite local planning reasons, but called for a Planning Inquiry Commission to look into the wider issues —

thus implicitly recognising the national dimensions of the case.

The date has been set for the public inquiries into the Somerset applications, for January and February next year. The Somerset County Council's refusal to consider the NERC applications has been treated by the Department of the Environment as a straight refusal.

Test drilling applications in Wales and Hereford/Worcestershire, expected last year, have still not been lodged. More can be anticipated over the next few years — there are at least 20 more shortlisted sites, most in Scotland, none discounted by NERC.

Future Policy

On 20th April, in a Sunday Standard interview, UKAEA Chairperson, Dr. Walter Marshall said that no radioactive waste would be buried in Scotland for at least 100 years; wastes had to be allowed to cool down first. Meanwhile, they are stored above ground at Wind-scale.

However, Dr. Marshall does not make government policy, and in response to a request from Gordon Wilson MP, Malcolm Rifkind MP was unable to guarantee that the government could back Dr. Marshall's statements.

On the other hand, the statements do seem to tie in with the main recommendations of the 2nd Annual Report of the Radioactive Waste Management Advisory Committee (RWMAC), published in June.

Some inconsistencies aside, the general theme of this report is that there is no hurry — waste disposal timescales can be lengthened and ultimate decisions left to future generations. The report advises that, for at least 50 years, or even longer, high level wastes might best be contained above ground or subsurface in an engineered storage system. Only then need it be decided whether to continue storage, dispose of the waste in a permanent site, or seal the store, thus turning it into a disposal facility.

However, the report states that current accumulations of low and medium level wastes present a more urgent problem.

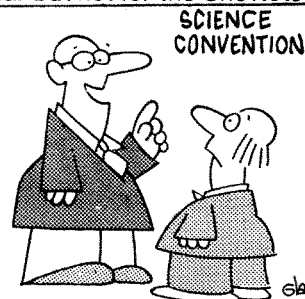
Research has now begun into potential disposal sites, partly through an assessment of existing mines and cavities.

In view of the statements made by Dr. Marshall and RWMAC, Dafydd Elis Thomas MP asked in Parliament whether the government intended abandoning the test drilling programme. The answer was negative.

Contracts

In March, tenders were invited from contractors interested in participating

in the radioactive waste management research programme for 1982/83 — without awaiting the results of the Mullwharchar and Cheviots inquiries, and thus making a mockery of the inquiry process. Very detailed documents sent out to interested contractors included reference to the Mullwharchar, Cheviot, Somerset and Hereford/Worcestershire sites. MPs Alan Beith and Gordon Wilson asked questions in Parliament about these contracts and the pending inquiry results. From the replies, it would appear that contractors are being "lined up" beforehand for Mullwharchar but not for the Cheviots.



"It's a fact that people will eat hot dogs no matter what you put in them. Which brings me to my idea for disposing of nuclear waste..."

Conclusions

So what's going on? Despite the "no great urgency" line on high-level wastes, the very expensive test drilling programme is still continuing, with local public inquiries likely to cost £300,000 each, judging by previous experience.

At the inquiries, the UKAEA justified the test drilling programme precisely on the grounds of urgency. Government embarrassment, now that this urgency supposedly no longer exists, may partly explain the long delay in announcing the result of the Mullwharchar inquiry. However, the government is also undoubtedly waiting for the most politically convenient time to announce its decision, having become aware of the strength of local opposition to drilling, strongly apparent during the inquiries and currently instrumental in delaying the Wales and Hereford/Worcestershire applications.

The search for safe waste management technology is shockingly unadvanced, even after 25 years' research. The industry's claims that they are confident of finding a solution do not add up to actually doing so! The RWMAC advises that "it may be better to leave to future generations the flexibility of deciding how and when to dispose of the solidified waste, having ourselves carried out the research and development to provide them with information on the technical options." Let us not be fooled by such statements into thinking we would thus be doing future generations a favour. There may not, in fact, be a safe and economic solution to the problem of disposal of high-level nuclear wastes.

POISON IN OUR HILLS

The peoples' report on the Mullwharchar waste dumping enquiry. Essential reading for anyone interested in opposing waste dumping — or public enquiries of any kind. £1.80 + 25p. p&p from Smiling Sun Shop, 37 West Nicolson St., Edinburgh.

Disposal Proposals

Highly radioactive waste will be dangerous for many thousands of years. Large quantities of nuclear waste have already been generated and, at present, about 900 cubic metres of liquid waste is being stored at Windscale, whilst more than 20,000 tonnes of Magnox and Advanced Gas-cooled Reactor [AGR] fuel is waiting to be reprocessed. More waste is continually being produced. The nuclear industry wants to convert the liquid waste into a solid form, which they believe to be safer. In this article we discuss the solidification processes.

Vitrification

In Britain and Europe the favoured method of solidification is the conversion of the liquid waste into a borosilicate glass. This process is known as vitrification.

Although British research into vitrification began in 1955, the technology is still in its infancy. In the 1960's, the nuclear industry, ever optimistic of its ability to solve technological problems, stopped all research for seven years, only to find their process was unsatisfactory. The industry has now developed the HARVEST process, which is at the stage of a full-scale plant using non-radioactive 'simulated waste'. But this process, the result of nearly twenty years of work, is to be abandoned. British Nuclear Fuels Ltd. have recently announced their plans to build a plant at Windscale based on the French AVM (Atelier de Vitrification de Marcoule) design.

Most of the plants around the world are experimental, based on a single batch process. For example, the HARVEST plant feeds the 'simulated' liquid waste and the glass-forming materials directly into an electrically heated steel pot where they melt to form a glass. The French system, on which the Windscale plant is to be based, is essentially a three stage, continuous process (see diagram). Firstly the waste is evaporated and heated to produce a granular product known as calcine. The calcine is highly radioactive. In the second stage, it is mixed with the glass-forming chemicals in a special furnace, and the liquid glass is poured directly into metal canisters which are then sealed and stored in air-cooled caves.

Synroc

An alternative process to vitrification is the incorporation of the liquid waste into a synthetic rock, known as synroc. In both America and Australia, research into these new minerals is taking place. In Europe little interest has been shown, largely because the development of synroc is still at the initial stages and the nuclear industry believes that a solution to the waste problem needs to be found now.

One of the most vocal proponents of synroc is Prof. Ringwood of the Australian National University. He has developed a synroc which consists of three titanium-bearing minerals that occur in nature. Ancient samples of these minerals containing uranium and thorium have, it has been estimated, been exposed to far more irradiation from alpha particles than the synroc containing radioactive waste will ever be exposed to. These samples have retained their original structure and Ringwood claims that the stability of the minerals could prove it to be a more satisfactory solution than the use of borosilicate glass. Ringwood also claims that his process will be cheaper. However, the European scientists disagree with him. The argument amongst scientists on the best method of solidification will only be finally resolved if and when the glass or synroc has remained stable for thousands of years.

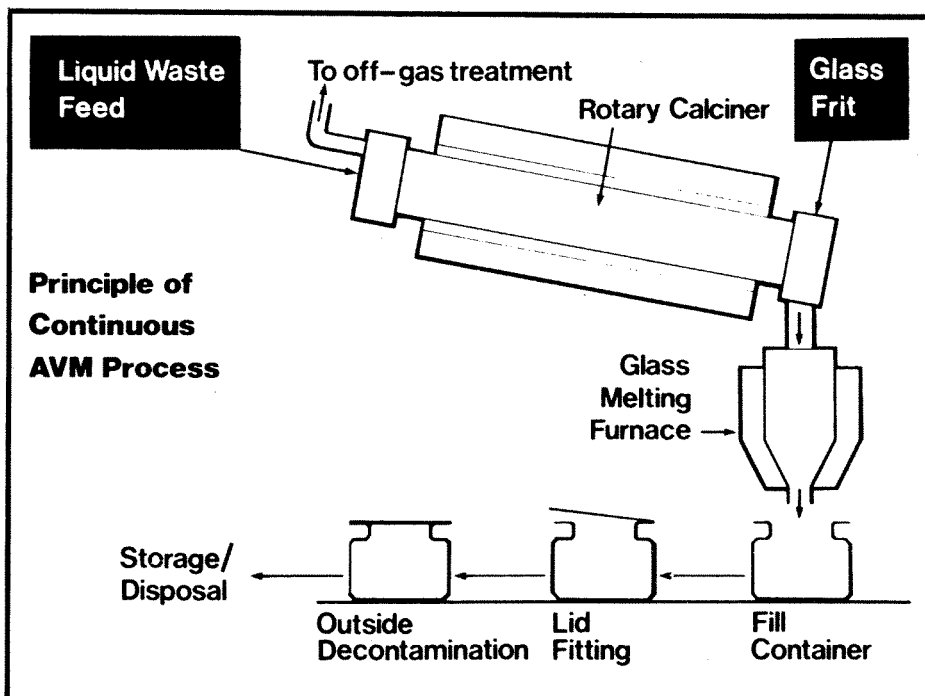
Problems

One of the most difficult problems to overcome in the development of a suitable medium for waste storage is that of leaching. When ground water comes into contact with the glass (or

synroc), the radioactivity slowly escapes into the water. This is potentially dangerous as it may result in contamination of surface water, culminating in human contamination via the food chain.

There is no way to stop leaching totally, but by careful design it can be reduced. It has been found that the rate depends on the temperature and pressure of the glass, and the acidity/alkalinity of the ground water. These same variables also affect the rate of devitrification — that is, cracking and crumbling of the glass. Leaching tests can be used to predict the rate at which radioactive elements will escape from the glass, but most of these tests have been performed at unrealistically low temperatures and pressures. During one test carried out under severe temperature and pressure conditions — such as might be expected when deposited in granite — small samples of glass containing 'synthetic' waste devitrified in a matter of weeks. Large quantities of synthetic waste escaped into the water.

Much work is needed to solve the problems of solidification of liquid waste. The scientists continue to argue over which is the best method. But they should question the need to solidify radioactive waste at all. Possibly a safer alternative would be not to reprocess, and to store the spent fuel rods themselves. Above all, the nuclear industry should stop producing nuclear waste, as there is no satisfactory solution to the waste problem.



District Heating Cooperation

The Appropriate Energy Group of the Anti-Nuclear Campaign was recently shown around a district heating scheme in Nottingham. It is the largest scheme in the country and has been running for around 10 years. This article, which describes the project, is based on their visit.

Anything from settees to grass cuttings make up the 100,000 tonnes of rubbish burnt each year in an incinerator, the powerhouse of the scheme. The efficiency of the incinerator depends on what is thrown into the city's dustbins. Two years ago tonnes of frozen christmas wrapping paper, frozen after waiting a fortnight to be collected, arrived en-mass, causing a lot of steam and not much heat!

The hot gasses from the burning rubbish are used to produce steam. This steam is first used to produce electricity (2.5MW) and then to heat water to 150° for the district heating system. The hot water is then pumped through a network of buried pipes.



The scheme provides enough hot water and space heating for 4,500 council houses, two indoor shopping centres, a polytechnic, council offices, pubs, swimming pools, libraries and old peoples houses. It is run jointly by the National Coal Board and the Council. Each house on the scheme pays a monthly standing order, which is adjusted at the end of the year according to individual consumption. Costs are approximately the same as for a gas-fueled house.

The scheme has not been without its problems.

The County Council, who became jointly responsible for refuse disposal following local government reorganisation, finds it easier to dump waste than take it to be burnt. So the incinerator occasionally runs short of rubbish and standby coal-fired boilers have to be used.

In the early days poor design and installation led to occasional ruptures of pipes and pavements. But new pipe design has led to dramatic improvements. In addition, the system for measuring the amount of heat used in a house has been unreliable. Improved devices are available, but they cost around £200, although mass production and new technology should bring prices down.

District heating schemes based on the incineration of rubbish have the advantage of both saving energy and solving the increasing problem of refuse disposal. The Appropriate Energy Group of ANC are encouraging local groups to campaign for more schemes of this sort.

CHP Plans not good enough

Representatives of seven of the nine cities shortlisted to become lead city for an experimental CHP scheme, have agreed to join forces to ensure that all cities in the race become a lead city.

They agreed at the recent District Heating Association National Conference that a combination of decade-long lead times, together with rapidly rising energy prices, made a nonsense of current government plans to develop a single pilot scheme.

Further meetings are planned between the nine cities:- Belfast, Edinburgh, Glasgow, Leicester, London, Liverpool, Manchester, Sheffield and Newcastle.

Energy Manager, Sept. 1981

Solar Heating

Over 1500 delegates from all over the world spent a week talking about solar energy at the recent Solar World Congress in Brighton. Since the last Congress, held two years ago, there have been some notable advances — and some disappointments. Much of the solar equipment on display at the trade exhibition showed improvements in better design quality and lower prices. World production of flat plate solar water heaters is increasing rapidly, notably in Japan and Australia. The UK market, though still small, is showing moderate growth. It is noticeable that large companies are moving into the renewable energy field.

A review of national solar programmes showed that while the US is cutting back on support for solar, several other countries — for example, Sweden and Canada — have very ambitious programmes to encourage manufacturers and users. By contrast, the UK government is distinctly luke-warm and offers no incentives at all to install solar heating equipment. Compare this with Israel, where it is now mandatory to incorporate solar water heating in all new buildings!

From the Scottish point of view, a paper which compared different climates in the EEC to assess their relative suitability for solar heating of buildings concluded that the most favourable locations are in the North and West of Europe, particularly in Scotland.

Kerr MacGregor, Chairman
Scottish Solar Energy Group

Beer Pump

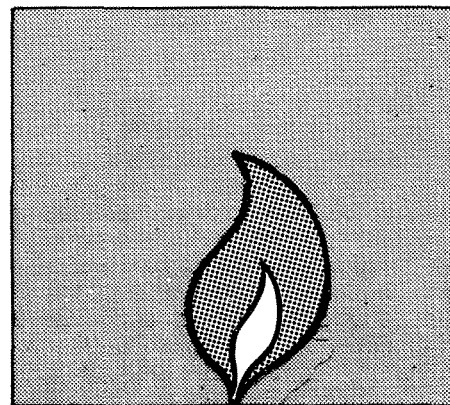
Associated British Maltsters can now boast the ownership of Europe's biggest gas heat pump. The heat pump has a total heat output of 3.5 MW with an overall thermal efficiency approaching 225%. ABM expect to be able to save 1.4 million therms a year.

What makes the heat pump so attractive is the continuous supply of warm, moisture-saturated exhaust air from the plant's two kilns. ABM consider that gas heat pumps have distinct advantages over electric ones. Firstly, an electric heat pump would need to operate against higher temperature differences, so it couldn't make use of the warm air and would need to supply all the heat itself. This would make it larger and more expensive. Secondly the annual cost of the energy with the gas engine will be roughly 60% cheaper than the electric alternative.

The heat pump was installed with the aid of a 25% grant under the Department of Energy's Demonstration Project Scheme. This scheme is funding three types of gas heat pump for the domestic market, at present, designed to produce up to 10KW of heat output. These projects are aimed at establishing the technical and economic viability of such systems. The three types being investigated are gas-engine systems, absorption cycle systems and turbo-compressor systems.

Gas heat pumps are, of course, much more desirable than electric ones, because their energy source doesn't come from a power station which is only 30% efficient. They, therefore, have a much higher 'Coefficient of Primary Energy'. Unfortunately they are still at an early stage of development and much work needs to be done by manufacturers to bring these systems to commercially acceptable products. Electric heat pumps are ahead, and domestic sized units are already on the market.

Energy Manager, July/August 1981
Energy Management, July 1981



Appropriate Technology

Which Energy Gap?

The recent United Nations conference on New and Renewable Energy Sources in Nairobi has illustrated the wide gap between the developed and the developing countries of the world. 'Many words and little action' has been a major criticism of the event. But for those interested in the state of renewable energy on a global scale, the conference has provided some useful information. Earthscan, an international media and news service, has compiled a summary of the conference papers which contain a wealth of information.

The present world consumption of energy is 90 million million kWh. At the moment new and renewable energy sources provide only 10% of developed countries' energy, but 40% of the energy in the developing countries. Nearly all of it comes from fuelwood, hydropower and charcoal (see table).



Fuelwood is the most widely used renewable energy source, currently producing about 12% of the world's energy. The shortage of fuelwood is proving to be a major crisis in developing countries. More than 10 million people cannot obtain sufficient fuelwood for their minimum energy needs. A further 1000 million are affected by shortages. It is estimated that by the year 2000 more than 2,3000 million rural people will need to be provided with cooking fuels to replace fuelwood. In Africa, fuelwood contributes 58% of total energy consumption. In some countries it amounts to more than 90% of all energy supplies. Some solutions to the problem were suggested at the conference, including increasing the productivity of existing resources, creating new forest resources, and the developing of more efficient ways of using the fuel.

China has sought to solve the fuelwood shortage by promoting biogas digesters. Since the early 1970's the

government has been providing information, bank loans and subsidies for interested communities. In 1975 alone 460,000 digesters were built, and by 1978 there were a total of 6 million in operation. The Chinese government has recently begun promoting the use of solar cookers in a similar way. More than 2,000 are in daily use. Production of these cookers is to be expanded, and it is planned that they should be used to compliment biogas, and new more efficient wood burning stoves.

Simultaneously with the UN Conference on New and Renewable Sources of Energy, a second conference, the Non-Governmental Organisations Forum, took place. The NGO Forum reported to the UN conference, contributed to its final session report, and gained good media coverage. Focusing on issues unlikely to be covered in the main conference, the forum discussed women and energy (women spend 20% more energy than men, but consume only about 1/2 as much food); debt problems of developing countries and how to solve them, the impact of transnationals on energy; small-scale solutions to energy problems; nuclear issues, strategies for replacing competition

with co-operation. Kenyan NGO's also organised a fuel woods demonstration.

Details from Environmental Liaison Centre, PO Box 72401, Nairobi, Kenya.

WISE, 13/20.8.81

Contribution of New and Renewable Energy Sources to Present Day World Energy Consumption

	Percentage
Solar	0.002
Geothermal	0.06
Wind	0.002
Tidal	0.000004
Biomass	0.7
Fuelwood	12.0
Charcoal	1.2
Peat	0.02
Oil Shale	0.02
Tar Sands	0.1
Hydro	1.7

Although each contribution, except fuelwood, appears to contribute very little to the total global energy consumption on a local scale the contribution may be very significant. Many of these energy sources have huge untapped potential. For example it has been estimated that by the year 2000, solar could be producing one thousand times more energy than at present.

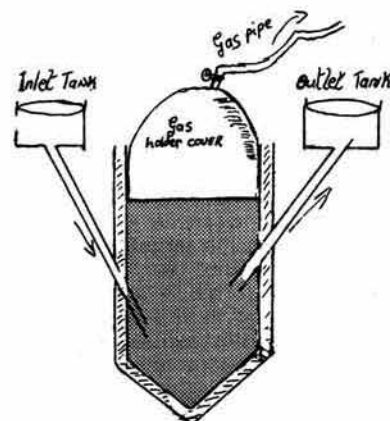
Methane in Manila

Electrification in a country with 7,000 inhabited islands can present problems, especially when there are no indigenous fuels except for wood and natural fibres. But this is what the Philippines are doing.

Most of the country's generating capacity at present is around Manila. Supplying the more rural communities is organised by co-operatives who either buy their power from the National Power Corporation or generate it locally, or both.

Six sites have been selected on the main island of Luzon for UK-built, 3.1MW wood burning power stations. For the first few years local timber will be used, but later fuel will be logs from the fast growing Hawaiian Ipil tree, which can be planted and harvested on a four year cycle. Some 100 square kilometres of land will be needed for biomass production at each site. The scheme is being substantially assisted by a UK overseas aid loan.

The principal items of plant for the power stations are made by the Peterborough firm Peter Brotherhood and



the generators by Parsons Peebles. In developing countries other possible fuels for rural generation include sugar waste, coffee husks, fruit fibre, woodchips and sawdust, domestic waste and even chicken litter. Brotherhood has quoted, or is currently quoting for contracts involving a number of these fuels.

Electrical Review, 7/14.8.81



No Shelters

Nuclear War: The Facts On Our Survival, Peter Goodwin, Ash and Grant, 1981. £5.95.

When we retire to our home-made fall-out shelters after a nuclear attack, the Home Office advises us to take some toys and magazines, presumably so that we can while away the happy hours doing cross-words and playing with children, before we emerge after a couple of weeks to "resume normal activities". Peter Goodwin's invaluable new book paints a very different picture: "You might find yourself spending hours by candlelight manipulating the flesh of your child's bloody face like a piece of meat in an attempt to extract pieces of glass."

Shelter living would quickly become "miserable, filthy, terrifying, demoralising" and would deteriorate as occupants began suffering from diarrhoea and vomiting caused either by nausea or radiation. Many people would have to face up to the realisation that they were slowly dying, that no medical help was available and that their shelter could become their coffin.

Shelters can only possibly be useful "on the fringe areas of devastation" and in any event only marginally improve anyone's prospects of survival. Far more important is whether or not you happen to live in a likely target area — like most of Scotland's central belt. In which case, according to Mr. Goodwin, you might be better to ignore Government advice to stay at home and evacuate to a remote rural area far from any military bases. Even then your chances of long term survival are remarkably slim.

On the controversial issue of civil defence Mr. Goodwin is illuminating. He casts doubt on the practical usefulness of civil defence and admits that the building of shelters in a nuclear-armed nation could make nuclear war more likely, pointing out that nuclear attack is actually far cheaper than any form of nuclear civil defence. On the other hand, in countries which do not possess nuclear weapons and are hence less likely to become targets, it would be "entirely reasonable" to build publicly-funded shelters. This is a point that is rarely understood in the current debate over local authorities' refusal to participate in civil defence preparations.

In looking at the likely form of nuclear attack on Britain, the author, a physicist by training, attempts a dispassionate analysis of four scenarios. In the first a small one megaton bomb is dropped on Birmingham, resulting in several hundred thousand deaths in the first four weeks and possibly double that number in the following few months. If a large 25 megaton bomb were used, two million people would be killed instantly. The second scenario envisages the strategic bombing of all our oil refineries, including Grangemouth, and "several millions dead or dying". The third 'option' is a limited 'counterforce' attack aimed at destroying all the major military bases:

this would kill an estimated two million immediately and leave many more fatally injured. The worst prospect, which assumes the use of 140 Warsaw Pact warheads in an all-out attack, would put the future of civilisation in Britain at risk by killing some 40 million people and leaving just 16 million to "survive".

Although providing a readable and useful description of some of the key factors which are increasing the likelihood of nuclear confrontation and a kind of 'idiots' guide' to the various weapons systems and the nature of radiation, the book says little about what should be done to prevent a nuclear holocaust. On two occasions the author comes close to suggesting that a small nuclear conflict might be beneficial as it could provoke such a massive swell of public outrage that the demands for disarmament would become irresistible: this is hardly a useful policy option.

We are left in no doubt that a nuclear war must at all costs be avoided. But apart from a rather ineffectual defence of the theory of deterrence in the book's ill-fitting afterword, the reader is left in the dark on the proper defence of the nation and on whether we should be pursuing multi- or uni-lateral disarmament or a mixture of both.

Rob Edwards

No Nukes

NO NUKES, by Robin Cook M.P. (July 1981). Fabian Society. Available from SCRAM Mail Order 75p + 20p p&p.

This pamphlet sets out to be a concise and up-to-date account of the nuclear argument for the Labour Movement, and succeeds in covering most of the issues in a lucid and succinct style.

We are reminded, to set the scene, that the Labour Party has played its full part in the development of the nuclear industry. But composite motions at recent conferences have left the Party with no clear policy, and this pamphlet sets out to fill the vacuum.

Robin Cook discusses the economics of nuclear generated electricity and concludes that it is, at best, dubious. A short summary of the history of nuclear power in Britain serves to demonstrate that it is far from a proven technology. Looking to America for reactor designs will not help solve this. PWR's have serious unresolved safety problems and The Three Mile Island Incident only helped to confirm already serious doubts.

Robin Cook argues that the energy gap is in fact an oil shortage, and electricity is of limited use as a substitute for oil. With an alarming surplus of generating capacity it is a cruel paradox that more and more people are suffering from 'fuel poverty'.

The alternatives to nuclear power are discussed briefly, the main inference being that there is great institutional inertia when it comes to implementing them, and renewable energy sources are left to pick up 'the bag end' of research budgets.

Finally, the pamphlet covers the grounds for anxiety over nuclear power:- nuclear waste, radiation hazards, proliferation and the threat to civil liberties.

It was disappointing not to find any mention of the employment potential of a non-nuclear energy programme. With 3 million unemployed, this could be a useful aid to debates within the Labour movement. There was also little mention of the detrimental effects on the coal industry a large nuclear programme might have. Although the pamphlet's arguments are cogent, I was left wondering whether it could change the Labour Party's present position with:- "... constituency delegates, who have tended to speak against nuclear power and... the unions, who... have spoken in defence of those employed in the nuclear industry."

Peter Roche

Nuclear Britain

Nuclear Britain by Peter Bunyard, NEL 1981. Available from SCRAM mail order, price £1.50 + p&p.

Nuclear Britain is a readable introduction to the technical side of the nuclear debate. Peter Bunyard manages to cover the whole nuclear fuel cycle in a way which is, in some respects, more useful than Walt Patterson's "Nuclear Power". It is not intended to be an unbiased account of the nuclear industry, and covers all those anecdotes which you may remember reading in "The Guardian" but can't trace when you need them!

The book updates similar texts by including recent evidence on nuclear proliferation, an analysis of the Three Mile Island accident, and the growing international opposition to nuclear power. All technical and safety aspects of the debate are covered; beginning with the Magnox programme which deserves far more criticism than it receives from the anti-nuclear movement. The beginning of the AGR programme is well documented, and there is adequate information on PWR's to aid the forthcoming debate. He has also succeeded in collecting together some useful information on Windscale.

Although called Nuclear Britain, the book is by no means restricted to British reactors and nuclear plants; it is particularly good on the French programme and has an interesting introduction concerning Plogoff.

The only criticism I have of the book is that, with all this useful information collected together in handbook form, it is infuriating to find that there is no index — making it virtually impossible to refer back to information you know is somewhere in the book. This problem is easily remedied, and I was sufficiently impressed that I have begun to compile an index. This should be ready in a few weeks and will be obtainable from SCRAM by sending an SAE and something to cover duplication costs.

Peter Roche

ANTI-NUCLEAR CROSSWORD

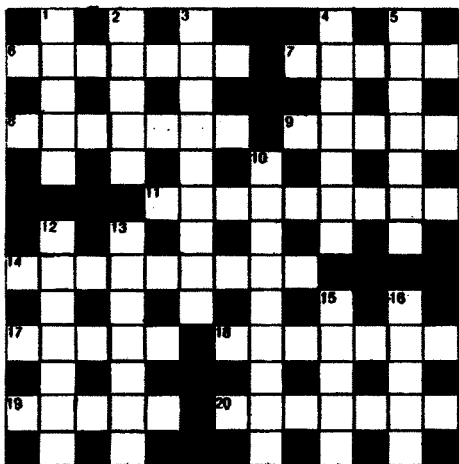
Compiled by T. Van Emerits

CLUES ACROSS

6. Call attention to the farce near Lancaster. (7)
- 7&9. Re: wet whale required for hydro turbine. (5,5)
8. Threatens but stops after the mischievous child. (7)
11. Bet the river is the proposed site for the next Scottish reactor! (9)
14. Sunny dungeon? No, the way out of the energy crisis! (5,4)
17. Flakes fall, at the moment in the Secret Service. (5)
18. Hot rocks for waste disposal? They were at one time. (7)
19. Sacred song by little Sarah in the afternoon. (5)
20. Where the A-train pulls into, and out of with Power. (7)

CLUES DOWN

1. A thousand in the fire destroyed by the Italian physicist's first fast breeder. (5)
2. Sort of blonde colour we will all be after the Bomb! (5)
3. The "three foot" club as a rule. (9)
4. American capital weightlessly cleaning up! (7)
5. Edward returns to stop but means to die. (7)
10. Aurora borealis in the attic? (9)
12. "River deep, mountain high" reversed is the point of the most recent Scottish reactor construction site. (7)
13. Harms, without writing, but feels alright in the Atomic Energy Research Establishment. (7)
15. Steal away from the fuel supply system of 7 & 9! (5)
16. Micro weight is the unit of genetic damage. (5)



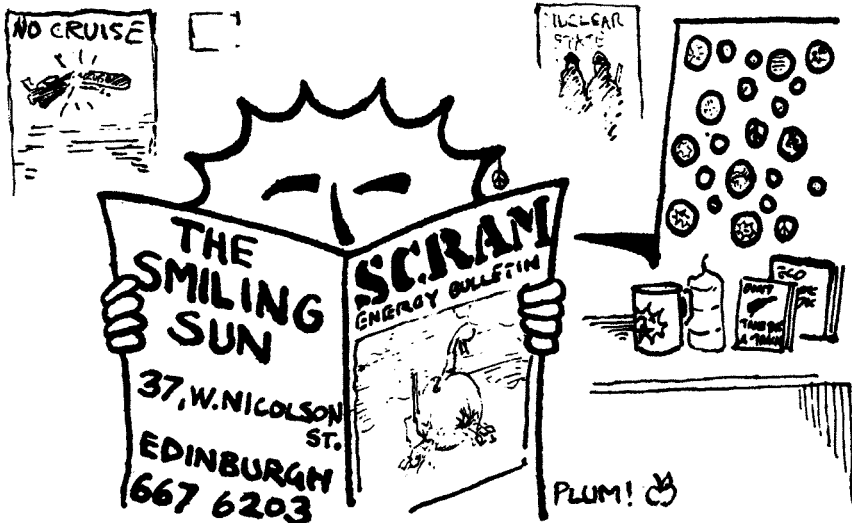
Apologies for the errors in the last crossword — a combination of bad proof reading and bad compiling! Hope it didn't spoil your enjoyment!

The winner of the June/July competition was Liz Spittal of Trowbridge, Wilts. The first correct entry pulled out of the hat on 1st December wins a complete set of Energy Bulletins, so far as stocks allow.

Solution to August/September Crossword

ACROSS: 5. Plutonium. 8&16. Mary Kathleen. 9. More Pain. 10. Nitric. 11. Yields. 13. Wastes. 15. Source. 18. Talk. 19. Radiation.
DOWN: 1. Play list. 2. Atomic. 3. Energy. 6. Par in a bar. 7. Windscale. 12. Eruption. 14. Scenic. 15. Sanity. 17&4. Heat Pump.

THE SMILING SUN



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URANIUM MINING IN EUROPE

Further Reading:

Report of the First European Uranium Conference (Limoges 1980), obtainable from OOA, Ryegate 19, 2200 Copenhagen, Denmark; price £2.

"No U-Turn — a report on Uranium Mining in France", available from Just Books, Wintavern St., Belfast; price 20p.

International Atomic Energy Agency Bulletin, Vol. 23, No. 2 (June 1981); this has a large section on uranium mining, both

European and world-wide. Available from IAEA, Wagramerstr 5, P.O. Box 100, A-1400 Vienna, Austria. Free.

A list of Anti-Uranium Groups throughout Europe can be obtained from SCRAM, 30 Frederick Street, Edinburgh EH2 2JR. Please enclose SAE.

See also the ANC/SCRAM leaflet 'Uranium - the Plain Facts', for a general overview of the subject. Available from ANC, P.O. Box 216, Sheffield or SCRAM (address above) 5p (+ postage); bulk rates available on request.

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NAG Won't Pay

The Scottish Consumer Campaign hit the headlines in August with the publication of **Cheap Electricker: The Real Cost of Nuclear Power in Scotland**. The report slams the SSEB's claims that nuclear power is cheaper than that produced by fossil fuels, and concludes that, far from saving £400 million, as the SSEB predicts, Torness will cost consumers £550 million. (See also Energy Bulletin No.25).

In the second major coup of the season, Ewan MacColl and Peggy Seeger became the 100th household to join the Consumer Campaign — i.e. pledged themselves to withhold 20% — the "nuclear portion" — of their electricity bills.

Details of the campaign and copies of the report (£1.50 + 20p p&p) from **Scottish Consumer Campaign**, 37 West Nicolson Street, Edinburgh [031-667-6203].

EAAANP Office

With only one year to go before the Sizewell inquiry, the East Anglia Alliance Against Nuclear Power have been offered office space by Ipswich FOE above their Shop at 67 Lower Orwell Street, Ipswich.

The Alliance has been mobilising opinion all over Suffolk for over a year, pressing the Councils to act responsibly over the inquiry issue. One of the attractions of the site — for the CEGB — has been the compliance of the Suffolk County, and Coastal District Councils. The Alliance has forced them to hold extra public meetings and

seminars and is now in continual contact with national anti-nuclear groups who recognise the "once and for all" commitment to nuclear development that Sizewell B represents.

The Alliance has been able to keep up its programme of large scale opposition only by contributions sent from outside the region — which is large and thinly populated. Now they have moved into their office they badly need funds to equip it and to pay their full-time worker, Roy Thompson, who started on the 14th September. If you think that you can assist them financially, Bankers Order forms are available from **John Dearnley, Clerk of the EAAANP, Garden Cottage, Bulmer, Sudbury, Suffolk. [Tel. Sudbury 75007].**

WONT Won't Play

On 18th July, Manchester WONT staged a protest against the heavy presence of military/police "attractions" at Manchester Show. Dressed in skeleton masks and long black hooded cloaks bearing anti-war slogans, the group attempted to carry a coffin into the middle of a military tattoo. They were turned back from this "family" event, but wandered around the showgrounds for an hour, attracting much attention, before being ejected.

The group has a copy of Dr. Helen Caldwell's slideshow, 'I Have Three Children of my Own', on the medical risks of nuclear power and its links with weapons produc-

tion. They are willing to take it to any groups in and around Greater Manchester during the autumn and spring — petrol expenses only required. Lasts 35 minutes; ideal for discussion in living room or small hall. Cassette recorder and automatic slide cartridge needed, but can be brought if necessary. **Contact WONT, c/o Grass Roots Books, 1 Newton Street, Manchester 1. [061-236-3112], or 224-4339 [evenings].**

No Nukes Music

To support the October 24th Demonstration we are organising two tours in October. One is with the Poison Girls and support... possibly European Theatre of War. It will be a powerful evening and should recruit a lot of people for the demo each night.

Secondly, we are bringing a theatre group, Fourth Wall Repertory Company, over from America to do a tour in October. Both tours should receive considerable publicity. Be sure not to miss these gigs.

No Nukes Music: 9 Poland Street, London W1. Tel. 01-486-4564.

PLUM! ☺, THE ARTIST WHOSE GRAPHICS OFTEN ADORN THE PAGES OF THIS MAGAZINE, IS LOOKING FOR WORK. VERY REASONABLE RATES — CONTACT HIM, c/o SCRAM, 30 FREDERICK ST, EDINBURGH.

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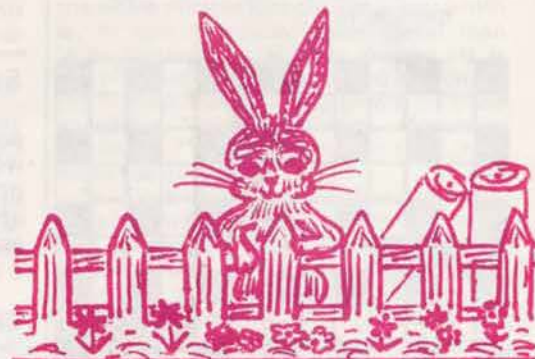


The well-established Edinburgh wood-stove suppliers **Forest Fire**, offer a wide range of wood, peat and coal burning appliances for space heating, cooking and central heating.

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As Little Black Rabbit was walking through the poignantly pretty villages of East Lothian, she stumbled over an extraordinarily large pile of insulating materials on the pavement outside a half-built house. After she'd struggled to her feet — not an easy thing when you're wallowing in bales of fibreglass — she fell into conversation with a man installing a triple-glazed window-frame. It turned out that he was one of that proud breed of ultimate do-it-yourself-ers, building his own home. And he had good reason to be proud of it — by the time it was finished it was going to be so well insulated that the entire house could be heated by **one gas-fire**.

The thing that really impressed Little Black Rabbit, though, was that it also turned out that he worked for the SSEB. She thinks that his choice of home and heating rather fetchingly illustrates the basis for the SSEB's unshakeable faith in its policies.

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Little Black Rabbit
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