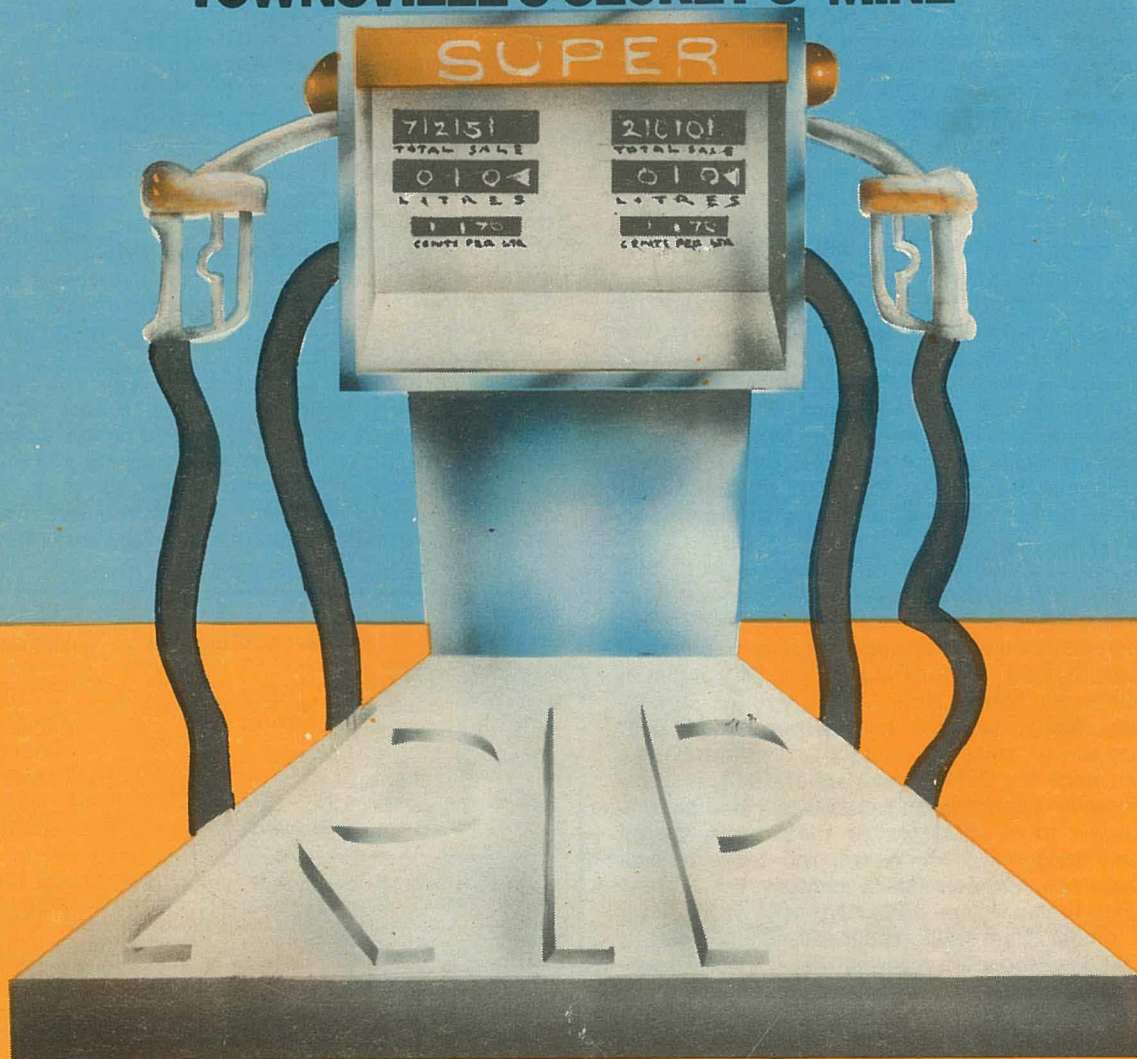


FRIENDS OF THE EARTH'S

CHAIN REACTION

ENERGY
THE CRISIS
THE ALTERNATIVES
TOWNSVILLE'S SECRET U-MINE



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PETROL DEMAND - COURTING DISASTER?

1979 is the year Australia officially discovered the Energy Crisis. The Federal Government is talking of "crash programs", oil companies advertise energy conservation every night on television, and the State Governments grab headlines with schemes for LPG cars, electric vehicles, and studies on energy-saving devices.

It may seem as if these Governments are simply jumping on the environmental bandwagon - but in fact the energy situation in Australia and world-wide has deteriorated to such an extent that Governments have no option but to act on the situation.

There has been ample warning that it is not safe to rely so heavily on oil, a commodity susceptible to huge price rises at the whim of the few countries and companies that dominate supply. The 1973 OPEC price rises triggered off huge inflation throughout the Western world, followed by recession. Apart from this there are the problems of pollution and of what to do when oil becomes too scarce and expensive to be used for ordinary travel.

Since its inception Friends of the Earth has been campaigning for general energy conservation measures - improved public transport, facilities for cyclists, and better town planning to encourage local/community centres, not sprawling suburbia. In this issue of Chain Reaction, we look at specific alternatives to petrol: methane, ethanol, hydrogen, electricity, LP gas and others. Many of these energy sources could play some part in replacing petrol. Some of them are available right now, and are competitive in price with petrol. But it is unlikely that any could meet future demand for energy if it continues to grow at its present rate.

Ironically, while the international press gives front-page coverage to the "energy crisis" there is in some countries an over-supply of electric generating capacity. This is affecting nuclear programs around the world, and is one of the factors making it hard for Australia to sign up customers for its uranium (see "Where Have All The Markets Gone?", in this issue). Many countries have slowed down their building programs or cancelled reactors . . . and the decline has happened *since* the OPEC price rises of 1973. It seems that nuclear power has not been able to step in and provide a smooth answer to oil shortages: on the contrary the oil shortages have triggered off inflation, and made it even harder for people to afford nuclear technology.

At the same time a general disenchantment with nuclear power and similar giant-scale, expensive technologies is starting to set in. People are realising that it's no use substituting one power source for another, at increasing economic and environmental cost, only to keep on wasting it.

Nuclear-generated electricity could be used to power electric cars, but the risks, and the costs of making the transition would be crippling. Alternatives such as LP gas are only a short-term measure: they too are in short supply.

The only energy alternative which costs nothing is conservation. All over the world people seem to be realising this (except perhaps in Canberra) and are cutting back on unnecessary energy use.

In the early '70s some wild predictions about future energy needs were made by nuclear enthusiasts such as Ralph Lapp in the USA. Now nuclear proponents have revised their estimates down to the levels forecast by conservationists such as Amory Lovins (FOE U.K.) ten years ago. In the meantime Lovins has cut his own early predictions almost to half of what they were.

Plainly, predictions about future demand for energy are not statements of fact. The figures forecasters come up with depend on the initial assumptions they make about what society will be like in the future - and how they would like it to be. Energy policy should not start with pseudo-scientific predictions of an inexorably increasing demand for energy, but with common-sense questions about what we need energy for and how we can use it more efficiently.

The "energy crisis" is due not so much to an absolute shortage of fuel, as to an inability to keep up with the escalating demand for it. If the world continues to depend economically on an ever-increasing supply of energy it is courting disaster. If it decides now to change over to renewable sources of energy, and to cut back the rate of growth in usage till it stabilizes, the future will look much more secure.

Year of forecast	Conservationists	Nuclear Hawks
1972	125 (Lovins)	190 (Federal Power Commission)
1976	75 (Lovins)	124 (ERDA)
1977-8	33 (Steinhart)	124 (Lapp)

U.S. energy needs in the year 2000 (in quads per year)

From: Pathways to Energy Sufficiency (FOE USA, 1979).

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EARTH NEWS

KAREN SILKWOOD'S 200-to-1 VICTORY; Finland: nuclear protest in the shadow of the USSR.

"CHANCY COLUMN" - Nuclear news, uranium news, wit, plagiarism and wisdom from the ascerbic pen of Judy Wilks. *Plus* End of the line for Fremantle Railway; Food Campaign.

BARRIER REEF - Not safe yet!

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TOWNSVILLE'S MYSTERIOUS MINE
By Lynn Martinez

When a Queensland minister announced that Minatome Australia would be permitted to mine uranium near Townsville, Lynn Martinez hired a light plane to fly over the site. She was warned not to go too close - or Minatome "would shoot" Why does secrecy surround the mine?

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THE ENERGY SQUEEZE

Article by Phil Gleeson
As petrol gets scarcer, the prices rise. Who profits?

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ALTERNATIVES TO PETROL

By Mick Harris
L.P. Gas, alcohol, methane and hydrogen - these are some of the fuels that could help to replace petrol. Electric cars and steam cars are also possibilities. Some of these alternatives are impractical, others an economic proposition right now. But can any of them provide the abundant, cheap energy we have come to expect?

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DARWIN'S AUTONOMOUS VILLAGE
A small village, totally self-sufficient in energy and water, is underway at Humpty Doo near Darwin.

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DR STRANGELOVE MEETS FRANKENSTEIN

By Mark Plunkett
A portrait of Dr Edward Teller, father of the H-bomb and prototype for the Character called "Dr Strangelove". Dr Teller is much admired by Lang Hancock and Queensland's Bjelke-Petersen.

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SPINACH BLUES
Another Eco-toon by Michael Vale: The Birthday Flight.



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THE RETURN OF THE SON-OF-A-FRIEND-WHO-COULD-BE-MISTAKEN-FOR-DR-STRANGELOVE

By Andrew Herington.
This is actually about Dr Peter Beckmann and his book "the Health Hazards of NOT Going Nuclear". Dr Strangelove's ally is extremely right-wing, that's for sure. But his book deserves reading.

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WHERE HAVE ALL THE MARKETS GONE?

By John Hallam
Last year Doug Anthony claimed that Australia was to be "another Saudi Arabia" made rich by its uranium. But since then world uranium demand has slowed down, and the promised riches are as elusive as El Dorado. Will Australia sell its uranium? Can the Miners add up straight?

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Interview by Barbara Hutton.
The Bataan Reactor near Manila is causing great concern to local people. This year 3 Filipinos toured Australia to let Australians know how they feel about it.

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A NUCLEAR REACTOR BY 1995? IT DOESN'T COMPUTE

Sir Charles Court would like to see a nuclear reactor in Western Australia by 1995 - the WA State Electricity Commission has threatened to build up to 27 of them by the year 2025. *Dr Peter Brotherton* has done a few calculations to see if it's possible . . .

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THE CHINA SYNDROME

Reviewed by Jodi Adams
A film that came uncannily close to reality.

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BOOK REVIEWS
KNOCKING ON HEAVEN'S DOOR - a voyage to the Moruroa testing ground;
SMALTERNATIVES - A Personal Guide to Saving Energy and Money; **THE SOUTH-WEST BOOK** - a compendium of fact and history about the wild and beautiful south-west of Tasmania.

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RESOURCES, LIST OF FOE GROUPS

This issue **WRITTEN BY:** Mick Harris, Jodi Adams, John Hallam, Judy Wilks, Lyn Martinez, Phil Gleeson, Mark Plunkett, Andrew Herington, Peter Brotherton, Barbara Hutton, Olli Tammilehto (from afar), Andrea Morgan, Mike Russo.
ARTWORK: Mike Russo (lay-out); Andrew Pearson (A FOE Guide to Survival); Michael Vale (Lang's Birthday Flight); Rolf Heimann (Cover); Robyn (illustrations).
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CR, August/September 1979



Karen Silkwood's 200-to-one victory

"who runs this country? show yourself - I want to see!" - Jefferson Starship.

On the morning of Friday, May 18th, Karen Silkwood of Oklahoma City became the first officially recognized U.S. victim of radiation poisoning. U.S. District Judge Frank This upheld the decision of a jury of six that the Silkwood family be awarded \$500,000 for Karen's injuries and \$10 million in punitive damages for the way Kerr-McGee had operated its plutonium plant situated near the village of Crescent, Oklahoma.

But her case is not over. The Silkwood's lawyers are currently pressing for the civil rights issues (and the question of who caused Karen's death) to be brought to trial. Their case may ultimately reach the U.S. Supreme Court.

The May decision has far-reaching implications. Kerr-McGee, one of America's largest corporations, the U.S.'s largest uranium producer and a veteran in the plutonium field, received the toughest penalty ever dealt to an American company. Citizens of Denver, Colorado (which was dusted with plutonium when fires broke out at the Rocky flats weapons plant in 1957 and 1969) have been watching the case with interest. A judge in California is expected to rule that the civil disobedience actions of protestors who occupied the Rancho Seco power plant (a twin plant to the crippled Three Mile Island reactor) were justified because of the dangers of nuclear energy. The nuclear industry is reeling.

But to the Silkwood family, the court decision meant that their quiet, dark-haired daughter's credibility had been accepted by the strangers on the jury. During the trial Kerr-McGee officials had openly described Karen Silkwood as (variously) a kook, a union fanatic, a drug addict, a lesbian and an alcoholic. In fact much of the defence's time was spent in implying



Silkwood caused her own death, either as suicide for personal reasons or to give her case against the company more media value.

Karen Silkwood would have been amazed to see the stir her death on a lonely stretch of highway caused. Karen, a twenty-eight-year-old divorced mother of three, was hired as a lab technician by Kerr-McGee in 1972. Her trust in the company was eroded as she realised that the plant's operation was unsafe and possibly illegal. Her fellow workers, many of whom were teenagers from nearby ranches and dairy farms had been forced to breathe in plutonium dust as a result of faulty equipment, and a company truck covered with plutonium particles regularly visited a local carwash. During the trial, witnesses described the plant's safety system as "a joke", and a former

plant employee, now a state trooper, testified that Kerr-McGee rarely told new workers about the dangers of plutonium and said he had never been given the training courses required by federal law.

In September 1974 Karen Silkwood learned that as little as one-millionth of a gram of plutonium could lead to cancer. She contacted two national officials of her union, "The Oil, Chemical and Atomic Workers International" (OCAW) and agreed to get documentation of illegal and unsafe practices at the plant.

A month later she told the union she had collected a manila folder full of evidence. She arranged to deliver it to a union official and a New York Times reporter on 13 November - but she never made it to the appointment.

Karen Silkwood was already running scared. On 7 November

radiation inspectors found microscopic traces of plutonium sprinkled on a package of sausage in her refrigerator, in her bedroom and bathroom. She was briefly hospitalised after eating some of the contaminated food and, frightened, told friends "I'm afraid I'm going to die." An isotopic analysis, which matches up neutrons and electrons like ridges in fingerprints, traced the plutonium material to Lot 29 in Kerr-McGee's inventory. Karen Silkwood had no possible access to the individual lots of plutonium.

On the day after her release from hospital, Silkwood prepared her evidence and drove off to deliver the manila folder plus her notebooks to a motel in Oklahoma City. On the way her car veered off the highway and smashed into a concrete culvert.

Karen was killed. Kerr-McGee say she ran off the road, but a private investigator hired by the union found dents in the rear of her car which he attributed to a wheeled assailant - The manila folder and notebooks were never found.

The six jurors, (three men, three women) faced a long list of critical decisions. They were the first private citizens to judge the efficiency of the commercial nuclear power industry since the "Atoms For Peace" program began twenty-five years ago. Could Kerr-McGee (a huge corporation which, to many, ran Oklahoma) have been so negligent in its security systems as to allow forty pounds of plutonium, enough for four bombs, to have been lost - or stolen? Why would Kerr-McGee forge the signatures of former workers on attendance records for safety classes? Did the giant company falsify x-rays which showed up dangerous imperfections in the fuel rods they produced? Was Karen Silkwood placed under heavy surveillance by the company, with her phone tapped and her notebooks photographed on their insistence? A local bet ran 200 to one against the Silkwood side winning.

The resulting decision is not only a victory for anti-nuclear lobbyists, it is a victory for every person who has ever dared to fight corporate or government giants. Too many environmental and consumer cases against business giants have been settled out of court - leaving important evidence

and serious accusations out of reach of the public. The Silkwood family who fought this case - and then called for further investigation of their daughter's death - are courageous, determined people, virtues that were obviously passed onto their beloved Karen.

The battle to find out the names of Karen's killers will still continue in the courts of America. But the saddest testimony of all reveals that even had Karen's little car reached Oklahoma City untouched, its owner was already lost. Dr John Gofman, a former U.S. Government scientist and the first to isolate the plutonium isotope, testified that "Silkwood was married to lung cancer - it was an inevitable process."

Jodi Adams - Greenpeace Aust.

Finland: nuclear protest in the shadow of the U.S.S.R.

Finland already has one 420 MW Soviet-made reactor in operation, and three more plants are to be completed this year. In 1974 a State committee released a plan to build 40 reactors by the year 2000. This plan is no longer taken seriously because of slow economic growth but has not been officially rejected. The Government is also planning to build small nuclear district heating units, called "Safe and Environmentally Clean Urban Reactors" (SECURE). These were designed by Sweden's ASEA-Atom but will probably first be built in Finland because of strong anti-nuclear feeling in Sweden.

But local opposition to nuclear power is also growing in Finland, especially among the better informed Swedish minority who have access to foreign newspapers. The peace-loving Finns are particularly alarmed at a Russian plan to supply nuclear power to Libya with Finnish assistance. Libya is known to want nuclear arms.

In January 1977 an anti-nuclear

group called EVY was set up and within a year it had 1500 members. EVY has launched a campaign of leafletting, showing films, and in October 1978 held the first national demonstration against nuclear power.

The anti-nuclear movement in Finland is now concentrating on stopping the next planned nuclear plant, a 1000 MW Soviet reactor scheduled to be completed in 1984, from going ahead. Olli Tammilehto writes that "the task has many difficulties unknown to other anti-nuclear activists: information about Soviet technology is much more difficult to get. The spent fuel is taken back to the Soviet Union and therefore the waste problems are much weaker arguments. Most Finnish politicians want to be good friends of the Soviets and therefore they evade criticizing a project which might be important to the USSR."

Whether or not they succeed in stopping this particular reactor, it seems that the combination of economic factors and local opposition must slow down the Finnish nuclear program.

This naturally leads to some questions about the signing of the Australian Safeguards Agreement to export uranium to Finland, last year. At present Finland gets all its nuclear fuel from Canada (which has huge reserves) and the USSR, which also takes back its wastes for reprocessing. With this convenient arrangement already working, why buy uranium from Australia? Was the signing of the Safeguards Agreement perhaps just a piece of good public relations on Australia's part? Or will Australia eventually supply uranium to Finland to have it reprocessed and the plutonium retrieved by the USSR? This last possibility is not as strange as it sounds - the USSR is a signatory of the Nuclear Non-Proliferation Treaty and there is probably less danger that the plutonium would be diverted to make nuclear weapons than if it were sold to some of our other potential customers... such as South Korea or France. Nevertheless it does seem ironic that Doug Anthony, who has accused anti-nuclear protestors of being Communists, should agree to export uranium to Finland, to have it reprocessed in the USSR.

Chancy

URANIUM . . . NEWS . . . NUCLEAR . . . NEWS . . . URANIUM . . . NEWS . . . NUCLEAR . . . NEWS . . . URANIUM . . . NEWS

Chained Reactor?

Things are looking promising for the anti-nuclear front these days. Since Harrisburg, and the last issue of C.R., a number of important international moves have taken place. Countries with nuclear power plants have begun to urgently reassess the safety of their installations. Many have closed down reactors, especially those similar in design to the one at Harrisburg. Others have halted further construction until the Harrisburg inquiries have finished:

JAPAN:

The Nuclear Safety Commission has either shut down or prevented the opening of just under half Japan's nuclear capacity. Plans to build a new plant have also been way-laid pending the findings of investigations in the U.S.

WEST GERMANY:

Nuclear power is also having trouble in Germany. Plans for a "nuclear park" (reprocessing and waste disposal) near the village of Gorleben, Lower Saxony, have been deferred. Growth rates of 7-8% p.a. projected by planners aren't happening. But what is growing instead is local opposition to the construction of plants. Consequently, the 1974 prediction of 47 plants by 1985, looks more like being in the range of 10-18 . . . at its best.

The decision not to open Gorleben has put the whole German nuclear industry in jeopardy. In Germany nuclear power stations are not allowed to operate unless they have some proven safe method of waste disposal. Gorleben was to have provided this.

CANADA:

Atomic Energy of Canada Limited recently had to swallow a bitter pill when it was forced to shut down Quebec's only nuclear power plant. It had been condemned by scientists as "a lemon".



SWEDEN:

Half of Sweden's nuclear stations are closed, either because of accidents or safety modifications. Sweden has had a series of nuclear accidents this year. The most serious occurred in March at an Atomic Research Station where liquid plutonium leaked into a transportation pipe. There it collected and concentrated, reaching a criticality factor of 0.83. Critical mass occurs at 1.0 . . . Close!

Mrs Carter Christens a Nuclear Disaster

Rosalynn Carter was among distinguished guests at the launching of the "biggest, deadliest, and most expensive" nuclear submarine ever built in the U.S.A. It carries 24 missiles with multiple nuclear warheads, which exhibit the even more amazing feature of being able to destroy any Russian

city with a population of 100,000. And to add to the list of the world's most exciting statistics; it's longer than the Washington Monument is tall.

The Anti-Nuke Demo. on which the Sun Never Set

From a World Information Service on Energy (W.I.S.E.) Communique: 'Round up on World-wide anti-nuclear demonstrations. June 2-3-4', World Environment Day.

"As three continuous days of anti-nuclear demonstrations drew to a close . . . well over 200,000 concerned citizens throughout the world had taken part in activities at existing and planned nuclear power station sites . . . Meetings, bike rides, marches, non-violent site occupations and civil disobedience took place at 80-100 places in thirteen countries.

"Dutch villagers marched with Mayor and aldermen at their head against a plan to dump radio-active waste, a woman and four men from Greenpeace parachuted into the planned site for the world's biggest power plant near Ontario (Canada); 600 were arrested at Shoreham (Long Island, New York), for occupying a nuclear site; Scottish trade Unionists joined a march against a nuclear weapons site at Faslane (near Glasgow) . . . German cyclists occupied a bridge over the Rhine when refused permission to take a power station model into France for an alternative energy exhibition.

"Sadly, the weekend claimed a victim when Spanish Police opened fire on 5,000 peaceful demonstrators in the small town of Tudella in the south of Euskadi (Basque Country).

" . . . all the demonstrations were essentially local, the expression of a growing grass-roots movement, not organized from above . . ."

Lobster and Champagne

Not long before Doug Anthony and guests were tucking into the lobster, turkey and champagne at the opening of Nabarlek (Queensland mines), he and his deputy Ian Sinclair went out for a spot of fishing with Pancontinental's chairman.

Since then the Government has been busy considering Environmental Impact Statement on Jabiluka. Here lies 50% of the Northern Territory's uranium deposits, valued at \$10 billion. They say a little friendly lobbying never goes astray . . . but it all seems pretty fishy to me.

Russian Winter of Discontent

Newspapers recently carried an eerie story telling of the loss of hundreds of lives in a serious nuclear accident in Kyshtum, a remote area near the Urals. The accident allegedly happened in the winter of 1958. It was reported not long after in a British magazine by exiled Russian geneticist, Zhores Medvedev. Medvedev claimed that: "nuclear waste, carelessly buried over a number of years, erupted like a violent volcano, spewing radioactive material over thousands of kilometres."

In the U.S. the Nuclear Regulatory Commission and the C.I.A. appear to be taking the incident seriously. So is Medvedev who is putting the finishing touches to his book "Nuclear Disaster In The Urals", due for release late this month . . . Meanwhile back at the Kremlin, it seems the Russians aren't giving away many clues - all remains very quiet on the eastern front.

.....
It is intended that "Chancy" be a regular column in C.R. Its appearance in C.R. this month (and in following issues) is symbolic of the desire of many friends of the earth to revitalize F.O.E.'S contribution to the anti-uranium and anti-nuclear campaign. I urge readers to write to me C/- C.R. and express their views on what F.O.E.'s contribution to the campaign should or could be.

Judy Wilks
(Uranium Co-ordinator,
F.O.E. Collingwood.)

EARTH NEWS

Fremantle Railway - end of the line?

The West Australian Government is threatening to cut out the Perth-Fremantle railway line and put a freeway in its place.

The Government has proposed to close the line on 2 September and keep it shut down for three years (the legal requirement) before ripping up the tracks and building the freeway. The trains will be replaced by buses.

Public outcry has already been enormous. The WEST AUSTRALIAN (28/7/79) estimates that about 75% of people in Perth would be opposed to ripping up the line. "Friends of the Railways", a public group which formed in March, has collected nearly 100,000 signatures on a petition to save the railway. The Government's response has been to criticize the petition on the grounds that many of the people who signed it would not be regular passengers of the railway!

The Friends of the Railway have presented a detailed submission to the Government proposing that the railway should be upgraded and converted to electricity. They say this would be cheaper than replacing the line with buses. So far the Government has rejected the submission.

If all else fails the Railways Unions may be called on to take industrial action to keep the railway open. In the meantime people living along the line near the numerous trainstops are wondering what they will do for transport while the Fremantle line is closed. Further Information:

Friends of the Railway,
C/- Dr Peter Newman
PO Box 800, Fremantle, WA.

"Save the Railways" car-stickers (bike stickers?) are available from FOE, C/- The Environment Centre, 537 Wellington St, Perth.

act for the future SAVE THE RAILWAYS

Something to get your teeth into: the politics of food

Everything from multinational agribusiness to local food co-operatives was examined at a two-night forum held in Melbourne recently. The forum was aimed at encouraging an activist approach to food issues i.e. ways we can fight back against the multinationals.

Food activists topics included an anti-Nestles baby food campaign and a tea campaign (both of which are operating in Australia); a People's (i.e. non-governmental) Food Commission currently working in Canada; food processing, additives and nutrition; strengthening the food co-operative movement; the school tuck shop.

Several action initiatives are ready to be launched (see especially box below) and people power is needed.

CAN YOU HELP ORGANIZE A POLITICS OF FOOD SEMINAR?

- a weekend in-depth, action-orientated seminar on 24-25 November 1979.

- issues could include food and: multinationals, unions, working people, energy usage, health, the education system, co-operatives, growing your own, political and economic structures, trade, the Third World, warfare, the cost of living, political campaigns etc. etc.

- size could range from city, state, to a national conference depending on people's energy.

- Enquiries: Ben Witham, FOE Collingwood, Food Justice Centre. Phone (03) 419-8700.

Ruth Seidler, A.W.D. (03) 419-5588.
Trish Collinson, C.A.A. (03) 419-7055.



Great Barrier Reef: NOT SAFE YET

There is a great deal of confusion at the moment about the safety of the Great Barrier Reef. The Reef is not safe! The campaign which has been waged over the last several months has achieved a few relatively small gains.

- ★ About 2% of the Reef Region has been declared Marine Park, leaving 98% unprotected from oil drilling.
- ★ A moratorium on drilling and exploration has been declared over the Reef Region for an *unspecified period*. Speculations by the newspapers that the moratorium would be for 10 years have no solid basis in fact. On top of this, seismic survey work, which is an essential lead-up to oil drilling, has been carried out in the Reef Region since the declaration of the moratorium.
- ★ It is very unclear at the moment, but it seems that the (pro-oil drilling) Queensland Government did not gain the level of control of Reef waters which was thought possible at the last Premiers' Conference. At first glance this appears to be a victory.

But the day after the Prime Minister announced the declaration of the Capricorn and Bunker section of the Barrier Reef Marine Park, it was announced that the Federal Government had established a joint Ministerial Council, with two Federal Ministers and two Queensland Government Ministers, which would over-see any further extensions to the Marine Park.

Although this does not rule out the possibility of future Park extensions, especially around the prime tourist resort areas, it virtually gives Queensland the power to veto any extensions it does not like — e.g. into areas that might have oil potential. The move to establish a joint ministerial council is a disaster for the Reef!

The Reef campaign has made a few small gains, but this one move has been a major set-back, out-weighing the benefit of the Government's concessions.

The Government concessions seem to have convinced the news media that the Reef issue is dead. And the fact that the concessions were made at the end of the Parliamentary sitting means that their real meaning cannot be probed in Parliament. So there is very little reportage of the Reef issue at the moment.

On top of this the energy crisis has been getting panic rating in the media, thus helping to create the climate for

rash and disastrous decisions on Reef drilling.

Some way must be found to let people know that the Reef has not been safeguarded from oil drilling, to let them know more about its biological wonder, to let them know why it is essential that the Marine Park is declared over the whole Reef Region now, and to let them know that well-thought out energy policies exist that would if implemented make it unnecessary to put the Reef at risk. (One such energy policy is set out in the book 'Seeds for Change'.)

The only way to ensure that the Reef will be protected from oil drilling is to declare a Marine Park over the whole region now. Declaration of the Park would immediately prohibit oil drilling and mining but would not exclude tourism, commercial fishing or other human uses — it would merely provide the machinery to manage these conflicting uses.

If you can offer some help in the campaign to save the Barrier Reef contact me at the *Environment Action Centre, 118 Errol St, North Melbourne (phone 329-5519)*

— OR *Alan Catford, Total Environment Centre, 18 Argyle St, Sydney.*

— OR *The Australian Littoral Society, P.O. Box 82, St Lucia 4067 (phone 378-6077). Do it now!*

—Phillip Sutton.

TOWNSVILLE'S Secret Uranium Mine

Townsville is a large sprawling city of 102,000 people.

Fifty kilometres north-west of Townsville, one of the tributaries of the Burdekin River, Keelbottom Creek, has charmed Townsville people for many years. The sandy-bottomed stream fringed with melaleuca and callistomon has been a natural retreat for families, bushwalkers and campers. The area has evoked much interest from geographers and naturalists from the James Cook University of North Queensland, who consider that the special environmental features of the area qualify it to be set aside for wilderness recreation.

Minatome Australia Pty Ltd began prospecting there for uranium several years ago.

Now, much of the Creek area is closed to public access.

An advertisement in the Townsville Daily Bulletin warned that trespassing in the area "is prohibited to motor-bikes and motor vehicles. Fishing, pig-hunting, shooting and traversing on any part of the lease including Keelbottom Creek . . . is prohibited and anyone found thereon will be prosecuted."

On April 8, the Queensland Minister for Mines, Energy and Police, Mr Camm, announced that Minatome would be granted its lease to mine soon, boasting that it would be Queensland's next uranium mine. Mr Camm has been anxious to resuscitate Queensland's uranium industry for some time.

His announcement preceded the completion of an Environmental Impact Study in April.

The Queensland Government's encouragement of uranium mining is closely linked with its ambition to see a uranium enrichment plant built in the state — an ambition shared by the West Australian Government and politicians in the Northern Territory. These two both have uranium mines which are ready to go ahead. The Queensland Government is therefore allowing the Keelbottom Creek mine to proceed as fast as possible, even without any guarantee that it will be granted approval to export, so as to give the State some justification for claiming the right to the enrichment plant.

This year the Queensland National Party chose Townsville to be the venue for its State Conference. The Conference featured as its guest senior scientists from the Australian Atomic Energy Commission. They were brought here to "explain" the process of enriching uranium, not only to the National Party conference, but to the entire region. To this end, they spoke in the schools, service clubs, and to political meetings. The local press, whose editorials have frequently evangelised for the nuclear industry, gave freely of its columns. The Townsville Daily Bulletin's Editorial on Dr Clarence Hardy's visit spoke of the "quiet, dispassionate tones" with which he dispelled any nervousness which might be felt about the establishment of a uranium enrichment plant in North Queensland.

In May this year, journalist Denis Reinhardt reported in the National Times that Mr Camm had confirmed that a site on the coastal plain north of

Townsville was the most likely location for the establishment of the proposed plant.

If the uranium industry is successful in establishing a uranium enrichment plant at Townsville, it is likely that all uranium mined in Australia would be transported here for enrichment. It is logical also, that the enriched material would be exported from the Townsville container terminal, close to the heart of the city.

Townsville could become the nuclear capital of Australia.

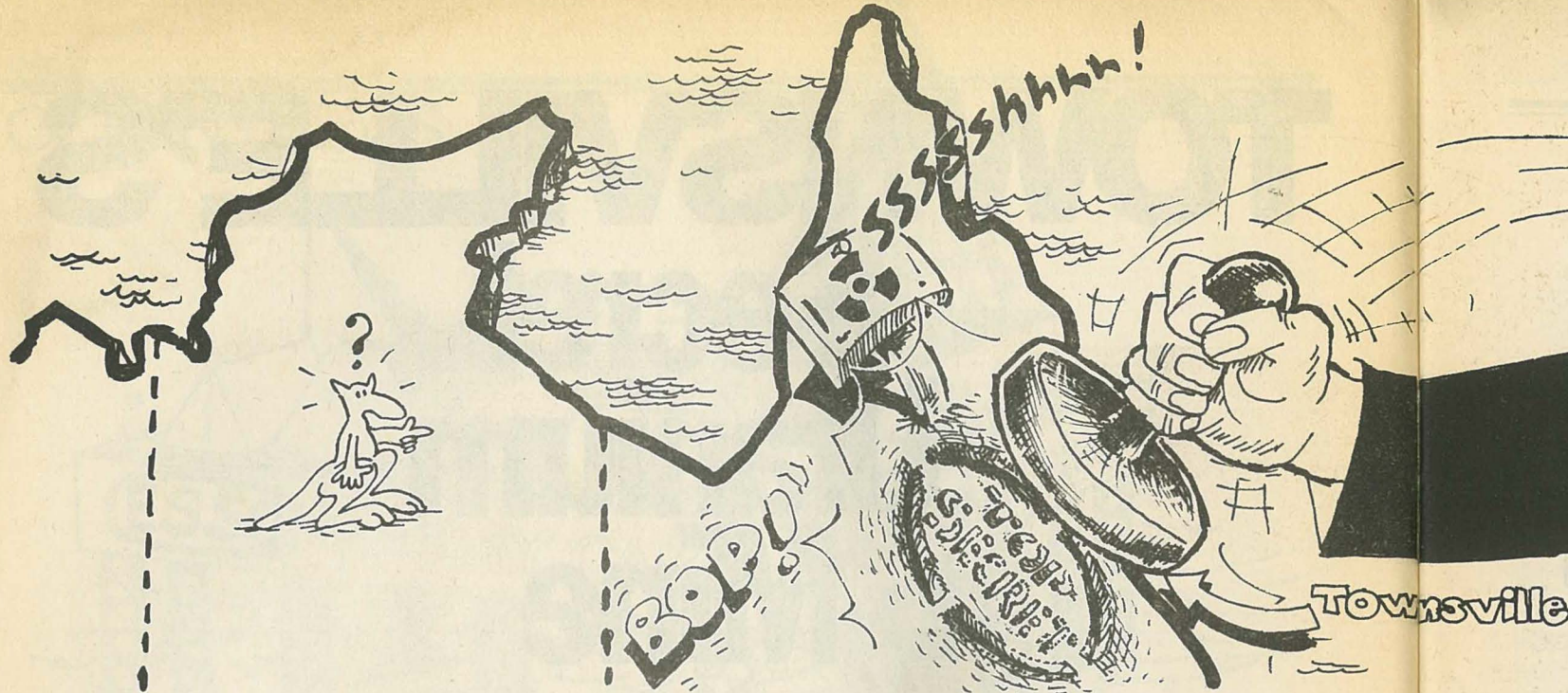
Secrecy Surrounds the Mine

A curious aspect of the proposed uranium mine at Keelbottom creek is that news of the imminent granting of the mining lease has taken most of Townsville's population by surprise. The company has assiduously avoided publicity and has actively discouraged scrutiny of its activities.

On April 26 of this year, an incident occurred which showed the company's fear of public scrutiny.

On that day, Senator Jim Keefe, another person, and myself, chartered a plane to fly over and photograph the Minatome project. As we were about to board the plane, the charter operator cautioned us that if we flew close to the mine site, "they" would "shoot". The charter operator told us that both his company and "the Department" (presumably the Department of Transport) had been warned.

One week before our trip an A.B.C. newsteam had aerially photographed the project and shortly afterwards the company had declared a danger



area over 2 square kilometres, to a height of 500 metres because of "surface blasting". It is possible that the word "shoot" is mining jargon for "detonate a charge". That was not explained. The threat was delivered without explanation or embellishment. It was as bizarre as the company's belief that such an extensively developed project could continue to be carried out in secret.

Minatome's arrogance towards the local residents of Townsville is reminiscent of the French Government's treatment of the local Polynesians during nuclear testing at Moruroa in the Pacific. During the testing information about the level of radiation released and the degree of contamination of fish and water were assiduously kept from the public. Minatome's similar policy of secrecy and disregard for the rights of local people is not surprising, considering the company's strong connections with the French Government. Minatome Australia Pty Ltd is a wholly-owned subsidiary of two of France's largest corporations; The Government-owned Compagnie Francaise de Petroles, and Pechiney-Ugine-Kuhlmann, also Government-backed.

It is ironic that France is not a signatory of the Nuclear Non-Proliferation treaty, is committed to uranium reprocessing and bomb-testing and would break every condition laid down in the Australian safeguards policy for export of uranium, even if it would sign the agreement. Yet it has been warmly welcomed by the Queensland Government as a developer of the state's uranium.

What worries the locals most about the mine project is the probability of contamination to the Burdekin catchment area. The damming of the Burdekin is the project most dear to Northern Queensland politicians, businessmen and farmers alike.

Recently the Townsville Regional Conservation Council asked Mr Camm for access to the Environmental Impact Statement on the mine, and the opportunity to comment on it. The council cited the proximity of the mine to Townsville and the location of the mine on the Burdekin River catchment area as reasons for its concern. The actual mine location is on the side of a mountain, Ben Lomond, which slopes down to the creek system feeding the Burdekin River. The entire project straddles the creek and gully system.

No information, no right to ask

Mr Camm replied: "I do not consider the facts that . . . environmentalist bodies have particular views on uranium mining, processing and utilisation, as being in themselves sufficient reasons for their being called upon to provide environmental assessment." Put more bluntly the Minister was not interested in hearing what environmentalists had to say on the subject and refused to let them see the impact statement.

A request from the Queensland Conservation Council to participate in the EIS drew an identically worded response.

Similarly, requests by private persons to see the EIS have been

rebuffed.

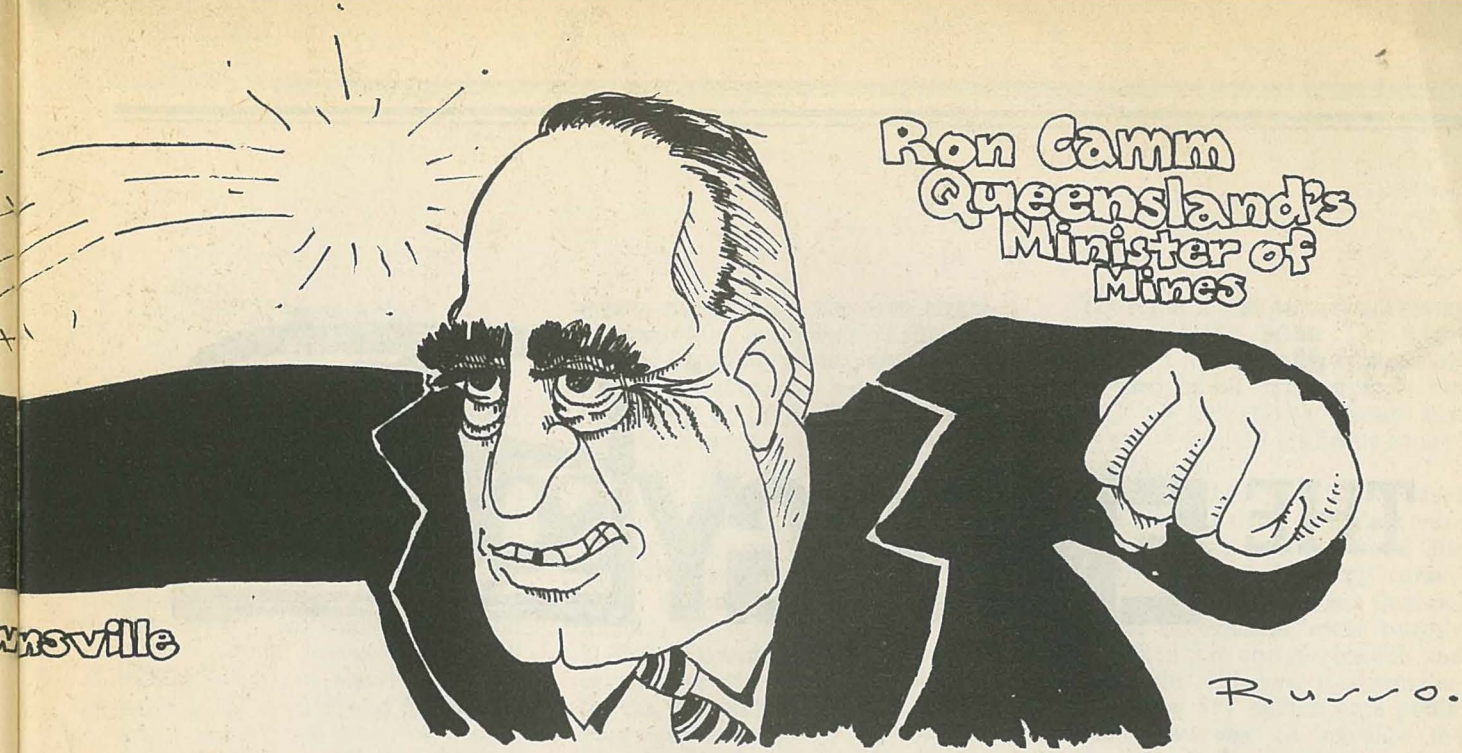
The Burdekin Dam lobby, anxious to avoid any political involvement while Federal commitment to the Burdekin Dam Scheme remain precarious, have been loathe to add their voice to those of other sections of the community in demanding that the EIS be made public. There is no doubt, however, that the presence of the mine is an embarrassment to them.

Although members of the public have no access to the impact statement, several local environmentalists were used to provide sections of the study. These people are now concerned that their names will be used on the statement as a public relations exercise, and they will not be allowed to comment on the report or even see it.

It is suggested that the EIS is quite inadequate. The guidelines issued by the Department of Mines for the study make no reference to natural hazards, such as cyclones, flooding, soil shift and heavy rain, — all of them characteristic of the area.

Recently the Queensland Government released revised procedures for the conduct of Environmental Impact Studies. Significantly, the word "environmental" has been dropped from the title and they are now to be called "Impact Assessments of Development Projects in Queensland".

Whereas under the old system the public was enthusiastically feted (at least on paper) the new procedures do not mention public involvement at all. They do contain a 6-page list of advisory bodies — all State Government departments.



They also state that local authorities should be considered as advisory bodies and should "always be consulted, along with any other Local Authority whose area may be affected by a proposed development."

It would seem that this policy has been totally disregarded.

None of the Shires affected have been invited to participate as Advisory Bodies. Not Dalrymple Shire (in which the project is situated), nor Thuringowa, whose border lies within a few kilometres of the project, and within which Minatome Australia Pty Ltd has its offices. The Townsville City Council has not been consulted, despite its proximity to the mine, and the fact that the city's development is closely tied to the future availability of the waters of the Burdekin River.

The Charters Towers City Council, which draws its waters from a dam on the Burdekin River, not far from the head of Keelbottom Creek, has expressed concern. However, it has not been asked to participate in the EIS.

In Queensland, we have become used to executive arrogance. Such disregard by Ministers of the Government for their own regulations has become commonplace. Where the rules do not suit, new ones are made, as evidenced by the amendments to the Mining Act passed in Queensland Parliament on May 1, 1979. These amendments, brought in specifically to allow mining to proceed on Moreton Island against the wishes of the Brisbane City Council, allow the Mines Department to overrule decisions made by local authorities on mining developments.

Laws in Queensland abound in examples of built-in checks against democratic procedures working.

This has been brought home to citizens of Thuringowa Shire who have called for a Local Government Poll on establishment of the uranium industry in the Shire. Under Queensland Local Government Act regulations, a poll can be required if it is

overrule the result of a Local Government Poll.

The Minister in this instance is Russ Hinze, notorious for his autocratic treatment of the Aboriginal local council at Aurukun, and said to be more right-wing than the Premier, Mr Bjelke-Petersen.

The Chairman of the Thuringowa Council, also extremely conservative, refuses even to have documents and official information on the nuclear projects tabled at Council meetings.

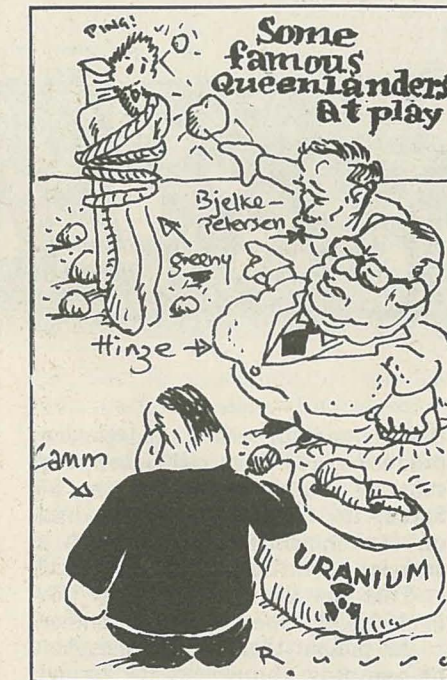
I believe that the majority of Townsville people are opposed to the establishment of nuclear facilities in this region.

However determined and widespread this opposition is, it will carry little weight with a State Government dedicated to protecting the people from themselves in the national interest.

Mr Camm said it well, in an interview with Denis Reinhardt of the National Times: "If I had to listen and take notice of protests against the issuing of a mining lease anywhere in Queensland and listen to the people in the close proximity of that mining lease, there would be very few mining leases ever issued."

The people will not be consulted. Their opposition will be ignored. Townsville people need the support of Australians all over. In order to understand the forces operating in Australia now, it is necessary to come to terms with the anti-democratic forces operating in the deep north of Queensland.

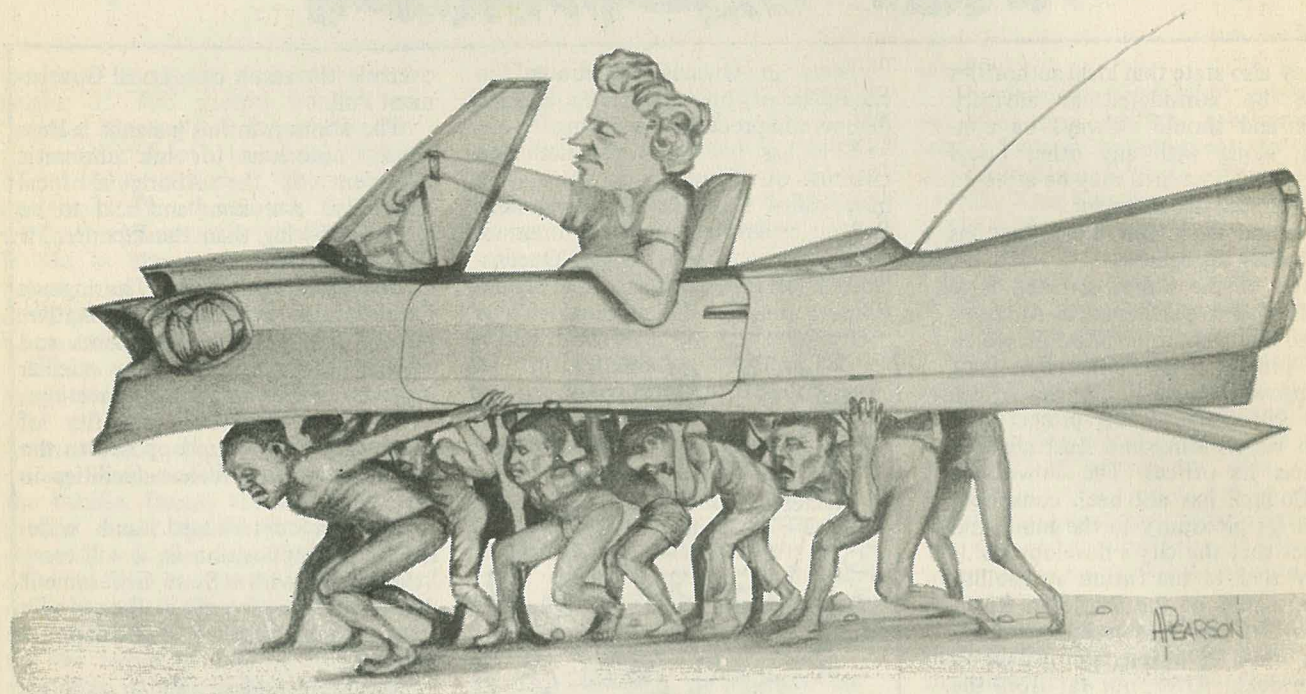
Lyn Martinez.



petitioned by 10% of the voters. A local branch of the Labor Party has already obtained 11% of voters' signatures on a petition.

The pre-poll lobby is only too aware that, in Queensland, the Local Government Minister has the power to

THE ENERGY SQUEEZE



The "Energy Crisis" first shocked the world in October 1973, when OPEC placed an embargo on oil supplies. Despite widespread panic, within 4 months (January 1974) the "Seven Sisters", the seven major oil companies in the US, held more stockpiled oil in the United States than they had 12 months earlier. At the same time, American consumers were beset by shortages of fuel for transport and heating, and increased oil prices. The shortage was in fact artificial, engineered by the oil companies to force up prices and increase profitability.

The "shortage" not only created massive windfall profits but also led to

the demise of many independent producers, and to special Government subsidies and tax-relief for the big Seven. The Government also cut back on environmental safeguards such as emission controls, to conserve fuel.

That was the situation in the USA in 1973/74. Does it sound familiar?

At present there is an atmosphere of near-panic throughout the Western world, as people brace themselves for further price rises, drastic changes to lifestyles, the likelihood of even deeper economic recession, and almost certainly increased unemployment. That gloom exists almost everywhere

... except in the boardrooms of the Seven Sisters!

The table below, showing profit rates in the USA for the first quarter 1978/9 compared with the same period 1977/78, tells the story clearly:

Exxon: up 37% to US\$995 million.
Mobil: up 81% to US\$437 million.
Shell (US): up 16% to US\$223 million.
Standard Oil (Indiana): up 28% to US\$349 million.
Standard Oil (California): up 43% to US\$347 million.
Gulf: up 61% to US\$249 million.
Texaco: up 81% to US\$307 million.

The question is whether these profits represent the final fling of the oil companies - I doubt it.

Known and Recoverable Reserves

NATIONAL TIMES (week ending 30/6/79) estimates that in non-communist countries there exist 1,700-3,000 billion barrels of oil, whilst consumption rates are 20 billion barrels annually.

While estimates of reserves are traditionally a little unreliable (and often understated, since only the oil companies have access to the full information) there seems to be no danger of oil running out in the near future. In the long term, of course, petroleum reserves will be exhausted and alternatives will have to be found, but the main problem in the short to medium term is rising prices, rather than a real lack of oil.

As a commodity, oil is worth more to the companies the longer it is left in the ground. If they can sell less, and profit more, then why should they use up their reserves? The oil shortages created by hanging onto reserves

merely makes prices rise even higher.

Meanwhile, Australia's oil situation is being frightfully mismanaged.

1. The oil companies are not drilling new wells. In 1978 only 52 exploration wells were drilled in Australia, compared with 48,000 wells in the USA and 7000 in Canada. So, whilst "local" reserves are depleted more quickly than is necessary (to offset the shortfall in imported oil), there is little hope of increased reserves being found.

2. The Government exercises no control over the level of oil imported by the companies and so our stockpiles are reducing by an unknown amount. Until recently the Government had absolutely no mechanism for monitoring oil stocks in this country, and it has admitted its ignorance of levels of stockpiles. In the name of free enterprise it has been allowing "market forces" to manage the situation: in other words this is left to the big oil companies. Isn't this like allowing the wolves to oversee the sheep?

The result is that Australian citizens are paying higher prices. This might be justified if the profits creamed off were used in oil exploration - but there is no legislation to ensure that any part of windfall profits be applied to searching for oil.

There is little or no chance, under present circumstances, of finding more oil. This might not matter if the Government pursued energy conservation seriously. In the last financial year the Government spent roughly \$15 million on energy research and development. This year it is considering spending \$17 million on a public relations campaign to convince the electorate of the need for energy conservation!

Of course the oil companies are interested in extracting the last drop of profit from the consumer. As profit-making enterprises they are expected to do this. By failing to do anything about the situation the Government is once again showing how shortsighted it is.

- Phil Gleeson.

ALTERNATIVES TO PETROL

As the demand for oil increases and supplies dwindle the cost of petroleum products increases rapidly. In the last three years the cost has more than doubled and is likely to have trebled by the end of the year. Production of oil from the Bass Strait oil fields will suffer a drastic decline in the early 1980s. By 1985 no more than one third of our oil will come from Australia as compared to two thirds now.

All this spells out one thing for people who rely on using motor vehicles in their day to day lives. In five years or so petrol will be so expensive that the majority of people will have to think very carefully about whether they can afford to drive a motor vehicle.

What then can people who need to travel and have inadequate public transport do? One alternative is car pooling, but this only postpones the real problem, which will occur when

petrol runs out. Sooner or later an alternative to petrol must be found.

ALTERNATIVE FUELS

L.P. Gas: In recent months there has been much discussion of liquid petroleum gas. The major attraction of L.P. gas is cost: on 1 July, 26 cents a litre for petrol and 12 cents a litre for L.P.G. were typical of the average prices. Recently the Prime Minister, Mr Fraser, announced that the 15% sales tax on LPG conversion kits was to be removed, thus encouraging even more people to switch to L.P. gas. The sudden popularity of L.P.G. has created long waiting periods for those wanting their cars converted - often several months.

However LP gas has its disadvantages. The initial cost of conversion is about \$750. This may increase soon because all conversion kits are manu-

factured overseas and high demand is likely to lift prices. It takes a number of years to recoup this cost from lower fuel bills: if a car is converted to LPG and then disposed of two years later, it is likely the owner will still be out of pocket. In addition, lower fuel economy can be expected from L.P.G.

As yet there are relatively few outlets for LPG, and it will take several years for the situation to improve. This is not much of a problem when cars have dual fuel conversions (allowing the car to run on both LPG and petrol) but many conversions are complete, allowing only the use of LPG.

Finally, reserves of LPG are small. At present domestic consumption is low - in fact, in 1975, 90% of the LPG produced in Australia was exported to Japan. A massive change-over to LPG will deplete our reserves much more quickly than has been

ALTERNATIVES TO PETROL

anticipated. Thus LPG can do no more than provide short-term relief from fuel shortages, and will only be cheaper for motorists who cover a lot of miles in their LPG-converted cars.

Alcohol: Alcohol has been used in Brazil as an additive to petrol since 1937. Its major advantage is that it can be distilled from plants and is thus a renewable energy source. Up to 20% of alcohol can be added to petrol before there is any need to regulate or modify the engine. Modified motor vehicles have been successfully run on pure alcohol, with slightly higher fuel consumptions than

obtained from petrol. Continuing research is being carried out in this field.

Total costs of ethanol from various sources range from around 14 to 47 cents per litre, depending on the method of distillation and the crops used. Although the lower figures are rather optimistic it can be seen that alcohol is already competitive with petrol, and is likely to become more so as petrol prices rise.

Alcohol can be produced from the waste products of the sugar industry and from other crops — along with other useful derivatives. For example wheat can be fermented to make

ethanol, and the by-products, yeast protein and wheat protein, which are a complete protein source, can be used as a meat substitute.

A CSIRO Interdivisional Working Party carried out a survey on the potential for liquid fuel production, using current technology, from existing plant residues and energy crops grown on as yet uncultivated land. The study found that enough ethanol or methanol could be produced from plant materials to supply 47% of current petrol needs.

Alcohol could provide an immediate, relatively cheap fuel to help replace petrol. The technology to produce it is readily available. However not enough alcohol could be produced to replace petrol by itself.

Methane: Methane (natural gas) is produced when animal waste or plant material is placed in a sealed container in the absence of oxygen and allowed to decompose. Methane has been produced in numerous backyard installations and in large sewerage farms such as the Carrum sewerage plant in Melbourne.

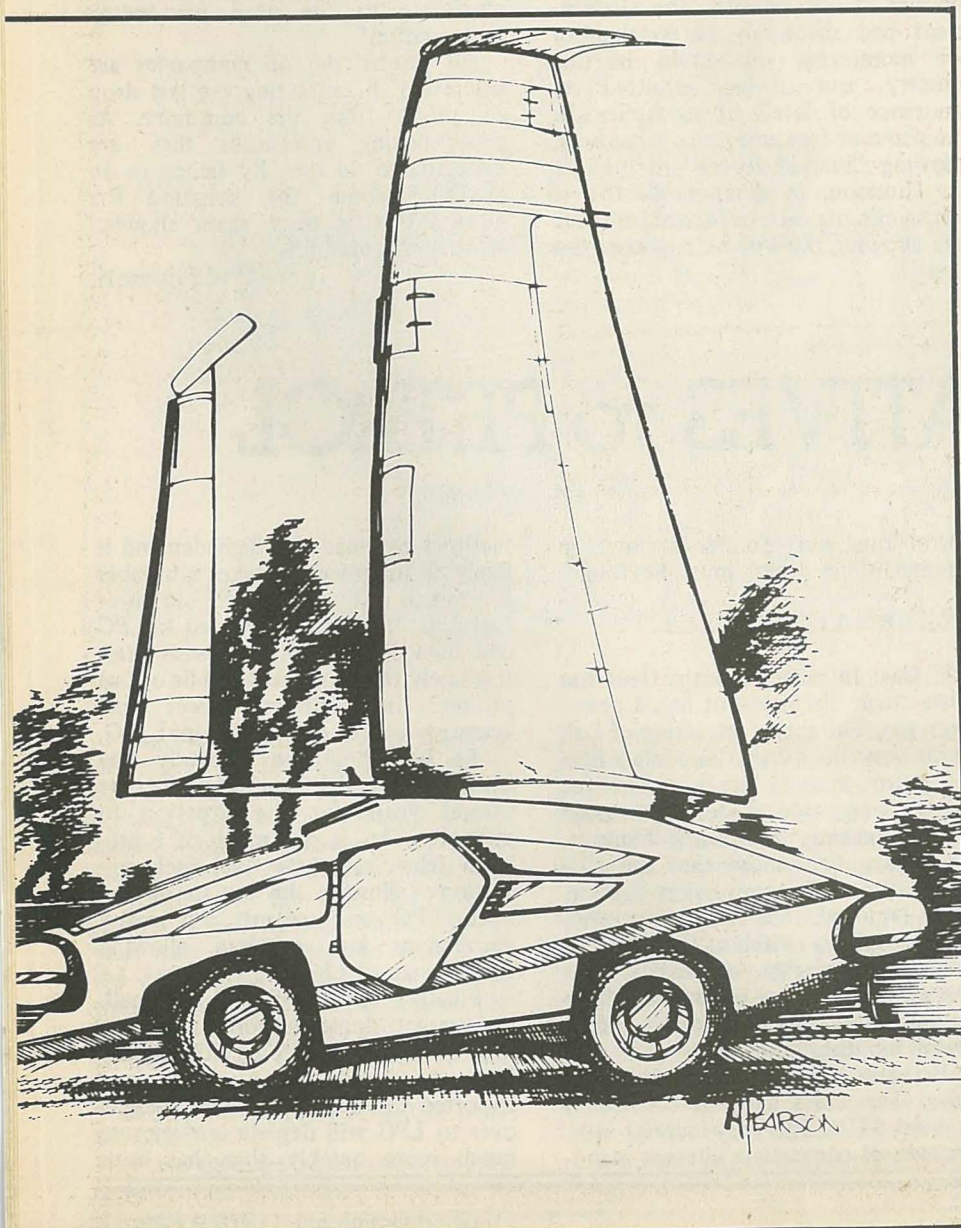
With some modifications methane can be used to run an internal combustion engine, but there are a number of problems in doing this.

Because methane is a gas it must be compressed so that significant quantities can be stored and transported. Compressing the gas uses energy itself, while the extra weight of the gas cylinder increases the weight of the vehicle.

When methane is digested a small amount of sulphide gas is produced. If this gas is not removed it can form sulphuric acid in the engine and cause considerable damage.

Perhaps the most significant disadvantage of using methane is the limited supply of organic waste available. The amount of methane that can be produced is relatively small compared with our present and projected fuel consumption.

Hydrogen: Water (H_2O) is made up of hydrogen and oxygen. If we could economically separate the hydrogen we would have an almost endless energy source. When hydrogen is burnt the by-product is water, and thus there is no pollution problem.



The hydrolysis of water is a simple operation, involving running a current through water to separate the two elements, but this takes energy — more energy than we get out of the hydrogen when we utilize it.

Using hydrogen to run motor vehicles involves major modifications to the engines, modifications which have not been perfected. Hydrogen is also highly explosive (remember the Zeppelins of the First World War). Thus, while hydrogen may be used to fuel motor vehicles, it could have more potential as a form of energy storage in conjunction with solar and wind systems.

Other Fuels: As fossil fuels come closer to exhaustion research has been carried out on a number of other possible replacement fuels. One of these involves passing an electric current through a liquid containing plant material, to produce a liquid fuel suitable for motor vehicles.

Even though most of the new developments hold some promise, many cannot produce the huge quantities of fuel needed cheaply. They will take time to be developed.

ALTERNATIVE VEHICLES

Electric Cars: Over recent years some impressive work has been done at the Flinders University of South Australia towards developing a viable electric vehicle in the near future. To do this the running gear and body of an existing Fiat 127 was used, fitted with a printed circuit motor (which is lighter and more efficient than other motors).

A modified lead acid battery, which is 30% lighter and smaller than conventional batteries has been installed, with an electronic control system to maximise battery life and motor performance.

The motor runs on a variety of voltages ranging from 12 to 144, as well as currents from 0 to 80 amperes. The motor is directly connected to the gear box: no clutch is needed because of the low mass of the motor.

Enough research has gone into the technology of electric cars to make them a commercial proposition and they may soon be available to the public. The specifications of the Mk II research vehicle are shown below.

Work is also being carried out on a delivery van.

Like most of the other alternatives to petrol — driven cars, electrical vehicles only provide a partial solution. While they are useful as commuter vehicles, they are not yet suitable for long-range travel.

If a large-scale changeover to electric vehicles took place an immense strain would be placed on our electricity generating capacity, further depleting coal reserves.

Steam: Over the last ten years a highly efficient steam car has been developed by Ted Pritchard in Melbourne.

This vehicle has a number of advantages. It can run on almost any fuel (it has already run extensive tests on alcohol produced from sugar cane) and it emits much less pollution than an internal combustion engine.

The steam car is the only form of alternative vehicle which approaches the performance of an internal combustion engine. Electric vehicles fall far short, and there are few other systems which supply as much power as this engine at a relative low cost.

The Pritchard steam car can maintain a cruising speed of at least 100 to 110 km per hour. Fuel consumption is between 25 and 35 miles per gallon on kerosene (and 170 miles per gallon on water). It takes less than 45 seconds to build up enough steam to drive the vehicle.

The project's main problem at this stage is lack of finance. About 12 month's work and \$120,000 will be needed before manufacturing can be started.

THE FUTURE

The transport crisis is not due so much to lack of energy as to the inability to find energy sources as concentrated as petrol.

A bowser can pump petrol into a car's tank at about 50 litres per minute. This rate of energy transference is equivalent to 30 Mega Watts; as much as a small electric power station. To look at it another way, the petrol pump transfers energy to your car at 10,000 times the rate an electric car could be charged from a power point.

Finding a power source as concentrated as petrol and in as large supply will almost certainly be impossible. If this is the case then lifestyles which involve commuting by private transport from home to work, home to shops etc., may not be possible any more. What private transport survives will have to be slower and more energy-efficient than petrol driven vehicles.

It is essential that the public transport system be enlarged and developed. Greater use of bicycles and of walking will also be necessary.

Ultimately we must look towards the restructuring of our society so there is less of a need to commute. We must develop communities of people within the urban environment, so that work, school, shops and all other services are within walking distance from the home.

We have no choice in the matter of adopting these measures. What we do have some control over, is whether the transition will be planned, and controlled or abrupt and devastating. We do not have the time to argue about the changes our society must go through with the demise of the family car(s). Even if we start now it will take time, and time is running out.

Mick Harris

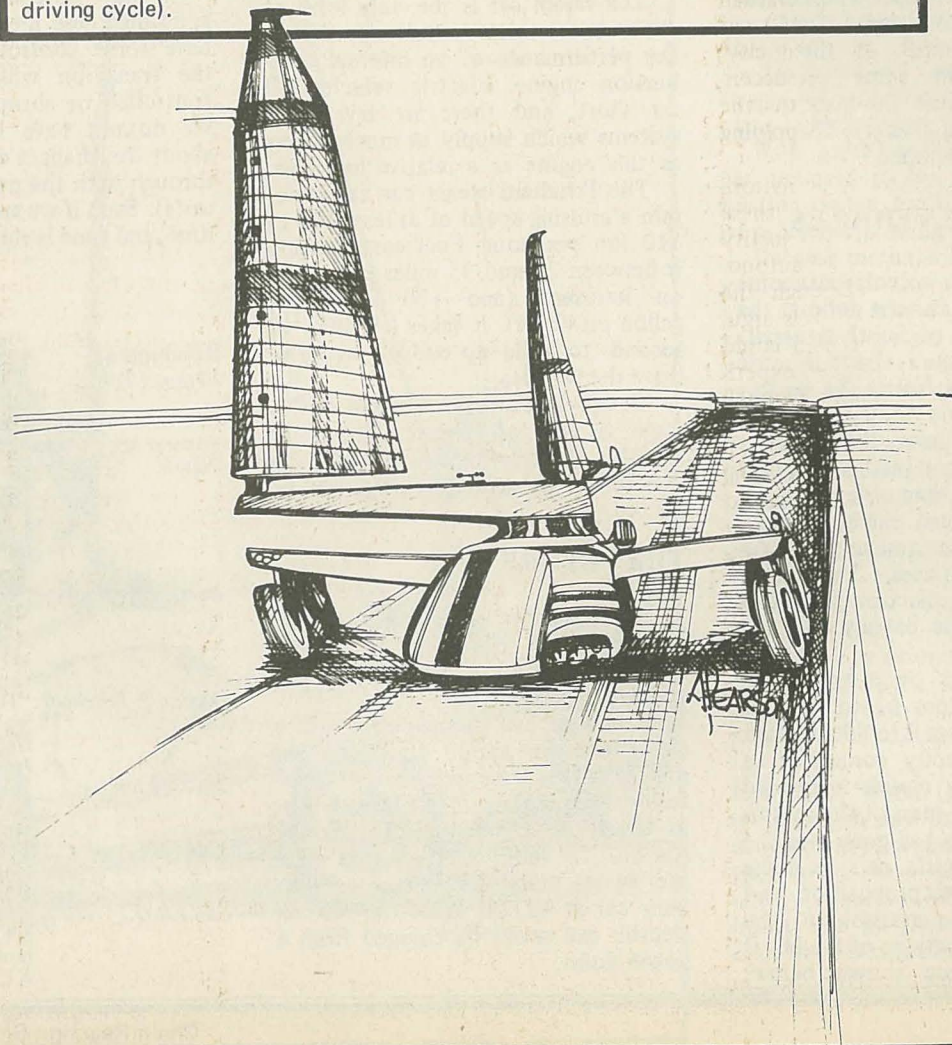
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ALTERNATIVES TO PETROL

SPECIFICATIONS – FLINDERS ELECTRIC VEHICLE MK II

Body Type:	Fiat 127
Motor:	2 x 4 kW. printed circuit.
Control:	Linear current control with battery preselection.
Battery:	12 x 12 volt units 6 kW. hr. at 1 hr. rate. 265 kg. 1020 kg.
Vehicle Weight: (Incl. battery)	To 40 km/h 16 secs.
Acceleration Rate: (Test weight. 1156 kg.)	To 60 km/h 37 secs.
Maximum Current During Acceleration:	80 amp.
Range (Constant speed):	60 km/h – 65 km.
To 80% of test speed	45 km/h – 100 km. 30 km/h – 130 km.
Urban Test Cycle: (To AEVA requirements)	50 km.
Grade Ability:	17.6%
Continuous rating	
Regenerative Down Grade Holding Ability (1 in 10 gradient)	3 km/h
Specific Energy Consumption: (as per AEVA requirements for Urban driving cycle).	171 watt. hrs. per tonne kilometre.



After the devastation caused by Cyclone Tracy in 1974, the Darwin Reconstruction Committee (DRC) was set up to rebuild the flattened city. The DRC was interested in decentralizing, but was faced with the problem of the high cost of supplying services to remote urban areas.

The Northern Territory Environment Council suggested that these costs were so high as to justify developing a self-sufficient autonomous services system. Although the DRC was not convinced by this argument, it did indicate that land could be made available for such an experiment if the Environment Council could produce a detailed feasibility study demonstrating its viability.

At this stage the Architectural Science Unit of the University of Queensland heard about the project and eight students started work on a detailed design for the site. By November 1976 a 600-page report had been compiled, concluding that the project was feasible.

Unfortunately the DRC was wound up at this stage, and the new planning and land authorities which replaced it showed no interest in granting cheap land for the solar village. This meant that fewer people could afford to commit themselves to the project than would have been possible with Government assistance.

A site of 130 hectares was chosen for the village at Humpty Doo, 34 kilometres south-east of Darwin. The

intending residents took out an option to purchase the site. The group then applied the findings of the students' report to the new site and produced a second report by February, 1978. The scheme allowed for an initial ten families, housed on individual quarter hectare blocks around a community centre, with the rest of the 130 hectares remaining as community property.

ENERGY SYSTEMS

The autonomous village plans to use a combination of home-made and off-the-shelf equipment to provide energy and water.

Water: During the dry season from May to October there is virtually no rainfall in the Northern Territory, and so windmills will be used to pump bore-water. The first windmill, a "Southern Cross" multi-vane type, is already supplying water for domestic use, and to irrigate the small orchards and vegetable plots which are gradually being established around the first houses.

Water heating: Solar hot water systems are very efficient in the sunny Northern Territory climate. Already 60% of houses in Darwin have solar hot water services, which require less than 10% of electrical boosting to meet their hot water needs. It is expected that all the village's hot water requirements can be met using commercial solar hot water systems

and no electrical boosting will be needed.

Electricity will be provided by a solar pond system supplemented by a wind generator.

For most of the year there is very little wind in Darwin, so the villagers are considering using a 5-kilowatt Dunlite windmill blade with a 2-Kw generator, to give the maximum output while cutting costs.

Most of the village's electrical power will be produced from sunlight. Under normal conditions the simplest way of doing this would be to use a concave mirror to focus the light. The temperature at the focal point is very high – high enough to produce high temperature steam from boiling water. However the light in Darwin is often diffused by cloud cover, and is hard to focus.

So, instead, the villagers plan to use solar pond technology, researched by the CSIRO.

The "pond" is filled with layers of salty water. The bottom level is extremely saline but has less-salty water above it. The top layer is almost completely fresh.

In theory this prevents convection currents in the water. The bottom layer is too heavy with salt to rise. As a result it can become very hot; can be used for heat storage or low-temperature electrical generation. (In practice, it's a difficult system to control.)

DARWIN'S SOLAR VILLAGE

Low temperature turbo-generators are manufactured by the Kinetics Corporation (USA) and Ormat Turbines (Israel). They have a peak output of 5-10 kilowatts and a conversion efficiency of 15% (that is to say that 15% of the heat stored in the liquid is converted to electricity, the rest being lost in the process.)

Electricity will be stored in a series of twenty-two 2.2 volt batteries, wired together to give a total of 50 volts, with a nominal capacity of 1500 amps per hour.

An inverter will be used to take this up to 240 volts, the same as is available from mains power throughout Australia.

It has been calculated that each household will need 3 Kw hours of power - enough to run 2 ceiling fans, 40 watt fluorescent lighting, and provide 10 hours of refrigeration per day. The solar pond and windmill systems should be able to cover this demand, except during occasional prolonged overcast periods.

The villagers could simply accept these occasional blackouts, however there would have to be some special provision for refrigerating food.

Alternatively, extra wind generating capacity could be installed to take over in cloudy (and generally stormy) times. However there is no hard data at present to show that cloudy and windy times necessarily coincide.

The villagers may eventually instal a wood-fired boiler (using on-site timber) to provide electricity, or may increase the thermal storage capacity to carry them over the worst anticipated situation. The final decision will be made when the village is completed, on the basis of cost. Till then a stand-by deisel generator is being used.

Solar Air Conditioning: At least one family is considering installing a solar absorption system of the type manufactured by the Yazaki Corporation (Japan) or Arkla Corporation (USA). **Biomass Conversion:** Methane is likely to be produced from wastes from agriculture and animal husbandry, to be used for cooking.

The deisel generator could also be modified to run on methane and so, perhaps, could some of the farm machinery. However ethanol would probably be more suitable for that purpose, and therefore experiments

with energy crops such as cassava and sugar cane are included in the plans for agricultural development. (For a more detailed discussion of methane and ethanol, see "Alternatives to petrol" in this issue.)

IMPLICATIONS OF THE SOLAR VILLAGE

The solar village will, it is hoped, be a source of inspiration, information and experience for other semi-rural developments taking place in affluent parts of the tropics. Further, the known scope for economies of scale in producing the hardware used in the autonomous village suggests that the concept is a viable alternative to rural electrification, especially in the third world.

Source:

Paper by Trevor Lee, Solarwise Project Officer, C/- The Northern Territory Environment Centre, PO Box 2120, Darwin 5794.

Mick Harris

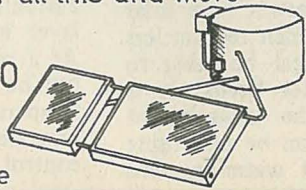
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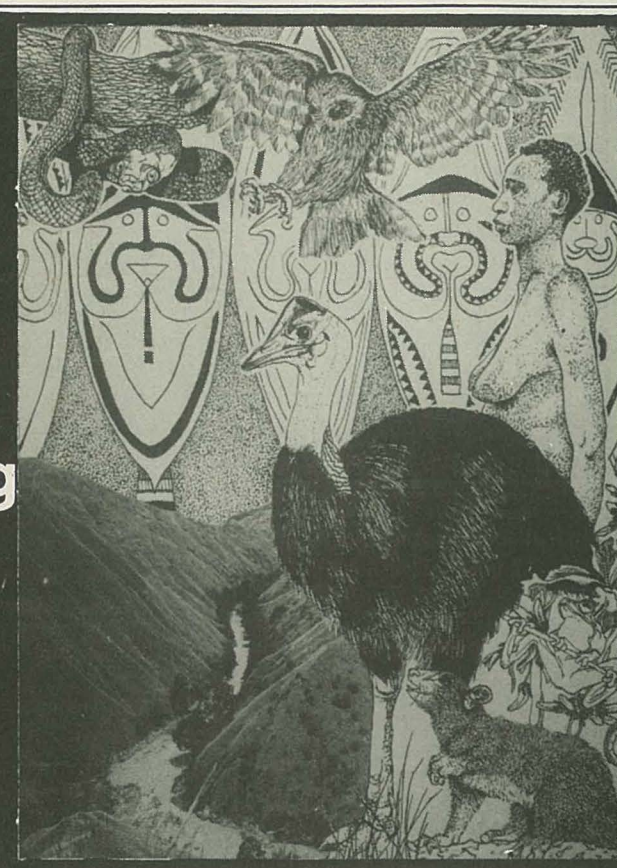
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Purari: over- powering New Guinea



What will happen to us when the clever men close the river?

People living in the Purari Valley in New Guinea have been asking this question ever since they were casually told about the plans to dam the big river.

By the time they were consulted the New Guinea government had already spent hundreds of thousands, probably millions of dollars on consultants' fees, aerial surveys, airstrips etc, in an attempt to please Japanese business interests, who wanted a massive dam (the Wabo Superdam) to power an industrial complex on the Purari.

The Papua-New Guinea government's consultants at first planned to build ten dams on the river, to produce an incredible 9,000 MW of power (equivalent to 9 large nuclear reactors or 18 Newport power stations).

Japanese business needed cheap power and a place to relocate its heavily-polluting industries, such as bauxite smelting. But since the scheme started Japan has found other tax-free Third World havens for its more environmentally destructive industries. Now the PNG Government is looking for partners in the venture.

Anyone who's concerned about the third world, and wants to understand the causes of social disintegration, poverty, the shift to the cities, overpopulation etc. should look at the Purari case study.

Purari: Overpowering New Guinea. Available from FOE Collingwood or the publishers, International Development Action, 73 Little George Street, Fitzroy, Vic. 3065. \$5 plus postage.



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blast!

The French Government has denied reports that an earthquake and tidal wave in the Polynesian islands were caused by a subterranean nuclear explosion which misfired.

Workers in hospital suffering from severe burns were, according to the Government, victims of a "non-nuclear" explosion.

Members of Greenpeace, trying to establish the real cause of the accident, contacted the DSIR (Geophysics Division) in New Zealand, which replied:

"Our seismographs have recorded what is apparently a nuclear test in the vicinity of Moruroa. The origin time was 17.57 U.T. on 25 July, 1979. This is the largest event so far recorded from Moruroa, equivalent to an earthquake of magnitude 6.3."

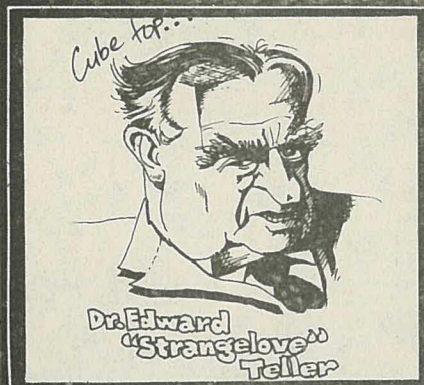
Dr Strangelove Frankenstein

ECO-BOLTS part 1

by Mark Plunkett

Dr Edward Teller is an emigre Hungarian scientist who has worked since the war for the American nuclear establishment. He has two epithets attached to his name "The Father of the H-Bomb" and "The original Dr Strangelove". The designer and a whole-hearted promoter of the world's most devastating weapons system, he is an ardent advocate of the unbridled development of "peaceful" nuclear power plants.

The fanaticism of Dr Teller's views are well satirised in the Peter Seller's movie "Dr. Strangelove" and have led many to dismiss him as a nut. However



his influence is considerable and over the last three decades he has been the public mouthpiece of the nuclear industry, making the unacceptable into the acceptable by advocating the use of nuclear weapons in "limited wars" and for "peaceful purposes such as mining".

Lang Hancock's association with Dr Teller goes back to 1966 when he flew Teller over his iron ore deposits in W.A., and discussed ways to blast the ore out of the ground with H-bombs.

In 1977 Hancock announced from London that Teller would lecture both houses of Queensland Parliament on May 10th. This puzzled observers for two reasons: firstly Queensland has only one house, the Legislative Assembly, and secondly it has the lowest sitting record of any parliament in western democracy. In 1977 it sat for a total of 38 days.

Notwithstanding these problems, an air strike (Lang flew Teller from New Zealand in his own plane) and the refusal of the Federal Government to allow a similar lecture, Dr Teller

eventually did address the Queensland Parliamentarians.

It was not a particularly intelligent speech and neither were the questions it drew. One Parliamentarian, Bob Katter Jnr, asked whether the Great Dividing Range could be blown up with A-bombs to allow water to flow on his inland electorate of Flinders.

Dr Teller referred to the Northern Territory Uranium deposits as a "treasure trove" and dismissed consumer advocate Ralph Nader as a "nippy and an ignorant amateur".

He accused environmentalists of being unduly emotive and then proceeded to warn "failure to export uranium would mean Australia would contribute to war, starvation, depression, despair and to successors that would compete with Adolph Hitler and Idi Amin."

He also argued that the chances of being injured in a nuclear accident were equal to the chances of being hit by a falling meteorite or run over by a tram.

(This argument might have had less weight if the Parliamentarians had been informed that some fifty years earlier, in 1928, Teller himself was knocked down and run over by a tram-car in Budapest. As a result his foot was amputated.)

Mr Bjelke-Petersen told the Assembly that on his most recent overseas junket he had discussed uranium with the now deposed Shah of Iran. He said the Shah had informed him that if Australia did not mine uranium, others would come and take it.

It would be easy to laugh at Teller and the other pro-nuclear enthusiasts, were it not for their part in forming the attitudes of Governments far more moderate than Queensland. Teller's background shows he has played a pivotal role in the development of the H-bomb and has had the ear of American Governments since the second World War.

The son of well-to-do parents, Teller was born on January 15, 1908 in Budapest, Hungary.

He studied mathematics and then chemistry, graduating from the Institute of Technology at Karlsruhe, Germany, in 1928, and went on to study at the Universities of Munich, Leipzig and Gottingen in Germany. In 1934 he was awarded a Rockefeller fellowship to study at Copenhagen.

Teller escaped to England and then the US when the Nazis came to power. He ended up lecturing in atomic physics at the University of Washington, Columbia.

The Manhattan Project

He was one of the earliest proponents that the science of the atom could be harnessed for warfare, and along with Dr Enrico Fermi and Leo Szilard, Teller urged in 1939 that the US Army begin work on an atomic bomb.

Teller was one of the six scientists who persuaded Einstein to write his famous letter to Roosevelt, which resulted in the atomic bomb development project - the Manhattan Project.

Teller worked hard on this project from 1941 to 1946.

After Hiroshima and Nagasaki, where the fruits of his genius blossomed, he began to warn that Communism and Russia posed a nuclear threat to the US.

In the face of strong opposition from other scientists in the Atomic



Energy Commission (AEC), who argued that work on nuclear weapons was immoral, Teller urged that the development of the H-bomb was the only way to save the country from Communism (Eascea, Aims of Science, 1973).

It was only after Dr Klaus Fuchs confessed that he had been spying for the Russians, supplying them with detailed information on A-bombs, that Harry S. Truman in January 1950, announced a "crash program" to develop the H-bomb.

Teller's brain-child was developed and exploded on November 1, 1952, at Eniwetok in the Pacific, with twenty-five times the Hiroshima blast.

Teller was acclaimed as the "principle architect of the H-bomb" (NY Times, July 4, 1954).

The arms race had begun and Communist paranoia was running high.

In 1945 Teller left the famous Los Alamos laboratory because the Director of Atomic Research, Dr J.R. Oppenheimer would not "test a dozen fission weapons each year" or proceed to develop the H-bomb.

On June 17, 1954, Teller got his revenge when he testified before the AEC Personnel Security Board (the Gray Board) in the famous Oppenheimer Case.

In the true McCarthy style of the era, Dr J.R. Oppenheimer was publicly accused of having Communist sympathies and had his security clearance revoked, was sacked by the US Government and ostracised from the scientific community.

It was alleged that Oppenheimer had associations with known Communist groups (his wife's first husband was also a Communist), and that he opposed the development of the H-bombs on moral grounds, saying that in his view it was also not political desirable.

Many scientists testified on Oppenheimer's behalf, including Einstein.

However Teller gave the most damaging evidence against Oppenheimer when he said: "I feel I would like to see the vital interests on this country in hands which... I trust more... I would say one would be wiser not to grant clearance. It is my belief that if at the end of the war some people like Dr Oppenheimer would have lent moral support to work a thermonuclear gadget... we would have achieved the thermonuclear bomb just about four years earlier..." (Keesings Contemporary Archives, Jun 9-12, 1954, p13619).

Oppenheimer's public honour was not restored until April 5, 1963, when the Kennedy administration awarded him the AEC Enrico Fermi special award for advances in nuclear science, one year after Teller was awarded it.

Bigger and better bombs

Teller remained the leading proponent in the scientific community to urge the US to develop bigger and better bombs to safeguard the free world from Communism.

He fought vigorously to prevent the signing of the US/UK/USSR test ban treaty of 1963, that outlawed atmospheric nuclear testing.

On August 21, 1963, he appeared before the Senate Foreign Relations and Armed Services and Atomic Energy Committee and he said that if the treaty was enforced the use of nuclear weapons in war would be hampered.

Blast the Himalayas

He queried, "Could the US (under the treaty), close the Himalayan

passes by nuclear explosions to protect India from attack from Communist China?"

Later in his testimony he said: "I would like to know that if China lands in Taiwan tomorrow we could use nuclear weapons the next day".

Throughout the sixties, Teller was a hawk when it came to Vietnam.

In 1963, he was one of the only scientists in the world to publically support Senator Barry Goldwater's call for the dropping of an atomic bomb on Hanoi to end the war.

In 1967 (New York Times 4/10/67) he was described as a "hardliner" on the war and was said to have the ear of Rockefeller.

Teller gave evidence before the President's Commission on Campus Unrest, warning that many young scientists were being indoctrinated to steer away from defense-related



research by radical political movements.

He complained that student anti-war protests had practically "cut the connection between the University and defense related industries".

During the Californian referendum to stop nuclear programs (Proposition 13), held on 18 July, 1976, Teller was a strong advocate of nuclear power. He claims to have made over 100 speeches in 100 days during the preliminary campaign. He has fought against five other anti-nuclear referenda in the U.S.A., and is still going strong.

Dr Teller was to have been one of the key guests attending Lang Hancock's "Wake up, Australia!" birthday flight around Australia. He could not attend, but was in touch with the merrymakers by phone.

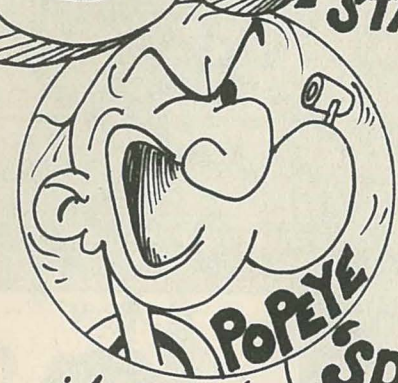
AT LAST!!

Ennio Toodles

- STARRING -

with **OLIVE OYL**
ALSO STARRING
(IN ORDER OF GOOD LOOKS)
- GINA HAYWARD
- AYRE'S ROCK
- JOH BJELKE-PETERSEN
& MANY MORE

PLOT - ANDREW HERINGTON
WORDS/PICTURES - MICHAEL VALE



POPEYE



OLIVE OYL

& in 'Spinach blues'

- you might remember, (if you read our last episode) that Lang has been held in Popeye's custody for his crimes against Olive Oyl...

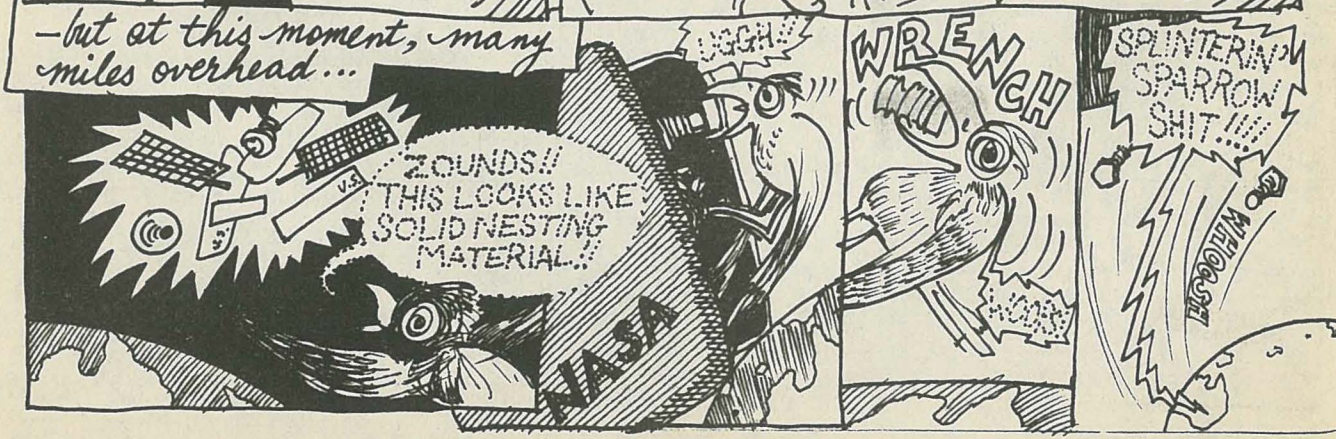
- meanwhile, his dutiful daughter, Gina, has been organizing a birthday party for her sweet ol' dad...



SOCIETY HAS'T BE PERFECTED FR'M LUBBERS O'THIS UNSAVOURY VARIETY!!

OH WHERE, PLEASE WHERE CAN MY DADDY BE? WHAT WILL I SAY TO WILLESEE?

- but at this moment, many miles overhead...

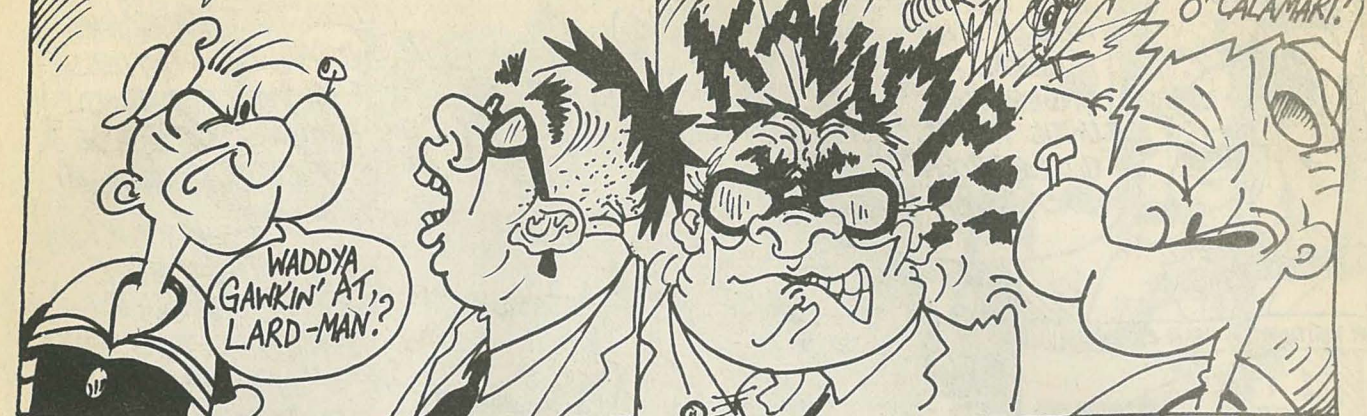


ZOUNDS!! THIS LOOKS LIKE SOLID NESTING MATERIAL!!

WRENCH

SPLINTERIN' SPARROW SHIT!!!!

meanwhile, far below...



WADDYA GAWKIN' AT, LARD-MAN?

seconds later...



MEOW!

Anxious moments pass... then...

MAN, AM I HUNGRY! YOU GOT ANY VEGIE-VITTLES THERE, POPEYE?

- as Popeye protects his spinach supplies from the ravenous Lang...

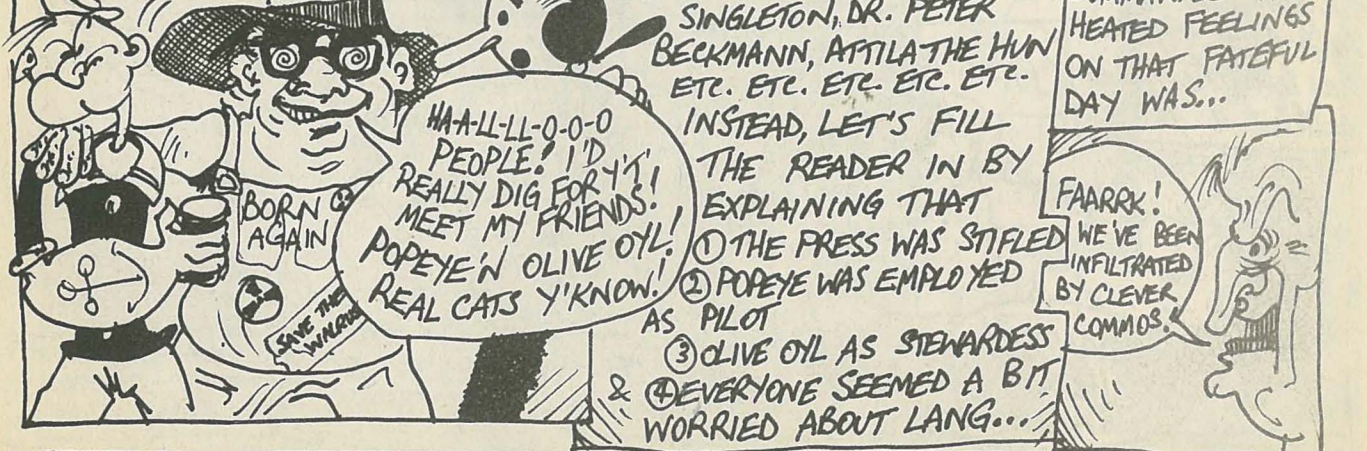


ER... GINA!

THIS GUY'S GOT MORE FACES THAN A SCHOOL PHOTO!

OUR GUESTS HAVE BEEN WAITING AT THE AIRPORT FOR THREE HOURS! THEY'RE GETTING VERY RESTLESS!!

one hour later...



HA-LL-LL-0-0-0 PEOPLE! I'D REALLY DIG FOR Y'X! MEET MY FRIENDS! POPEYE 'N OLIVE OYL! REAL CATS Y'KNOW!

IN FACT THE ONLY COMMENT THAT WOULD SEEM TO SUMMARIZE THE HEATED FEELINGS ON THAT FATEFUL DAY WAS...

INSTEAD, LET'S FILL THE READER IN BY EXPLAINING THAT
① THE PRESS WAS STIFLED
② POPEYE WAS EMPLOYED AS PILOT
③ OLIVE OYL AS STEWARDESS
& ④ EVERYONE SEEMED A BIT WORRIED ABOUT LANG...

FAARRK! WE'VE BEEN INFILTRATED BY CLEVER COMMOS.

terminals built in the heart of cities, dams that could kill tens of thousands, accidents that already have. Even solar power is criticised as it is "dispersed, and hence likely to lead to even more accidents in transport and at home".

The point I want to raise in relation to this is not that nuclear power is safer as claimed, but that there are a lot of other major problems with other energy sources needing community pressure to get Government action. Friends of the Earth have in fact been active on some of these issues and FOE (USA) have produced a trail-marking book, "Frozen Fire", on the dangers of Liquefied Natural Gas.

Clearly environmentalists have focussed their attack on nuclear power alone because of their limited power and money for educating the public. Also Beckmann seems to fail to under-



stand that we are mainly protesting about the number of people who *could* be killed in a single accident rather than the number who have died so far (conceded by Beckmann to be 20 uranium miners per billion megawatt hours of electricity generated, compared to 1036 coal miners for the same amount).

Nevertheless it would be a bad mistake to neglect Beckmann's point just because it originated from the right. Already there are signs that conservatives in Australia are taking up his argument to sustain a charge of hypocrisy against environmentalists. (For example, Senator McGibbon (Qld) quoted similar statistics during the debate on the Atomic Energy Act in the Senate, June 6th 1979.)

Environmentalists need to take up the gauntlet thrown down and involve themselves more in industrial health issues, pollution, chemicals in food and the general problems of technology, employment and energy.

These are issues that people are confronted with daily and which threaten their lives in far more real ways than nuclear power. If the environmental movement is to build on the public consciousness generated from the nuclear debate and broaden people's perception of their environment it must turn its attention to these "here and now" issues.

Most of these issues are far less clear-cut than nuclear power but the challenge is to demonstrate that a blind faith in technology to answer problems, the subservience of people's well-being and safety to the profit motive, and the control big business exercises over Government are problems not restricted to nuclear power but which extend throughout society.

Beckmann throws up a strong caution against extremism without substantiation. He ruthlessly catalogues doubtful and outrageous statements by environmentalists and holds

them up to ridicule. The "Kiss your children goodbye" slogan has fallen into disfavour but Beckmann makes hay with it and other instances of emotional arguments which pay little regard for the truth. He has even dragged up a press report from a scientist claiming that the opening of nuclear power plants led to an increase in violent crime.

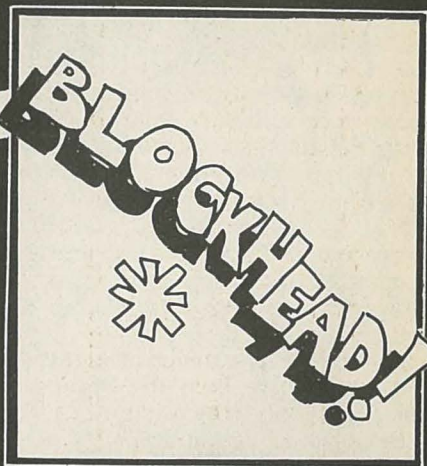
The anti-nuclear movement has had a tendency to resort to crass mutant jokes especially in the early phases of the campaign. Obviously this was felt at the time to be essential to focus public attention on the issue but to have continued to oversell the genetic dangers must have become increasingly counterproductive. The problems are already being felt in terms of public scepticism and confusion about the effects of 2,4,5T and other chemicals and the difference between mutations and deformations in babies.

Since our basic argument is that the facts support our moral arguments environmentalists need to be a little more rigorous to maintain public credibility in the face of attacks from people like Beckmann.

Not that Beckmann himself pays much respect for the truth and I'm

sure the majority of his readers are either friends of Lang Hancock or cynics enjoying an outrageously overstated and distorted case. The book digs up the most incredible and unusual statistics and fires them off like machine-gun fire amidst a furious torrent of abuse directed at everyone from *Readers' Digest*, the Atomic Energy Commission, the American Academy for Advancement of Science and even the power companies operating nuclear power plants (you see, because they also run many coal plants the companies are too scared to point the finger at coal as being dirtier than nuclear power in case environmentalists stop coal stations too).

The logic is fascinating but if you can stop laughing occasionally there are serious lessons to be learnt about how the environment movement is



perceived and how it can project its message more effectively.

- Andrew Herington

**from "Blockhead", by Devo (which is short for De-evolution), from their album "Duty Now for the Future" on Warner Bros. Records.*

The Decline of the NUCLEAR INDUSTRY

Until recently, the arguments against uranium mining were based on issues of safety and morality. Nobody doubted that mining would be profitable. Australia was said to be selling its soul, but we assumed that there would be buyers. However, evidence is mounting that the thirty pieces of silver are not forthcoming, and that companies who have invested millions of dollars in uranium mining may have thrown away their money. This raises disturbing questions not only for uranium miners, but for their opponents, who tend to feel that however wicked mining companies are, they are at least capable of perceiving their own interests correctly. The wasted uranium investments suggest that they may be unable to do even this.

The most enthusiastic advocates of uranium mining as a source of profits for Australia have been the Deputy Prime Minister Mr Doug Anthony, and the chairman of Pancontinental Mining, Tony Grey. On 22 July 1978, after signing Australia's first safeguards agreement (with Finland), Anthony declared that we would become

"another Saudi Arabia on the world energy scene". He said that there was a long queue of countries waiting to sign agreements with Australia for the supply of uranium.

Now, a year later, the U.S., South Korean, Finland and the Phillipines have signed agreements, and Britain hopes to sign soon. Australia's supposedly biggest customer Japan, has shown a majestic lack of haste to sign, but has signed an agreement with Canada, Australia's main rival. The EEC has upped its own uranium reserves, and signed agreements with Canada. Iran, whose once ambitious nuclear program Australia hoped to supply, has fallen apart at the seams, and looks likely to scrap its nuclear program altogether. Australia has had no new contracts since 1972, and only one miniscule contract with the Phillipines looks like being signed. Even this is in doubt, as Marcos may abandon the Bataan plant (the only nuclear plant under construction in the Phillipines) altogether, leaving us with no new contracts at all.

At the same time, world uranium

production capacity is undergoing considerable expansion, while the size of world nuclear capacity in years to come (the usual benchmarks are 1985 and 1990) - look like being a good deal lower than was estimated a couple of years ago.

Let's have a look at how these developments will affect the market for our uranium, and our efforts at selling it to a few selected countries.

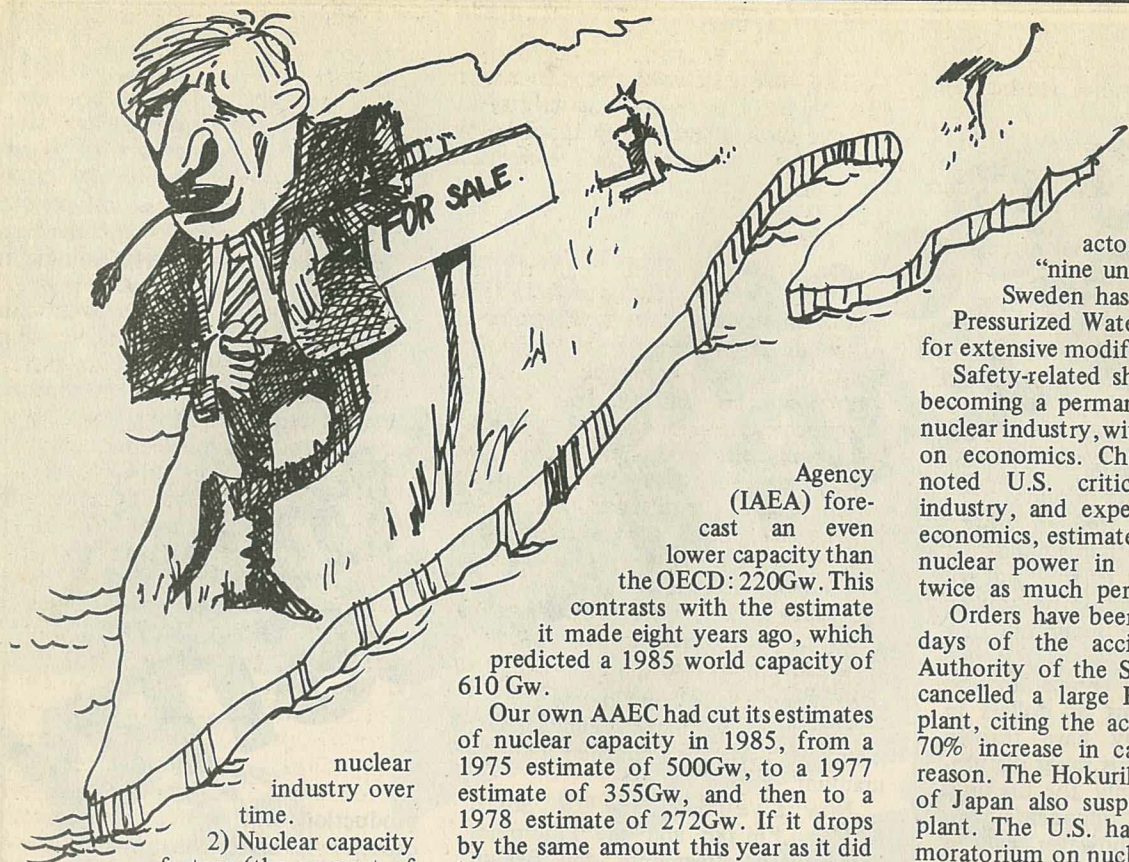
The Market -

The demand for Australian uranium will depend on the size of world uranium demand, and the share of the world market we manage to get. The profitability of our mines will depend on how much that figure is below our production capacity. Thus, if there were to be a demand for 10,000 tonnes a year of Australian uranium, and Australian mines were to produce 20,000 tonnes a year we'd clearly end up with egg on our faces (or maybe yellowcake).

World uranium demand will depend on:

- 1) The growth or decline of the

Where have all the markets gone?



nuclear industry over time.

- 2) Nuclear capacity factors (the amount of electricity produced by a reactor over a given time, compared with the amount it could have produced had it operated at full power for the whole of that time).
- 3) Uranium inventories. (The amount of uranium kept on hand in stockpiles by utilities and bodies such as the US Department of Energy [DOE].)
- 4) "Fails assay" (the percentage of U-235 discarded in tails with U-238 from the enrichment process.)

Thus the progressive cuts in estimates for future nuclear capacity, lower-than-expected capacity factors, expected shedding of uranium inventories by utilities, and dropping of tails assay by DOE will all contribute to a lower demand for uranium including Australian uranium.

Let's have a look at future nuclear capacity. In doing this I am going to make a big demand on the reader: I shall assume that, unlike Anthony and Grey, you can count. So be brave.

In February 1978, over a year before the Harrisburg accident, the highly-respected Organisation for Economic Co-operation and Development (OECD) cut its estimates for 1985 nuclear capacity in the Western world from 479-530 Gw* (the estimate it had made in 1977) to 278 Gw, a drop of 42%.

The International Atomic Energy

Agency (IAEA) forecast an even lower capacity than the OECD: 220Gw. This contrasts with the estimate it made eight years ago, which predicted a 1985 world capacity of 610 Gw.

Our own AAEC had cut its estimates of nuclear capacity in 1985, from a 1975 estimate of 500Gw, to a 1977 estimate of 355Gw, and then to a 1978 estimate of 272Gw. If it drops by the same amount this year as it did last year, it will be about 170Gw. (Existing 1978 capacity was 99Gw, and a further 185Gw is under construction, as well as 111Gw on order, so the AAEC assumes that much of this will still be "in the pipeline" or cancelled by 1985.)

It's too early to know what the Harrisburg accident has done to official nuclear projections, but there are some rather hefty straws or maybe logs in the wind.

The accident has already had a substantial effect on capacity factors, causing nuclear power to be less economic than expected. This in turn is likely to cause a falloff in further orders (if any) not to mention cancellation of existing orders, hence a drop in long-term uranium demand. At the same time, safety-related closures will mean a drop in immediate uranium demand, because reactors that aren't working do not use up uranium.

In the US, all reactors made by Babcock and Wilcox (the firm responsible for building the Harrisburg reactor) have been shut down by the Nuclear Regulatory Commission, and official bodies have recommended that all Pressurized Water Reactors be closed for safety modifications, which could be a prolonged and messy business. Japan shut down all its Pressurized Water Reactors for two months, affecting over half of its

nuclear capacity, and leaving only its Boiling Water Reactors — known as the "nine unreliables" in action. Sweden has also shut down its Pressurized Water Reactor capacity for extensive modifications.

Safety-related shutdowns look like becoming a permanent feature of the nuclear industry, with disastrous effects on economics. Charles Komanoff, a noted U.S. critic of the nuclear industry, and expert on power plant economics, estimates that by 1985-6, nuclear power in the U.S. will cost twice as much per Kilowatt as coal.

Orders have been cancelled. Within days of the accident, the Power Authority of the State of New York cancelled a large Babcock & Wilcox plant, citing the accident itself and a 70% increase in capital costs as the reason. The Hokuriku power company of Japan also suspended a 1,000Mw plant. The U.S. has now a de facto moratorium on nuclear plant construction. On 29th March, 1979, General Electric, the world's second biggest reactor manufacturer, and the only builder of Boiling Water Reactors, announced that it would withdraw from building reactors, a step it had been contemplating for a while.

A searching political reassessment of nuclear power is now going on within the U.S. congress; in Sweden, where the question will be submitted to a referendum next year; and in Germany.

It doesn't require great arithmetical ability to see the effect all this is likely to have on the demand for Australian uranium.

Uranium Demand

Now we come to the difficult bit. This involves numbers, but I promise it won't hurt.

In February 1978, the OECD made some estimates for uranium supply and demand. These estimates were more optimistic than many estimates, including those of the AAEC.

According to the OECD, — 1980 will see a demand of 41,000 tonnes a year of yellowcake (U₃O₈), and a production of 53,000 tonnes, giving an excess of production over demand of 12,000 tonnes. (The AAEC

*A gigawatt is 1,000 Megawatts — the size of a standard nuclear reactor, and about one third of the total electrical capacity of Victoria.

estimated that demand in 1980 would be only 30,000 tonnes, giving an excess of 23,000 tonnes.)

— 1983 will see a demand of 59,000 tonnes a year, and a production of 82,000 tonnes a year, giving an excess of 23,000 tonnes.

— 1985 will see a demand of 65,000 tonnes, and an output of 88,000 tonnes giving an excess of 23,000 tonnes. (The AAEC says demand will be only 54,000 tonnes, giving an excess of 34,000 tonnes!!)

— 1990 will see a demand of 102,000 tonnes and an output of 110,000 tonnes, giving an excess of 8,000 tonnes.

Clearly, even if the Harrisburg accident had never happened, and even if nothing disastrous happens to world nuclear programs, on the optimistic estimates of the OECD there will be a glut of uranium at least till the 1990s. If the AAEC's estimates for uranium demand are coupled with OECD production estimates, the situation obviously looks a hell of a lot worse for the miners. Thus, with the OECD production figure of 88,000 tonnes a year in 1985 coupled with the AAEC demand figure of 54,000 tonnes a year, the surplus of 34,000 tonnes would be about equal to 1979 world production! This sort of surplus would obviously play havoc with any Australian share of the market, and there could be large stockpiles of unneeded uranium up to the year 2,000 and beyond. If nuclear capacity were to remain static or decline after 1985, and if the OECD's predictions of high production were to come true then, things could be worse still, with disastrous implications for the Australian industry.

Official AAEC estimates say Australia should be able to supply 10,000 of the predicted 54,000 tonnes world demand for the year 1985. These official estimates are a lot less than Anthony's and Grey's astronomical estimates, which assume that world uranium demand in 1985 will be 100-200,000 tonnes a year of which Australia will supply 20,000 tonnes. One wonders if they live on the same planet as the AAEC.

Unofficial, internal AAEC estimates of world demand are even lower than the official figures, and suggest that we may be able to sell as little as 2,000 tonnes a year by 1985.

At that rate only the "get

rich quick" Nabarlek project is ever going to make any money, while Ranger and Pancon will be costly holes in the ground into which money will be poured.

Competition

Major competition to Australian uranium miners is coming from Canada and South Africa, while the U.S. is expanding its production capacity rapidly, and Europe has recently doubled its uranium reserves. Smaller producers such as Niger, Gabon, and Zaire are also upping production. All will compete with Australia, while some (such as South Africa for example), are not fussy about inconveniences such as safeguards.

Canada has been spurred on by major discoveries in the state of Saskatchewan, and a report by the international broking firm Mead and Co. on developments there concludes that "Saskatchewan seems likely to win the race with Northern Australia in becoming the next major world area of uranium supply." The same report says that "The Australians have lost the early development race, and the uranium spot-price will fall." The report optimistically assumes that world demand for uranium in 1985 will be 100,000 tonnes a year. (not the 54,000 tonnes predicted by the AAEC and the IAEA) so the real city should be even less favourable to Australian (and Canadian miners than the report assumes.)

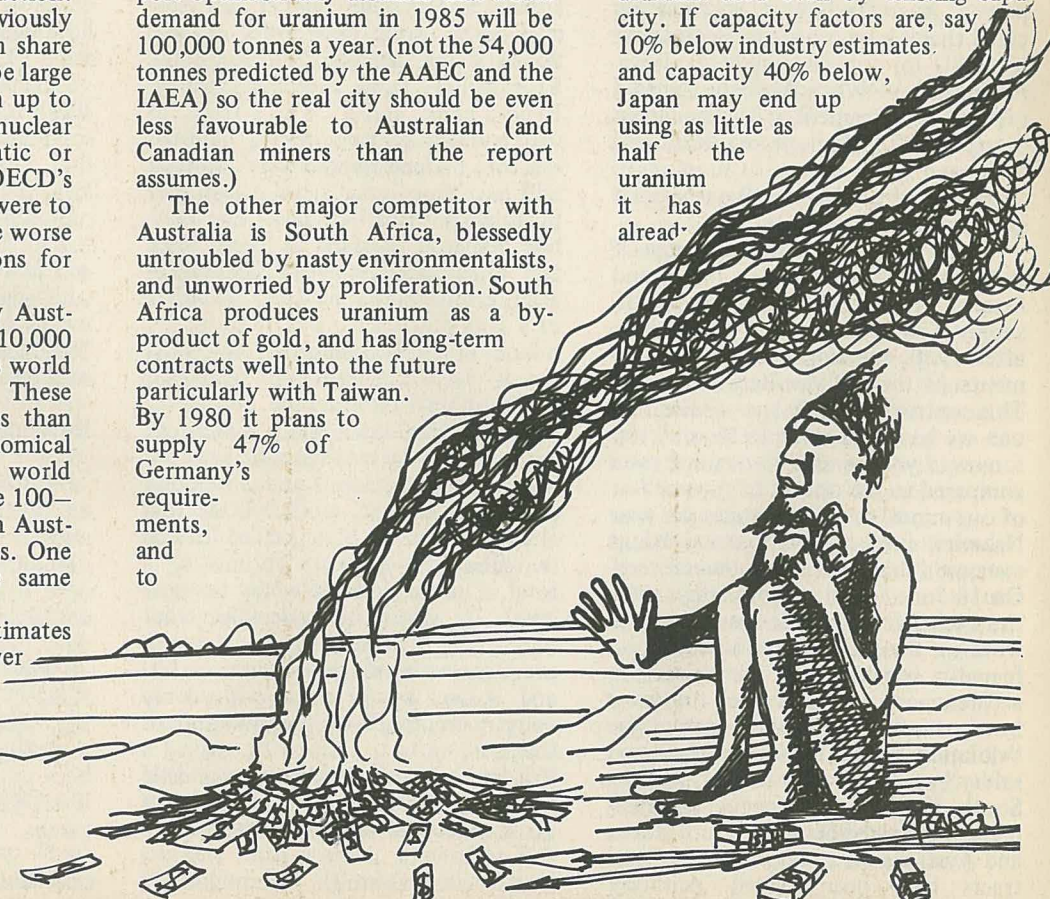
The other major competitor with Australia is South Africa, blessedly untroubled by nasty environmentalists, and unworried by proliferation. South Africa produces uranium as a by-product of gold, and has long-term contracts well into the future particularly with Taiwan. By 1980 it plans to supply 47% of Germany's requirements, and to

double its 1977 production.

The Disappearing Markets

While competition to supply uranium is growing, many countries that were mentioned as potential markets for Australian uranium in the early 70's now seem to be running into difficulties over their nuclear programs.

Japan: — Much hope has been placed in Japanese demand for our uranium, but Canada has beaten us to the contract stage, and in any case, Japanese requirements for both existing and planned capacity are contracted for till 1990. In fact, the planned capacity may not materialise, leaving Japan with more uranium than it will need by 1980. Japan has recently cut its predicted 1990 capacity from 100,000 Mw to 60,000Mw (60Gw). In fact, only 19,000Mw is actually in operation, under construction, or on firm order, and can be depended on. Of this, planning for 1Gw has been suspended by the Hokuriku Power Co. since the Harrisburg accident. Japan's 1990 capacity is thus likely to be far below that planned, while lowered capacity factors due to safety-related closures and plain unreliability will reduce the uranium used even by existing capacity. If capacity factors are, say 10% below industry estimates, and capacity 40% below, Japan may end up using as little as half the uranium it has already



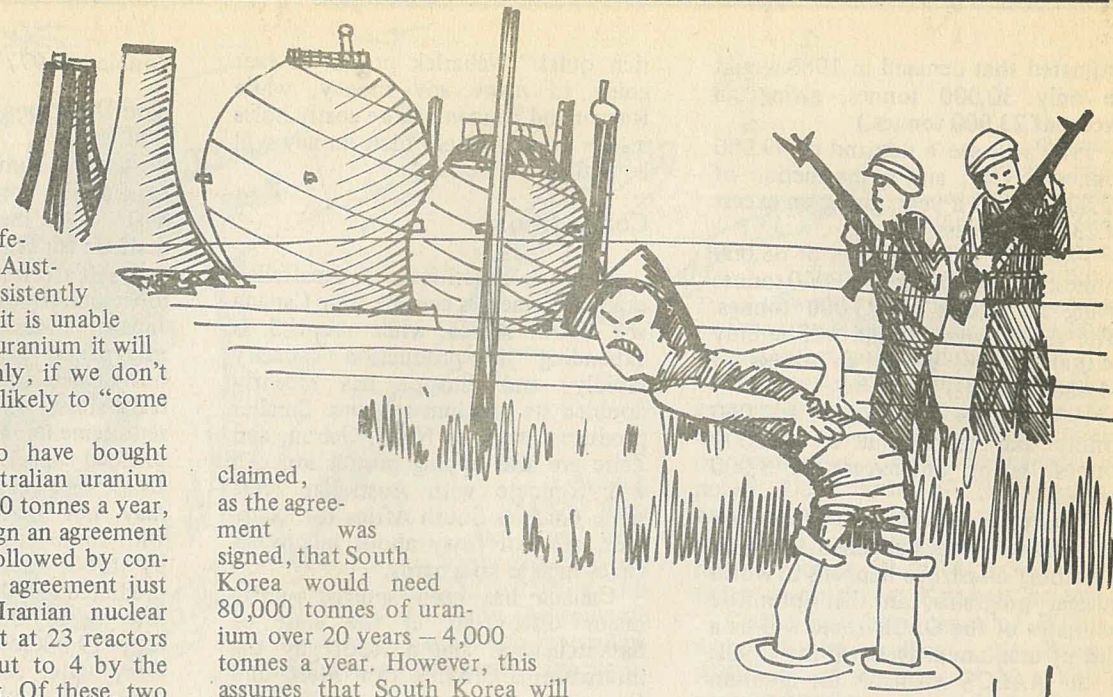
contracted for. Maybe it is not surprising that Japan has been "coy" in signing a uranium safeguards agreement with Australia. Japan has consistently said to Australia that it is unable to predict how much uranium it will need from us. Certainly, if we don't develop it, Japan is unlikely to "come and get it".

Iran: — Iran was to have bought 15,000 tonnes of Australian uranium from 1980–85 at 3,000 tonnes a year, and was expected to sign an agreement in July 1978, to be followed by contracts. The safeguards agreement just didn't happen. The Iranian nuclear program, originally put at 23 reactors by 1990, had been cut to 4 by the time of the Shah's exit. Of these, two reactors were actually being constructed by the German firm of Kraftwerk Union (KWU). Construction on these has now stopped, and the sentiment of the AEIOI (Iranian equivalent of the AAEC), is against completion because energy can be supplied by oil and gas in Iran at one third the cost of nuclear power. Apart from this, Iran has decided that it is un-Islamic to pay interest to KWU for the uncompleted plants.

Philippines: — When Australia signed a safeguards agreement with Manila on 9 August 1978, Marcos wanted between 1500 and 1900 tonnes of uranium in total, for the 600 Mw Bataan plant then under construction.

On 8 June 1979, an exchange of letters took place between Fraser and Marcos, in which Australia arranged to supply 160 tonnes a year of uranium after 1980, covering the total requirements of the 600Mw Bataan reactor. This contract — if it is one — is the only one we have had since 1972, and 160 tonnes a year is almost nothing even compared to the output of the smallest of our mines, the 1080 tonnes per year Nabarlek project. But a cloud hangs over even this miserable little contract. On 18 June, 1979, only ten days after the exchange of letters, Marcos halted work on the Bataan reactor, saying he feared a repetition of the Harrisburg accident, and said he wanted to investigate cancellation of the contract for "violation of the implied warranty of safety".

South Korea: — A safeguards agreement was signed between South Korea and Australia on 2 May, 1979. No contracts have been signed. Anthony



claimed, as the agreement was signed, that South Korea would need 80,000 tonnes of uranium over 20 years — 4,000 tonnes a year. However, this assumes that South Korea will actually succeed in its intention to build 40(!) reactors in the next 20 years. South Korea has recently embarked on an ambitious expansion of its nuclear power program, but 40 reactors in 20 years doesn't add up. In order to finance the construction of just an additional two plants to the 5 already in operation, under construction, or on order (2 + 5 = 7 not 40) South Korea has had to borrow some \$1.3 billion from the U.S. Import-Export bank, and a "Who's Who" of world banking. In order to have 40 reactors on line by the year 2000, it will have to complete — not just start planning or construction — two reactors a year at a similar or higher price tag. W. Mooz of the RAND corporation estimates that by 1985, the price of a 1000Mw reactor will be about 3.1 billion in 1976 dollars. At this rate, the South Korean program will cost \$120 billion without the benefit of inflation. The most South Korea can hope for on any realistic time-scale for ordering, designing, and building reactors by 1985 is the 5 reactors already planned, plus the additional two (that's being pretty optimistic): a total of about 5,600Mw. By the year 2000 it might have doubled that number, again assuming no delays. In practice, it is unlikely to have even this, and Australia will not be the only country wanting to supply uranium to Korea.

Britain: — It seems like an optimistic sign when Britain signed a safeguards agreement with Australia, late in July this year.

However, although Britain has six

reactors under construction there are no more on order — in fact there have been no new orders since 1973.

At present Margaret Thatcher is making very nuclear-sounding noises, and this may mean that the two Advanced Gas-cooled Reactors Britain was considering ordering will materialize. However Britain has an excess of both nuclear and conventional generating capacity, and again, Australia will not by any means be the only source of supply. The increase in EEC uranium reserves may be significant in this context.

So what?

Both mining companies and nuclear opponents have assumed that the nuclear industry needs Australian uranium. The fact is that it does not need our uranium because it is slowly and painfully dying anyway. But this does raise some interesting questions. — Why are the people who manage Ranger, Pancontinental, Western Mining, Queensland Mines, and Noranda investing in what no longer seems to be a profitable venture? Tony Grey, at least, seems to believe his own propaganda. He is certainly making his

CONTINUED PAGE 32

In June this year many Australian newspapers carried articles on a "halt" in nuclear power plant construction in the Philippines. The reasons given for this halt were that the Three Mile Island experience had eroded the Filipinos' confidence in nuclear power; and secondly that Westinghouse (suppliers to the Philippines), had refused to send experts to advise in the assembly of their own equipment. Concurrently with this decision, three Filipino nuclear opponents toured Australia, in an attempt to

I asked the visitors what the electricity from this plant would be used for.

Filipinos: We don't need much electricity in the local area because there are less recreation areas and less electric lights there than you would find in a big city. The energy from that plant will supply the Bataan export processing zone, it is not for the local people.

The export processing zone is designed for the convenience of multinational companies: the Ford factory, exporting body panels, the Amco jeans factory (which is an Australian company) and others.

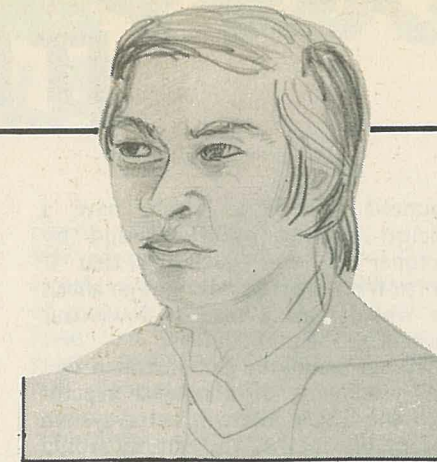
FOE: Has the construction of the reactor brought prosperity to Bataan province?

Filipinos: As I observe it is really a disadvantage, especially now that most of the people in Morong (the reactor site) are involved in construction, and have become dependent on it for income. Fifty one families in Morong have been "relocated" — their farmlands have been taken for the construction site and they have built shanties in Morong. Some of them have been compensated by the Government but others have been told "no"; the Government does not even supply them with building materials.

Other workers have also come in from the rest of the country and built shanties. When the construction is finished they will be unemployed.

FOE: What do the people in Morong usually do for a living?

Filipinos: Farming and Fishing. That is the problem: the fishing



Filipinos talk about Bataan Reactor

industry has been reduced to one tenth of what it was. The people catch milk fish ("fingerlings"). Due to the erosion from the construction the fish are dying. The sea is too muddy for them to live.

FOE: How many reactors are planned for the Philippines?

Filipinos: What we heard at first was that there would be at least five, at Bataan, Laguna and Mindanao. They do not claim this anymore.

FOE: Why is that?

Filipinos: Because of the strong opposition. We hope that the Bataan reactor will be the first and the last reactor to be built in the Philippines. At first they said it would cost \$600 million. Now the cost is up to \$1.7 billion.

A lot of people, especially at Laguna and Mindanao have been asking US support groups for help. There is a legal challenge against the Bataan reactor at the moment, concerning the safety of the reactor. The Nuclear Regulatory Commission gives a licence to operate it after the plans have been checked. However people are saying that the Bataan reactor is not safe because it was not built by workers with nuclear expertise. The Westinghouse Corporation have

dispel the belief that nuclear power is needed in the Philippines, that the ordinary people must have it to raise their living standards.

One of them, Delfin Ganapin is a lecturer at the University of the Philippines. Jose Mario Francisco is a Jesuit priest. The third, is a resident of Bataan Province, site of the Philippines' first (and perhaps last) nuclear reactor. So far the containment shell of the reactor has been built, but the reactor parts inside have not been completed.

nuclear engineers, but they weren't working on the site — all the work was done by Filipinos.

FOE: Do people in the Philippines want more electricity? Do they want a Western type of lifestyle?

Filipinos: Of course yes, they want shopping centres and all the things you have here. But the right way to progress is not having a nuclear plant which is disastrous because it isn't safe.

FOE: If you do not have nuclear plants, where will electricity for the local people come from?

Filipinos: There is plenty of potential for hydro-electricity, and it is much safer than nuclear plants.

FOE: What's your idea of progress?

Filipinos: Progress in agriculture, because this is what the Filipinos are skilled at. We need to spend more time and money on the irrigation system; things like that.

The export zones are not the best way to progress. In them we see exploitation of labour and low wages. The labour code of the Philippines says that you become a regular employee, entitled to social security, hospital and unemployment benefits, only if you have worked for six months for one employer. The employers and employees both pay a premium to cover this. So, after five months the employers change their workers!

Barbara Hutton.

A NUCLEAR REACTOR BY 1995

IT DOESN'T COMPUTE FOR W.A.

Late in 1974 the W.A. Fuel and Power Commission (FPC) published an amazing document (Report FP31) which attempted to estimate the likely range of growth rates in electricity-demand on the State Electricity Commission interconnected system for the following half-century.

In the Brave New World projected by the FPC, by 2025 peak electricity demand in the South-West of W.A. would be from 20 to 50 times higher than peak demand levels in 1975. In the not too distant future, in fact somewhere between the winters of 1991 and 1994, the first 600 megawatt (MW) "non-fossil" (i.e. nuclear) station would be introduced into the SEC interconnected system. During the next 30-33 years a further 13-26 nuclear power plants would be added to the system.

When, during 1975 the SEC (with the aid of many pretty slides) began explaining these wondrous visions in public places there were not a few people who found it difficult to resist the temptation to roll mirthfully in the handiest aisle. Surely, just a little more than 12 months after the 1973 oil crisis no-one still believed that the single-minded extrapolation of energy consumption rates from the basement to the ionosphere in the shortest possible time could form the basis of future energy policy!

It soon became clear that the SEC was of this peculiar belief and the sweet Indian summer of mirthful rolling ended - as it does all too often - abruptly.

However, as the growth rates projected in 1974 failed to materialise and the SEC began to revise its estimates downwards the potential spectre of nuclear power began to recede into the next century. Indeed with each passing year the possible introduction of nuclear power seemed to be moving an additional 2-3 years into the future, for many a very reassuring trend.

This trend changed in 1978. In that year energy policy ceased to be based on heavenwards projection from the SEC and began to be based on trumpeted pronouncement from Sir Charles Court. In mid-year Sir Charles pro-

nounced that W.A. would have a nuclear reactor by 1995, and by October he was declaring that if North-West Shelf gas did not go ahead he would ram a reactor down our throats by the mid-1980's.

It can readily be demonstrated that the placement of a nuclear reactor into the SEC's interconnected system before the turn of the century would break all the economic and engineering criteria normally associated with good electricity supply practice.

When Could a Reactor Fit into the Grid?

Consumers of centrally-produced electricity become most aware of the system on which they depend when they suffer a black or brown-out. Some people may not mind these too much. Statistics show that many people go to bed early, while others may exchange ghost stories around flickering candles. While I personally quite enjoy black-outs, they are generally not to be encouraged. The severe blackout in New York in July, 1977 caused an economic loss of at least \$1,000 million. Some people are inevitably seriously disadvantaged by such happenings. These, and others who may be just plain grumpy, complain to the SEC when black-outs occur and therefore the SEC doesn't like them either.*

Black and brown-outs, occur when the demand for electricity which consumers place on the system exceeds the system's ability to supply electricity. There must be sufficient generating capacity to cope with the demand on the coldest day each winter, normally the day of maximum demand. It is necessary to have a reserve capacity to allow for breakdowns, routine maintenance and possible underestimates of maximum demand. Conventionally, up to 25% may be deliberately allotted to reserve capacity, although a well-designed system (particularly a large one)

*Moreover SECs are statutorily obliged to provide power at all times. Black-outs are more than an embarrassment!



should not need this much reserve capacity. It would be unwise to have, say, 50% reserve capacity because then a large amount of capital would be tied up in plant which may rarely, if ever, be used.

Maximum demand for W.A. in 1977-8 was 905 MW. So if the SEC had 2 generators of 600 MW each at the moment (it doesn't) it would seem to have sufficient reserve capacity. However, if a generator supplying half of total capacity broke down it is obvious that serious supply difficulties may occur. Therefore, prudence demands that no generator in the system should supply more than 15-20% (less is better still) of the total capacity. 20% will be used in future calculations, and this figure will provide a positive bias for nuclear power.

The SEC estimates (probably it over-estimates) that between 1978 and 1998 total electrical energy (not power) production will increase by 6.6% per year and the primary fuel input to electricity production will increase by 5.5% per year (Report RP68). The difference between these two figures is a measure of expected improvements in efficiency of converting fuel to electricity.

However, we are interested primarily in the growth rate in peak power-demand rather than the growth rate of electrical energy demand.

Between 1973/74 and 1977/78 electrical energy demand grew by 7.8% per year, while peak power demand grew by only 5.4% per year. Therefore, if 5.5% per year is chosen as an estimate of peak power demand growth until well into the next century it is seen to be a very conservatively high growth rate by anyone's standards.

The final thing we need to know is how big are nuclear reactors? Answer: at least 1,000 MW - these days anything smaller is regarded as uneconomic. (By contrast, the most economic size for coal-fired stations is generally regarded to be 300-500 MW.)

Now the mathematically inclined can get their teeth into calculating when a 1,000 MW unit could be sensibly slotted into the SEC's interconnected system.

A 1,000 MW unit would comprise 20% of a total generating capacity of 5,000 MW. 5,000 MW capacity would provide 25% reserve capacity when peak power demand was 4,000 MW. Starting from a peak power demand of 905 MW for W.A. in 1977/78, a growth rate of 5.5% per annum in peak power demand would reach 4,000 MW in 2005/6 (if I can do my sums right). However, in the last few years leading up to 2005/6, before a 1,000 MW unit could be added, peak power demand would be eating up the

reserve capacity of the existing 4,000 MW of plant. If we allow for 25% reserve capacity with the 4,000 MW of generating capacity, it can be calculated that peak power demand may reach 3,200 MW in 2000/1. If a 1,000 MW plant was slotted in then, the reserve capacity would be $(5,000\text{MW} - 3,200\text{MW}) = 56\%$ which is ridiculously high. These wild swings in reserve capacity are a consequence of allotting 20% of generating capacity to a single unit and bear out the earlier comment "less is better still". However, on the basis of these figures a nuclear reactor could be slotted into the grid somewhere in the first few years in the next century.

The downward trend of the past few years for SEC estimates of demand growth should also be taken into account. I think it would be surprising if peak electricity demand growth was sustained at 4% per year for the next 10 years and 2% per year thereafter. If this were to occur, the possibility of fitting a nuclear reactor into the grid would recede well into the second quarter of the next century. What a dramatic contrast this provides with the Fuel and Power Commission's aged vision of building 27 reactors by 2025!

What Would It Cost?

In the last half of 1978, Fuel and Energy Minister Mensaros twice stated that a 1,000 MW nuclear reactor would cost about \$600-\$800 million to build:

- "Based on overseas estimates for a first-off \$1,000 MW nuclear power station the capital cost would be \$600-\$800 (per) KW (-Hansard, p. 1930, 1st August 1978.)

"Based on 1,000 MW... a nuclear power station would cost \$600-\$800 million" (-Letter to the WEST AUSTRALIAN, September 6, 1978.)

These figures appear to be approximately 6 years out of date. The last time the US Atomic Energy Commission appears to have estimated capital costs of this order was in a January 1973 revision of its document WASH 1230. Even then, the figure was probably a gross underestimate.

The Committee on Government Operations of the US Congress in its report "Nuclear Power Costs" (April, 1978) pointed out that "nuclear capital costs have been seriously underestimated in the past... and the gap between estimated and actual costs is still increasing".

In such an uncertain inflationary situation it is perhaps unsurprising that Mr Mensaros no longer knows (if he ever did) what a nuclear reactor may cost: "No, I couldn't give you any figure" (-NATIONWIDE ABC, April 2 1979.)

However, it is very surprising that the Minister now claims he cannot recall estimating what a nuclear reactor may cost:

Mensaros: "As I said I can't recall. When you said the figure of \$600 million that was a little suspect to me. I don't know in which connection. I mean if you show me in what interview or in what..."

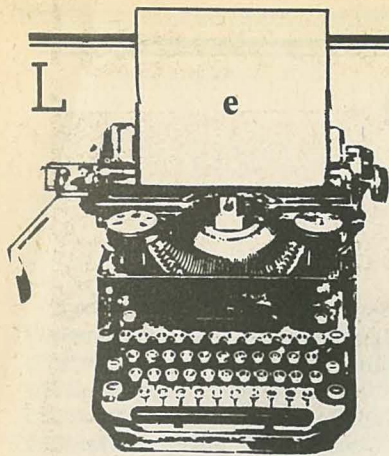
"Nationwide": "That probably was a bad report."

Perhaps the Minister is also prone to being misreported in Hansard and in his own letters.

Capital costs for nuclear reactors beginning construction now are generally estimated to be \$1,500-\$2,000 per KW. Harisburg certainly won't make them any cheaper, provided it hasn't made them impossible.

Estimates for nuclear reactors beginning construction in 1985-90 involve very considerable uncertainties. However, a useful estimate has been provided by Rand statistician William E. Mooz in his paper "Cost Estimating Relationships for Light Water Reactors" produced for the US Energy Research and Development Administration in 1977. Mooz estimated that capital costs for a 1,000 MW reactor (in 1976 dollars) could be as high as \$3,100 million in 1985 and \$4,000 million in 1990. The cost is inflated. 1985 and 1990 dollars would be considerably more extraordinary, giving new meaning to the expression "nuclear energy costs the earth".

Dr Peter Brotherton,
Friends of the Earth,
537 Wellington St, Perth 6000.



There's more to Fish than Food for Thought

Dear friends,

In response to Brian Appleford's article, "Fish - Food for Thought", Vol. 4 No. 4, we would like to add that protection of fish stocks is more complex an issue than was evident from the article.

Protecting fish stocks will not, and should not, come from people eating less fish but rather from ceasing to use fish stocks for animal fodder and pet food*. Fish has traditionally been a poor man's diet, not a wealthy man's. If the whole fish catch was available for human consumption, then millions of people would receive an adequate diet.

(*Half of 1968 world fish catch was fed to livestock - FAO.)

Modern technology leads to greater efficiency in fish catching (because of spotter planes, powered boats and winches etc.). There are few nursery areas protected from this technology. Often non-marketable, but edible species are dumped, usually dead.

Because of low catch prices and high running costs of large boats, bulk fish have to be caught to pay a boat's way.

Until recently, there existed few controls over quantity and quality of fish, fishing areas, numbers of vessels fishing. Many undersized fish have been left to die both by amateur and professional fishermen.

Industrial growth with its attendant pollution is the most vicious predator of fish. Industrialisation tends to destroy fish nursery areas and breeding grounds which lie in estuaries and

shallow coastal areas, (favourite effluent sites). This destruction comes from direct pollution by sewage, overuse of pesticides and herbicides. Indirectly, estuaries are affected by increased rainwater runoff from sealed urban areas, causing sharp changes in salinity and temperature to which fish are very sensitive. Reclamation projects sedimentation from causeways and breakwaters, dams that restrict migratory fish, and dredging, all contribute to dramatic changes in estuarine breeding grounds (see "The Frail Ocean" by Wesley Marx).

So, the first and most important step is to protect fish breeding and nursery areas by stopping pollution of waterways and interference with water flow in estuaries.

- next, to clamp down on the catching of undersized fish.

- closer co-operation and more communication between fishermen and fisheries officers to prevent over-fishing.

- more over species of fish used for pet-food.

- greater public awareness of fish and their habitat.

"Human failure to identify emotionally with fishery life and the tendency to regard the water environment as alien and hostile (have) hindered understanding and action on

FROM PAGE 38

investment decisions as if he does. One is struck by the extent of which the closed and incestuous world of corporate decision-making is not the real world. It is a world in which decisions seem to be taken not with cash-register in hand, but on the basis of myth and ideology. Sober calculation of profits on an informed and realistic basis would lead companies not to risk their precious capital on uranium mining. Food for thought.

- What are the implications for the anti-uranium campaign in Australia? Should we perhaps be looking more closely at plans to build reactors in W.A. and Victoria, rather than at mining in the N.T.? Should we perhaps be looking more closely at energy policy as a whole, and at the values underlying it?

In answering these questions, the ability to think may be more important than the ability to count.

John Hallam

the question" (of pollution).

- "Fish and Fisheries in the Context of Environmental Concern" (FAO, May 72).

Yours,
Peter & Anne Needham

P.S. There should be provision in all ports for tanks into which fishermen can pump their oily bilge water. At the moment bilge water is discharged into the harbour. There's no sense in slapping a fine on someone if no alternative is provided.

I would be following in the footsteps of the Easter Bunny if I disputed the points made above, they require little comment. They are salient and all that I will do is qualify the points that I made.

a) I was not, in my article, attempting to point out the threats to fish so much as I was trying to make the point that many people have the idea that the ocean is a limitless source of food.

b) It is important to realise that much of our processed fish is imported from countries where poverty and starvation are rife.

c) It is in the developed countries that the greatest amount of fish is eaten regardless of whether it is caught there or elsewhere.

The comments of Peter and Anne on estuarine pollution are relevant, particularly in relation to diadromous fishes and shell fishes although all other littoral breeding and feeding fishes are also suffering environmentally altered habitats.

Finally I should point out that since the collapse of the Peruvian Anchovy fishery in 1972 far less of the world fish catch has been used for stock feed. However, as F.A.O. has difficulty in obtaining realistic figures and I have no hope of doing so I can only agree that whatever the percentage of the world fish catch is used for stock feed . . . it is that much too much.

The letter from Peter and Anne is correct in essentials and philosophy . . . I won't argue with them, can't argue with them, and thank whosoever for the extent of sanity in the world.

Brian Appleford.

Ammunition for sharks



Dear Linnell,

As a member of Friends of the Earth (S.A.) I was, personally, very annoyed about your criticism of Helen Caldicott's book "Nuclear Madness - what you can do" in Chain Reaction Vol. 4 No. 4.

From my recollection of past events - Helen was the first really concerned person in Adelaide to voice her apprehension about the effects of radiation on the population of the world, due to fallout from nuclear weapons testing. She was always willing, and felt it was her duty as a doctor to direct her knowledge and concern towards the community at large. I am quite convinced that she was, at least, one of the people who originally alerted us to the future dangers we face.

I find your personal attack unworthy of Friends of the Earth and wish, as a member, to disassociate myself from your expressed views. They will certainly be good ammunition for the pro-uranium sharks!

from

Your anti-nuke friend,
Bette Beckwith.

My review of Dr Helen Caldicott's book 'Nuclear Madness - What You Can Do!' was in no way intended as a personal attack. It was simply a criticism of the book as I saw it.

I do not dispute that Dr Caldicott was one of the people involved in the movement against the French nuclear tests, but I do maintain that she was only one of many. 'Nuclear Madness' left me with the impression that Dr Caldicott was the sole initiator and thereafter the most active participant in the anti-French tests campaign.

I don't believe that my review will provide effective ammunition for anyone. I see it rather as an indication of the diverse and widespread range of views encompassed and united within the anti-uranium movement. This uniting of greatly differing attitudes and ideologies is part of the strength of the movement and should not, I feel, be suppressed.

Linnell Secomb.

Seminal stuff!

Dear editor,

Thank you very much for your magazine, which immediately after its arrival is being useful for our groups. Although only just a few persons can read English, those who can, translate for the benefit of others and all of us find Chain Reaction quite interesting, informative, seminal.

Our group (the Mexican Chapter of Friends of the Earth) works in close connection with CIDHAL, a feminist group and the one that is most concerned about environmental issues. Our groups are small and weak, typically Third World groups. The short pieces of information, as well as articles, letters or news clippings, that we think may be of interest are all of them in Spanish. If you consider it worthwhile to translate them, we shall willingly send them to you.

Once again, thanks a lot for your magazine. We are looking forward to receiving future issues.

Cordially yours,

Arturo Aldama
Amigos de la Tierra, A.C.
Apartado Postal 269
Telefono 2-76-38
Cuernavaca, Morelos.



Goodbye Leopard Skin Pill-Box Hat!

The US Government Fish and Wildlife Service has been lobbied to transfer the leopard off the Endangered Species list.

An unofficial survey, carried out in a dozen African countries, has reported a large increase in the leopard population. Conservation and wildlife bodies claim this whirlwind census was based on guesses and estimates, not on a physical count, and is quite inaccurate.

They say that if the remaining leopard population is to survive an accurate census must be made. According to Dr Perez Olindo, of the East African Wildlife Society, the leopard will be doomed if it is taken off the US "protected" list.

Friends of the Earth in Burnie are mounting a campaign to save the leopard. Donations and volunteers are needed. Burnie FOE is also selling SAVE THE LEOPARD stickers (\$1.60 for a sheet of 25) to raise money for the East African Wildlife Society.

The Tasmanian "tiger" has disappeared with hardly a trace - the true tiger looks like following it. Now at last people in Australia are helping the embattled conservationists in Africa to save another of the great cats, the leopard, from human greed: the status-seeking desire for genuine furs.

Contact: John Gillett,
PO Box 350, Ulverstone,
Tas. 7315.

The China Syndrome

By Jodi Adams

March 28, 1979. A spring morning in quiet Harrisburg, Pennsylvania. While residents slumbered, dairy cattle huddled together against the early chill. No-one was aware of the insidious puffs of radioactive steam drifting across the sluggish river which separates the little town from its nuclear neighbours, the twin-reactors of Three Mile Island power plant. By afternoon, the alarm bells ringing inside the doomed reactor's control room could be heard around the world.

In Vancouver, British Columbia, where I was staying with fellow Greenpeacers, newsreaders reported the "incident" in French, English and American broadcasts, as helicopters surrounded by an eerie mist flew across our screens. Dixy Lee Ray, the pro-nuclear governor of neighbouring Washington state was shown boarding a plane bound for a Nuclear Regulatory Committee (NRC) meeting, the good lady smiling and full of assurances that the situation was well under control. Walter Cronkite, the grand old man of U.S. evening news was already hinting at irregularities between NRC and power company reports on the "accident". Ralph Nader called for closures. Power company P.R. men called for calm. It was the day before my 23rd birthday and even in far-removed Canada I could feel the fuses burning for the nuclear industry...

The China Syndrome, based on a script co-written by a former nuclear engineer, opened in theatres throughout the U.S. and Canada in early March 1979, well before the world had heard of Harrisburg. Starring a combination of top young Hollywood stars (Jane Fonda and Michael Douglas) and a golden screen veteran (Jack Lemmon) the film was sure to keep the box offices busy, even without its controversial and current affairs theme — the safety and ethics of the commercial nuclear industry. The film ruffled a few feathers — the General Electric Company refused to sponsor a talk show hosted by Barbara Walters, a top-rating interviewer, unless her interview with Jane Fonda



discussing the film was scrapped. But since the film's expected audience mainly consisted of young, aware and converted middle-class whites. Since the film's expected audience would consist mainly of young, aware and converted middle-class whites the film was not seen as a real threat. The many workers and housewives who did not question nuclear power would probably never go to see the film.

But when news of the accident broke even General Electric couldn't keep Walter Cronkite and Harrisburg off the air. By the night of March 28th Columbia Pictures executives were rubbing their wallets with glee as clips from their newest baby flashed across every TV news report in North America. Because film crews could not gain access to the panic-torn control room at the Three Mile Island reactor, the stations were using footage from the very believable *China Syndrome* to illustrate the disaster to viewers.

As the NRC press statements and Metropolitan Edison power company denials continued into the morning of March 29th, a strange mind-warping situation became apparent. The saga of the doomed Three Mile Island reactor read increasingly like a film script — and the film script began merging into the news reports... So accordingly I have included examples of the strange fact/fiction saga in my look at *The China Syndrome*.

In the film Jane Fonda plays

Kimberly Wells, a newsreader who the station bosses are moulding into a novelty item for their network. Kimberly wants to contribute some novelty item for their network. Kimberly wants to contribute something apart from a good figure to the Los Angeles-based newsteam, but her employers have other ideas. To keep her serious aspirations temporarily under control, however, the network boss throws her a feature on the energy crisis to compere. Kimberly jumps at the chance to do something other than read cute human interest items and employs an old friend, cameraman Richard Adams (Michael Douglas) to film the feature on the Ventana Nuclear Plant.

The station Kimberly works for wants to show the nuclear industry in a good light — particularly, as Kimberly and Richard later discover, because Cal Gas & Electric (the power company running the Ventana plant) are major network sponsors. But even Bill Gibson, a smooth-talking P.R. man (who, incidentally bears a remarkable resemblance to Three Mile Island's front man) fails to hide the nuclear industry's dirty secrets when an accident occurs at Ventana during the news crew's visit. After all, an earthquake-intensity shudder passing through thick concrete walls, and a control room full of panicking men are hard to cover up. And although the near-meltdown situation is eventually

averted by the coolness and experience of the only qualified nuclear engineer in the plant, Jack Godell (played by Jack Lemmon), the cameraman ignores the P.R. man's assurances that the incident was "nothing more than a blocked valve" and secretly films the control room during the panic station situation.

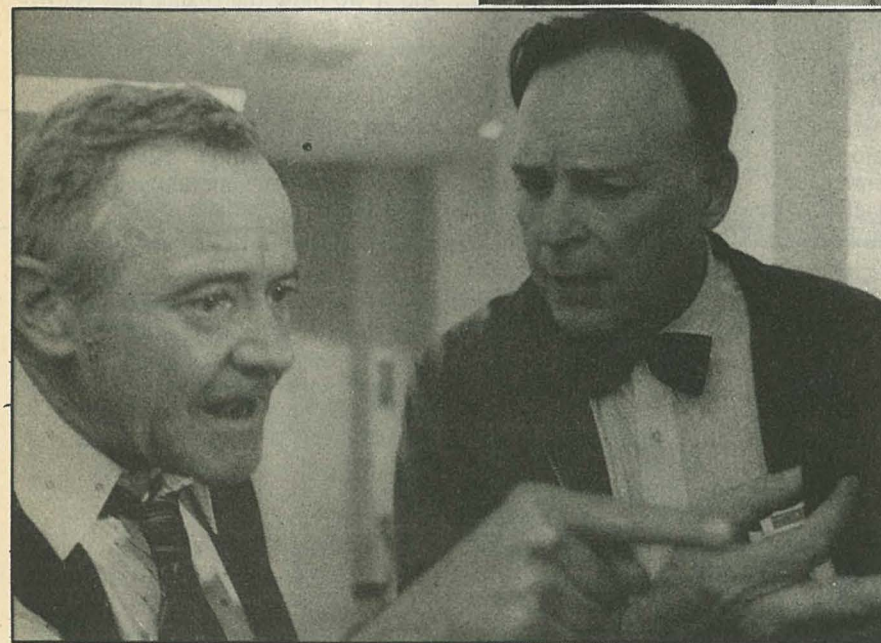
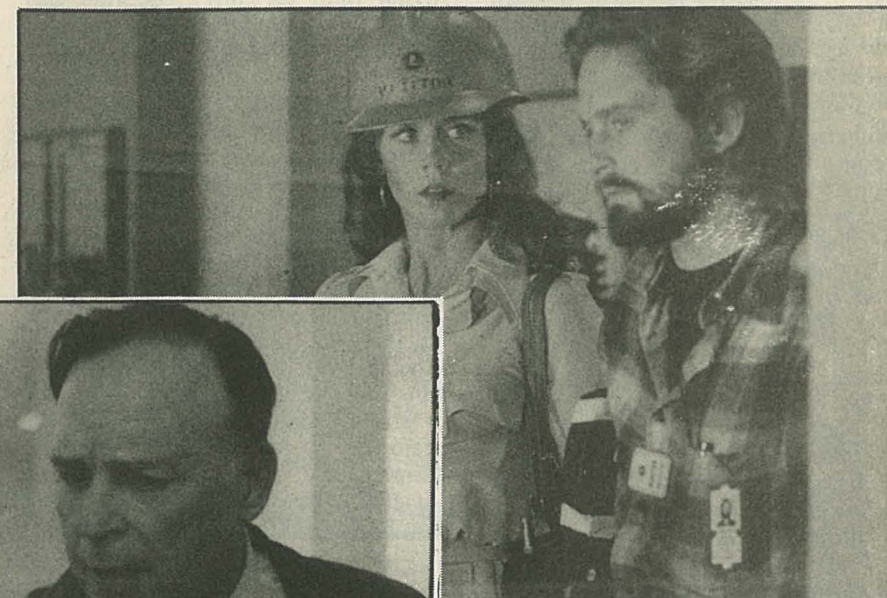
The disturbing coincidences between the film and reality have already begun to appear... a nuclear reactor control room full of young, unqualified men who panic when they have to cope with a dropping water level and a nearly uncovered reactor core... a P.R. man who plays down the danger of the situation and lies to the media about the incident...

Kimberly and Richard soon discover that their exclusive footage of the accident won't be shown on air as the

Although a quickly-called nuclear board of inquiry (read NRC) hearing into the Ventana incident has cleared the plant and staff, Godell has discovered a major leak in a pump which has spilled contaminated water and radiation onto the floor of the reactor room, and he wants a full investigation into the cause of the accident. His boss, Herman De Young is under pressure to reopen the plant and fears

plant's welding merely photostated one x-ray repeatedly.

When Godell challenges the nuclear technician on this point, his life is threatened. After all, the company who built Ventana has a lot to lose if it is reported to the nuclear authorities as it is busily engaged in building dozens of other plants. (Note: a report in Newsweek early in May noted that NRC officials engaged in investigating



TV network executives refuse to use the film, claiming a dangerous legal situation. Richard later discovers that Cal Gas & Electric have threatened to withdraw their sponsorships unless the film is dumped. (Barbara Walters would find this situation familiar after her Fonda interview).

Kimberly has a surprise meeting with Jack Godell who assures her that there was no accident and no danger to the public at the Ventana plant. But Godell hasn't much reason to believe in the nuclear industry.

a huge cash loss if the plant reopening is delayed any longer. Godell, who sincerely loves his job, begins to see his beloved nuclear industry in a new light and is hurt and confused by the cost-cutting and unprofessional attitude his employers are taking. He also discovers that the x-rays of the reactor welds have been faked — that is, instead of each weld being x-rayed for any weakness which could affect the reactor's stability in times of stress (a check required by law) the technician who supervised the Ventana

the cause of the Harrisburg accident have complained that technicians involved in building Three Mile Island have been evasive and deceitful in their answers to questions on the safety codes and building techniques used in the plant).

Meanwhile Dr Lowell, a top physicist, has been shown the film, of the Ventana incident. The following amazing conversation takes place at the screening, held privately during a public hearing on the licensing of a new reactor:

Dr Lowell: (after viewing Richard's film): "it looks like they came close to having a China Syndrome."

Kimberly: "What's a China Syndrome?"

Dr Lowell: "Well, if the core of a nuclear reactor is exposed for any reason, the fuel heats beyond core heat tolerance in a matter of minutes. Nothing can stop this process once it has started. It then melts through the core container, through the concrete basin surrounding the reactor and right

through the bottom of the plant. Remember your childhood myth, the one that says if you dig straight down and far enough you'll get to China?

Well theoretically, that core could melt its way right through the centre of the earth. But of course it wouldn't, because sooner or later it would hit ground water. And when it did, the amount of steam generated by the core's incredible heat would send a blast of radioactive vapour up through the earth and into the atmosphere. The vapour would move quickly up and away, depending on wind strength and direction, of course."

Kimberly: "Could this China Syndrome be dangerous? Could it kill people?"

Dr Lowell: "How many people would be killed? It's hard to say. But it could render an area the size of the State of Pennsylvania permanently uninhabitable. Well, let's say for the next 25,000 years. That's reasonably permanent. Cancer cases will show up within weeks, months and years after the blast. They could number in the hundreds of thousands, even millions."

Kimberly: "Is that true?"

Dr Lowell: "Without being alarmist, it is entirely possible. In fact, highly probable. Even though I'm talking theoretically. Because theoretically, to a scientist, means that the total event hasn't yet occurred but conclusions derived from laboratory experiments indicate a strong degree of probability. And we already have a mass of very hard data from Hiroshima and Nagasaki."

If you're shocked by reading this conversation now, imagine what the audience reaction was on March 29th — the night after the first news reports from Harrisburg — when I saw the film for the first time in a Vancouver theatre!

After hearing this Kimberly and Richard decide to visit Godell, the nuclear physicist employed at the Ventana plant. Godell at last agrees to give them a parcel of evidence exposing the still-unresolved safety problems at the plant. But the driver of the car carrying the evidence is tailed and forced off a cliff (painful reminders of the Karen Silkwood case). Godell finds himself in great personal danger, and, ironically, is forced to take refuge at the Ventana plant, the only place

where security is stringent enough to protect him from hired killers.

Of course, being a Fonda film (which like *Julia*, *Comes A Horseman* and *Coming Home* are full of brave, virtuous martyrs and ordinary citizens who find new strength and courage) the message of the troubled nuclear engineer Godell comes across in the end.

The China Syndrome is an inspirational film, certainly. The film also shows the ineptness and lack of technical knowledge which are a feature of many anti-nuclear workers, and raises questions about the effectiveness of some methods of public demonstration — in fact, one demonstrator's tactics at the nuclear inquiry in the film is boring, stupid and yet, unfortunately, all too familiar to those of us who have worked both in the media and in environment organisations. The message is clearly "shape up your act, nuclear protestors!" . . . And is a bit of constructing criticism not useful to the movement? The film is drawing large crowds of the "silent majority" housewives, teachers, farmers and social clubs in North America, perhaps because of its

realism, perhaps because there is very little "We told you so" preaching to be seen. Ironically, the most sympathetic and martyred character in the film is Godell — the little man who has such faith in his job, his employers and his industry.

Look for the subtle ad placed right before the end credits of the film. Encourage your friends, neighbours, local Rotary Club or Parents and Citizens to see the film when it is released here — after all the *Woman's Weekly* has been publishing the story (with pictures) under the label "The film that nearly happened": this in itself may be the best publicity the Australian anti-nuclear movement has ever had. We have never had a better time to show the nuclear industry for what it is — corrupt, greedy and wasteful of both energy, lives and dollars, and if we blow the chance that Harrisburg has given us . . . we might as well switch on the TV and wait for doomsday.

—Jodi Adams is co-ordinator of Greenpeace Australia, based at the New South Wales Environment Centre, 399 Pitt Street, Sydney, 2000.

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KNOCKING ON HEAVEN'S DOOR

by Rolf Heimann
 published by Friends of the Earth
 \$4.95.

We were talking about activism, and how to evaluate its effectiveness. Judging activism by its media coverage alone seems to ring quite hollow. One of the things I've discovered is the value of having fun as an objective, while being politically and environmentally active . . . just the buzz from standing up for myself against those authorities I was told to respect without question from childhood. It is this enjoyment of the experience of activism which I value beyond most other aspects, and it is this aspect which is almost always overlooked by people discussing the subject.

With all this in mind, you can now consider Rolf Heimann's journey of protest, on his yacht La Flor, as one of the great success stories of activism. If his activism is to be judged solely on whether Rolf saved the world, and stopped the French nuclear tests at Moruroa — his object of protest, or even gained much media response — then his epic yacht journey through the south seas would be considered a failure. Which would be a great shame, because Rolf's graphic account of his adventures in his (non-cartoon) book, *Knocking on Heaven's door* is very enjoyable, informative reading.

The book is actually a travelogue, and as a travelogue it is a fascinating document of the trials and tribulations of sailing the romantic South Pacific. Rolf didn't quite make it in time for the French nuclear tests but he experienced enough adventures on the way to fill a book. They are described in very human detail — with no pretensions to heroisms and eco-martyrdoms which has marred descriptions of other better-known journeys of protest to Moruroa.

Knocking on Heaven's door, which I read mostly in one sitting, is full

of brilliant colorful real-life characters including a self-styled King and liberator of the tiny island called Tana (he turned out to be a Corsican — shades of Napoleon — named Antoine Fornelli). The islanders themselves were so bent on their own freedom from white colonials, that at one stage they threw all their money into the sea or spent it in a wild orgy. They figured the whites couldn't live without money; if the islanders didn't have any money then it followed that the whites would leave.

Heimann's descriptions of the Polynesian peoples, both in an historical and contemporary perspective and some of the more colorful Polynesian and European characters is a delight, as well as his own traumas and ecstasies in just sailing the yacht. An excellent book for those of us who still have the odd fantasy of the romance of sailing our way to a South Pacific freedom.

Michael Russo.

Smallalternatives a personal guide to saving energy & money

If you're no more than an armchair ecologist, you won't appreciate "Smallalternatives: a personal guide to saving energy and money". It's a small, readable, practical, illustrated book which asks you to modify your lifestyle away from extravagant energy usage. To this end, there are nearly 200 specific guidelines which can help you save energy, reduce pollution and save money at home, at work and at leisure. But for them to work, you have to be prepared to use them.

This is a new production of the little booklet produced by the "Smallalternatives Working Group" in Brisbane, which has already sold over 12,000 copies, at a conservative estimate. "Smallalternatives" has been written for Australian conditions, and anticipates the world-wide preoccupation with efficient energy use which is likely to be one of the major issues of the '80s.

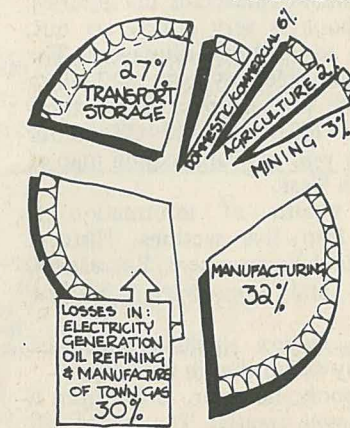
The Smallalternatives Working group has no vested interests, nor affiliations with any political party, religion or commercial group. The members are, however, concerned that the world's energy resources be shared more equitably than at present (Australians are part of the one third of the world's population which consumes four-fifths of its resources.) They ask us to devise our own guidelines, and involve those we live and work with in using them too, to produce a cumulative effect.

"Smallalternatives" uses simple illustrative graphs and diagrams. These bring home why even small energy conserving measures are important. For instance when electricity is produced from coal (as was the case in N.S.W. in 1977), about four-fifths of the energy stored in the coal may be lost in the conversion process. By using less electricity we are also avoiding contributing to the wastage which occurs in supplying us with power.

It is surprising to learn that 37% of the electricity bill for Melbourne and Sydney households is for water-heating, and that each degree of heating water makes about 3% difference to the average house's water heating bill. Maybe we can do without steaming hot water for all of the 24 hours of the day . . .

Using Smallalternatives guidelines all the time, it is claimed that we should be able to reduce our gas and electricity bills by up to two-thirds. Wouldn't we all benefit from using Smallalternatives?

Andrea Morgan



ENERGY USE IN AUSTRALIA 70-71
 SOURCE: KALPA (1976)

Tasmania's wild South-west

THE SOUTH WEST BOOK
Australian Conservation Foundation
 \$11.70 Soft-back; \$15 Hardback.

Mainland Australians sometimes think of Tasmania as a tame, picturesque island, a patchwork of forms and apple orchards. But the rugged South West is one of the wildest, least explored parts of Australia, with its thick, wet forest and rapid rivers. It is one place where the original ecological balance of the Australian bush has not been disturbed by white settlers.

Early this year the Tasmanian Government extended the area of wilderness that would be proclaimed a Conservation Area, following recommendations by the Australian Conservation Foundation. However it is still allowing forestry and mineral exploration to continue inside the Conservation Area, and the Tasmanian Hydroelectric Commission is planning a massive dam on the Franklin River.

Against these recent developments the South West Book appears, published by the ACF. The book was conceived as a collection of information that would teach people about the South West and help in rational decision making for the area. It is an attempt to draw together knowledge of all aspects of the area into a single reference source.

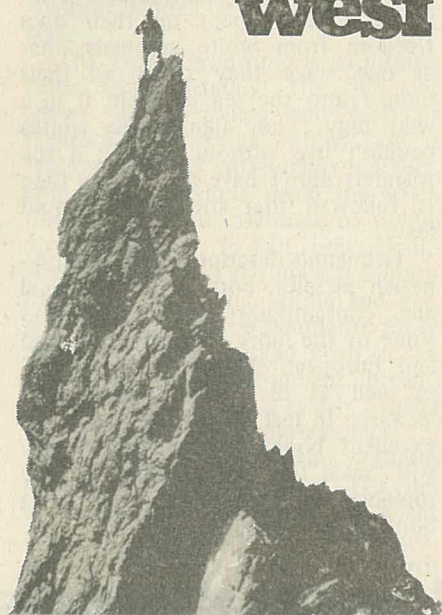
In an attempt to provide a holistic view of the South West, the editors found mountains of disparate and never-before published material existed — held in the minds of bushmen and academics — scattered in the dusty corners of museums and libraries.

The book is very clearly set out, indexed, sourced and illustrated. The text is enhanced by over 400 black and white photographs, maps, drawings and diagrams, and 23 colour plates, as well as a large colour map of the South West.

The wealth of information is divided into five sections, History, The Natural Environment, Recreation, Industry and Conservation in the 1970s.

Each section includes material written by authorities in their fields.

The book, however, is far from a dry academic treatise. The reader will become fascinated and enthralled by such things as an account of the



extinct tribes that inhabited the coastal fringes of the South West for thousands of years: a letter written on the beach besides the encroaching waters of Lake Pedder, extracts from the diary of Olegus Truchanus on the first canoe journey down the

Gordon River; the story of the pioneering King family who made their home in the remote backwaters of Port Davey and a nostalgic poem from the solitary girl



of De Witt Island, Jane Cooper. Tales of river adventure and memories of walks of long ago are recounted, and numerous rare photographs bring them to life again. Much of the scientific sections stem from fresh research.

Articles will take you exploring the fascinating underground world, the biology of cave systems, the remains of giant marsupials who wandered in the S.W. 14,000 years ago.

Forestry and hydro-electric developments are explained in full. Their impact on a wilderness is portrayed in stark reality and the evolving conservation consciousness is delineated battle by battle.

Whilst the controversy surrounding the South West has been an issue for over a decade, few people have been equipped to argue about it authoritatively. However, this comprehensive treatment of the issue now makes it possible for those who care to, to gain an understanding of the Tasmanian South West.

"The South West Book", was compiled in Tasmania by Helen Gee, Janet Fenton and Greg Hodge, and designed by Chris Cowles.

Copies are available from the *Tasmanian Wilderness Society*, 102 Bathurst Street, Hobart, 7000. Soft cover \$11.70, Hardback \$15. Profits will aid the *Wilderness Society* to carry on its campaign.

Also available from the book shop, *FOE Collingwood* (address p. 47).

— Thanks to *TOGATUS* magazine.

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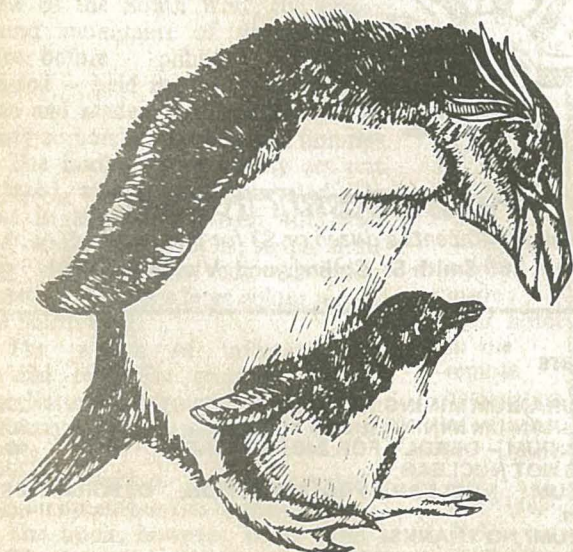
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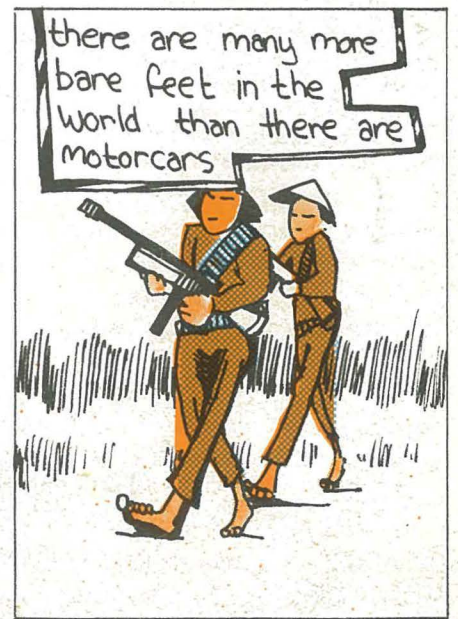
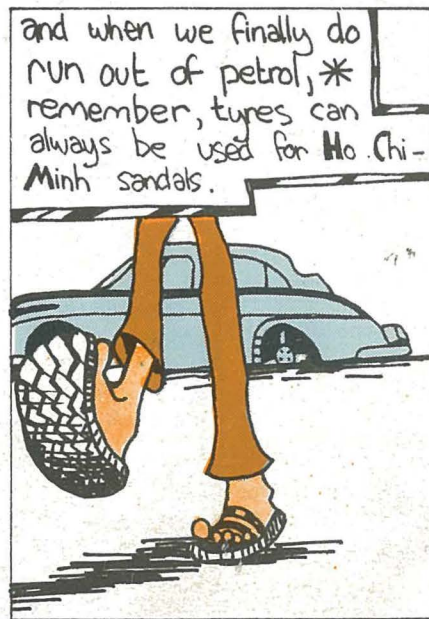
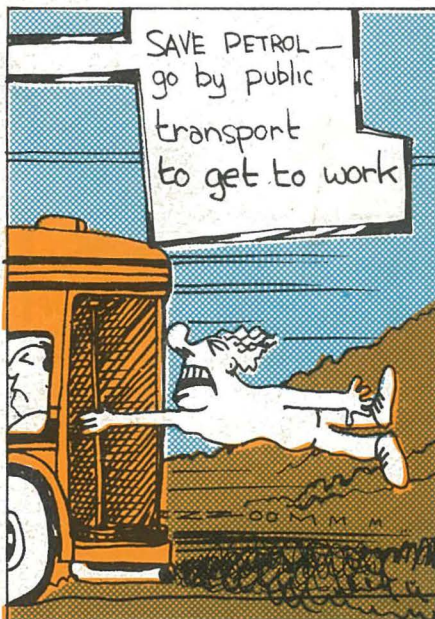
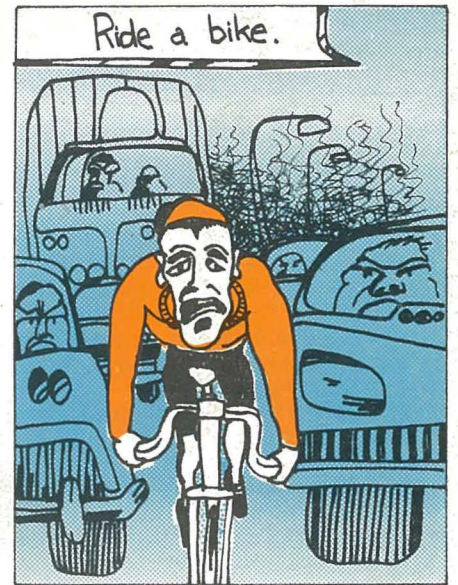
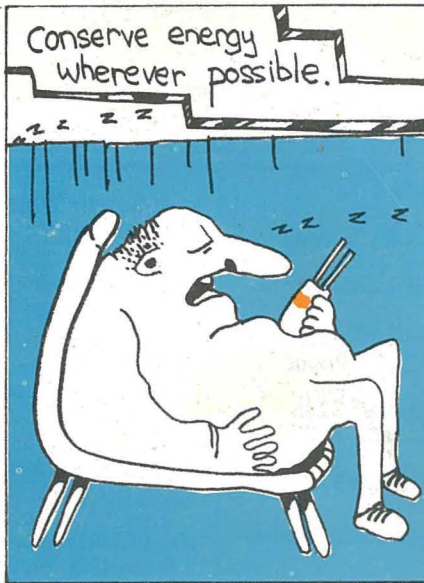
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