FRIENDS OF THE EARTH'S

chain reaction

SPECIAL TRANSPORT ISSUE

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EDITORIAL

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The Fox Commission has attempted to seek out the grey areas of compromise in the uranium debate, between black and white, environmentalist and miner. It gives a bit to both sides while studiously avoiding a clear recommendation one way or the other. But when an issue is ultimately one of life or death — the destruction or not of Black society and culture, and, when we consider nuclear proliferation, even the continued survival or not of the human race — we believe there should be no compromise.

As this issue rolls off the press, the Federal Government will be announcing the go-ahead to uranium mining in the NT. Even after the decision it would take two years to complete the construction phase at the Ranger mine and begin mining there. With the current snowballing of public support for the anti-nuclear case — in Australia, Japan, Western Europe and the USA — no shareholder in Ranger Uranium Mines should feel confident of ever reaping a dividend. With the recent wharfside arrests of about 60 people in Sydney and Melbourne for trying to prevent the shipment of uranium out of Australia, we have already witnessed the commitment of the anti-uranium lobby. If export is attempted, combined workers' and citizens' action could make it a very difficult and expensive operation.

The Government has recently changed horses by acknowledging that the risks of nuclear proliferation associated with the spread of nuclear power are real after all. It now argues that exporting uranium under 'strict safeguards' and supporting President Carter's nuclear policy is the best we can do to minimise those risks. But Carter's anti-proliferation measures are almost certain to fail (see p.6).

The new US policy and Australian uranium exports still encourage the expansion of the conventional nuclear industry based on thermal reactors, from which plutonium for bombs can readily be obtained. Carter seeks to prevent other countries from getting commercial uranium enrichment and reprocessing plants, but many key countries already (or soon will) have such facilities. Nuclear-technology supplier countries like France and West Germany are most unlikely to comply with US requests to forgo lucrative sales. Carter's halting of US work on the breeder nuclear reactor is commendable, though in itself does nothing to mitigate the awesome risks associated with an expanding conventional nuclear industry. Attempting to keep sensitive nuclear technology and materials to a trusted group of uranium suppliers — notably USA, Canada and Australia — also significantly increases Australia's chances of joining the nuclear fuel 'cycle' in its timeless terminal stage. The spectre of buried radioactive wastes in Central Australia no longer seems so unreal.

So far as Australia is concerned the energy crisis means primarily impending shortages of indigenous oil. Bass Strait reserves will run out in the mid 1980s and new discoveries are unlikely. On current consumption trends this will lead to massive economic crisis as we bid on the precarious international market for increasingly expensive overseas oil. Some people have suggested we buy time by paying for oil imports through sales of uranium. However, the hazards of uranium mining and the international nuclear industry make this an unacceptable alternative. The only acceptable solution is to begin now to reduce our consumption of oil, and restructure society to meet the realities of the future. In this *Chain Reaction* we look at the kinds of changes that are necessary in the area of transportation and the way we build our cities. Of prime concern is the number one resource waster and air polluter, the motor car.

What can be done to throw off the tyranny of the car? Established planners claim it is human nature that keeps us attached to the car, that we must retain the car-orientation of our cities and find other fuels for more new cars. This is clearly not so and at last a group has done something to prove it. The Conservation of Urban Energy committee in Melbourne has been working for many months on a plan for restructuring cities to reduce dependence on the car and to rediscover our lost sense of community. *Chain Reaction* is indebted to the CUE group for allowing us to use their material in preparing the article starting on p. 18 . We believe the ideas suggested there for changing the urban environment, physical and social, present a great challenge. either this challenge is met and the stranglehold the car has on society is released or we are locked onto the road we are currently treading towards fuel rationing, resources warfare and economic collapse.

"Well in our country," said Alice, still panting a little, "you'd generally get to somewhere else if you ran very fast for a long time as we've been doing."

"A slow sort of country," said the Queen. "Now here you see, it takes all the running you can do to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that."

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Chain Reaction is the quarterly magazine of Friends of the Earth Australia, publishing feature articles and news on national and international environmental issues, and searching for the way towards a sustainable, convivial society which lives in harmony with its environment.

Sorry we're a bit late this time: absenteeism reached 100% during the Swanson Dock demonstration. The special articles on transport and urban restructuring in this issue were produced by Alan Parker, Barbara Hutton, Andrew Herrington, John Andrews, Mike Russo and Mark Carter. We thank the Conservation of Urban Energy Group in Melbourne for access to their material. Thanks to Mark Snell, David Carter, Graham Barron, Rosy Carter, Sandy Pulsford, Paul Marshall, Alastair Machin, John Cotter, Rob Pardy, Neil Barrett, Steve Myers, Richard Nankin, and many others for their help with the rest of this issue.

Thanks also to Currency Productions for bromide work and to Waverley Offset for typesetting and printing.

Original contributions to Chain Reaction — articles, news snippets, leaks, photos, drawings, cartoons, poems or short stories with some sort of environmental association — are very welcome, but we can only guarantee to return them if they are accompanied by a stamped addressed envelope.

Address all correspondence to *Chain Reaction*, Friends of the Earth, 51 Nicholson St., Carlton, Vic. 3053. Tel. (03) 347 6630.

EARTH NEWS

"I'd use elephants if I had them"

Vic. Chief Commissioner Miller

Melb., July 2

At 8.30 pm on Swanson Dock in Melbourne, the anti-uranium campaign in Australia entered an ugly new phase. Mounted police led a charge on peaceful demonstrators sitting on the concrete wharf beside a ship loaded with Australian uranium. The scene was wild. Many people were trampled by horses' hooves, or injured by rough handling by Victorian police while being dragged, some by the hair, to waiting paddy wagons.

An ex-policeman with the demonstrators received a kick in the face as he was lying on the ground after his arrest. A Monash University lecturer suffered bruised kidneys. Practically all those who bravely sat there as the police charged — almost St Petersburg style — received bad bruises or cuts.

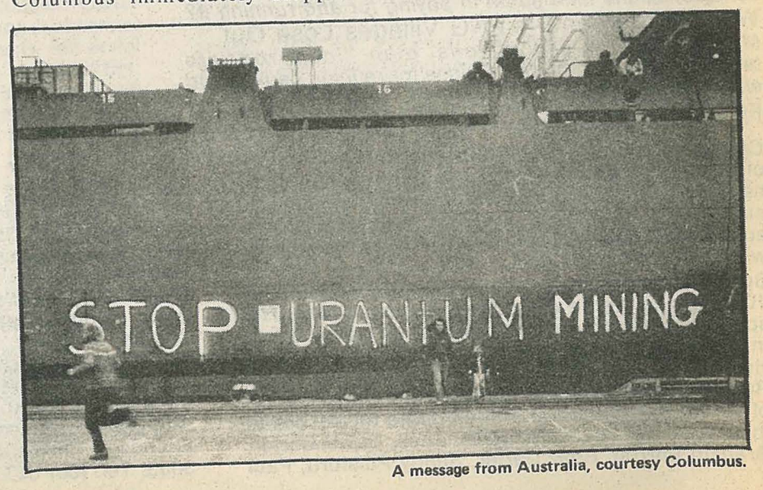
In all 30 people were arrested, three for assault and/or resisting arrest, the rest for trespassing. All were released later that night. Numerous statutory declarations by demonstrators detailing police violence have been presented to the Victorian Chief Secretary, Mr Dickie. Mr Dickie, of course, had made up his mind about the situation before receiving this evidence. The day after the incident, on the basis of police reports alone, he had confidently asserted the police action was faultless. Police horses, he said, were specially trained so that they didn't tread on people; anyway "Force must be met by force".

The demonstration at Swanson Dock was called for the Saturday morning to protest at the arrival in Melbourne of the West German container ship, Columbus Australia, carrying as part of her cargo Australian yellowcake bound for the US. The yellowcake, from the Mary Kathleen Mine in Queensland, was loaded onto the ship in Brisbane on 28 June.

About 300 people turned up at 10.30 am at the dock gates. A little later, as a number of workers came out from the dock, the crowd gently surged forwards, opening the gates and allowing hundreds of people to run in and take up positions alongside the ship.

The wharfies working on the Columbus immediately stopped work because of the danger of an accident with so many people milling around under their loading gantries. The ship's captain wound up the gangplank, giving the men a further reason for refusing to work, since regulations say loading cannot take place unless the gangplank is down.

A delegation to the ship's captain was called for and eventually allowed. Four people went aboard to explain the reason for the demonstration and try to get the ship to unload its cargo. Captain Jurgen Stolle refused, saying in effect that he was just obeying orders. (Later he said in an *Age* interview that "I would rather carry a cargo of beautiful girls but I can't be choosy . . . I'm just a captain doing my job".)

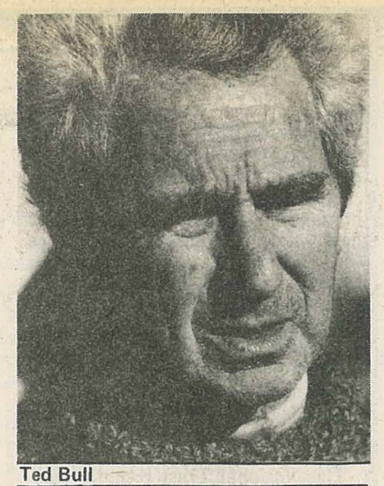


A message from Australia, courtesy Columbus.

Meanwhile the wharfies had been meeting and a spokesperson came over to tell the demonstration, to loud cheers, that the men had decided that if the police took any action to move people away, they would black the ship.

This put the police and harbour management in a no-win situation. If they made no attempt to move people from the side of the ship, the gangplank would stay up and no loading could proceed. If they did move in on the demonstrators, the wharfies would black the ship — again no loading. Eventually the police, in a very heavy-handed manner, chose the second option that night, and with charges of brutality ringing in their ears obviously backed a loser.

And the ship sailed, early the following Wednesday, without picking up any more of its intended cargo from Melbourne of frozen meat and automotive parts, but with the yellowcake. The loss from the delay to the ship's owners, Columbus Line, was probably in the region of millions of dollars.



Ted Bull

Each shift of workers after the police charge on Saturday night decided not to work on the Columbus. On Monday morning a meeting of Melbourne wharfies decided on a 24-hour strike throughout the port of Melbourne in protest against the police action against demonstrators. After a 6½ hour stopwork meeting in Festival Hall on Tuesday, the Melbourne branch of the Waterside Workers' Federation voted to black-ban the Columbus Australia and to refuse to handle any more uranium.

The Federal WWF policy is to honour existing contracts, but the Melbourne branch is taking a tougher line.

Ted Bull, Melbourne Branch secretary, explained: "Until the whole question on the mining, handling, and treatment of uranium is settled to the satisfaction of the Australian people, we will not load, or unload, handle or stevedore any ships loading uranium or carrying uranium, or materials for the mining of uranium."

As the Columbus Australia entered the comparative calm of the high seas, her owners, the Columbus Line, announced that it would not be carrying any more uranium out of Australia while the WWF bans remain.

GLEBE ISLAND

Anti-uranium demonstrators were also active on the docks in Sydney. Between 20-23 June they tried to prevent the ship ACT 6 from taking away a cargo of 200 tonnes of yellowcake from the AAEC's stockpile at Lucas Heights which was destined for Japan. In all about 40 arrests were made at the Glebe Island Container Terminal No. 2.

Trucks appeared at Lucas Heights on the afternoon of Monday 20 June, and were immediately spotted by people at FOE's Atom Free Embassy set up outside the gates (see *CR* **2** (4), 1977.

A phone call from the embassy to FOE Sydney at 5.30 pm reported no movement. A second call at 7.30 informed that the convoy carrying the yellowcake was already half way to the docks. Local residents staffing the embassy had been taken by surprise when the convoy moved out of the AAEC gates at 70 km/h. There was no time to call Sydney so they followed the trucks, risking their lives weaving in and out of the rapidly moving traffic.

In a para-military operation involving both the Commonwealth and NSW Police, traffic lights were held, back-roads and one-way streets (the wrong way) were used to speed the 2 km long convoy to the docks. Despite the short notice, waiting for the trucks on their arrival at the Glebe Island Container Terminal were 150 people from FOE and MAUM and local residents from around Lucas Heights. But the convoy bypassed the demonstrators, getting into the terminal through a back entrance. A lone FOE was there to jeer as the trucks rolled in.

One person was arrested en route for violating a police directive and three others were arrested that night on the docks for trespassing. One person was knocked unconscious by a policeman. The arrests followed a mass scaling of the fence into the terminal, to the delight of the rank-and-file waterside workers.

After the scaling of the fence on Monday night, loading of the ship was halted. One crane operator walked off the job when he learnt he was handling uranium. Workers from the nearby silo hung up their own sign: "Yellow Wheat Yes. Yellow Cake No."

Loading of the ship later continued. On Tuesday morning some people slid down the bridge embankment and over the fence onto the wharves. Police eventually arrested over thirty people for trespassing. Another was arrested later that day on trumped-up charges and beaten up at the police station.

Early Thursday morning, police scuba divers inspected the hull of the ACT 6 in what the media called "standard procedure". The ship sailed later that morning three days late, bound for NZ. Tug crews indicated they opposed the export of the controversial cargo but finally agreed to follow ACTU policy and handle it.

Meanwhile 100 people were waiting on the bicycle path on the Sydney Harbour Bridge. Uranium dollars (Fool's Gold), flowers and a mushroom were tossed onto the ACT 6 as it passed beneath the crowd. A lone canoeist was picked up by the water police for trying to impede the progress of the ship. He is currently in New Zealand still paddling his own canoe.

With the Federal Government's sweeping aside of the Fox Commission's principal recommendation for a wide public debate on the uranium mining issue, polarising demonstrations such as those at Swanson Dock and the Glebe Island Terminal are unfortunately likely to be a taste of things to come. Combined citizen and worker action seems certain to make exporting uranium a very difficult, unpleasant and expensive operation. How many shipping lines will run the risk of carrying this emotive cargo away from our troubled shores?

MOORA MOORA IN POWER STRUGGLE

The Moora Moora Co-operative community near Healesville (Vic) is fighting the Victorian State Electricity Commission over the SEC's plan to bring power up Mt Toole-be-Wong through the community's land.

The plan is to run a 20,000 volt power line up the mountain with poles spaced at 400 metres. According to the SEC, no trees would be cut down.

The scheme would cost a total of about $28,000 and about 20 neighboring landholders on the mountain would contribute. The SEC's communication tower on the mountain would also be provided with power.

The present residents of the mountain, including two families outside the co-operative, are opposing the scheme. Five absentee landholders wanting the power say they will be resident in a couple of years.

The SEC convened a meeting of those in favor of the scheme at its office in Ringwood in late November. Five members of Moora Moora attended the meeting to oppose the scheme.

The co-operative said it was against "The destruction of wildlife and the visual environment that would result from running an easement for power lines up the mountain and through our property".

Trees could not be grown under the power lines, and with high winds there would be a fire danger if lines were brought down by airborne debris.

A planning report for the Shires of Healesville, Lillydale, Sherbrooke and Upper Yarra recently described the mountain as a "dominant peak on the eastern ridge line. Seen from many places in the area, it forms a strong visual termination at the head of the Little Yarra Valley".

The National Trust recently classified the mountain along with Ben Cairn, Mt Victoria and Donna Buang for its scenic value.

Government loan

The State Government has also recognised the environmental and planning value of the Moora Moora development on the mountain by guaranteeing a loan of $175,000 to finance the land purchase.

The co-operative believes the mountain offers an opportunity for using alternative energy sources and gives residents the possibility of providing their own basic needs.

Moora Moora is "opposed to unthinking consumerism which is encouraged by big institutions with statements such as that a product would 'of course be of benefit to everybody'."

The community uses motor-driven generators at present. Total consumption is normally less than five kilowatts.

Three of four houses planned are designed to have solar hot water and space heating. Other facilities will include wood-burning stoves and gas-powered lights, fridges and cars.

With the cost of SEC power and the information available at the co-operative, members believe it would be silly not to experiment with alternative sources.

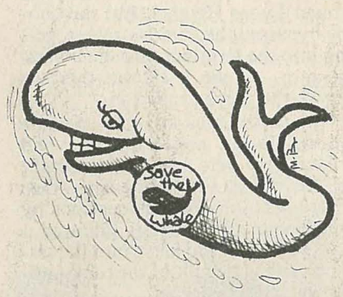
For more information, contact Moora Moora at PO Box 214, Healesville 3777 or on (059) 62 4104.

Newsletter subscription costs $3 a year.

10,000 Whales Live On

Although Mr Sinclair, the Minister for Primary Industry, has maintained a hard-line attitude to whaling and Australia has not withdrawn from commercial whaling, the International Whaling Commission has responded to heavy pressure from conservationists at its recent Canberra meeting and reduced the 'kill quota' from 28,000 whales last season to 18,000 whales this season.

Groups that have joined with Project Jonah (the only group that is solely a Save the Whale group) include the Oceans Society, the Ark, the Anti-vivisection Society, ANARE Club, Friends of the Earth, Beauty without Cruelty, and Croydon Conservation Society (this is not an exhaustive list).



Project Jonah's conference in Sydney ("Whales — A New Understanding") on June 3 and 4 was a great success, attended by several hundred people.

Public awareness and support for the anti-whaling movement is now at an all-time high.

—from Jennifer Talbot, Melbourne Co-ordinator of Project Jonah.

Japan's Uranium Needs—A Myth

The myth is repeated ad nauseum in the media: Japan has a huge nuclear programme and urgently needs Australian uranium. Late in June we decided to publish a detailed research paper on the subject. Entitled "Japan's Nuclear Power Experience: Exposing the Myth", this paper clearly shows that Japan's nuclear power programme is in a miserable state.

Due to widespread opposition by local residents, the number of reactors in 1985 will be 60% fewer than planned. The existing 13 reactors have been out of operation for 50% of the time since commissioning, and the problem of storing nuclear wastes in an earthquake-prone country still defies solution.

By 1985 nuclear power will comprise only 4% of Japan's energy needs. With moderate energy-conservation measures this demand could be reduced and the remainder (if any) met using steaming-coal imports from Australia.

The paper looks also at the way in which the nuclear authorities have reacted to the opposition movement. Two lines of attack have been used: large grants to local councils which accept nuclear plants in their area; and sophisticated well-planned public-relations campaigns.

The response of the Australian media to this paper and its accompanying press release was very disappointing. Only ABC radio ran the story.

(See back pages for publications available.)

Lay-Offs at Lucas

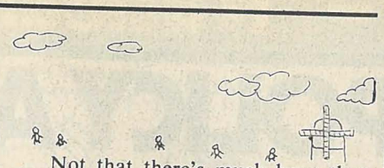
From **Dave Elliot** in the UK

The latest on the initiative of Lucas Aerospace workers in the UK to change the production of the company from defence equipment to socially-useful alternative technologies.

Long predicted by the Lucas Aerospace Combine Shop Stewards Committee, the threat of mass redundancies has now materialised in the shape of a warning from the company that 1100 jobs would have to be lost by August. The Lucas workers plan to fight these redundancies and have made it clear that industrial action — including strikes — will be the response to any sackings. An overtime ban and selected blocking of movement of parts is already in operation.

The cohesion of the Combine Committee and the support for the Alternative Corporate plan drawn up last year have never been greater. At a special meeting, held on March 1 in the House of Commons, and attended by the entire 30-strong Combine Shop Stewards Committee, the stewards made it clear to Labour MPs that they wanted immediate talks between themselves and the Departments of Industry and Employment on the future of the industry.

They also called for a government enquiry into the way Lucas Aerospace had been operating — in particular with regard to the £31m 'deferred tax' concession which Lucas received from the government, some of which, it is alleged, has been used to fund expansion abroad.



Not that there's much hope that the UK government can influence a privately owned company like Lucas.

Although sympathetic MPs may be able to generate some disquiet in the corridors of power, what happens over the next few months really depends on the workers themselves — and on the reactions of the Company, who have already indicated, by announcing that they do not recognise the Combine Committee as a representative body, that they intend to challenge not only the Corporate Plan, but the Combine organisation itself.

The current redundancy threat is therefore a crucial test for the whole 'corporate plan' approach. For the Combine Committee's aim in producing the plan *in advance* of redundancies was to have something ready for just such a situation — although they also hoped that it could be gradually implemented by negotiation.

The workers at the Burnley plant have in fact been successful in negotiating for the adoption of one of the products proposed in the corporate plan — natural-gas powered heat pumps for use in council houses. Agreement to develop prototypes at Burnley had been reached with local management just before the redundancy threat, by *central* management, was announced. Detailed technical discussions with customers and consultants were also under way. Hopefully this project will not be affected by the threatened 350 redundancies at Burnley — but rather will be the forerunner of a whole series of projects drawn from the Corporate Plan.

S.A. says no to U-mining

"I doubt whether it will ever be possible to demonstrate the safety of the mining and treatment and use of uranium," stated Peter Duncan, the South Australian Attorney-General, in a recent interview with F.O.E. (S.A.). He was speaking on the S.A. Government's recent decision to ban the mining and treatment of uranium in that State.

The motion to ban uranium mining was moved by the S.A. Premier, Mr Dunstan, and passed unanimously in the House of Assembly in May. It effectively bans any mining or treatment of uranium — unless it is demonstrated to be safe. Mr Duncan sees this as a stronger move than the five-year moratorium on uranium mining and use being called for by anti-uranium groups, because "it will last longer than five years".

As an alternative to nuclear energy, Duncan sees everlasting or renewable energy sources, such as solar, tidal and wind power, as the inevitable solution to the world's energy needs.

The S.A. Government is also taking the initiative in the area of solar energy. Changes in the law are being looked into by the S.A. Law Reform Committee to ensure the 'rights to sunlight' of people involved in the use of solar power are protected.

Territory Reactions to Ranger Report

Initial reactions to the Second Ranger Report from Aboriginal groups in the NT was generally favourable, but this response must be seen in the context of blacks' feelings that uranium mining is inevitable. They were pleased a government inquiry gave them as much as it did, even though it stated that Aboriginal opposition to mining should not be allowed to prevail.

Early reaction from the Northern Land Council came from Alex Bishaw, the council manager, who said: "After a quick look at the report, we are willing to say the Aboriginal interests we represented are well covered.

The morning after the report's release, the NT Cabinet Member for Resources and Energy, David Pollock, and the Australian Labor Party spokesperson on Resources, Dennis Bree, discussed the report. The Country-Liberal Party were still confident that uranium mining would go ahead, but the ALP were: " . . . dubious about the benefits which would accrue."

The Uranium Action Group in Darwin met later that night and decided that with the national campaign covering the broader issues of the report, it would tackle the nitty-gritty aspects. Firstly, the UAG called on the Ministers responsible for the full implementation of the Kakadu National Park as laid down by the Second Fox Report.

Secondly, the UAG demanded that a full ecological research programme be carried out before mining is contemplated.

Two days later the *NT News* moved into the field of resources diplomacy in its editorial. It traded off buffalo meat against uranium. Because the EEC has forced the west German Government to impose a massive $2000 per tonne levy which has priced our buffalo meat off the tables in Bavaria, the *News* reasons, Mr Fraser should not hesitate to play the uranium ace in any dealings with West German leaders.

from Steve Myers in Darwin

Carter 1 – Nuclear Policy

U.S. POLICY AND AUSTRALIAN URANIUM

Senior ministers of the Fraser Government have asserted that Australia should export uranium because it would be in our interests and would also assist the new US nuclear policy. This policy, they say, is the best hope for stopping the proliferation of nuclear weapons. But their argument is fallacious on several counts:

- *Both the US policy and Australian uranium exports encourage the expansion of the conventional nuclear-reactor industry, from which (among other dangers) plutonium can be readily obtained for the construction of nuclear weapons. This in turn diverts funds and effort from developing and deploying saner, safer and more diversified energy sources (especially renewable ones such as solar energy).*

- *The US policy will be ineffective in limiting the 'breeder' and 'recycling' parts of the nuclear fuel cycle in the short-term, and will lead to their expansion in the long term, with increased prospects of proliferation.*

- *The US policy is based on a highly doubtful assumption: that the United States can and should control the nuclear market, and can force other countries (including Australia) to submit to US interests and policies (for example, it will create pressure to make Australia a radioactive waste-storage site, under US direction and 'protection').*

Plutonium from existing reactors

Every 1000 MW nuclear reactor of the kind developed in the USA (light water reactors — the kind most commonly sold around the world), produces approximately 200 kg of plutonium each year. Only eight kg of plutonium, of the quality produced in such a reactor, is needed to manufacture a nuclear weapon.

Plutonium is extraordinarily toxic and minute quantities (as small as one millionth of a gram) can cause cancer. As the volume of plutonium produced in wastes, or recycled, increases, so does the risk of plutonium escaping into the environment. As well, nuclear facilities and plutonium become more accessible as targets for criminals or deranged elements.

On 7 April President Carter announced that the US would:

1. **indefinitely defer the commercial reprocessing and recycling of plutonium within the USA;**
2. **defer the introduction of the breeder reactor;**
3. **embargo the export of nuclear technologies that would permit uranium enrichment or fuel reprocessing;**
4. **discuss internationally proposals for similar action by other nuclear energy countries;**
5. **ensure ready availability of uranium, and of used nuclear-fuel storage sites on an international scale.**

From the possession of a nuclear reactor it is practicable to move to the construction of nuclear weapons. A nation does not need a major fuel-reprocessing plant to extract plutonium. India, for example, produced the plutonium to build its nuclear explosive without a commercial reprocessing plant.

Whether or not the breeder reactor is introduced, the spread of the nuclear energy industry to further countries would mean that plutonium will be produced in sufficient quantities to enable the spread of nuclear weapons to occur.

Reactions of other countries

The new US policy could only stop plutonium recycling if other countries were persuaded to 'voluntarily' follow suit. Given the conflict of national interest mentioned above it is hardly surprising that, in their immediate reactions, they showed little inclination to do so.

The Japanese response to a US request to suspend the operation of their new $300 million pilot waste-reprocessing plant was rather cold. The Japanese Prime Minister, Mr Fukuda, "agreed to disagree" with the request[1] and reiterated his country's determination to go ahead and put the plant into operation by August[2].

While the British Government reiterated its desire to "strengthen international action" to prevent the spread of nuclear weapons, it did not announce any restrictions on its own deep involvement in breeder and fuel-reprocessing technology.

The French continued to negotiate the supply of reprocessing plants to South Korea and Pakistan, and West Germany announced it would stick to its agreement to supply Brazil with fuel-reprocessing and enrichment equipment.

Ulterior motives

A hidden motive in the new US nuclear policy was suggested in *Time* soon after Carter's speech: "Carter may be gambling that by coming out strongly against the breeder reactor . . . he can damp down the debate over the safety of nuclear power and press on with the development of conventional uranium-fuelled plants. Partly because of the safety controversy, orders for such plant declined from 30 in 1974 to three last year".[3]

The motivation for restricting the development of the breeder reactor becomes clearer if viewed in the context of the extremely poor performance of existing prototypes (particularly in the USA), and their enormous capital cost. In the words of Dr Edward Teller (father of the H-bomb), "breeders are a waste of funds. They are no more ahead of where they were 15 years ago".[4]

Another aim, alleged by high-level officials in several countries, is that the new US policy is at least in part an attempt to increase dependence of other countries on the purchase of US technologies and US-processed fuel supplies.

Fraser's 'safeguards'

On 24 May Mr Fraser announced a series of non-proliferation 'safeguards' to be applied to any Australian uranium sales. In general these relied on the discredited Non-Proliferation Treaty and International Atomic Energy Agency, coupled with bilateral agreements.

After listing nine "main limitations and weaknesses of the present safeguards arrangements", the first report of the Ranger Inquiry states that: "The Commission recognises that these defects, taken together, are so serious that existing safeguards may provide only an illusion of protection".[5]

Fraser's sudden conversion to the cause of developing stronger safeguards was probably a reaction to these reservations about existing arrangements expressed by the first report. It also allowed him to be seen to be supporting the new US policy. But the Government's announcements stopped short of supporting the US position on the recycling of plutonium from conventional reactors. Recycling was relegated to the vague area of "studies and consultations" in which the Government "will seek to contribute actively and constructively to relevant aspects".[6] This reticence presumably stems from the knowledge that cutting out exports to countries with reprocessing facilities would cut out all our major potential customers. Instead it seems, if the Government is to have its way, Australia will continue to export to countries like Japan and Germany who are busily setting out to isolate their own stores of plutonium.

Role of limited uranium stocks

The Government has attempted to bolster its case for mining by arguing from the well-known fact that world uranium reserves are relatively small. Thus, so the argument runs, if Australia does not export, uranium shortages will develop earlier, creating extra pressure for the dangerous recycling of plutonium as an extra supply source.

The argument assumes that an Australian decision can affect only the *supply* of uranium and not the *demand* for it. This is clearly not so.

The stance which Australia assumes in the escalating international struggle between citizen groups and the nuclear industry, is likely to be vitally significant.

By exporting now and guaranteeing a present security of supply, Australia would give moral and physical support to a rapid proliferation of nuclear power stations, leading to eventual uranium shortages on a very large scale and massive pressure for future widespread plutonium recycling.

On the other hand by witholding its uranium Australia would give vital support to the increasingly effective opposition to nuclear power, at a critical time when the nuclear industry's future is in the balance. This is the way Australia can most effectively strike a blow against the hazards of plutonium recycling and nuclear weapons proliferation.

Australia as a nuclear waste dump

It has been widely reported that the successful implementation of the Carter policy would require the 'cooperation' of Australia, as a dumping ground for the highly radioactive wastes.[7] The waste-storage problem is presently reaching crisis proportions for the US nuclear utilities and they are extremely anxious to find suitable "politically stable" storage sites. Proposals to export their problems to Australia are clearly unacceptable to us.

References

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2. *The Age*, 19 April 1977, p.7
3. *Time*, 18 April 1977, p.23
4. *Forbes Magazine*, 1977
5. *Ranger Report 1*, 1976, p.147
6. *Financial Review*, 25 May 1977
7. *Financial Review*, 29 April 1977

An edited version of *Nuclear Weapons and Australian Uranium*, Jim Falk, Ian Henderson, Ian Lowe, Uranium Moratorium, June 1977.

FOX REPORT 2: MAIN POINTS

● The Second Fox Report still leaves open the question of whether or not to mine and export Australian uranium, for a decision by the Australian people after a wide public debate.

● The Commissioners reiterate their view expressed in Report 1 that "*the most serious danger is that of proliferation of nuclear weapons*", and that "*the nuclear power industry is unintentionally contributing to an increased risk of nuclear war*".

● Report 2 focuses on the likely impact of mining on the local environment in the Alligator River region of the N.T. and on the Aboriginals in the area.

Aboriginal

● *"The traditional owners of the Ranger site and the Northern Land Council are opposed to the mining of uranium . . . They have a justifiable complaint that plans for mining have been allowed to develop as far as they have without the Aboriginal people having an adequate opportunity to be heard"* (p. 9).

● Silas Roberts, Chairman of Northern Land Council:"*We are worried that we are losing a little bit, a little bit, all of the time . . . we are very worried that the results of this Inquiry will open the doors to other companies who also want to dig up uranium on our sacred land . . . we think if they all get in and start digging we'll have towns all over the place and we'll be pushed into the sea.*

"The people who are belonging to a particular area are really part of that area and if that area is destroyed they are also destroyed" (p. 47).

● *"The local Aboriginal communities are in a state of acute social stress, largely as a result of their contact with European society"* (p.7).

● *"Having in mind, in particular, the importance to the Aboriginal people of self-determination, it is not in the circumstances possible for us to say that the (uranium) development would be beneficial to them"* (p. 9).

● *"The principal threat to the welfare of the Aboriginal people, and the one they most fear, is constituted by the large numbers of people who can be expected to enter the area"* (p. 9).

● Mining companies proposed a mining town in the area of population around 15,000. The Report recommends this town should be restricted to about 3500 people, with restriction of entry of tourists to the town and surrounding area (p. 219). But this is precisely the size of Nhulunbuy, Nabalco's notorious bauxite mining town on the Gove peninsula, where the culture of the local Yirrkala people has been virtually wiped out by alcoholism, population pressures and loss of control by tribal elders.

● *"While royalties and other payments . . . are not unimportant to the Aboriginal people, they see this aspect as incidental, as a material recognition of their rights. The material benefits they visualise as likely . . . are things like motor vehicles, hunting rifles, fishing gear and the like. Our impression is that they would happily forego the lot in exchange for an assurance that mining would not proceed"* (p.269).

● Report 2 clearly endorses Aboriginal ownership of the lands which the companies propose to mine. It recommends not only that the crown lands in the area become Aboriginal lands (under the Aboriginal Land Rights act passed last year), but that two cattle leases be resumed and handed over to the Aboriginal people.

● It suggests a substantial area in the region become a national park (Kakadu), with Aboriginal participation in its management.

● It proposes programmes of education, health care, and reduce alcohol dependence and improve white understanding of Aboriginal culture.

● But all this could happen **without** mining.

Environmental

● The Commissioners rejected the proposals put forward by the companies wishing to develop the Ranger deposit, and suggested stringent alternative environmental controls to be adhered to if mining should proceed (p. 335). They rejected the suggestion that a tailings dam at Ranger be used as a permanent storage for tailings and recommended that the latter be returned to the mining pits.

● They recognised that if mining goes ahead, even with stringent controls, environmental damage is inevitable: *"Some seepage* (of containment water) *from the* (temporary) *tailings dam would be inevitable"* (p. 90), and *"The available data are subject to considerable uncertainty"* (p. 93).

● They recommended against the present development of Noranda Australia's mine at Koongarra, which is inside the proposed national park, because it would threaten the uniquely valuable wildlife in the Woolwonga wildlife sanctuary.

Economic

● The report makes it clear that the most important markets for uranium are the highly industrialised nations, particularly Japan, the US, and Western Europe, **not** the developing countries.

● The Commissioners propose **sequential** development of uranium mines (if any) starting with Ranger. They say Pancontinental's Jabiluka mine should not proceed simultaneously with Ranger.

● With this proposal, up to 1500 people would be employed at any one time (p. 364).

● The whole uranium industry would make only a contribution of between 0.2 and 1.3% of gross national income , at its peak in the 1990s (p. 174).

● A delay of two years would reduce economic benefits by 17%; a delay of five years by approximately 38% (p. 179).

CHAIN REACTION INTERVIEW

Bruce McGuiness & Gary Foley

Bruce McGuiness and Gary Foley of the Aboriginal Co-operative in Melbourne give their reaction to the second Fox Report on uranium mining.

Chain Reaction: The second Fox Report admits that uranium mining won't be beneficial to the Aborigines in the NT, yet right in the introduction it says that the Aboriginal opposition shouldn't prevail. What's your reaction to that?

Bruce McGuiness: The so-called government of this country claim that they will consult not only with the Aboriginal people in regards to mining, but with Australian people generally. But taking it from the Aboriginal viewpoint, we are the most talked to and probably least listened to nation of people in the world. They put up the pretence of consultation. They do it all the time. They have no intention in the first instance to listen to what Aboriginal people are saying. It's obvious to me that the whole inquiry into uranium mining has been an attempt to make it look as though the Government and mining companies are concerned about the feelings of Aboriginal people. But they're not. As the Fox Report states right at the finish there, we are not going to take any notice of Aboriginal people, or words to that effect.

CR: Fox suggests that mines should be developed one at a time, not all together as the mining companies would like, in order to minimise the effects on the Aboriginals and also keep the mining centre to a reasonably small size. Do you feel that those measures will have any effect in helping out the Aborigines who own that land?

BM: No. No uranium mining, even if it is only a ton a day, is going to be of any benefit to Aboriginal people. For a start, the land is going to be desecrated. It's sacred land, but it is going to be desecrated. Secondly, waste must come into it. That's got to be seen as being important . . . the radiation factor, plus the replanting of waste materials in the earth from the area where it's mined. But also what is of interest to us is what is going to be the effects of uranium after it's mined. They say peaceful purposes for energy use in an energy crisis. Now that's a load of crap. We know what it's going to be used for. Some of it will find its way to energy uses, but the majority will be used to protect the interests of the super-powers. They want to make sure that they will be able to continue to live in the style in which they have been accustomed to. And if that means fucking other people and wiping out people, they don't give a stuff, they'll do it.

CR: What do you think the effect on Aboriginal people of uranium mining will be?

BM: It will create black bourgeoisies, elite communities within the Northern Territory. Aboriginal people who are on land that has uranium in it will benefit more from uranium mining in terms of monetary gain than Aboriginal people alongside of them. The Northern Land Council will receive some of the royalties, but the bulk of the royalties will go the communities from which the land is taken. Now that comes under the Land Rights legislation.

And now with the black bourgeoisies, you're going to have people who do not fully understand a cash economy with oodles of money to spend.

The luxuries and materialist things of capitalist society are thrust in front of them. It will in fact ultimately destroy those people in much the same way as what it's done in urban centres right throughout Australia. We have Aboriginal people who have been brainwashed, indoctrinated into looking after the materialistic things in life and to neglect completely their own cultural values, their own cultural beliefs and their own way of relating to each other as people, as human beings, not only to themselves but to other people outside of them.

CR: It looks pretty clear that Fraser will give the go-ahead to uranium mining Do you see any hope in stopping it?

Gary Foley: Not unless the people of Australia — all people of Australia — are prepared to take some form of direct action against the Fraser government. But what you are talking about now is pointless in small groups of people throughout Australia trying to sabotage the mining of uranium because in the long term the American mining companies and their Australian lackeys have the resources and the facilities to crush any opposition to uranium mining like that.

The only way I see that we will be able to stop them is when the Australian people have reached a stage of consciousness where they understand the full implications of not only uranium mining, but of all of the things and all of the ways in which we are all being fucked up in this country and seek them with that knowledge to bring about an independent socialist Australia. The anti-uranium mining movement at the moment is mistaken if they think they can do it without any major political, social and economic changes to Australian society.

Carter 2 – Oil Policy

WHAT HAPPENS TO AUSTRALIA IF IT FAILS?

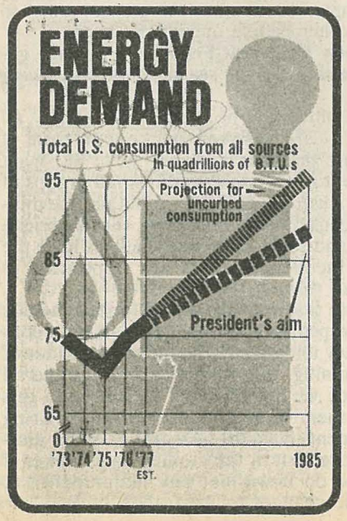
When Jimmy Carter said that the oil crisis is a threat to the United States "second only to nuclear war", he was not exaggerating. Most of the news and journal commentaries in Australia did not appreciate the full meaning of that blunt statement at the time, and they still don't. They thought it meant the Carter Administration was exclusively concerned with Americans switching over from over-reliance on one source of energy, oil, to others they have more of, coal, natural gas, uranium and solar energy. The long-term security implications of Carter's policy were conveniently ignored. The crucial issue is: What happens to Australia if Carter's policies partly or wholly fail? If our big ally fails to cut back on the oil imported and ends up outbidding the rest of the world on the international oil market in the late 1980s, denying other countries the lifeblood of their economies?

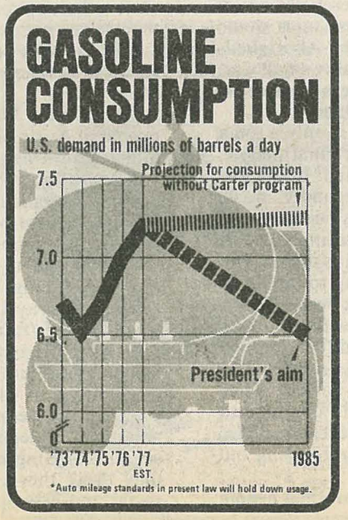
The consequences of the US failing to curb its oil imports were made quite clear recently by Walter Levy, the pre-eminent international oil adviser. Speaking at a *Time* Energy Conference in the US in April, Levy warned that as oil shortages became more severe, the US could be placed in the politically perilous position of bidding against its own allies for oil. "We may be successful (in outbidding allies)," he said, "but we would not survive."[1] This is an indirect way of saying that America would be in a state of 'economic war' with its previous allies, including Australia, who would probably retaliate by nationalising every US industry within their jurisdiction prior to the inevitable collapse of the western-world economic and political system. In this economic war over oil, third-world nations would be the first to suffer.

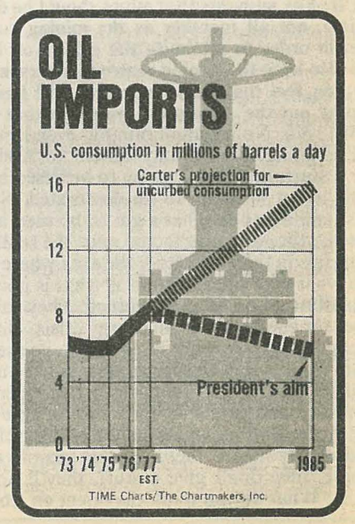
Western Europe will also be thirsting for oil in the 1980s, with the exception of Britain and Norway who will no doubt be keeping their North Sea crude to themselves. The OECD has calculated that 57% of Western Europe's energy was derived from oil in 1974 and that this will have to be cut back to 40% of the total by 1985. But as overall energy consumption is growing, European demand for oil is likely to be as high or higher in 1985 than it it today.[2] No European countries, except Sweden, have yet shown any real commitment to energy conservation measures. Japan's oil needs are also likely to increase.

As Carter's energy supremo, James Schlesinger, spelled out to the *Time* conference: "Oil production should peak out around the world in the early 1990s . . . That means that in five years' time we may have chewed up most of the possibility of further expansion of oil production"[3]. The strange thing about the present conservative Australian Government is that now the Carter administration has placed its conservative seal of approval on the need for a massive changeover in fuel-usage patterns, it has failed to accept this policy for itself and failed to understand what will happen to the Australian economy if Carter fails to curb America's mal-usage of the world's oil. At present there is no Australian commitment to reducing the level of oil imports: on the contrary, official projections suggest that with the run-down of Bass Strait reserves Australia will be importing two to three times more oil in the mid 1980s than today.[4] With this level of demand and the US competing for world oil, it is difficult to see how the Australian economy could avoid a collapse.

A consequence of the present Australian policy, one which would be totally unacceptable to all those who oppose uranium mining and nuclear power, could be that Australian uranium was exported on a barter basis for oil. Aside from the moral questions involved and the shakiness of the international nuclear industry, this measure would do nothing to solve the fundamental economic contradictions implicit in existing patterns of resource depletion. It would merely allow the Australian Government to continue its disastrous policies a few years longer.







But can Carter's policy work?

Carter's policy pivots about the energy-conservation objective of cutting US oil imports to three-quarters of the present level (see "Oil Imports" diagram). To achieve this reduction he has proposed:

- *a standby tax on petrol* — price per gallon would rise 5 cents for each year after 1979 in which consumption exceeded Federal targets (see diagram below) by 1%, up to a maximum of 50 cents.
- *a big car tax* — placed on new cars that do not meet Federal mileage standards, and rebated to consumers who purchase more energy-efficient new cars (see The Gas-Guzzler Tax table below).
- *an increase in the price of domestic crude oil* — so that parity with world oil prices was reached by 1980, providing more incentive to increase domestic production.

So far US energy experts, while applauding what Carter is trying to do, are unanimous in saying his policy won't work. Indeed, how can any nation come to terms with a problem "second only to the threat of nuclear war" with 'band-aid' solutions like petrol and big-car taxes and the rest of his energy package. Some of the package stands a good chance of success, such as the incentives for installing insulation and solar energy in homes, but the crucial part of it which affects millions of Americans who are physically and psychologically addicted to their motor cars is doomed to failure, since increased petrol taxes and taxes to improve the overall fuel economy of cars are most unlikely to reduce oil consumption sufficiently. It even looks probable that Congress will prevent the petrol tax from being imposed.

It is interesting to compare Carter's policy to the energy scenarios worked out by the Energy Policy Project (EPP) of the Ford Foundation in 1974.[5] Firstly the conservatism of Carter's goals are clear from the fact that the EPP suggested that oil imports in even their 'middle-of-the-road' "technical fix" scenario should drop to half their 1973 level, whereas Carter is only going for a drop to about three-quarters of this quantity.[6] In his petrol and big-car tax he has broadly followed EPP conservation plans (except that legislation to ensure that new cars produced had better fuel economy would work much better than taxation measures), but he has not addressed himself to the other EPP aims which would have the important long-term effect of changing the whole structure of transportation in the US. These additional measures include:

- shifting urban traffic to public transportation, and bikeways and walkways
- slowing the growth in air travel
- transfer of freight from trucks to rail
- expansion of new communities where the need for mobility is reduced.

A tax on oil and other forms of energy is only likely to reduce consumption significantly if the revenue collected is used to finance a gradual change in the US industrial system towards energy conservation, the use of renewable energy sources, and towards a 'lower-energy society' generally.[7] For example, revenue from a petrol tax could be used to introduce public transportation systems, with special emphasis on ensuring that poorer sections of the community are not disadvantaged by the tax in the short-term. Other funds raised could finance the conversion of car factories producing the 6- and 8-cylinder gas guzzlers to more appropriate production.

Carter has taken no real positive initiatives to effect a basic structural change in America's ravenously energy-hungry economy. Unless such initiatives are taken soon, a future US President may well have to introduce fuel rationing within the next decade in the face of crippling oil shortages and a US economy still critically dependent on oil. Unless the Australian Government soon wakes up to the looming oil crisis here, fuel rationing could become a reality in Australia too.

THE GAS-GUZZLER TAX

How much taxes would increase (+) or rebates lower (-) the price of a new car under President Carter's mileage-based plan:

Miles per gallon	1978	1981	1985
12	+$449	+$935	+$2,488
16	+$112	+$416	+$1,384
18	0	+$245	+$1,021
21	-$128	+$ 52	+$ 610
24	-$224	-$ 91	+$ 304
29	-$341	-$264	-$ 62
39	-$473	-$474	-$ 493

TIME Chart

References

1. *Time*, 25 April 1977, p.33.
2. *Time*, 2 May 1977.
3. Ref. 1, p.32.
4. See Ref. 1, following article.
5. *A Time to Choose*, EPP of Ford Foundation (Ballinger, 1974).
6. Ref. 4, p.76, table 13.
7. The use of long-run marginal-cost pricing of all energy supplies could be used to raise revenue for funding a soft-energy path, and to encourage conservation and awareness of dwindling fuel reserves. In this system, energy is priced *now* according to what extra supplies will cost *in the long run*. See Lovins, *Energy Strategy — the Road not taken* (FOE Australia, 1977).

THE ONLY WAY
An Oil-Conservation Policy for Australia

The Lucky Country, with plenty of oil in her Bass-Strait belly was one of the few industrial nations who didn't suffer during the Arab oil embargo in 1972. Next time round we won't be so lucky.

The most serious energy problem confronting Australia is that the Bass-Strait oil fields will probably run dry within the next ten years (see p. 32), and thereafter the country will have to buy an ever-increasing quantity of crude oil on the world market. If President Carter's policy to reduce oil imports fails, as seems likely (see previous article), Australia will be buying oil in cut-throat competition with the United States, Western Europe and Japan. Oil prices could sky-rocket: oil supply could be cut off overnight, by, for example, a recurrence of hostilities in the middle-east. At present neither of the major political parties in Australia has any policies to deal with this imminent crisis.

The policy of the present Federal Government is based on letting the oil and car industries do exactly what they want. The consequences of this approach were clearly shown by J. E. Lane of the Australian Roads Research Board in a paper presented this May to the Australian Transport forum in Melbourne[1]. This paper showed (see graph below) just how much more dependent Australia is going to become on imported oil by the late 1980s.

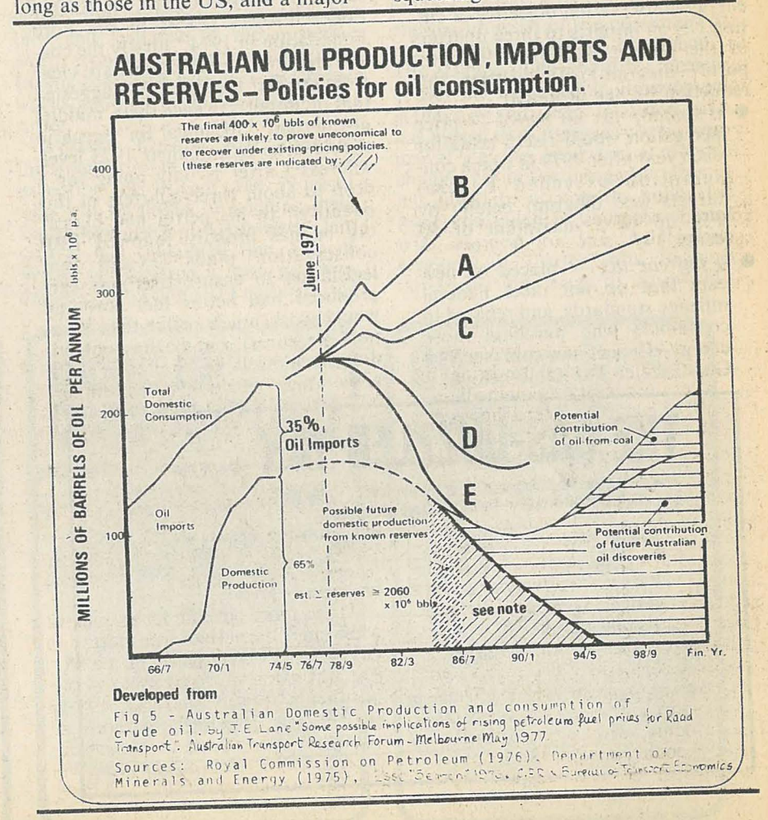
Curves A and B represent two predictions based on current policies. Curve B is a wholly disastrous policy based on 4.9% average annual growth in gross domestic product and a 1.7% p.a. population growth. This would require a four-fold increase in the present level of oil imports by 1986. The only way this import bill could be paid would be through a new mining boom, including full-steam ahead for yellow-cake. Curve A is calculated as for B except that GDP and population growth are reduced to 3% and 1.25% respectively.

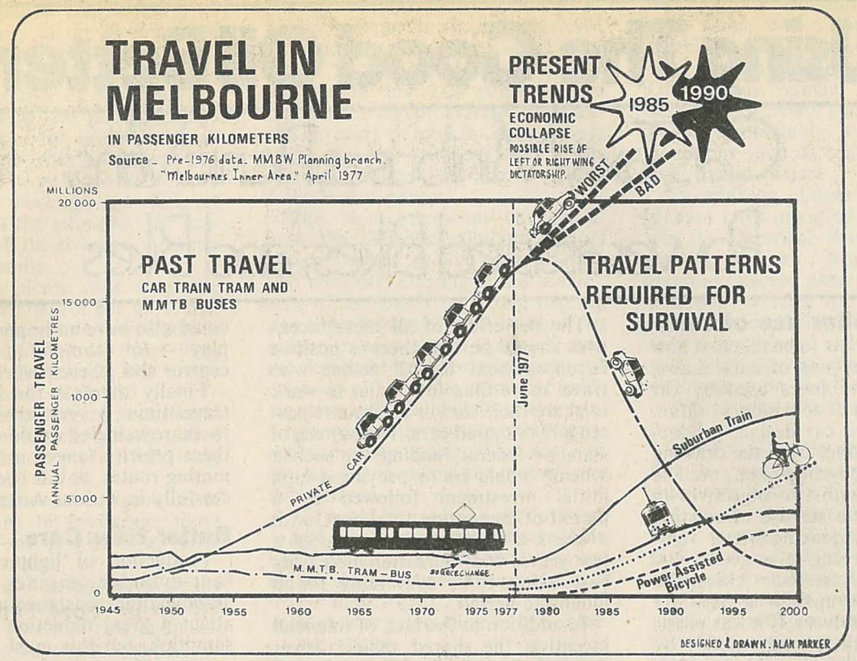
The most we can realistically expect from the present government is the policy represented by Curve C : a 3% p.a. growth rate, 1.25% p.a. population growth, coupled with strong energy-conservation measures in industry. Even in this scenario, oil imports will be running at twice their present level by 1985, which is still disastrous.

Curve D (added by the author) represents the US policy of reducing the level of oil imports to three-quarters of what they are now by 1985. This would be a very radical policy for Australia because our domestic oil supplies will not last as long as those in the US, and a major shift away from private cars would be required to achieve it. Curve E (also added by the author) is based on a 'fail-safe' policy of oil conservation, as partially outlined in this article. Such a policy must be achieved if Australia is not to collapse economically and become either a right- or left-wing dictatorship, which one can be sure will introduce fuel rationing for the benefit of all, while preserving the goodies for the dictatorial elite.

Oil from coal, and future discoveries.

The graph further shows that squeezing oil from coal cannot make





a significant contribution in the short-term. Even if it were possible to advance oil-from-coal projects by ten years, this method would not solve Australia's energy problems.

The potential contribution from future oil discoveries in Australia, based on Esso estimates[2], is shown coming in after the mid 1980s. But the fraction of these yet-to-be discovered reserves which will be economically recoverable remains unknown.

Oil in transport

To achieve the desired oil consumption objective given by Curve E it would be necessary to bring in measures for conserving oil in all sectors of the economy. Here, however, we will focus on conserving oil in the transport sector, which has the largest single share of consumption, 54% of the total, and which offers scope for the largest savings.

Transportation in Australia is almost totally dependent on oil. Even though suburban railways using electricity derived from coal or gas move a very great number of people each day, the overwhelming usage of large cars with only a driver in them consumes so much petrol that 99.5% of transport energy comes from oil. The oil-conservation goal outlined in Curve E could be met without the introduction of any exotic new technology: it merely requires an adaptation of what already exists.

An obvious starting point is to get more people using trains and trams, which are not only more energy efficient per passenger-km travelled, but generally use a more abundant energy source, coal. Buses too could satisfy more transport needs since they are typically several times more efficient in their fuel consumption per passenger-km than cars. Existing large cars could be used more efficiently by car-pooling and encouragement of shared taxis. Production of new large cars could be gradually reduced to a low level and the production of smaller cars reduced at a somewhat slower rate, with energetic steps taken throughout this scaling down of the car industry to provide alternative employment for the workers involved (see p. 28). The slow atrophy of human muscle power could be halted by more people turning to cycling, power-assisted cycling and walking.

To be more specific let us look at what an alternative transportation policy for Melbourne could be like. The illustration above shows two possible transportation futures for Melbourne, described in terms of passenger-kms travelled by various modes. The curves assume an average car occupancy of 1.3 people, and average carrying capacities for buses, trains and trams. The pre-1976 data were assembled by the Melbourne & Metropolitan Board of Works[3].

One future represents a continuation of past trends of increasing travel by motor car, the other an alternative in which car travel declines and use of other modes increases while the total mileage travelled stays constant. In the 'travel patterns for survival' option cycling and public transport become the key means of urban transport by the end of the century.

More detailed discussion of some measures to implement this alternative transport option are discussed in turn in the following section. An important variable not considered here — land-use planning as it affects transport needs — is the subject of the article beginning on page 18. The travel in Melbourne diagram above speaks for itself in suggesting a likely consequence if we continue to let motor cars take over our cities.

References

1. "Some possible implications of rising petroleum fuel prices for transport", J. E. Lane, Australian Roads Research Board, paper presented to Australian Transport Forum, May 1977, Melbourne.
2. Ref. 1, Fig. 6.
3. M.M.B.W. Planning Branch, "Melbourne's Inner Area", April, 1977.

Using The Good Oil Better

Cars, Taxis, Minibuses, Picnic Vans, Power-assisted Bikes, and Bikes

Making Better use of Cars

A new look has to be taken at how to make better use of cars. Laws, regulations and lurks used by car producers and consumers alike, every aspect of car design, production and servicing, from the drawing board to the recycling plant, need to be examined with two objectives in mind: making wiser use of existing vehicles and producing better vehicles related to long-term needs.

Today in Australian cities the average car occupancy is only 1.3 (including the driver). If it was possible to raise this average merely by one passenger per car, freeways would become superfluous, road congestion would disappear, and petrol consumption and air pollution on busy streets would fall to about half their present levels.

A most important measure would be to provide an immediate financial incentive for people to share cars for the purposes of commuting. Firstly an increased tax on petrol would make sharing cars more attractive. The price of petrol could be increased as suggested earlier (p.) according to what extra supplies will cost in the long-run, which would also bring home to people the real cost of using up a non-renewable resource.

A measure which overlaps with this one is the suggestion that the annual fixed costs for a car of insurance and registration should be reduced to a minimum and replaced by higher taxes on petrol. Currently fixed costs are high enough to encourage greater use of a car to get 'your money's worth' out of the money paid out, and to bring down the average total cost per km. With the alternative proposed, running costs of a car would predominate, so the less you drove the less you'd pay.

A tax rebate for a shared vehicle used consistently during the peak hour could also be provided, in the same way as self-employed people can claim a rebate on a car used for business purposes.

The net effect of all these incentives should be that there is positive encouragement for all people who travel more than four miles to work to share their cars or to become passengers in shared cars. The pattern of state or federal funding for such a scheme would be to provide a high initial investment followed by a period of decreasing total cost, with a break-even point coming after a few years, and thereafter increasing cost savings to the community for an indefinite period.

In addition to the lack of financial incentive, the shared vehicle driver currently has other problems, for example:

- It is illegal for the car owner to charge his/her passengers.
- Third-party insurance does not cover paying passengers.
- The lack of a recognised fare structure makes the current illegal practice of charging an awkward and sometimes unpleasant act of negotiation that many people are not prepared to go through.
- The lack of a recognised code of behaviour that will enable both passengers and driver to know what is expected of each other means that people who share cars often have unpleasant disputes when problems arise about routing, lateness or other matters, and they are thus discouraged from sharing.

Steps should be taken to overcome these legal and operational difficulties associated with car sharing. To make a metropolitan-wide shared car system work, research and development could be done on specifying design modifications to existing vehicles to make them more suitable for sharing, and on computerised driver/passenger matching services. The latter have been used in conjunction with radio-controlled shared-car systems in the past and much could be learnt from this experience. More informal means of getting car-sharing groups together could also have an important role to play — for example, at community centres and at each work location.

Finally there is the question of travel time. A very strong incentive to share vehicles would be to allow them priority lanes on major commuting routes, as has been tried successfully in various American cities.

Better New Cars

Production of lighter cars with four-cylinder engines and less aerodynamic resistance would bring about a great reduction in oil consumption, but this must also be accompanied by measures to take out 'built-in obsolescence'. If there are to be cars, they should at least be quality products.

A further fuel economy measure would be to modify car engines and gearing systems so that accelerative capacity was reduced, and top economical cruising speed brought down to below 50 mph.

Shared Minibuses

After the initial debugging of the financial incentive scheme for shared-car users, it should be possible to give car sharers the chance of buying modified minibuses as a tax-free concession. The owner(s) of such a minibus could use it as a commuting vehicle carrying six to twelve people to work during the week, and as a family/neighbourhood/other-community-group vehicle for leisure-tripping at the weekends.

The shared minibus with bicycle racks on the back is theoretically one of the most flexible transport vehicles ever designed. The integration with bicycles would greatly increase both the catchment area at the starting point of trips to work, and the area served along and at the end-point of the route followed. It offers the further advantage of allowing people to be dropped directly at their destinations on days when the weather makes cycling unpleasant. The flexibility of the fully equipped minibus is a totally unexplored area in transportation planning. [1]

Multi-Purpose Vehicles

Getting away at the weekends at low energy cost per passenger km has been accomplished in Melbourne by a large number of bush walkers, youth hostellers and family groups since the end of the last war. Large furniture vans with windows and detachable seats go out with 30 to 40 people every weekend, travelling at over 10 times the efficiency per passenger km of the average weekend driver and family.

Known as picnic vans, they use only 15% more petrol per mile than the average six-cylinder car. There is now a fleet of 25 of these vans operating in Melbourne, but in the fifties there used to be 450.

We believe the Government should actively encourage the greater use of these vehicles by the following measures:

- Changing the cost environment of picnic vans to encourage more furniture van operators to move into this area.
- Sponsoring a design study on the concept of multi-purpose vehicles and their potential role in an oil-conserving transport system.

Integrating Taxis with Public Transport

At present radio-controlled taxi services using only slightly modified standard production cars seating five people operate within most Australian cities, but most taxi trips involve only one passenger. The fare structure does not allow sharing of taxis, except when some drivers allow it in the early hours of the morning. Also many passengers can afford to travel that way as a business expense.

Improved taxi services linked to public transport in various ways have an important part to play in an alternative passenger transport system. To achieve this taxis would need to have much higher average occupancies, to carry in total far more people and a greater variety of small loads, and to offer greatly reduced fares for fully loaded trips.

The most important connection with the 24-hour public transport system would be via computerised taxi controls, offering a 'dial-a-bus' type of service. If on a long trip the passenger's destination is close to public transport pick-up-point, and the computer indicates adequate load capacity on a public transport vehicle, the taxi would deliver the passenger to the appropriate public transport pick-up point. The cost, of course, would reflect the level of service offered.

Through the telephone system people would therefore have at their call the following services:

- very high cost private use of a taxi for long trips;
- high cost private use of a taxi for short trips;
- low-cost shared use of a taxi for short trips;
- low-cost shared or individual use of taxi/express public transport system for long trips.

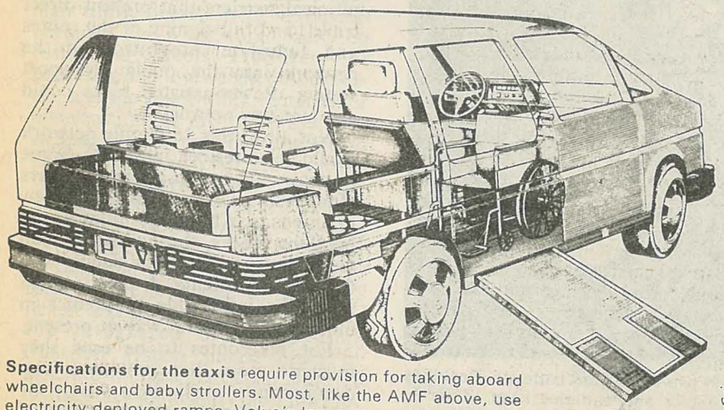
Obviously today's taxi fleet would have to be replaced in the longer term by vehicles designed specifically for their new role as outlined above. Many of the desired characteristics of such vehicles can be seen already in prototypes and vehicles in production overseas. Last year the American public was introduced to many exciting new taxi designs by New York's Museum of Modern Art, which has a long history of working with government and industry to improve industrial design. One display vehicle, a Californian steam car, is small, yet can carry five people comfortably; it has design innovations such as ramps for prams and invalid chairs.

In addition, Lucas Industries in Britain have modified existing vehicles to electrical drive to give a battery-driven nine-passenger minibus, a seven passenger large car, and two vehicles for use as taxis. Lucas is developing automated battery charging and changing systems with the aim of making battery-exchange time shorter than it takes to fill the tank of a standard car with petrol.

Each taxi would need an on-line link to a central transport computer fitted with a dial-a-bus type memory unit that records telephone calls from prospective passengers. The taxi driver would have a visual display unit to indicate the location of waiting passengers plus the times of arrival of express public transport services for making connection with these. A lot of other information would be on call so that the driver could advise passengers on their transport needs as and when required. Passsengers could be alerted by the driver via the computer/telephone system a minute or so before arrival to reduce waiting time.

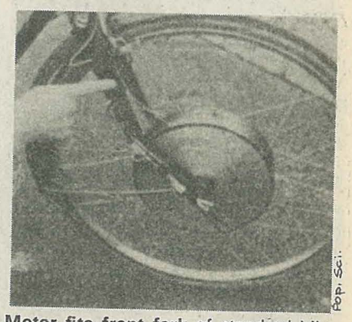
Power-Assisted Bicycles

The power-assisted bicycle was very popular in the UK and Europe in the fifties and early sixties. It had a cruising speed of 20 mph and notched up 200 miles per gallon with



Specifications for the taxis require provision for taking aboard wheelchairs and baby strollers. Most, like the AMF above, use electricity deployed ramps. Volvo's low entrance permits entry from sidewalk level without use of ramp.

Pop. Sci.



Pop. Sci.

Motor fits front fork of standard bike, making retrofit of existing bicycles an attractive possibility. Wires from electronic commutator and motor winding connect to batteries and control box at the terminal block, which is taped to fork (see pointing finger) on the prototype.

its tiny 30 cc engine. You only pedalled to start it and to help it up hills. There were three basic types: two with power units driving directly onto the tyre of front or back wheel; the third with a motor mounted into the rear wheel (see photo).

We suggest the use of power-assisted bikes instead of mopeds or lightweight motor cycles because the latter are too heavy and fast to mix with ordinary cycles on a bike route/way, especially when one is trying to encourage middle-aged and older people to start cycling again.

It should now be possible to improve the older models of power-assisted bike by making them lighter and with even better fuel economy. A machine with a cruising speed of 15 mph on the flat, 22 mph with normal pedalling, 10-12 mph up hills with vigorous pedalling, and giving overall 300 miles per gal., could well be designed. Able-bodied people could then travel up to 30 miles a day with little physical effort. The less fit could cover shorter distances with much less effort than they would need on an ordinary bike.

Travelling in wet weather is also easier for power-assisted riders since the less effort required means they do not sweat as much inside their waterproof gear.

With good acoustic muffling power-assisted bikes could be fairly quiet and their low petrol consumption would make air pollution minimal. The good fuel economy would also allow precious renewable transportable fuels such as methane or alcohol to be used.

All these advantages, coupled with ease of parking and storage, make the power-assisted cycle eminently suitable for use as a feeder to the public transport system over distances up to 10 miles.

Since most of the relevant patents have expired, all that is needed to get this machine redeveloped is for the Federal or State Governments to approach manufacturers and subsidise the research and development of those willing to do the job.

The power-assisted bicycle has been reintroduced in modern form in several countries; one of the most successful designs, developed in England, is illustrated opposite. This machine is still a prototype and has a unique high-efficiency pancake motor (see drawing). An Indian company will begin making machines of this design shortly, and we believe the Australian government should study how to introduce similar machines into this country. The front-wheel kit costs $115 including batteries.

Front-drive electric bicycle has synchronous motor and gearbox integrated in front hub. Top speed is 18 mph in prototype form; range is up to 40 miles with two small auto batteries. Positions of motor and batteries keep center of gravity low. Control box could be reduced to 6-by-4-by-3 inches.

Another British company to develop an electrically-powered cycle is Joseph Lucas, who have pioneered electric cars, buses and taxis. According to a recent letter,[2] this company is interested in developing this machine in any country prepared to classify it as a bicycle. The latter is already done in several American states and certain European countries, and it is clearly a necessary measure if power-assisted cycling is going to really catch on.

Bicycles

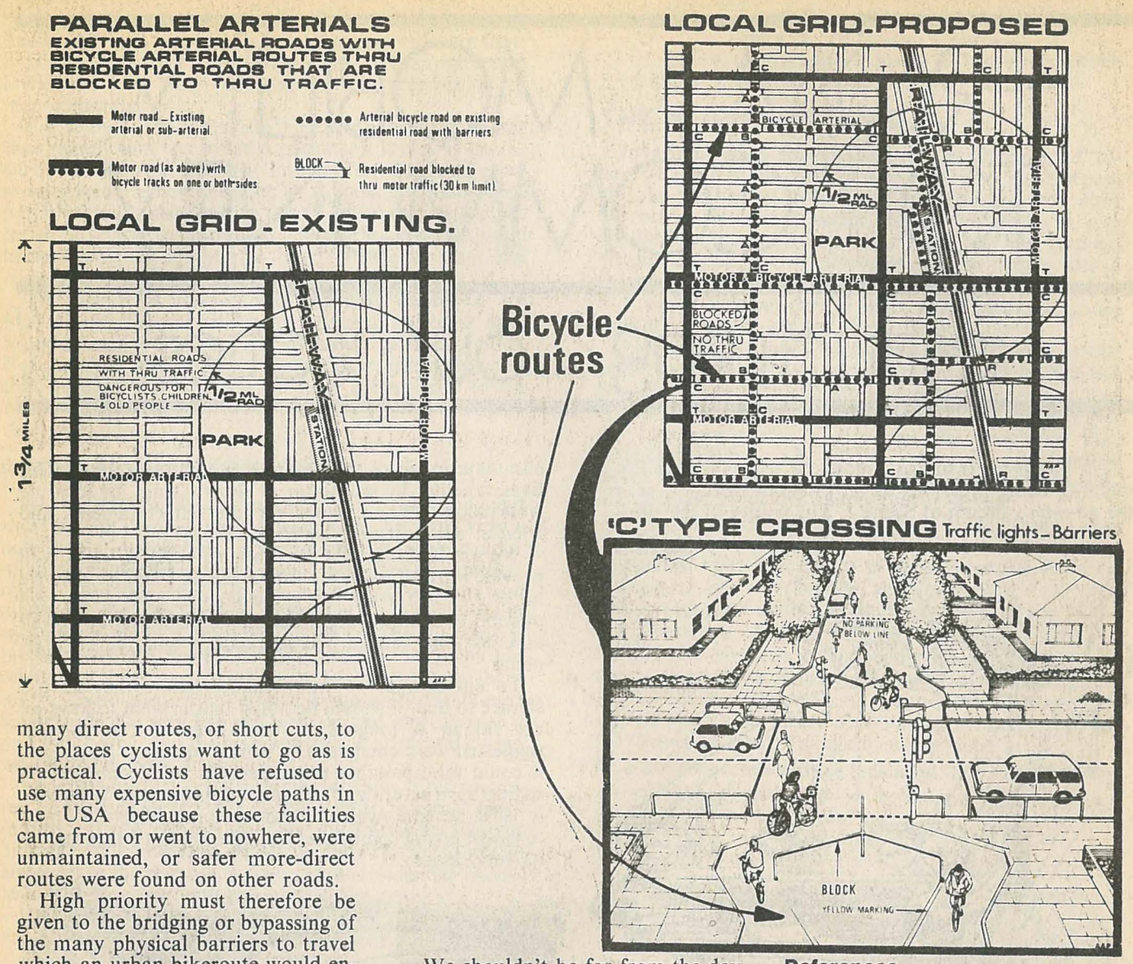
In promoting a return to cycling it is most important to persuade the road building authorities to plan for and build into the road system the means for cyclists to avoid as much of the severe road congestion as possible. One promising way by which this could be achieved would be to plan a bike-route network on the relatively-unused residential street system in each of our cities (see illustrations). This scheme avoids the high costs of building a *bikeway* network (i.e. pathways on which cyclists only could travel) completely independent of the existing road system. Most residential streets are in fact ideal for cycling, since generally less than 1500 cars a day use them and they have good road surfaces.

In Melbourne, for example, a short-term objective would be a 500-mile arterial bikeroute network to be brought into operation within three years. Small low-cost signs and a cheap bikeroute map would indicate which streets to follow. Similar schemes, with appropriate adjustments for local conditions, could be carried out in other cities.

In the long-term we believe a 1500-mile network for cyclists is required in Melbourne, with many structures to bridge or bypass the physical barriers that prevent direct travel, and full signing of the routes and complete integration of the network into the public transport system. Power-assisted bikes could also use this network.

Not all of this 1500-mile network would be on residential streets. Some routes would be 'on-street' bikeways along sub-arterial roads and a few main roads. About 300 miles would be along creeks, through parks, and along railway, electrical-supply and drainage easements. A precise form would be impossible to predict in more than a general way at present.

For bikeroutes to be used they must do more than provide a less-dangerous, pollution-free, or generally pleasant means of travel for cyclists: they must also provide as



many direct routes, or short cuts, to the places cyclists want to go as is practical. Cyclists have refused to use many expensive bicycle paths in the USA because these facilities came from or went to nowhere, were unmaintained, or safer more-direct routes were found on other roads.

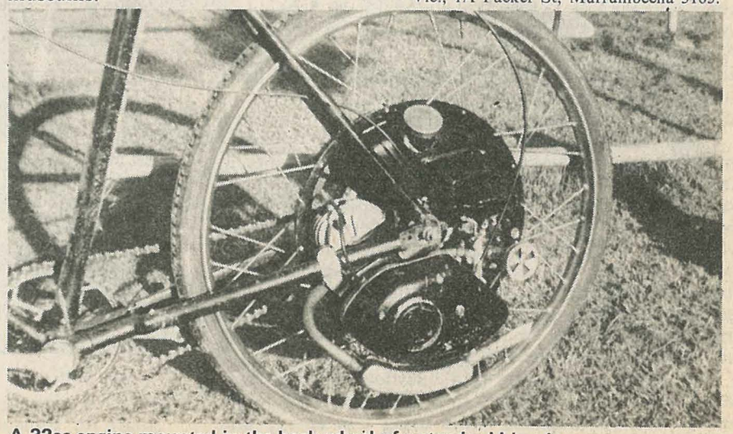
High priority must therefore be given to the bridging or bypassing of the many physical barriers to travel which an urban bikeroute would encounter. These barriers include badly congested arterial roads, railway crossings, rivers and creeks. Of these, bypassing arterial roads with high traffic density is of major importance for a network based on residential streets. However, the small size and low weight of the bicycle, and the small width required for bikeways, allow off-road ways such as bridges or tunnels for bikes only to be constructed at relatively low-cost.

As the network would feed the public transport system as well as providing door-to-door bicycle travel, the combined effect should be a significant reduction in motor-car usage. Once it is seen to be an efficient and pleasant means of travel, the integrated bicycle/public-transport system should begin to generate its own particular kind of traffic and significantly alter the present useage patterns of the various modes of urban transportation.

We shouldn't be far from the day when "the bike-route sign means happy cycling", and Esso signs are confined to "The Oil Age" section of museums.

References

1. The only ref. known to us: *Bicycle Transportation*, US Environmental Protection Agency, Dec. 1974, p. 21.
2. To Alan Parker, Secretary, Bicycle Inst. of Vic., 1A Packer St, Murrumbeena 3163.



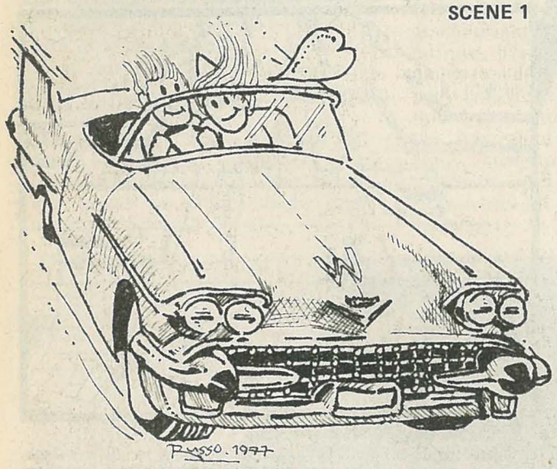
A 32cc engine mounted in the back wheel of a standard bicycle.

FROM MOBILITY TO COMMUNITY

restructuring our cities

The motor car is sold as a means to achieving mobility, mobility being presented as an essential freedom, as in the ad-*man's* dream of Scene 1. The reality of the situation most of the time is nearer Scene 2. In our cities the car has become essential for most people to travel to work, take the kids to school, get to the shops, to the doctor, and even to escape into the country at weekends. With this form of mobility it is the activity at the destination that is important; the journey itself is usually a nuisance. This mobility is precisely the converse of joyriding: it is enforced — in*car*ceration, you could say.

SCENE 1



Cars indeed to give a greater range of personal mobility, but it is a mistake to argue that mobility in itself is the greatest good. On the latter argument, the solution to the problems of urban transportation would lie in providing present (or even higher) levels of mobility while using less energy and generating less air pollution — for example, by a massive shift to rapid high-frequency public transportation. In this article, however, we place emphasis not just on mobility, but also on *access*, on the activity at the destination which was the reason for travel in the first place.

With this approach the root question becomes: how can we restructure our cities so that people can gain access to desired locations while using less energy and generating less pollution? In particular, how can we eliminate much of the enforced mobility in our present lives, whether by motor car or electric train, by locating workplaces, schools, shops, services, entertainments, and friends, much nearer to where we live?

We are looking then for land-use changes which will provide *maximum access with minimal mobility*, and we hope to show further that these changes offer a very real possibility of improving the quality of urban living as well as conserving scarce energy reserves and the environment.

To nip charges of impractibility before they have a chance to bud, it should be noted that in what follows we are taking a long-term view. Even if the changes suggested were energetically worked on from right now, it could take possibly many decades to accomplish the radical restructuring of urban areas proposed. However, it is a scheme which could be progessively worked towards, giving some relief from the present chaos during its early stages.

SCENE 2

RESTRUCTURING

We will now sketch a broad design for a strategic regional plan for a large city incorporating integrated goals for transport, land use and human involvement. Too often in the past such grand designs have paid little or no attention to how people will be affected in their day-to-day lives. In what follows, then, we will look firstly at changes at the local, 'grass-roots' or microplanning level, and only then proceed to the grand-scale or macroplanning level.

For change to take place in our cities as a whole, rather than merely in a few isolated pockets, it is clearly necessary to work simultaneously on two fronts: at local community level to mobilise popular support and allow wide participation in deciding on the direction of change; and an all-city level to co-ordinate diverse local activity and bring concerted pressure to bear on federal, state and metropolitan governments and instrumentalities.

The plan that follows was orginally conceived for Melbourne, but we believe its principal concepts have broad relevance to practically all major Australian cities. For example, the approach bears close resemblance to that adopted by FOE S.A. in their submissions to the North Eastern Area Public Transport Review hearings in Adelaide.

RECREATING COMMUNITY

Aside from profligacy in energy use, pollution, and sheer pace of living, large sprawling cities have spawned a new illness — isolation, of young and old single people, of insular families, of particular members of families, most commonly the car-less housewife, housebound and alone with the kids for most of the day while the husband escapes to work. Compared to the closely knit social fabric of suburbs before the advent of the motor car and television, today's conurbations are almost totally lacking in community, that elusive community of interest between people who live and work in and identify with a particular area, and the co-operation, sharing and caring which can thereby arise.

Our first priority is accordingly to frame a restructuring of a city in such a way as will help to re-create community. To do this we propose the following five-tier hierarchy of community-involving activities, in locations adapted for the purpose, starting at the residential 'block' level and finishing with the central city area.

Tier 1 The domestic unit
Tier 2 Neighbourhood house serving a residential block
Tier 3 Local focus for neighbourhoods — an urban centre for the suburbs
Tier 4 Community focus at district centre level
Tier 5 People's focus in central city area

THE NEIGHBOURHOOD

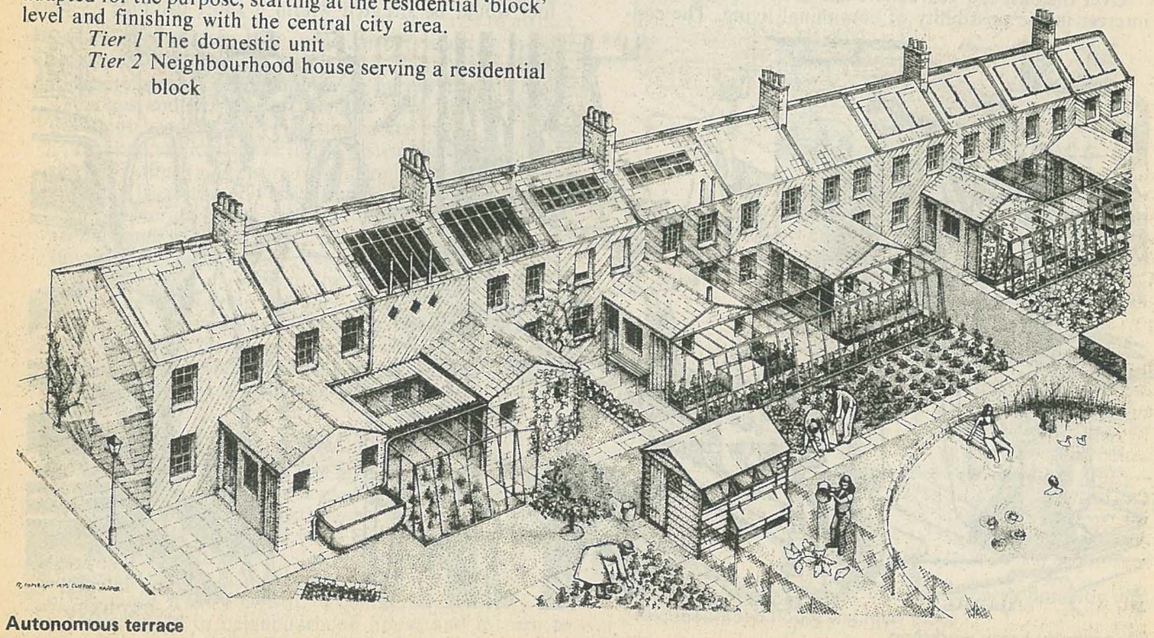
Invariably when we say the word 'neighbourhood' today, we use it in the sense of a physical area, not the people, the neighbours, who live there. This semantic shift mirrors a significant social change. Generally a city dweller's closest friends are not his/her nearest neighbours, but rather fellow workers or people with a common leisure-time interest who more than likely live in a totally different part of the city. Hence of course the need for a motor car for social visits.

To begin the process of recreating community at the neighbourhood level we see a role for a 'neighbourhood house', an ordinary suburban house or other building reserved as a drop-in centre, meeting place and location for community activities for all the people in that neighbourhood — i.e. all the houses in a residential block. The neighbourhood house would be in easy walking distance of all the houses that it served.

This way of creating community is by no means a utopian idea. Its beginnings can already be seen in many Australian cities in the form of drop-in centres, learning exchanges, day-care centres and some of the schemes which originated under the Australian Assistance Plan.

The concept of neighbourhood houses has evolved to fulfill a real-life need for supportive services in suburban areas. Typically a house *begins* with a small group of mothers living within walking distance of each other, getting to know each other and making arrangements for themselves to meet a range of needs, such as:

- someone occasionally to look after the young children
- someone occasionally to be around when the kids come home from school



Autonomous terrace

- someone to go shopping with, instead of always going alone
- someone handy to turn to in emergencies
- someone to help overcome isolation and boredom by swapping confidences, sharing a cup of tea or a meal, taking up some co-operative craft.

Of course, a neighbourhood house could be started in countless other always; for example, by a group of people forming a co-operative to buy bulk health foods with a minimum of packaging. Whatever the origins of the house it is essential for its growth into a true neighbourhood facility that it gradually attracts into its activities more and more people of all ages, male and female, from the block it serves.

Involvement with the neighbourhood house would be entirely voluntary. The underlying aim would be to break down the isolation of neighbour from neighbour by fulfilling genuine common needs, and to assist people in developing a responsible and caring attitude towards each other.

In Melbourne neighbourhood houses along the lines described here have been started, for example, in St Kilda, Ivanhoe, Bundoora, and in Selby and Kallista in the Dandenongs. Each of these houses has a distinctive local character, though we believe they all have a unity of origin in the pressing needs so many suburban people have for re-establishing some tangible community feeling and warmth in their localities.

NUCLEAR FAMILY OR URBAN COMMUNE?

There is currently a growing movement in Australia urging that the basic domestic unit should also be reorganised. As the anthropologist Margaret Meade points out: *"We now expect a tiny family unit to achieve what no other society has ever expected of a family. In effect we call upon the family to achieve alone what the whole clan used to do".*

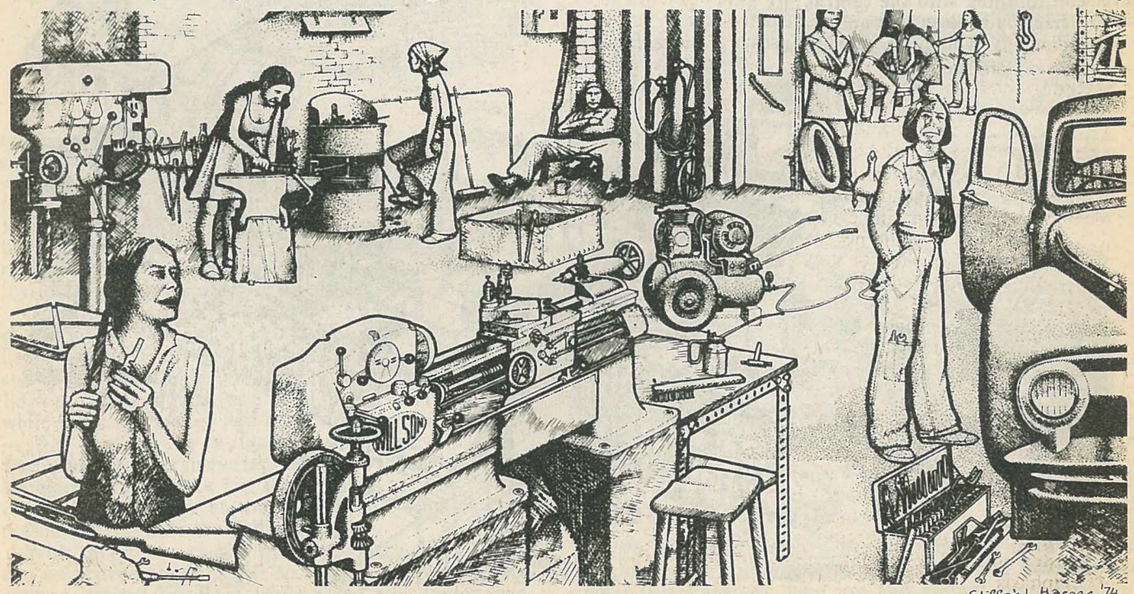
Over the past few years there has been a resurgence of interest in the possibility of communal living. The conception is that in place of the stereotype nuclear-family home (i.e. a completely separate living unit for each married couple and their children), it would be better living for all concerned if there were to be a sharing of certain aspects of domestic activity, such as cooking and eating, washing and cleaning, childrearing and gardening, with a possibility of more social life in the home.

The neighbourhood-house movement and communal-living experiments are therefore different ways of widening the basis of 'sharing and caring' to overcome isolation and consolidate a wider feeling of belonging than can usually be found within the detached suburban house. However, the relationships within an urban commune, as distinct from those in a neighbourhood house, are very intimate ones and demand compatible temperaments and complementary interests to a high degree as well as a highly developed sense of reliability and tolerance of each member to all other members of the extended group. For this reason there is a tendency for attempted urban communes to form, founder and re-form in an effort to obtain a viable group of people.

The stability of these communal groups is also hampered by a lack of accommodation suited to their purposes. We believe that all obstacles arising from conventional aspects of building method or design, geared as they are to the requirements of detached nuclear-family housing, should be removed to facilitate urban communal-living experiments. Stable communes within the residential-block area, alongside nuclear-family houses for those continuing to prefer this form of domestic unit, would be entirely compatible with the establishment and strengthening of a neighbourhood house in the same block, since the house should benefit from the group's experiences of sharing, co-operation and mutual accountability.

THE LOCAL FOCUS

Beyond the neighbourhood house, the next stage proposed for potential community activity is a local *urban* centre in the suburbs, a *local focus* (tier 3). Local foci would be situated within a short distance — easy



Community heavy workshop

cycling — of all people in the residential hinterland it served; the furthest neighbourhood house in the catchment area would say be no more than about 2 km away from the centre. Ideally a local focus should be built around an electric rail station, or interchange for some other form of rapid urban transit.

The major aim in designing these centres would be to concentrate within a small area, relatively close to people's houses, a wide range of facilities which at present are distant and scattered. As we see it, a local focus would therefore be a *mixed-use* area comprising:

- a transport interchange
- a shopping centre
- light non-polluting industries, craft production of goods
- offices
- services — welfare, health, education, other
- cultural, entertainment and recreational facilities
- indoor spaces for community-involvement activites.
- higher-density residential accommodation.

Light industries with strictly controlled environmental impact, workshops for craft production, and the array of offices, services, entertainment and recreational outlets, would all serve to provide a wide range of employment opportunities within a few kilometres of the residential catchment area. Consequently, if a higher proportion of people in the surrounding area worked in the local focus, a good deal of the mobility enforced by long commuting work trips would be eliminated.

Location of a shopping centre, and provision of educational, entertainment, craft, hobby, game, indoor sport and social opportunities in the local focus would further increase its magnetic pull on the surrounding residents, and hopefully obviate much of the need for people to travel further afield in search of these facilities.

Above all, if the local focus is really going to come alive, ample space would have to be provided where activities personally involving people in some capacity other than purchasers or audience would be developed. There has to be sufficient diversity of activities to attract sufficient patronage; and sufficient patronage to sustain that diversity. The more mixed the uses in the local focus, the more people coming and going during day and night, weekdays and weekends, the more likely it will be that the focus becomes a living community entity.

The key tactical move in the restructuring being considered is thus to try to redirect people's attention to the potential friendship, diversity and excitement to be found among several thousand people living as a community around and within a single local focus. This is not to suggest that people would never make long trips to other parts of the city or out into the country; merely that by deliberately clustering facilities and providing lively — during day and evening — mixed use centres at a local level, the need for many long trips would be reduced. Such measures would obviously save immense quantities of energy simply by reducing the amount of travelling done.

ALLOCATION OF FUNCTION

Without wishing to suggest any rigid boundaries, we propose in the table below and illustrations over page, a possible allocation of functions between domestic unit, neighbourhood house and local focus.

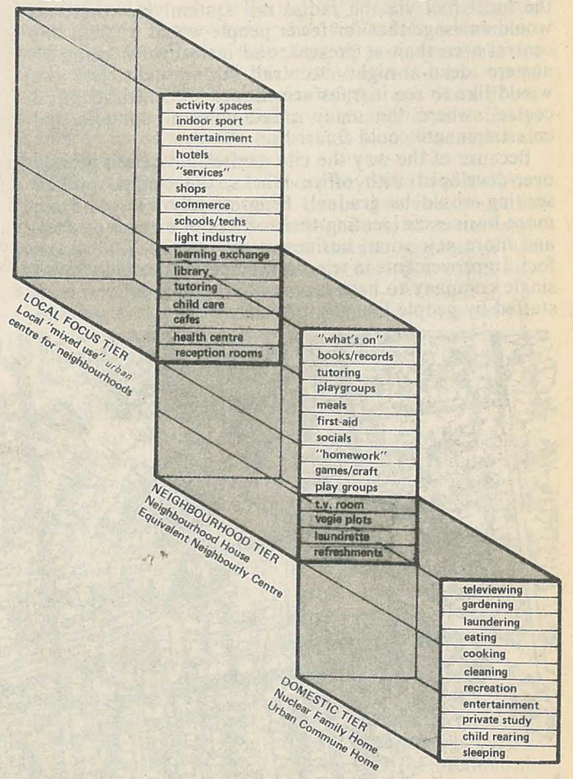
Compared with the situation in present-day cities, the suggested social arrangements represent a definite shift of emphasis from domestic to community activity, that is, from home to neighbourhood house and in turn to local focus.

One feature of the new scheme which bears special mention is the idea of getting neighbours to co-operate in starting neighbourhood orchards, vegetable plots, chicken runs and urban forests. This urban 'farming' could be done on co-operative plots run by neighbourhood houses, or parts of several adjoining backyards consolidated into one bigger area. As well as providing the benefits of fresh vegetables, fruit, nuts, eggs and timber, this local urban production of a good proportion of local needs for food and wood would also reduce the mounting transport energy, and storage and packaging energy, expended in bringing these commodities from the countryside to the city. It would also literally bring the cities back to life, and city-dwellers closer to natural cycles.

More generally, with local production of a sizable fraction of local needs for goods and services of most types, the local focus and its environs would have a much higher degree of 'self-sufficiency' than typical suburbs of today.

DISTRICT CENTRE

The fourth tier proposed for community involvement is the *district centre.* In Melbourne and Sydney, for instance, we envisage several district centres on each radial rail line. These would be similar to local foci to the extent that they were compact mixed-use urban centres served by bus and bicycle, but they would serve a much wider catchment area by virtue of their access by electric train and express bus (discussed later). They would also be bigger than local foci with a broader range of employ-



A suggested allocation of function between domestic unit, neighbourhood house and local focus.

ments, retail outlets, recreational, educational and cultural facilities, and community-involving activities of all kinds.

Human and therefore pedestrian amenity would be the outstanding feature of all district centres, as of all local foci. Pedestrian ways or arcades would traverse all buildings. Interspersed among the familiar commercial functions would be places for community activities which would continue late into the night and throughout weekends.

In embryo such centres are already forming in the suburbs of our larger cities, but they are not accessible enough, not connected efficiently with public transport, and not attractive enough for community-involving activities. These existing centres tend to be purely commercial in purpose, whereas we see the new district centres as having high-density residential accommodation, plus the spaces for educational, recreational and cultural activities, intermingled with those for commercial functions.

In the process of bringing about the redistribution of urban population called for by the new scheme, both local foci and district centres could absorb all the resettlement which at present is taking place on the urban fringes.

ALL-CITY CENTRE

The last tier is the all-city centre. Here the more unique and specialist facilities and activities which could only be supported on a city-wide basis would be located. The city centre would be easily accessible from each of the local foci via the radial rail system. However, we would envisage that far fewer people would work in this central area than at present, and instead of it being an austere dead-at-night "central business district" we would like to see it transformed into a "central cultural centre" where the many-varied cultural pursuits and entertainments could flourish.

Because of the way the city centres have been grossly over-developed with office blocks, the change we are seeking would be gradual. Progressively we would see more businesses locating their offices in district centres, and more new small businesses starting up in the local foci. Improvements in telecommunications would allow a single company to have a series of regional offices, each staffed by people living in the surrounding area. As well as reducing the amount of commuting, this arrangement would also facilitate the co-operative sharing of facilities by different firms, and eventually the dissolution of big businesses into locally oriented and controlled operations.

OVERVIEW

The whole process of restructuring described so far amounts to an anti-randomness anti-sprawl operation, increasing overall intensity of low-energy human activities in a hierarchy of selected urban nodes, as a partial substitute for excessive high-energy travel and consumerism.

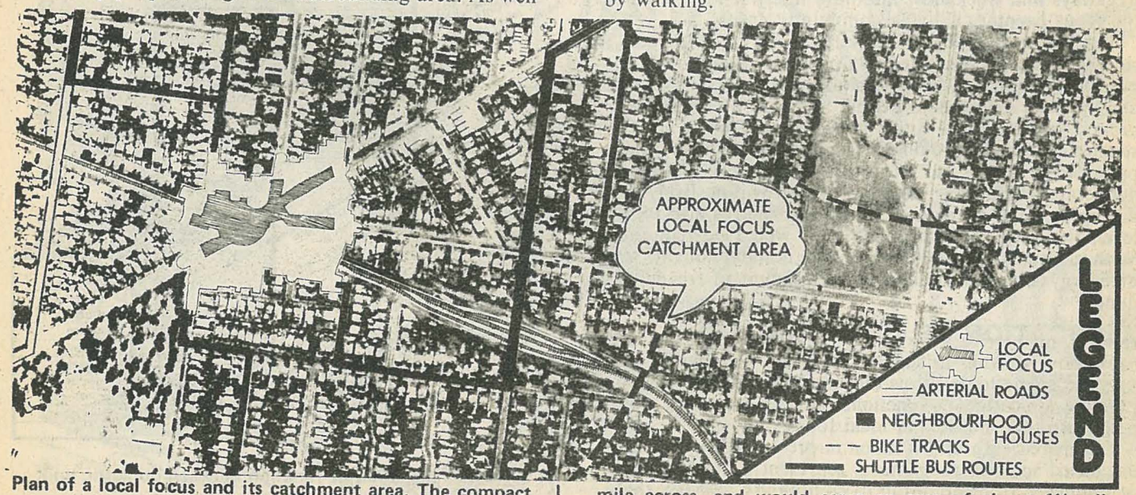
The future viewed by a typical middle or outer suburban resident could consist of convenient access to diverse activities in ten or twenty nearby local foci, as well as those in say two to four district centres and the central city area. In Melbourne or Sydney this would mean access to the most significant activities of somewhere between 100,000 and 200,000 people — surely enough to satisfy most people's needs. Inner suburban dwellers would have access to even more activities.

To this point we have concentrated on restructuring cities in order to enrich and enliven people's lives, as well as reduce the demand for transportation. We must now consider transportation in more detail, and discuss how this new design allows maximum access to desired locations via a meld of low-speed individual transportation and high-speed mass-transit systems.

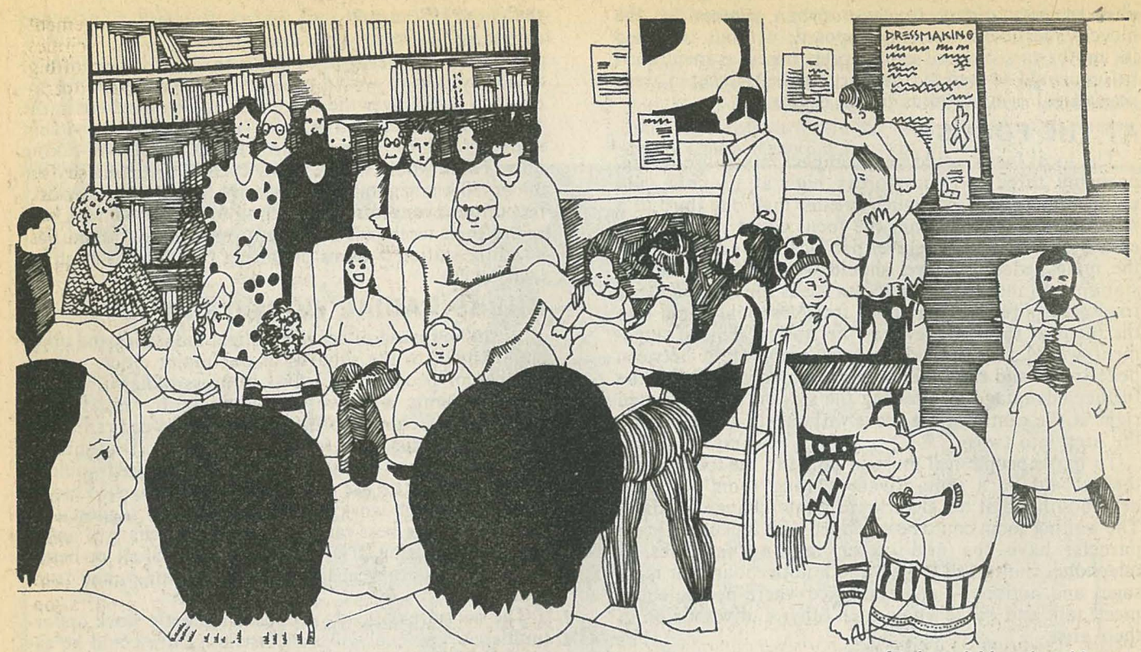
THE MICROTRIP

Let us begin where we begin most of our journeys, from the home, and move outwards seeing at each stage how we gain access to desired facilities in the rest of the restructured city. Firstly we will consider *microtrips*, short journeys from home to other locations within the overall local-focus catchment area. Such microtrips would constitute a high proportion of all trips undertaken if the underlying purpose of recreating community is realised.

If the neighbourhood house does work as a lively community focus for all or most people living in the block it serves, then one of the commonest microtrips will be from home to this house. This distance would be at most a couple of hundred metres and could easily be covered by walking.



Plan of a local focus and its catchment area. The compact mixed-use centre would typically be about a third of a mile across, and would serve an area of about 1½ mile radius.



At the neighbourhood house

Let us next look at how to get from home to the nearest local focus, a journey which would typically be undertaken to get say to a workplace in the local focus, the rail station, shops, local services, or a community activity or entertainment. The length of this journey would in most cases be no more than 2-3 km, though could be greater in the lower density outer suburbs where the catchment areas of local foci are likely to be larger.

The first option for this trip to the local focus would be the bicycle; the journey would be an easy ride, taking no more than ten minutes if the outermost house in the local focus hinterland was about 1½ miles distant from the centre. We believe that all possible measures to encourage the use of the bicycle for these trips should be taken, including provision of bikeroutes to guarantee safe cycling, and ample and secure bicycle-parking facilities in the local focus. The use of tricycles for old people or invalids could be explored. Ways towards bicyclisation and other low-energy means of transportation are discussed in greater depth on pages 16-17.

The growth of vital local centres, combined with proper provision for cyclists, could add a significant spurt to the present increasing popularity of cycling, opening up the pleasant prospect of short pedalling distances to many who now feel daunted by the prospect of hours of sweat to get anywhere worthwhile.

But even given the most favourable conditions, it is clear that the bicycle could not become the universal mode of transport for the microtrip. There are just too many obvious exceptions: people who are too young, too pregnant, or too sick; people with very young children or heavy bags; days when it is too windy or too wet; places where it is too steep. We think therefore that there is an urgent need for a greatly extended local transport service in the form of buses or minibuses.

We envisage a *shuttle-bus* service connecting home with local focus. The obvious place for a bus stop is the neighbourhood house, within easy walking distance of home and a warm convivial place for people to wait for a bus and find out what's on in their locality. The shuttle buses would honeycomb the residential catchment served by a local focus, funnelling all passengers into the focus and bringing them back home again. A bus would not go beyond the boundaries of the one local focus catchment area. Any adjoining residential area would be served by its own shuttle-bus, which would connect with the neighboring local focus.

If the catchment area extended beyond 1½ miles from the centre, as would no doubt be the case in some outer suburban areas, it would probably be helpful to run semi-express buses from the more distant regions of the catchment: i.e., buses which honeycombed sections outside the 1½ miles to the local focus.

Finally, travel between two locations in different sectors of the catchment area could be either covered by bus to the centre from home and out on another bus to the destination, or by direct cycling.

HOPELESSLY UNREALISTIC?

But, you may be thinking, isn't this grand scheme hopelessly unrealistic so far as the low-density outer suburbs are concerned, where the car must surely remain an indispensible all-purpose vehicle? The prospects for the new scheme are not that bad, however.

It will be remembered that ideally we require the local focus to be on a rail line. So let us consider what proportion of the population in our large cities live within 1½ miles of a railway station, i.e. 7½ minutes cycling distance at 12 mph. A calculation for Melbourne has shown that "only 15% of Melbourne's population is within 7½ minutes walking distance of a station, but over 85% are within 7½ minutes cycling distance of a station" [2]. As can be seen from the map on page 25, the percentage of Sydney's population living within 7½ minutes cycling distance of a station is about the same as for Melbourne. Given then that local foci were established only about existing rail stations in Melbourne and Sydney, in each case a very high proportion of the urban population would be

able to gain access to these urban centres by the bicycle/shuttle-bus system proposed, without the need for motor cars. Special semi-express buses, as mentioned before, could be used to transport residents living in areas beyond a 1½ mile radius to the centre.

AT THE FOCUS

The local focus would be a compact mixed-use centre, probably three to four storeys high at its core, and embracing an area not much greater than one third of a mile across. Travel within the focus could therefore be entirely pedestrian. Wherever practicable we suggest that the main pedestrian level should 'straddle' the railway station, and that the main access roads for the buses and road transport carrying small freight should come into the focus at the same level as the station. This arrangement would thus provide a grade separation between pedestrians and the other transport modes, and has the further advantage of allowing the station to be situated right at the centre of the focus without the track cutting the area into two.

To make people feel more at home in the local focus, there could be a semi-private waiting room for each neighbourhood at the electric-train interchange building. The waiting room could be equipped with lockers to leave parcels, have tea and coffee making facilities, a telephone, chairs and tables, and a noticeboard for messages and notices — another space where people could meet, talk and get to know each other and what's on in their area.

THE MACROTRIP

By *macrotrip* we mean any journey longer than that from home to local focus. Two key types of macrotrip would be travel between home and the nearest district centre and between home and the central city area. Since the local focus and district centre should be on the same radial rail line, both these journeys could be made by electric train. As suggested previously, there would for example in Melbourne be several district centres on each radial line. The aim would be trains which provided as quick a service as cars for journeys between two places on the same line.

We suggest that district centres on different rail lines be connected by express, or semi-express, bus services running circumferentially (or more precisely, cross-radially) on priority lanes on existing arterial roads. Trams could partially fulfill the same role in the inner suburbs.

All district centres would thus be interconnected by rapid public transport, efficient enough to provide a service from one centre to another as fast or faster than that possible by private cars. Cars would be excluded from local foci and district centres, allowing these to be more compact and free from noise and air pollution, and giving a strong incentive for people to turn to the public transport available or their bicycles.

In addition to the road and rail systems proposed we see a need for a third network, one for bicycles and power-assisted bicycles (see p. 16).

In Melbourne there are at present 3600 miles of residential access streets, with low traffic density, constituting a network pervading the whole metropolitan area. The basic situation in other major Australian cities is similar. We suggest therefore that it could be along selected streets in this category that the bicycle route network is designed. With this plan the need for a completely new system of bikeways would be obviated. With some extra road signs and road paint bicycles could safely share the kerbside of these back streets with cars, since the car traffic would only be low frequency, low speed and travelling only short distances.

A bike route network of this type — i.e. in the form of a grid system — would provide a further option for individual travel over the longer distances anywhere in the Metropolitan area, in a safe, healthy and non-violent manner, and for the most part without any breath-taking hills. There would not be many cyclists pedalling say the 30 or 50 km right across the city, though we strongly recommend long-distance cycling to the people who now spend their weekends cruising around in unmuffled gas-guzzling station wagons or boring through the bush on trail bikes.

CROSS-RADIAL WORK TRIPS

With the spread of heavy and light industries and other employment to the suburbs of our major cities, a large number of people now travel in cross-radial directions between home and work, invariably by motor car. Wherever a factory or office is located between radial rail lines, some distance from either track, the shuttle-bus/train/express-bus system we have proposed would in general be of little use to employees who travelled cross-radially to their workplaces. Basically we suggest that this problem is best tackled by land-use changes and a gradual relocation of employees to equivalent or better work opportunities nearer their homes or public transport.

The measures already proposed to create work opportunities in the local focus or district centre could be expected to discourage long cross-radial trips, but there would remain certain workplaces which would have to be located remotely from compact residential areas: e.g. heavy noxious industries and land-intensive activities such as bulk warehousing.

We suggest that this problem could be largely circumvented in the short-term by transporting employees to and from 'remote' urban workplaces by chartered minibus or car-pooling, and by encouraging the use of bus/bicycle combination modes — i.e. allow bicycles to be carried on the back of express buses. Longer term, as the residential populations in district centres and local foci grew, it should be possible to draw the labour force for these industries from nearby local foci and the nearest district centre, rather than from more distant areas. The situation could be further eased by siting all new industries which are incompatible with residential zones very close to rail lines.

BEYOND ESCAPISM

Perhaps no sight better illustrates the general dissatisfaction of city dwellers with modern urban life than the lines of cars streaming out of the city at weekends — people escaping to the country, though they usually find their country retreat or picnic spot packed with fellow townies. The car-based holiday, spent mostly on the move, is another symptom of the same malaise.

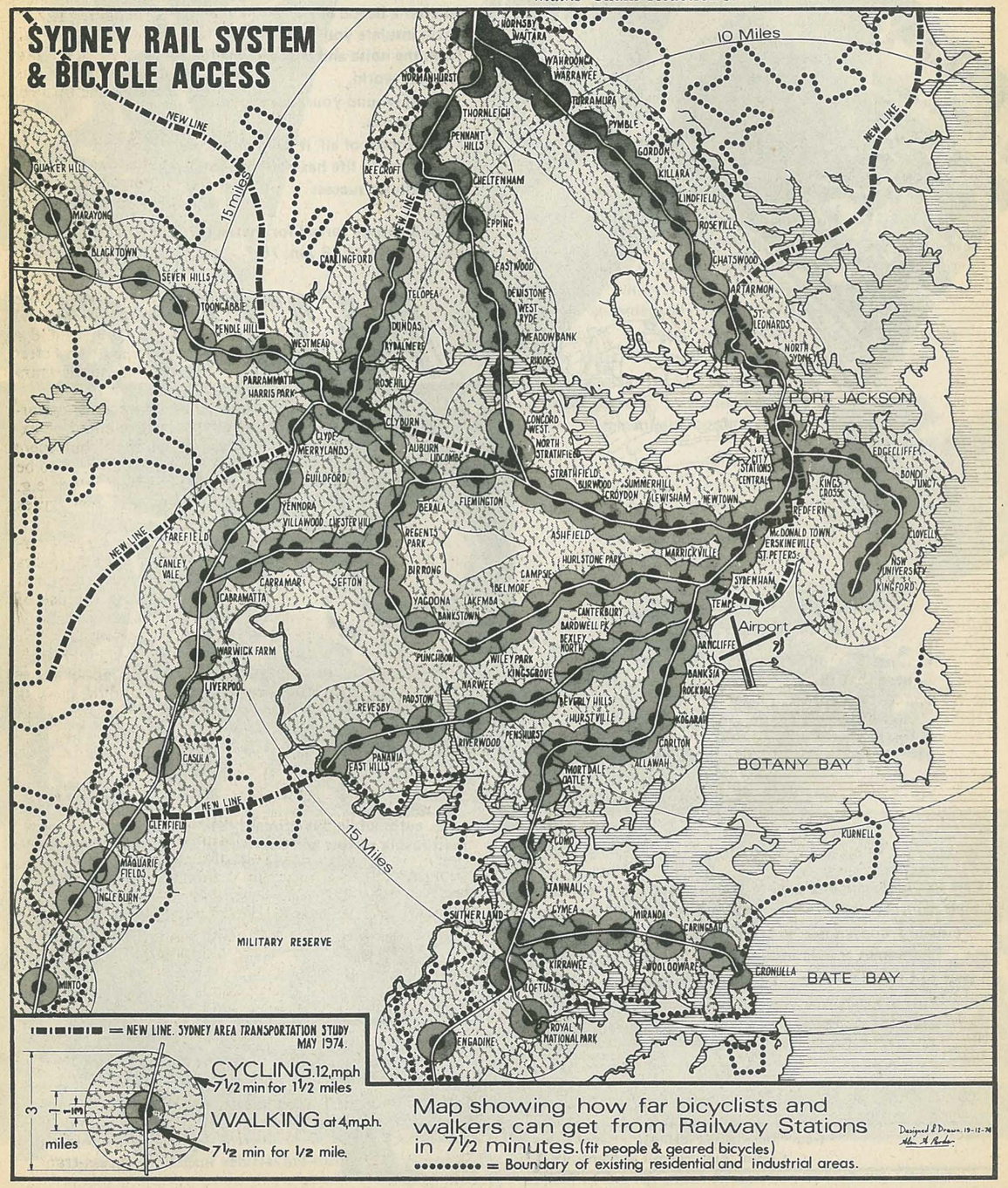
We are certainly not suggesting that city people would never visit the country, though we would see a reduction in the weekend and holiday exodus as a clear indication that the restructuring was working and local urban community-involving activities were proving a real attraction.

Travelling can of course be a satisfying activity, but most of today's mobility of city people is arguably closer to the restless flight of gnats than it is to a meaningful human pursuit. We have argued in this article that it is shortsighted to look for solutions to urban transportation problems solely in terms of improved mass-transit systems. Land-use changes to give maximum access with minimal mobility must also be a paramount consideration, and these could also aid us in rediscovering the lost community of our suburbs, in getting to know our neighbours.

Footnotes

1. Contact F.O.E. (S.A.), 310 Angas St, Adelaide 5000 for further information (Tel. (08) 223 6917).
2. Calculation by Alan Parker, Secretary, Bicycle Institute of Victoria.

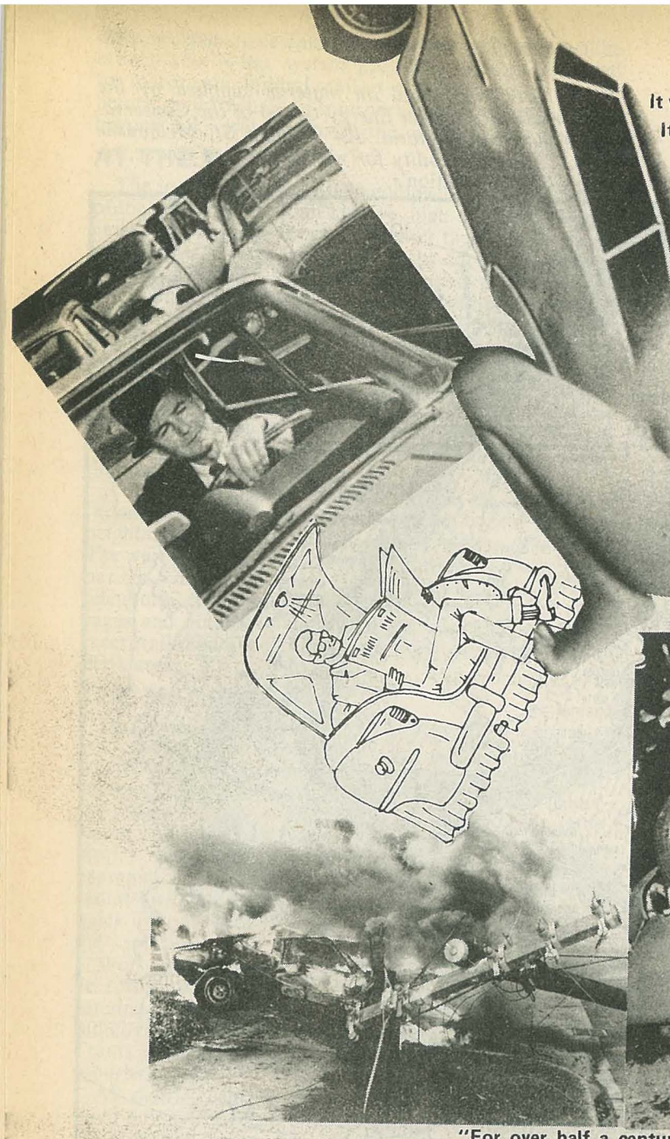
This article is based on material supplied by the Conservation of Urban Energy Group of the Conservation Council of Victoria, 324 William St, Melbourne 3000. The responsibility for what is said, of course, remains Chain Reaction's.



Map showing how far bicyclists and walkers can get from Railway Stations in 7½ minutes. (fit people & geared bicycles)

•••••••• = Boundary of existing residential and industrial areas.

Designed & Drawn 19-12-76 Alan H. Parker



It will reassure you when you need it.
It will help restore your confidence
should it ever desert you.
It will soothe and solace
you after a hectic day.
It will insulate you
from the noise and chaos of the
outside world.
It will rebuild your morale; your
ambitions.
But most of all, it will remind you
that your life has not been totally
without success

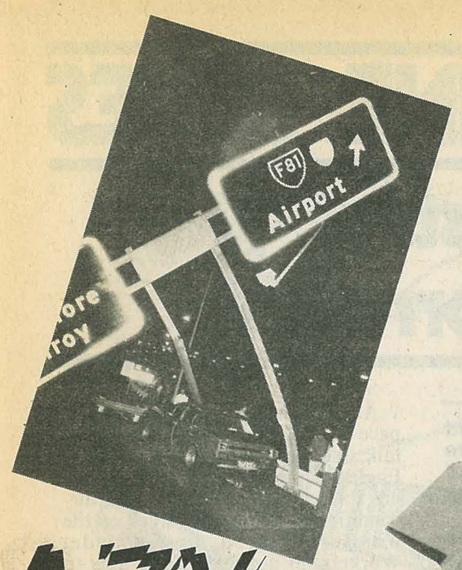
full-page spread for the Jaguar in the *Observer* 18 Jan. 76.*

AUTOCRAZY

"For over half a century the automobile has brought death, injury and the most inestimable sorrow and deprivation to millions of people."
Ralph Nader, *Unsafe at any speed* (1965)†

Cars are designed in sketches which are transferred to full size clay models. The clay is carefully sculpted and since the priority is to outward appearance the models are dummies with fake windows and no interiors. The interiors are designed later to fit into the shape dictated by the exterior "design". This is a classic example of separating design functions rather than integrating all steps equally.*

* from "Materialized Ideology", Hakon Stang
† from "Automerica", Antfarm, 1976.



The grotesque lengths to which even governments are prepared to go to ensure 'freedom' for the driver is evidenced by the official US program for development and installation of a 'safety balloon' in car dashboards — which is to be inflated instantly and automatically when heavy objects impinge upon the car, thus replacing the constraints of seat belts. This will allow for increased speed on what is characteristically called, in this 'land of the free and the brave', by an ideologically fetching and fundamentally *correct* name: freeways.*

This rendering of a car of the future by Ford stylists suggests a nuclear power source in a wheel-less car. It retains the familiar round taillights that characterized Fords during the 1950s.†

The car as a vehicle will go the way of the horse. The horse has lost its role in transportation but has made a strong comeback in entertainment.

Marshall McLuhan in *Understanding Media* †

"Highways and motor vehicles are truly the keystone of the American way of life"
George McCoy, President of the American Association of Highway Officials†

PRODUCTION LINE BLUES

The Car Industry now and tomorrow

It is commonly assumed that workers in the motor industry want to hang on to their jobs and would resist any attempt to scale down the production of automobiles[1]. However, the workers themselves have seldom been asked what they think about this suggestion. In a recent letter to **Chain Reaction** (published in full on p.3 1), Len Townsend, Federal Secretary of the Vehicle Builders Employees' Federation, spells out his union's view:

"Workers in the vehicle industry generally work there for reasons of economic survival. Few of them have a great deal of loyalty to their particular employer or to the industry as a whole. Indeed, they do have, however, a great and real fear, that government mismanagement will mean that their jobs in industry will disappear. **We suggest not the greater expansion of the private motor car, but a more efficient planning for public transport and for manufacturing industry generally which will lead to more secure employment, in the long term, for our members."** (Emphasis added).

We asked a worker what it was like working on the assembly line at the Fishermen's Bend motor factory in Melbourne.

"Horrible," he said, "but when you're desperate, what else can you do? I got out as soon as I could."

He was an immigrant from Yugoslavia and now spoke English well enough to get a better job. We asked him why he didn't like the assembly line work.

"It's like being a robot. The men are working harder than the machines — the machines just move along, the men do the work.

"If you want to go to the toilet you have to wait for someone to come and relieve you. Sometimes they forget about you. What do you do? . . ."

Other workers at Fishermen's Bend complained about the feeling of being "constantly under observation" and unable to think because of the monotony.

> **"(The worker) shall be so stupid and so phlegmatic that he more nearly resembles in his mental make-up the ox than any other type"**
> —F. W. Taylor, pioneer of the work-study techniques in the 1880s which led to the assembly-line method of production.

To get a better idea of working conditions in an automobile factory we visited the GMH plant at Dandenong, south-east of Melbourne. Most of the workers there are on the assembly line. It takes only about one or two days to 'train' the workers. All they have to do is stand in one spot and perform a simple action; for example, fasten some bolts to an engine on each vehicle as it passes. On average they have 2½ minutes per vehicle for body assembly and 2¼ minutes for mechanical assembly.

We noticed one worker who was standing in a trench, checking the engines of cars as they passed over his head. He was reading the newspaper at the same time. Every time a car appeared above him he checked the engine, and then returned to his paper for half a minute till the next one appeared.

Other workers were taking their tea breaks in roped-off areas under the same factory roof. The noise was not intolerable, but loud enough to force people to shout. Most of the people taking tea-breaks did not seem to be attempting conversation; some were reading while others were staring into space. Even in the foundry at Fishermen's Bend there is no separate area for breaks and the union complains that the workers there are gradually being deafened by the noise.

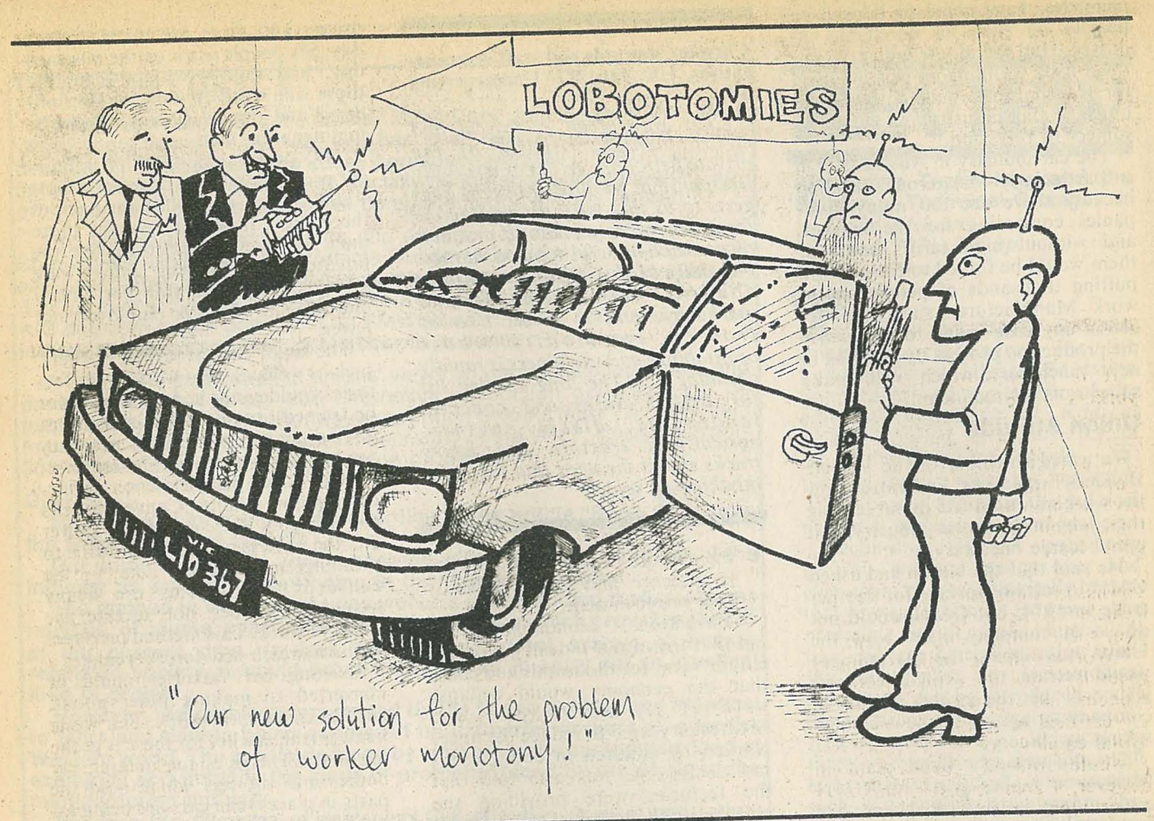
At Dandenong the noise and the pace of the work make it hard to talk, and many workers do not speak English, so instructions for assembling the car (e.g. whether to fit air-conditioning or not) are stuck on the windscreen in a simple code. Workers do not need to be able to read, talk or think when they are on the line. All they need to know is how to switch off and work mechanically.

This can have its disadvantages. For instance, when a worker makes a mistake he only has 2½ minutes at most to fix it up, and they can't tell anyone about it: by the time someone has made themselves heard above the din it is too late; the vehicle is way down the line. Our guide told us that once, due to a mix-up, sides of two-door cars were accidentally sent down the line to be paired off with sides of four-door cars. The result was a perfectly welded three-door car. The workers had no idea what they were doing.

"*Quality, Quality, Quality!*" say the signs plastered up at the Dandenong plant. The workers are exhorted in three languages to check the paintwork and the finish of the vehicles they turn out. However, less attention is paid to the engine and the brakes; the cars are not even given a proper test drive when they are completed. The workers know this and have little faith in what they are doing.

The level of dissatisfaction is clearly shown by the turnover of staff. Our guide at GMH said it was 50% per annum. Other figures[2] put turnover at 110% per annum for Chrysler and GMH. Nearly 4000 members of the Vehicle Builders Union left the industry in 1972-3.

The feeling of acting like brainless pieces of machinery alienates the workers. A unionist from the GMH factory at Fishermen's Bend complained: "The big companies don't care about us — it's the same as the old days when GMH went down to



the boats to get the new migrants . . ."

What then are the companies doing wrong? The Industries Assistance Commission[3] blames the production process itself for driving the workers away:— "Workers on the job experience monotony, physical tiredness and the feeling of having to work too fast . . . These problems are thought, to a large extent, to be caused by the production process. The assembly line, for example, is characterised by minute subdivisions of the work task, repetitive and low-skill operations, predetermined tools and mechanically controlled rhythms and speed of work."

Conditions at the Dandenong plant seemed quite good by factory standards. The companies try (moderately) hard to appease the workers, but they can never eliminate the feelings of hostility that the assembly system produces, because basically the workers are right — the companies are thinking entirely in terms of efficiency and profit. Workers are treated as cogs: the less they react as human beings, the more efficient they are.

The Uncertainty of Employment in the Motor Industry

The motor industry is more subject to fluctuations in demand than many other industries. New cars are prestige items, and whenever there is a downturn in the economy new car sales are among the first to suffer. Families will go without a second car when they need their money to pay the rent, and in a slump companies will not purchase new executive cars.

The motor industry magnifies every boom and bust of the economy. It is largely responsible for creating an artificially high demand for cars. It has used advertising and frequent model changes to sell more cars: whenever a new model appears on the market the old-model cars start to look outdated and lose some of their value, so that people are encouraged to trade them in and buy the latest style.

But every time there is a model change thousands of cars must be sold just to pay for the new presses. GMH has invested heavily in new labour-saving machinery and expects to pay for it by increasing sales. What will happen if the market stops growing?

The standard policy when overproduction occurs in the United States has simply been to lay-off workers and close down the plant (this has repercussions throughout industry of course).

When demand picks up, the workers, who have been waiting around, unemployed and relying on Government benefits, are re-employed. GMH, which is run under direction from the U.S., has repeatedly tried to do the same thing here but has run into trouble from the unions in Australia.

Recently GMH suffered a slump in sales and asked workers to take a compulsory week of their annual holidays in May. When the union refused the offer the company threatened to lay-off 600 workers. The eventual outcome was that the management held talks with the union and they agreed to ask the Government jointly to drop vehicle sales tax by 12½% to boost sales.

It is horrifying to think that the U.S. economy, and thus the economies of most Western

countries, have come to depend so heavily on such an unreliable industry. Had the motor industry confined itself to filling an existing need for transport it would have been a much smaller industry, but much less subject to recession.

The car industry in Australia is in a particularly dangerous position because there are too many companies competing for the market, and without high tariffs some of them would be forced to close down, putting thousands of people out of work. Manufacturers such as GMH are in any case trying to mechanise the production process by bringing in new machinery which will make some workers redundant.

Union Attitude

We asked a member of the Vehicle Builders Employees' Federation how the workers would feel about leaving their jobs in the motor industry, if it ever became necessary.

He said that the Union had asked GMH to retrain workers for another trade in 1974, but GMH would not do so in company time. Now the Union was hoping the Government would retrain the skilled workers, who will be retrenched when the company brings in its new labour-saving machinery.

The Fishermen's Bend plant in Melbourne makes parts for GMH and many skilled workers are employed there. Some have been working there for 17 or 20 years and are quite attached to GMH. They will be very angry if they are laid off each time there is a temporary slump in sales. Some of the more aggressive workers are saying that "if anyone gets the sack they'll tear the place apart brick by brick".

However, they accept that some workers will be retrenched when the new machinery comes into operation — "That's O.K. if we get severance pay for long service."

Len Townsend of the VBEF said in an interview, "We will be like the Seamen's Union and the WWF (Waterside Workers) in that we are willing to sell jobs but we want better pay and conditions for those that stay in . . . We want generous redundancy payments for those that get out" (*Age*, 27 Feb 1977).

The Future

In the long term, it does not seem worthwhile trying to protect jobs in the motor industry given that:

- workers find some of the work (particularly on the assembly line) so unpleasant that they are constantly leaving the industry;
- their future in the motor industry is insecure and they frequently face retrenchment.

Conventional economists point out that the motor industry provides employment for thousands and claim that the economy would collapse without it. But when Lord Shaftesbury tried to reduce the hours worked by children in cotton mills last century he was also told that the factories were providing the children with valuable employment and that if they were not prepared to work long hours the economy would collapse. The same argument is still being applied to adult factory workers.

It is not certain whether the motor industry really does have a healthy effect on the economy. It stimulates production, but the cars produced fall apart in five years' time — a monumental waste of metal, glass, energy and human effort. Meanwhile the costs of the motor car — petrol imports, road building, traffic police and hospitals for the road accident victims — drain the economy.

The overall effect is like that of a war. It stimulates the country to great efforts of production but nothing lasting is produced. Society is left to pay the debts.

Many problems would be solved if cars were gradually replaced by public transport as the main means of travel. More durable cars could still be used in the country, and in the city mainly as taxis and commercial vehicles. Minibuses would be needed to carry people to the network of public transport.

On busy routes it takes two people to operate a bus: a conductor and a driver, and there are three shifts a day. Six people work on the bus each day, and this is without counting those who work on it during the holidays and on weekends, cleaners, maintenance men and so on. The 90,000 people employed on motor-car production could operate at most 15,000 buses, or 3-4000 for each of the States. It would take far more than 3000 new buses to replace the private cars in Victoria. If there were a switch to public transport many more people would be employed, not fewer.

The small core of skilled workers, such as welders, who work in car factories could continue to make cars or be trained to make buses and trains. Trains are not made like cars; they are built with great care by teams of workers which complete one engine/carriage at a time. Conveyor belts are used but they are much slower and the work is not broken down into meaningless repetitive acts — the conveyor belt carries the heavy weights but does not dictate the speed of work. This method produces vehicles which last for 30 years.

Existing car factories could be converted to making other goods, such as buses, or possibly solar water heaters (the market for these is growing fast). The dyes for making car bodies and the jigs which hold the parts in place when cars are being assembled would have to be scrapped but these become redundant every time there is a major model change anyway. The buildings themselves, and welding, pressing and spray-painting equipment, could all be used for other purposes, and the conveyor belts could be slowed down.

Car factories have readily been converted for making munitions in wartime. In peacetime they could also be converted to making something people really need.

Chrysler stewards and staff representatives, UK, Jan. '77 (Undercurrents 18).

"The widespread ecological and environmental criticism of the private petrol driven car as a socially irresponsible form of transport suggests to us that we must explore the feasibility of new kinds of products of a socially useful kind to harness the skills of the existing workforce and the existing plant and machinery, and to divert it away from a commodity whose profitability and usefulness is rapidly declining . . . The long waiting list for British buses and coaches, landrovers, diesel engines, agricultural tractors and heavy trucks shows the need that exists for this kind of vehicle."

References

1. Even left-wing writers presume this: e.g. Jack Blake, discussing a switchover to public transport, writes (*Arena*, No. 40, p.27): "If we now look at the social forces involved, the only section of the workforce likely to support it would be the workers in the public transport system . . . Strong opposition from workers in the automobile industry would be likely because their jobs would be threatened."
2. Don Atkinson, "The Transport Trap", *Arena*, No. 42, p.50.
3. Industries Assistance Commission Report on Passenger Motor Vehicles, July 1974.

Thanks to GMH and the Vehicle Builders Employees' Federation.

LUCAS FEEDBACK

So far union reaction to the article "Make Cars, Join the Dole Queue, or What?", published in the last *CR*, has been very positive. This article described the initiative of the Lucas Aerospace workers in the UK who are fighting for the right to work on socially useful and environmentally appropriate technologies instead of components for military aircraft.

The Australian Railways Union, the Amalgamated Metal Workers' and Shipwrights' Union and the Vehicle Builders Employees' Federation all see Lucas-style tactics as having some relevance on the Australian industrial scene. "Lucas Aerospace Workers — Are there Lessons for Us?" was one item on the agenda of an AMWSU seminar for shop stewards on industrial democracy held in Melbourne in June.

A full report on Australian unions' views on the Lucas experience, and on industrial democracy and alternative production generally, will be published in the next *CR*. But we're reprinting below a letter on Lucas sent to us from Len Townsend, Federal Secretary of the VBEF, since it has particular relevance to this special issue on transport.

Dear Sir, 9 May, 1977

Many thanks for bringing my attention to the article "Make Cars, Join the Dole Queue, or What?"

Our union is naturally very concerned with the long term future of the industry as well as its well-being in the immediate future.

The method in which the Lucas workers have handled their problems must be, of course, peculiar to the circumstances which prevail in the UK at the present time. In fact, within our current system of heavily regulated society, it would prove very difficult to carry out an identical kind of project.

However, the problems expressed by the Lucas workers are identical to fears and doubts being expressed by industrial workers all over the Western world. The problems faced by workers in the car industry kind of exemplify and magnify the kinds of problems faced by the whole of the manufacturing industry.

We face the dilemma of vanishing fuel supplies, market saturation, diminishing space and a general slump in manufacturing. Workers in the vehicle industry generally work there for reasons of economic survival. Few of them have a great deal of loyalty to their particular employer or to the industry as a whole.

Indeed, they do have, however, a great and real fear, that governmental mismanagement will mean that their jobs in industry will disappear.

We support not the greater expansion of the private motor car, but a more efficient planning for public transport and for manufacturing industry generally which will lead to more secure employment, in the long term, for our members.

This we believe, must be the only way which we can try to conserve the environment and at the same time conserve jobs. We believe that workers should have the right to demand socially useful alternative projects on which to work. However, in the present environment that simply is not feasible.

Maybe in a few more years, when our work force is better educated, when union leaders have fought more forcibly for these kind of aspirations, then it will be possible. It is certainly a desirable end to which we are working.

The technology which is used to produce motor vehicles does not adapt very readily to constructing anything other than forms of transport. The assembly line production process is not one which we would want to readily inflict on another industry.

As yet we have not made any real research into the area, as we are still very much concerned with the day-to-day survival of our members.

Of course this tends to happen in most industries and can end up by obscuring the longer view. We hope to avoid that by taking close note of international developments with which we are necessarily in close contact. The motor industry is of course one of the largest of the multinational operations, and in order to deflect its course or redirect its course we would need powerful friends.

We would be pleased to talk to you about these issues.

Yours fraternally,

L. C. TOWNSEND Federal Secretary.

REVIEW

Alternative Technology and the Politics of Technical Change
by David Dickson
(Fontana, 1974) 224 pp.
$1.50

This book by David Dickson, science correspondent for the London Times Higher Education Supplement and a member of the editorial collective of *Radical Science Journal*, is a must for all alternative technology people — especially those hooked on hardware.

The central theme is the political nature of technological innovation.

Technology is not politically neutral, Dickson writes over and over again to press this vitally important message home. However, the prevailing 'ideology of industrialisation' distorts the real situation to assert the opposite. So a technological innovation can be introduced under the apparently objective guise of increasing economic or technical efficiency, even though the change will have direct political consequences such as to confirm a dominant class in their position of power, to increase the oppression and alienation of the workforce, or give rise to greater pollution of the physical environment.

Tracing the development of the industrial system in detail from the beginnings of the Industrial Revolution in the late 18th century to the present day, Dickson shows with great effectiveness how the relations of production in industrial societies — in nominally capitalist and socialist countries — have been determined "not only by concern for the efficiency of production technology, but also by the requirement of a technology that maintained authoritarian forms of discipline, hierarchical regimentation and fragmentation of the labour force".

In short, technological development both reflects and is used to reinforce the existing political system. It is in fact another political instrument, though the ideology of industrialisation works to obscure totally this role.

Dickson's final suggestion for the way ahead is clear: those institutions which wield power in industrialised societies must be confronted before there is any chance of setting up a lasting alternative system.

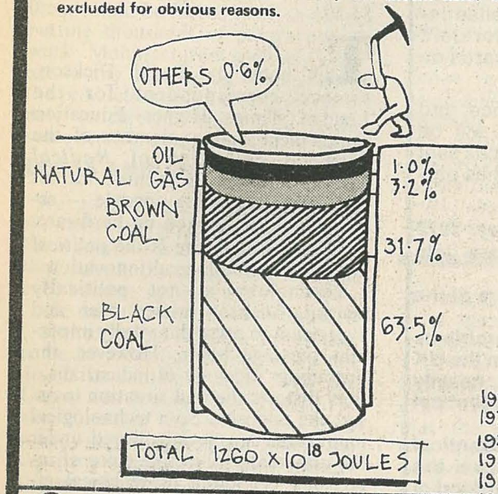
John Andrews

Energy Guide

This is a guide to how energy is used in Australia, with emphasis on consumption for transportation purposes. The simple, and in many places, alarming, conclusions arrived at here provide reasons for many of the changes in the type of transportation used, and in our overall need for transport, which are suggested in this Chain Reaction.

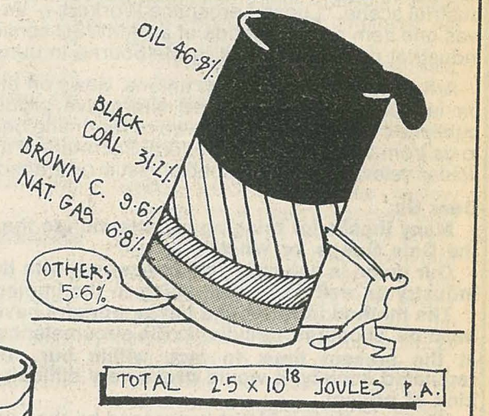
1 What we've got*

Australia's known economically recoverable energy reserves (1974/75 figures). Fossil fuels only are shown here. Uranium is excluded for obvious reasons.



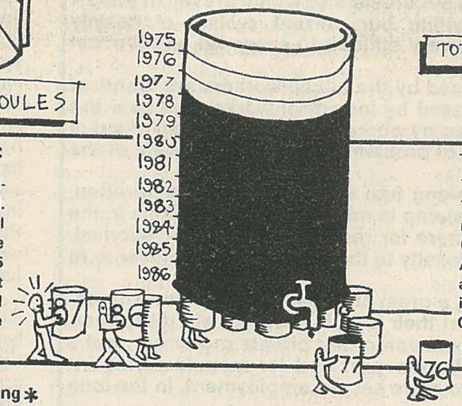
2 What we're using*

Australia's domestic consumption of energy (1974/75). While oil accounts for only 1% of our reserves, we're using it to supply no less than 46.8% of our total annual energy requirements.



3 The way the barrel will empty.*

Consumption of domestic supplies (almost all from Bass Strait) of crude oil. The full barrel represents the total known Australian oil reserves which are economically recoverable (1974/75 figures). The shaded portion is what we've got left, and the layers marked show the likely consumption in the years ahead.



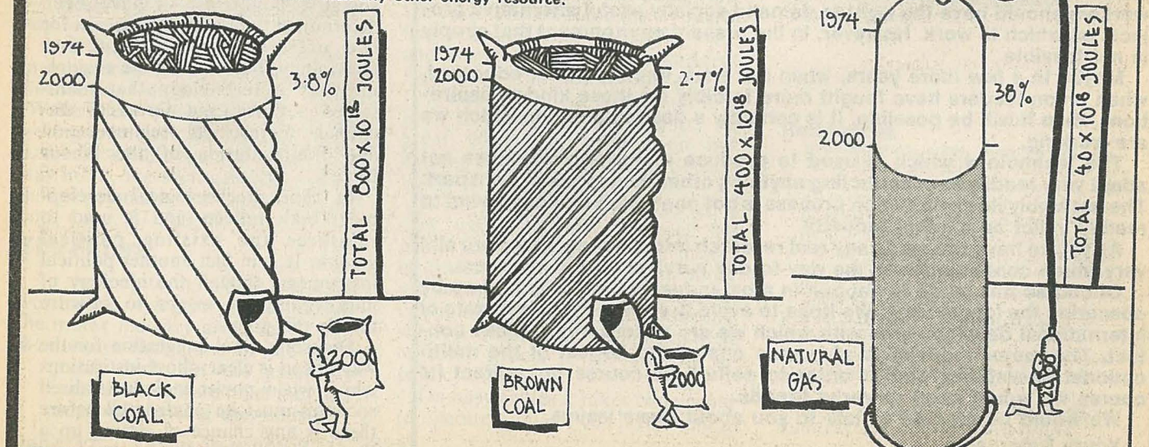
The barrel runs dry during 1985/86

The total amount of economically recoverable oil is 1660 x 10^6 barrels. (12.5 x 10^{18} Joules) (1974 figure). An extra 25% would become recoverable if the price was raised to that of imported oil. (Figures from Royal Commission into petroleum, 1976).

Source: J.E. Lane (see ref.1 p.13*)

4 How the other fossil fuels are going*

The total projected consumption of the other major fossil fuels up to the year 2000 as a percentage of the total known reserves. Clearly we are using oil far faster than any other energy resource.



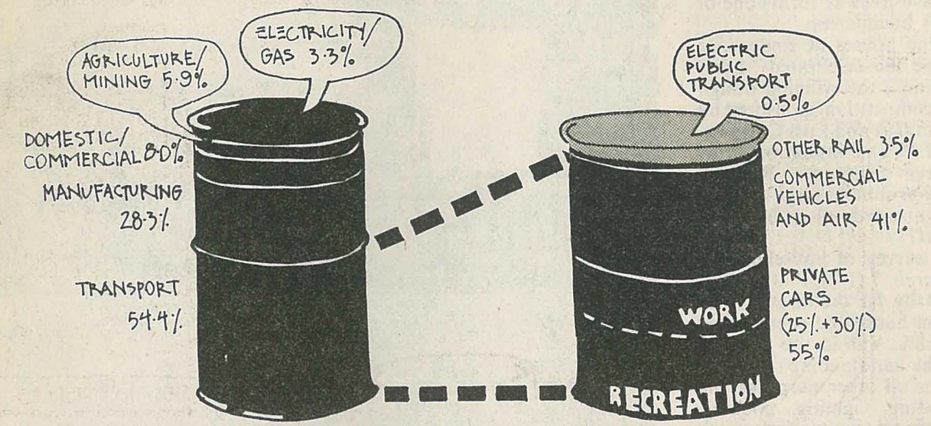
5 Where the oil goes

The major part of our consumption of oil is for transport. Any attempt to conserve what we have left must concentrate on reducing the wasteful use of oil by private motor vehicles. However, attention should also be given to converting factories over to other fuels (with appropriate anti-pollution measures), and in rationalising the use of fuel by aviation. The latest figures for Victoria (State Government Green Paper on Energy, March 1977) show that 49% of the total energy reaching consumers is used for transportation.

6 How we use it to get around

Private cars have the lion's share of the energy used in the transport sector, with more energy being used for private car tripping than for business or work journeys.

If we're aiming to conserve fuel for transport, a prime target must therefore be the motor car.

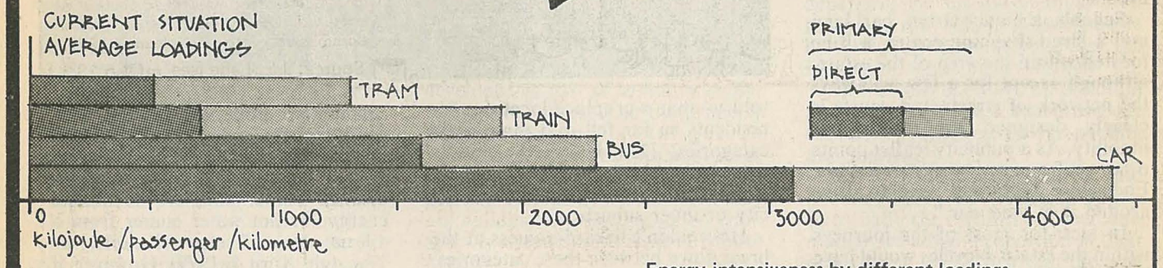


7 Energy intensiveness — typical australian figures

There are many debates over the best way to compare the energy intensiveness of different transport modes. The energy intensiveness of a mode is the average amount of energy required for it to transport each passenger 1 km.

We present here two tables which agree with most of the authoritative studies and include most of the considerations.

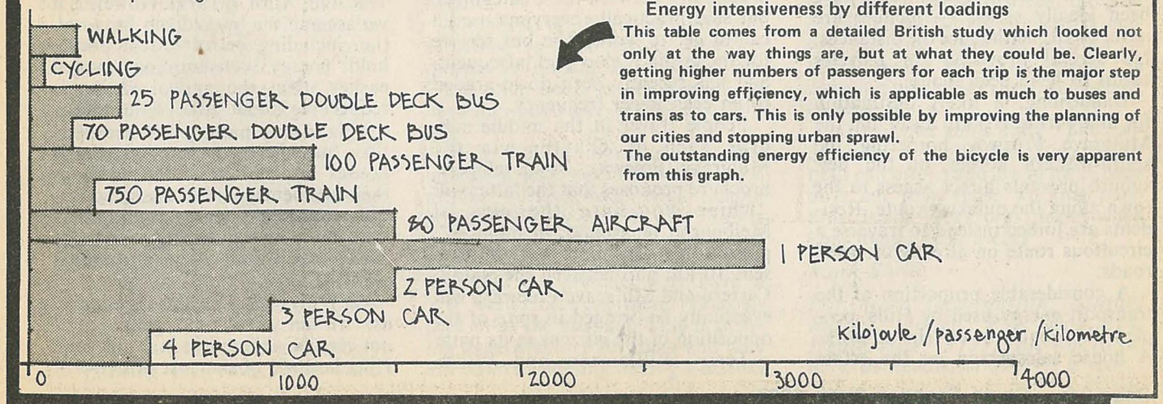
This table was prepared in Melbourne by the Conservation of Urban Energy Study Group, and is based on Australian data and average loadings. The "Direct Energy" figures show the efficiency of each particular mode when compared solely by the amount of oil used or electricity consumed. The "Primary Energy" figures take into account the energy used in providing the fuel at the point of use (e.g. generating electricity, transporting petrol) and the energy needed to produce vehicles,roads and railways.



Energy intensiveness by different loadings

This table comes from a detailed British study which looked not only at the way things are, but at what they could be. Clearly, getting higher numbers of passengers for each trip is the major step in improving efficiency, which is applicable as much to buses and trains as to cars. This is only possible by improving the planning of our cities and stopping urban sprawl.

The outstanding energy efficiency of the bicycle is very apparent from this graph.



BEYOND THE

ENDEAVOUR HILLS

Endeavour Hills is the latest addition to Melbourne's urban sprawl. A new suburb about 32 km from the city centre, it is being developed on 420 hectares of yesterday's farmland near the town of Dandenong, formerly 'gateway to Gippsland', now front gate to Melbourne. The new Mulgrave freeway forms one of the suburb's boundaries.

One of the houses at Endeavour Hills will be the celebrated "Low-Energy Home", the winning design in a recent competition sponsored by the Victorian Gas and Fuel Corporation, ACI Ltd. (an insulation firm) and *The Age* newspaper. But, we wondered, how much energy will the low-energy home dwellers be using for transport?

A recent survey of households in Sydney (*Search*, 7 (1-2), P. 35, 1976) showed that by far the largest fraction of direct household energy consumption, 68%, was in the form of petrol for the car(s), compared with only 32% for all other purposes, including heating, lighting, cooking etc. The situation in Endeavour Hills, which is designed around the motor car, is unlikely to be radically different.

It's not that Endeavour Hills is any worse than a typical suburb, more that it is so very similar, that will make its residents almost totally dependent on their cars for getting around.

Schools, a kindergarten, parkland and a large shopping centre, will be located within the area of the estate, although except for a few walkways the network of streets and courts is clearly designed for motor car mobility. As a publicity leaflet points out: "To really appreciate Endeavour Hills you have to drive around it in your car."

In fact, for most of the journeys within the estate, bicycles would have been ideally suited — inclines are never great, neither are the distances. No special provision for bicycles seems to have been made.

Dandenong, a likely destination for many trips, is 5 km away, but the Mulgrave Freeway bordering the south-western corner of the new suburb prevents direct access to the town along the quickest route. Residents are forced instead to traverse a circuitous route on already crowded roads.

A considerable proportion of the transport energy used by Hills' people will probably be on trips to work. A house salesperson on the estate told us that workplace locations for residents so far fell into three main categories: Dandenong, the middle suburban area around Oakleigh, Clayton and Huntingdale, and the city or inner suburbs.

He wouldn't hazard a guess at the breakdown between these categories, but said practically everyone used a car to get to work. The bus service for the estate is slow and infrequent, and has recently been down-graded to an even lower frequency.

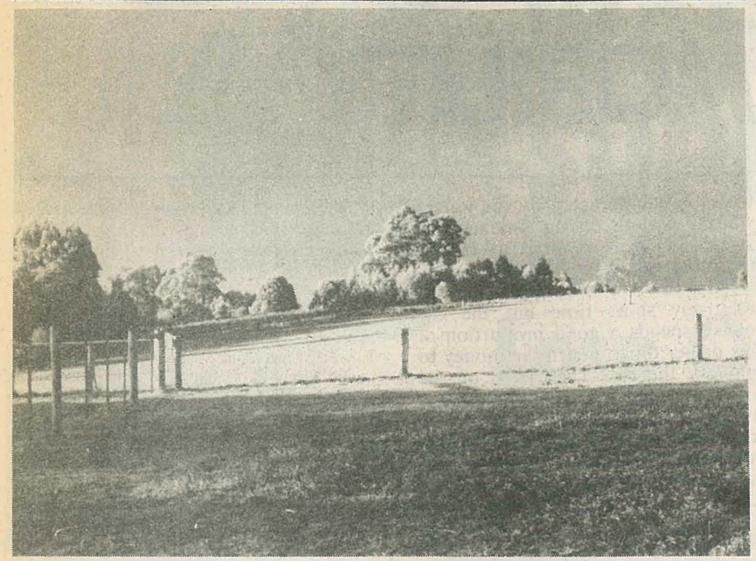
People travel to the middle suburbs such as Clayton via the Mulgrave Freeway. A developers' brochure promises that the latter will "whisk you into the city of Melbourne in around 30 minutes", presumably assuming that the present 10 km gap between the South-Eastern and Mulgrave Freeways will eventually be bridged in spite of the opposition of the citizens in its path.

Terry Williamson and Willys Span, the architects of the low-energy home, calculate that it will operate on about 37% of the total annual energy requirements of an average home. 80% of the annual energy for hot water comes from a 4.8 m^2 array of solar collectors (see *The Age*, April 4, 1977). However, if we assume the breakdown for *total* (i.e. including petrol) direct household energy consumption quoted earlier, then the annual saving is reduced to about 20% of the total.

This wasn't part of the competition, but where you site 'low-energy houses' in relation to the needs of their residents — for work, education, community etc. — is all important if the energy savings are to be really significant from a national point of view.

As Willys Span wryly suggested to us: "In ten years' time, people may not even be able to live in Endeavour Hills because of the cost of petrol."

URBAN FRINGE



MOORA MOORA

The Moora Moora Co-operative Community at Healesville, Victoria, is a group of people who are creating an alternative to suburban living. With a current membership of 34 people and planned size of 60 residents, the co-operative owns 245 hectares of mountain-top land about 65 km north-east of Melbourne.

A planning permit for 30 dwellings has been issued to the co-operative, and at present three low-cost homes are being constructed from natural materials. The community's publicity leaflet reads:

"We are designing homes in six clusters, where communes, families and individuals can build clustered together in harmony with the environment. Our energy will also be drawn from the environment — from the sun, wind and water."

One Moora Moora member, Peter Cock, sees personal development in an alternative community as "taking responsibility for one's own existence".

"From nature we get our shelter, our food and our clothing," he writes.

"Struggling with the ingredients of survival is not only a prerequisite to personal growth, it is also an essential part of it."

At Moora Moora some members are growing their own food while others buy health foods. Some recycle op-shop clothes; others are starting to spin their own wool. Naturopathy, herbal remedies and other 'natural health' measures are practised where it is felt to be appropriate. Work is not seen as an end itself, but a means to an end. Some members work part-time and others are able to structure their work to suit their needs. Education is being developed as part of community life.

Bicycles are used on the property and occasionally to get to Healesville, but rural communities in particular find a need for cars, especially during the period when they are building and settling in. So transport is a contentious issue at Moora Moora.

Members of the community are sensitive to the visual and atmospheric impact of cars but are finding the need, in some cases, to have more than one car per two people.

Neil Collier lives at the co-operative and works full-time as a teacher at Ringwood High School about 48 km away. His wife Fran is full-time matron of the Upper Yarra Bush Nursing Hospital at Yarra Junction. At present, they have a VW beetle between them. Fran sleeps in at the hospital. This is proving unsatisfactory for them and they are now considering buying a Suzuki 4WD so that Fran can be home more often.

Mike and Dorothy Evans are also toying with the idea of buying another car, unregistered, for lugging tools and building materials around the property.

Peter and Sandra own a Holden station wagon. They both work three days a week, Peter at Monash University (staying in Melbourne two nights) and Sandra at Lilydale. Peter is against owning more than one car on principle and has suggested that the community should agree to a policy to that effect. He would prefer to encourage cars to be owned on a 'cluster basis'.

Phillip Ross commutes to his work at the Healesville Sanctuary three days a week by bicycle. If he or his wife Pam need the use of a car, they borrow one belonging to other members.

Leigh Norman, a mechanic, has three cars. He is unemployed because he wants to direct all his energies to improving the property and he has no money. So he uses his cars very rarely and often takes a lift to Healesville with another member. He'd prefer not to leave the property at all.

And I own two motor bikes, but (particularly in winter) I often take lifts with other members of the community.

As Peter Cock wrote in the Moora Moora newsletter: "We are really dependent on the automobile, even though a few strong-bodied people have ridden their bicycles up the mountain and even walked up. Where we can cut down on pollution and consumption is in converting our cars to LP gas and by car pooling and sharing."

But it is important to stress that Moora Moora is in its early stages. Eventually the members of the community see a high proportion of their needs being satisfied within the area of the co-operative. For travel outside this area, they will need an efficient **public** transport system, in common with other rural, and urban, communities.

Neil Collier sums it up: "The people working full-time down below both can afford and are in more need of a car than those working part-time. I look forward to the day when I no longer need a car."

Mark Snell.

For more information, contact Moora Moora, P.O. Box 214, Healesville, 3777, or on (059) 62 4104 newsletter sub, $3 a year.

TRANSPORT, TIME & MOBILITY

Transportation, as well as wasting our fossil fuels, also makes surprisingly large inroads to another limited resource, namely the 24 hours allotted to each of us every day. Obviously time is consumed when we travel, but few people seem to be aware of the extent to which our time is required to pay the financial costs of our journeys and the journeys that are made for us as part of the normal workings of the economy.

Various calculations have been made for the "net" speed of owning and using a motor car, most notably by Ivan Illich in his book *Energy and Equity*. Figures for Australia[1] are given in the box below, and another set of figures incorporating the idea of "useful social mobility" are given by Gary Glazebrook in his paper "The 4mph Car".[2] All these calculations agree that the actual net speed of the motor car, after taking into account the hours of work needed to pay all the costs caused by the car is in the range of 11 to 22 km per hour. This is certainly a lot slower than most people think they travel.

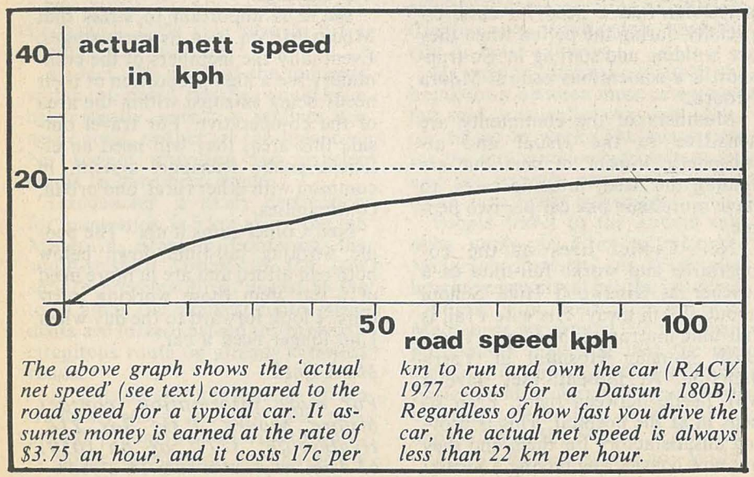
The same calculations for public transport give a similar "net" speed. The increased efficiency of trams and trains is counteracted by the longer waiting periods on stations and bus stops. Bicycles work out as fast as the more expensive cars (see box).

Thus to drive to work takes only a relatively short time but the car owner spends a good proportion of his or her time to earn the money to pay for the car. The cyclist on the other hand spends little time earning money for the bike but spends relatively more in riding. This has some benefits (fitness, taking life at a slower pace etc.) and some disadvantages (bad weather). The big advantage in a bicyclised society is that the *total* distance travelled would be much smaller and hence the time spent travelling much less, thus giving more time for meaningful activity rather than just travelling.

The above calculations, though no more than a rough guide, do nevertheless point to the illusory nature of the mobility apparent to the driver of a car compared to other forms of transport. The car first became popular because it freed (rich) people from the land-use patterns based on trains and trams and gave them mobility. In a similar way, we believe in the future that the bicycle will come to predominate because it frees people from car-culture and adds to the quality of their lives without severely restricting their access.

References

1. *Getting on the Right Track*, National Action for Public Transport, 1976.
2. Garry Glazebrook (2 Nuna St, Birchgrove, NSW), "The 4 mph Car", unpublished paper.



The above graph shows the 'actual net speed' (see text) compared to the road speed for a typical car. It assumes money is earned at the rate of $3.75 an hour, and it costs 17c per km to run and own the car (RACV 1977 costs for a Datsun 180B). Regardless of how fast you drive the car, the actual net speed is always less than 22 km per hour.

An 'Illich' for the Australian Car

* The average driver goes about 16,000 km a year.
* The most economical standard car (e.g. Honda Civic) costs $1865 a year to own and operate.
* To park it costs at least $150.
* To earn this $2015 at the average wage of $4.25 takes 474 hours.
* To actually drive the 16,000 kilometres takes an average of 400 hours (at 40 kph).
* Parking and servicing the car consumes a further 100 hours.
* Thus it takes 974 hours to travel 16,000 km.
* This is an average speed of 16.4 kph (10.25 mph).
* It's easy to ride a bike that fast.

And for the bike

* A typical bike costs around $150 new.
* It lasts about six years.
* Maintenance and insurance cost on average about $30 and involve about five hours of the cyclist's time each year.
* The average cycling speed is 16 km per hour.
* The average distance travelled each day is approx. 4 km.
* The community time cost in constructing and maintaining roads for bicycles averages 10 hours per year per bicycle.
* The net mobility for cycling then works out to be about 11 km per hour.

WABO SUPERDAM
PNG villagers Lose Out

Superdams in third-world countries can provide multi-national companies with cheap power supplies for energy-intensive industries. Unfortunately, the locals usually lose out when their governments succumb to the temptation of the huge financial input these industries promise. One such project, involving the Australian Snowy Mountains Engineering Corporation, is planned for the Purari River in southern Papua New Guinea. In this report ROB PARDY describes how the scheme will benefit only the miners and processors of aluminium, steel, oil and uranium.

Today, Wabo is just an airstrip and a campsite cut out of the forest in the Purari River Basin of Papua New Guinea. But it is not likely to stay that way for long since it is also the site ear-marked for an enormous dam, 145 metres high, which will be used to generate more than 1000 megawatts of hydroelectricity. It will be the first dam to be developed in the proposed Purari River hydroelectric project, which is planned to produce in total over 9000 megawatts of cheap power.

The Purari River drains a basin of 33,670 square kilometres from 4700 metres high to sea level, including parts of the Southern, Western and Eastern Highlands, and Chimbu and Gulf Districts of PNG. 41% of the country's population live in the Highlands districts. Chimbu district is a very densely populated area which has been the scene of many violent clashes over land ownership.

The filling of the Wabo dam will take about 136 days and will involve the flooding of an area up-river of 260 square kilometres. 434 PNG villagers who lived in this area, have already been resettled on the right bank of the river, just below the proposed dam wall.

Many hundreds more who have long-standing cultural and family links with the area, will also be affected. These non-resident 'owners' of land tend to get very little consideration in compensation decisions even though their claims are widely recognised as valid among tribal people.

The people already resettled were given little choice. Indeed, an observer present at the time of the shift described it as a "forced move". In return, they were promised such benefits as nightly film showings, some jobs and a school as enticement.

The land they have been given will not grow sago, the staple food they have grown for centuries. Some of the men of the villages have now taken laboring jobs across the river with the Australian and Japanese technicians planning the dam. This

work gives them an income to buy, at the company store, the food they no longer grow for themselves, and to pay the head and income taxes for which they are now liable.

No compensation has been given to these people for the loss of their sago and vegetable gardens. Only transistor radios and John Wayne movies replace the sacred mountains, trees, rivers and animals which gave the villagers their identity.

The indigenous people of the basin are also deeply concerned about the exploitation of their resources. They say:

"Tell them the water is ours and has a name and that name is Ere Varia. Tell the people in the big government meeting that we do not want them to close our river because they want to make money for themselves."

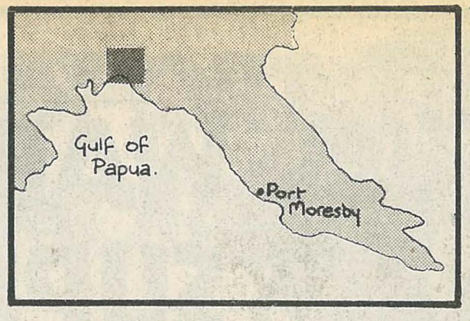
Opposition

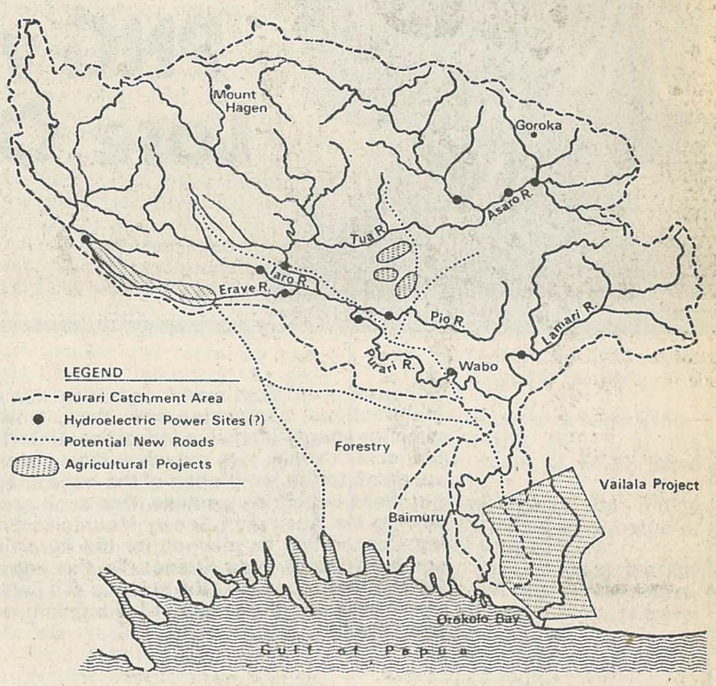
A group of educated and conscientious people living in the Purari delta have organised themselves into the Purari Action Group to fight the hydroelectric project and inform villagers in the area how they will be affected.

The Purari Action Group claims the indigenous people have nothing to gain from the project and much to lose. In a petition to the Government they state:

"We lose on all counts. In the name of econonic development, you are prepared to sell our land, our resources and our people to multinational firms which have already committed so many horrible crimes in other parts of the world.

"You have listened to the colonial advisers who could not care less about what happens to our country and our people. You have let these colonial advisers manipulate you."





The Purari catchment area in PNG (left) and enlargement (below). The lower map shows the proposed dam site at Wabo and the area at Vailala (shaded) set aside for intensive agricultural development.

Appropriate Technology?

In 1973 the Papua New Guinea House of Assembly laid down eight guidelines for the future development of the country. A strong influence in the formulation of this policy was Jimoh Omo Fadaka, an associate editor of the *Ecologist* (See *Ecologist*, Vol. 5, No. 6, 1975, pp 216-7), and well-known writer on appropriate technology for the third world. He spent nine months in PNG as UN adviser to the newly independent nation.

The PNG government accordingly decided to foster development in a way that was tied to traditional village values and built upon village-scale technology. Foreign investment and technology were to be accepted only in so far as they complemented local initiative and remained under local control. The thrust of the policy was to promote national- and village-level self-reliance, rural improvement, a reduction of the inequalities in the distribution of incomes and services, and decentralisation.

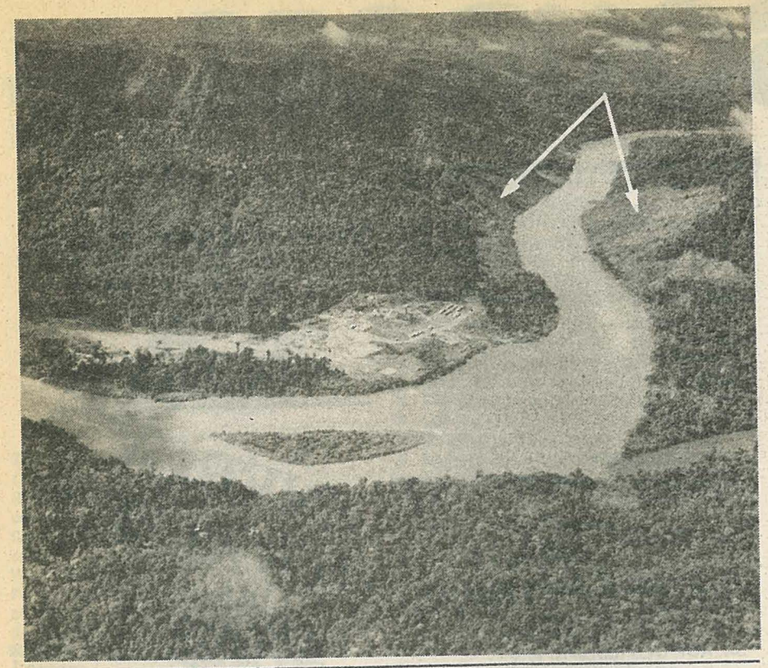
Against this background, it is difficult to understand how a proposal such as the Purari Comprehensive Development Scheme could have been given any consideration.

Uranium Enrichment

The Purari scheme does not only involve hydroelectric power generation. A crucial component is an industrial complex with associated town of population 12,000, and a port capable of handling 6.5 million tonnes a year at Hall Sound. The intended industries are aluminium smelting, ferro-alloy processing, petro-chemical refinement and uranium enrichment. Hall Sound is about 800 km from the Australian uranium and bauxite deposits.

The third component of the project is the "eventual total development" of intensive agriculture, forestry and tourism along with a road and an inland navigation system.

The Japanese company, Nippon Koei, completed its feasibility study in 1972, and in April 1974, the Australian Snowy Mountains



An aerial view of the camp site established at Wabo as part of the feasibility studies. The arrows indicate clearings made at the site of the proposed dam wall.

A woman preparing sago in the traditional way. In the background the Purari River flows by carrying with it the silt which nourishes the crops of thousands of village people.

Engineering Corporation completed a review of the Nippon Koei plan.

Proponents of the scheme say that the cost per kilowatt of generated power could be the lowest in the world — provided development takes place on a sufficiently large scale. At present, bauxite ore is being shipped up to halfway round the world to cheap sources of electrical power.

No light for Villagers

It is unlikely that the power generated will even be used to put lights in the local villages, since the scheme is designed as a self-contained system of large-scale power generation, high-voltage transmission and massive industrial consumption.

It is easy to see that the people who want the Purari project to go-ahead are those who control the mining, processing and trading of such commodities as aluminium, steel, oil and uranium. These people are not Papua New Guineans.

The Purari Action Group is proposing what they see as a much more appropriate path, in fact, along the lines of the official government development policy:

"Alternative development on a more realistic scale, based on agriculture and farming, can be done to suit our way of life and for the welfare of all people in the Gulf District, without involving these giant foreign firms that are not investing their capital in our country because they love us."

The Group suggests water wheels could be used to provide electricity in the villages and promote village-based industries and agriculture.

It has a further strong argument in pointing out the detrimental effects superdams have had in other developing countries:

"The indigenous people in the dam areas of Africa and Asia are poorer and suffer from more disease than before. There is plenty of cheap electricity for foreign enterprise . . . but the Africans and Asians are still without electricity because they cannot afford it."

And the local Purari people are fond of quoting an example closer to home: . . . *the people in Arawa village were promised electricity when they ceded their land for Arawa Town. Have they got it? Yes, just one miserable lamp in the middle of the village."* The Wabo superdam will not even provide this.

RESOURCES

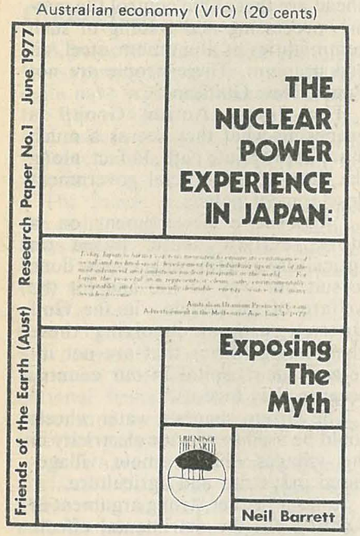
N — Nuclear. E — Environment.
A — Alternatives. G — General.
Ab — Aboriginal. ( ) — States available.

Leaflets (free)

N Why stop uranium mining (ACT, QLD)
N Uranium and you (VIC)
Ab Aborigines and uranium mining (ACT)
N Uranium mining and equality (ACT)
E Save the whale (NSW, VIC, SA, ACT, QLD)
E A Queanbeyan soft drink factory (ACT)

Papers/Broadsheets

N Nuclear weapons and Australian uranium (VIC, ACT) (20 cents)
N Uranium mining. Impact on the Australian economy (VIC) (20 cents)



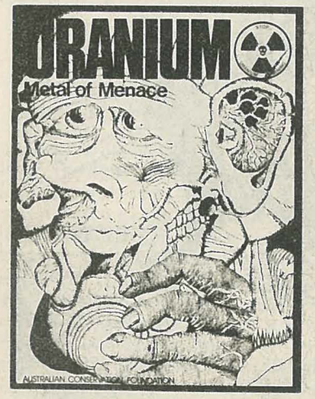
N Nuclear power experience in Japan: Exposing the myth (VIC) (50 cents)
N The incident at Brown's Ferry (NSW, WA, ACT, QLD) (20 cents)
N Karen Silkwood (ACT) (20 cents)
N Slow burn (QLD)
N The story of nuclear power plants (WA, QLD) (20 cents)
N The deflation of Rancho Seco (ACT, QLD) (20 cents)
N The case against mining and export (QLD)
E Forestry massacre (SA, ACT, QLD)
E Inside Micronesia (QLD) (20 cents)
A Non-nuclear futures (NSW, VIC, ACT, QLD) (20 cents)
A ACF energy broadsheet (VIC) (free)
A Bicyclisation (QLD)
A National commuter (QLD)
A Technology . . . New Scientist reprint (QLD)
G Not man apart (ACT, QLD)
G International Whaling Conference ECO's No.s 1, 2, 3, 4 (VIC) (free)

Magazines

G Chain Reaction — 1 (4) (VIC, ACT, WA QLD) (20 cents)
Chain Reaction — 2 (1) (VIC, ACT, WA QLD) (25 cents)
Chain Reaction — 2 (2) (VIC, SA, ACT, QLD) ($1.00)
Chain Reaction — 2 (3) (SA, ACT, WA QLD) ($1.00)
Chain Reaction — 2 (4) (NSW, VIC, WA SA, WA, ACT, QLD) ($1.00)
N Uranium Deadline — 1 (1,2) (ACT, WA QLD) ($0.60)
— 1 (3) (NSW, VIC, ACT, QLD) (50 cents)
— 1 (4) (VIC, ACT, QLD) (60 cents)
— 1 (5) (VIC, ACT, QLD) (60 cents)
— 2 (1) (NSW, VIC, SA, ACT, QLD) (50 cents)
— 2 (2) (NSW, VIC, SA, ACT, QLD) (60 cents)
— 2 (3) (NSW, VIC, SA, ACT, QLD (60 cents) WA

Booklets

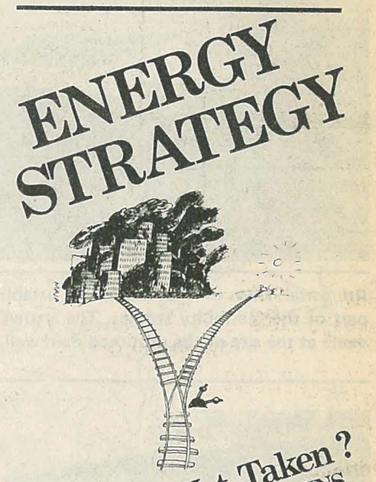
N The rocky comic (ACT) (75 cents)
N Uranium Metal of menace (ACT, QLD) ($1.00)
N First Fox report (abridged) (QLD, VIC) (40 cents)
N Give me water (NSW, QLD) (60 cents)
N The uranium debate: a trade union contribution (WA) (40 cents)
N Inspect Uranium School kit (VIC) ($1.50)
E Is recycling the solution (NSW , VIC) ($1.20)



E The Merrie creek study (VIC) ($2.50)
E The great forest sell-out (ACT) (50 cents)
E The packaging plague (ACT) (50 cents)
E Australia uprooted (ACT) (20 cents)
A Energy strategy; the road not taken? (NSW, SA, QLD) VIC) ($1.00)
A Getting on the right track (ACT) ($1.00)
G Worldwatch papers (NSW) ($2.00)

Books

Ab Mapoon — book 1 (NSW, VIC. ACT, QLD) ($1.80)
— book 2 (NSW, VIC, ACT, QLD) ($1.80)
— book 3 (NSW, VIC, ACT, QLD) ($1.80)



N Nuclear power — Walt Patterson (NSW, VIC, ACT, QLD) ($2.95)
N Red light for yellow cake. The case against uranium mining (Falk, Barrett, Hayes) (NSW, VIC, SA, WA, ACT, QLD) ($1.00)
N Rush to destruction (ACT) ($6.00)
E National parks for Cape York Peninsula (ACT) ($2.25)
E Incredible Fraser Island (ACT) ($4.00)
E Green bans (ACT) ($7.00)
E Alps at the crossroads (ACT) ($4.50)
A World energy strategies. Amory Lovins (NSW, VIC, ACT, QLD) ($4.50)
A Non-nuclear futures. The case for an ethical energy strategy, A. Lovins. (WA, ACT, QLD) ($5.00)
A Direct use of the sun's energy (ACT) ($2.75)
G Confronting the future, C. Birch (NSW) ($2.95)

Stickers

Stop Uranium Mining (NSW, VIC, SA, WA, ACT, QLD) (20 cents)
Save the Whale (NSW, VIC, WA, ACT) (25 cents)
Solar Energy (NSW)
Save Native Forests. Stop Woodchipping (ACT) (40 cents)

Badges

Uranium. No thanks (NSW), VIC, WA, ACT) (20 cents)

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Save the Whale (NSW, VIC, SA, ACT) (50 cents)
Whale (WA) (25c)
People need Public Transport (WA) (20 cents)
Ganges River Dolphin (WA) (25 cents)

Posters

Kiss your Children Goodbye (VIC) (20 cents)
The Nuclear Family (VIC) (20 cents)
Whales by Jenny Talbot (VIC, WA) ($1.00)
The Great Whales (SA, WA, ACT, VIC) ($2.00)
Calendar (NSW, VIC) ($1.00)

T-Shirts

Whale (NSW, SA, WA) ($4.00 adult and $3.60 children's sizes)
Friends of the Earth (NSW, VIC, SA. Act) ($4.00)
Stop Uranium Mining (NSW, WA) ($4.00 adult, $3.60 children's sizes)
Only Safe Nuclear Reactor (WA) ($4.00 adult, $3.60 children's sizes)
Keep Uranium in the ground (WA) ($4.00 adult, $3.60 children's sizes)
Uranium. No thanks. (ACT) ($4.00)
Save a tree (ACT) ($4.00)

Films

N Nuclear Dilemma (VIC)
N Energy: The Nuclear Fission Alternative (NSW, VIC)
N Hiroshima Nagasaki (NSW, VIC, ACT)
N Lovejoy's Nuclear War (VIC)
N Dale Bridenbaugh (NSW)
A Energy: Less is More (NSW, VIC)

Slides

N Dale Bridenbaugh (NSW)
N Rum Jungle (NSW)
E Fraser Island (NSW)

Speakers On:

Uranium (NSW, VIC, SA, ACT, QLD)
Alternatives (NSW, VIC, SA, ACT)
General Environment (NSW, VIC, SA, ACT)
Whales (ACT)

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(WA) (20 cents)

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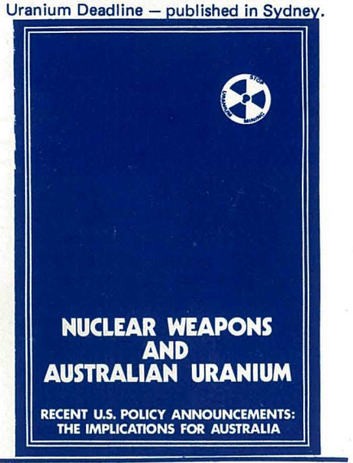
Collectives — Working Groups — Workshops

Publications Collective (VIC, ACT, QLD)
Uranium (NSW, VIC, SA, ACT)
Alternatives (NSW, SA, VIC — Stephen Ingrouille 41.5575)
Whales (Project Jonah— NSW, SA, ACT)(VIC)
Food Co-operative (VIC — Max Smart 347.6788)
Newsletter (VIC)
City Organic Gardening (VIC — Stephen Trednick 347.6788)
Office (VIC)
Music (VIC — Stephen Ingrouille 41.5575)
Chain Reaction — published in Melbourne.
Uranium Deadline — published in Sydney.



Contact FOE Sydney for their detailed Resources Catalogue.

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