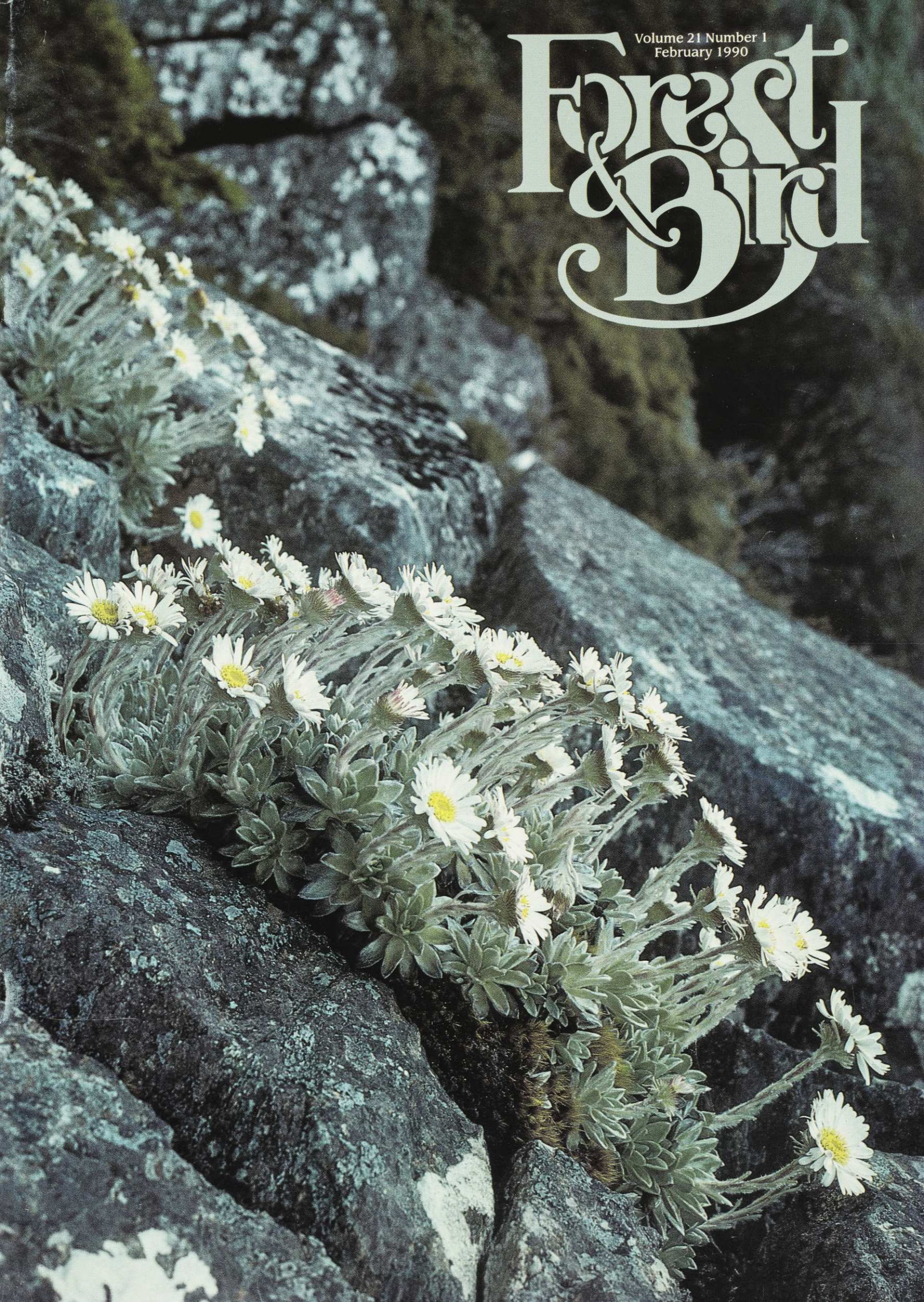
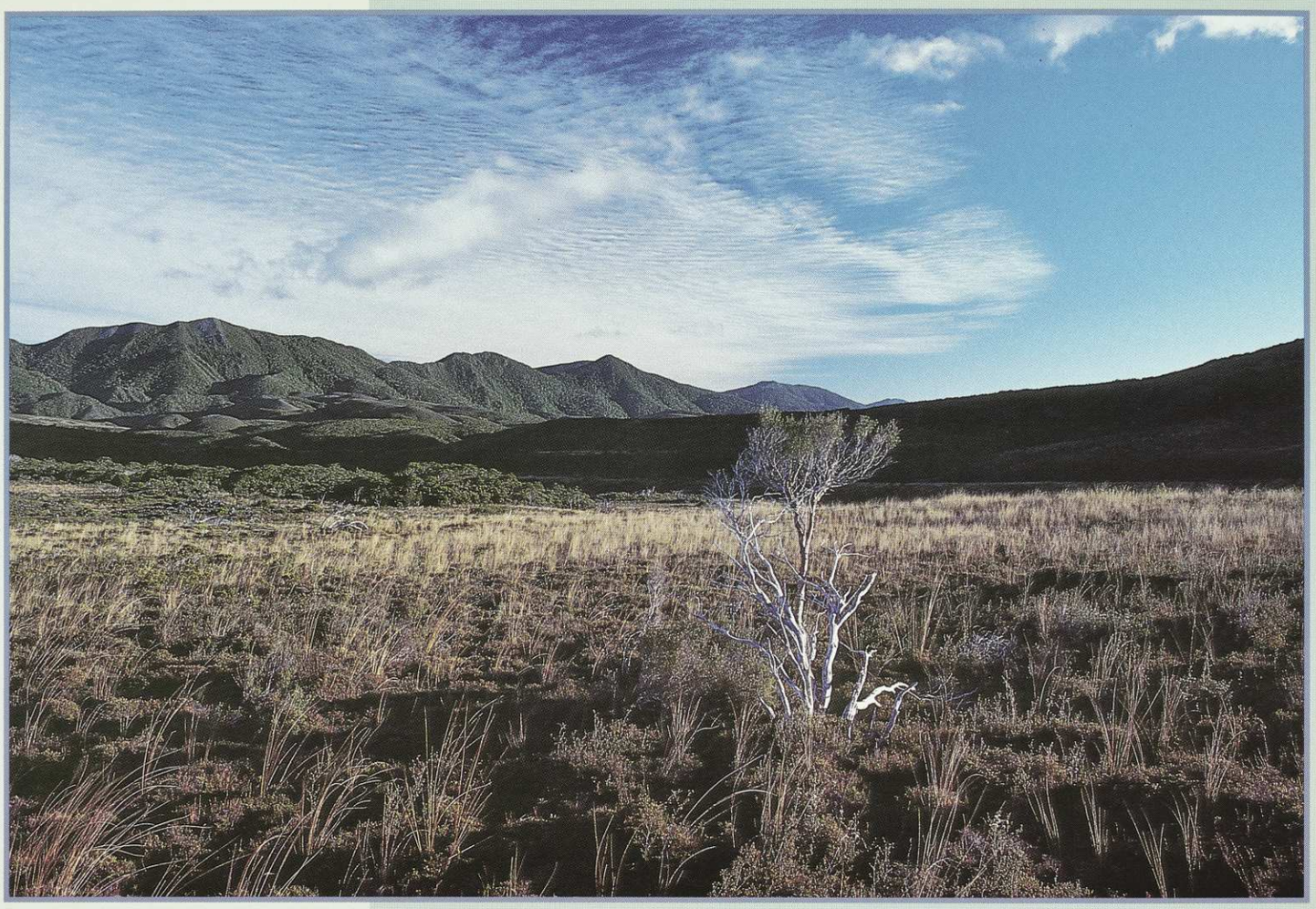
Volume 21 Number 1
February 1990

Forest & Bird





National parks, reserves and forest conservation lands have long been protected from mining by the Minister of Conservation's veto. The Resource Management Bill strips away the Minister's ability to protect these key conservation areas. One such is the Gouland Downs in North West Nelson, part of the proposed World Heritage site being nominated by conservation groups. This scene will feature in the Society's forthcoming book on this fascinating region. Photo: Craig Potton

Front Cover: Celmisia macMahonii *clings tenaciously to rocks on the one peak in the Marlborough Sounds where it now occurs. Wild goats are blamed for reducing this plant to the endangered level. Can we sustain New Zealand's heritage of native plants in the face of such threats?*
Photo: David Given

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Going Easy on the Earth

Suddenly politicians and business seem to be taking the environment seriously. Our concerns make headlines every day. There is a widespread feeling that the world won't last unless we treat it better.

This "environmental crisis" is popularly felt in the weather. No longer does the scenario for a damaged and dangerous world rely on academic theories. People can feel the climate changing. That is something which affects votes and influences customers.

There are many factors affecting climatic change and it is simplistic to suggest that the process is going to stop if we don't drive cars, nor use freons. But there are things people can do, choices people can make in everyday life, which may help in future.

During the sixties and early seventies some of us explored alternative lifestyles, or even voted Values, critical of galloping consumerism. The fuel shortage in 1972 gave a taste of life to be, when finite resources burn out. Yet that fuel crisis was born only of international politics and we soon recovered faith that everything lasts forever, that science will always find a new way. Now again, suddenly it seems, it's becoming clear to everyone that we have to go easy on the earth.

Those fashions of the sixties are becoming imperative for the nineties.

This issue of *Forest & Bird* looks at the broader environment and the choices we have to make. Additionally, the Society has just published a booklet *Go Easy on the Earth* about "green alternatives", simple choices people can make in daily living.

Some people ask why we are doing this, while others want the Society to act more globally. Local support for the international campaigns of Greenpeace is a measure of this popular concern about the world environment.

Forest and Bird cooperates and supports several international campaigns, within its present means, on issues such as global warming, ozone depletion, Antarctica, "wall of death" fishing and tropical rainforests. Yet there is always much to do at home. As a New Zealand-based organisation, strong in membership, branches and initiatives, we particularly speak for our own threatened animals, plants and places. While we are active in the Pacific rainforest campaigns, there are New Zealand forests being chipped for short-term advantage. While the farthest oceans of the world are stripped of mammals and fish, similar deserts are being created in our own seas. New Zealand, contrary to the surface impression of comparative cleanliness, lags behind some other parts of the progressive world in measures of environmental conscience. For example we produce more rubbish per head of population than most other people.

Politicians don't lead in a vacuum; an informed electorate creates the need and will for change. That is why Forest and Bird conducts its lobby.

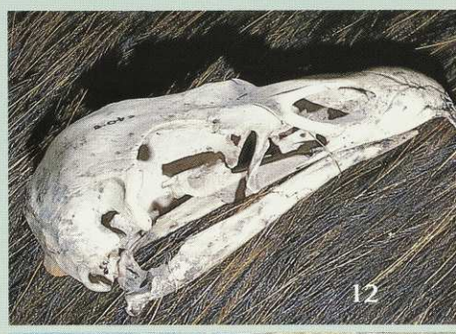
There is presently a shift in focus among environmental groups towards survivalist issues. Branches and members of Forest and Bird should press their perspectives on the National Society to keep our policies taut and purposeful.

This issue of the journal is a gesture of concern for the whole earth. Our readers, however, through their lifestyles and actions, will decide the depth of that concern.

Gordon Ell
Acting National President

C·O·N·T·E·N·T·S

Articles



Departments

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Society's aims: to protect New Zealand's native species, natural ecosystems and landscapes and promote an appreciation of these.

The Royal Forest & Bird Protection Society is a member of the International Union for the Protection of Nature and Natural Resources (IUCN) and the International Council for Bird Preservation (ICBP).

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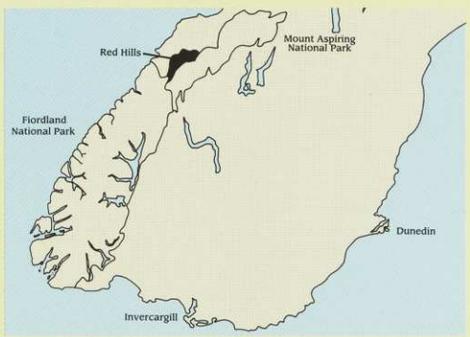
A Red Letter Day

ON 8 DECEMBER 1989 West Otago's Red Hills were formally added to Mt Aspiring National Park – 30 years after the idea was first discussed and 21 years after the first formal proposal that it become a national park.

In that time there have been endless consultations with interest groups, the last of which was in 1987 when the public were asked for their views on whether the 27,000-ha area should become a national park. The answer was a resounding yes from 96 percent of the 3500 public – many of them Forest and Bird members – who wrote to the Government.

Federated Mountain Clubs, and especially former FMC president Les Molloy, must take much credit for achieving national park status for the Red Hills. Forest and Bird and the Otago Parks and Reserves Board have also played an important role in championing the park proposal.

The major opposition to national park status – mining interests – finally lost heart as they realised public opposition and lack of a market for asbestos (because of its health hazards) would never see mining become a viable option for the area.

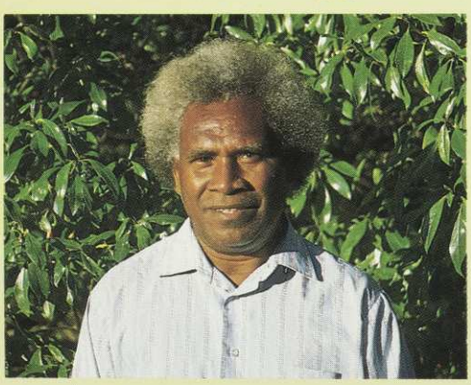


The extended Mt Aspiring National Park lies at the heart of the proposed South West or Te Wahipounamu World Heritage area. The World Heritage Committee will evaluate the South West nomination for its international significance later this year.

Gerard Hutching

Virtually devoid of vegetation thanks to its ultramafic properties, Red Mountain stands in striking contrast to the silver beech-clothed mountains that surround it. The dramatic cut-off point is evident in the gully leading to Simonin Pass. Mt Aspiring is to the right rear. Photo: Geoff Spearpoint

South Pacific Appointment



Abraham Baeanisia

FOREST AND BIRD IS DELIGHTED to announce the recent appointment of Solomon Islander Abraham Baeanisia as its first full time campaigner for Pacific rainforest conservation. He will be employed by Forest and Bird and the Maruia Society under our joint Pacific Rainforest Coalition.

Abraham is currently the Director of the Solomon Islands Development Trust (SIDT), a charitable organisation seeking to educate and inform village people on health, development and environmental issues throughout the Solomons.

His main area of work for 1990 will be to set up a new sector of SIDT that deals specifically with forestry. This would involve close liaison with village people, providing information and support for forest conservation and the establishment of sustainable community forestry projects.

A GIFT OF THE PRESENT

FOR THE FUTURE

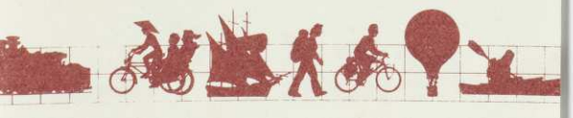
New Zealand's wild plants and animals are a priceless gift. The Royal Forest & Bird Protection Society has been working since 1923 to ensure this gift is passed along for future generations.

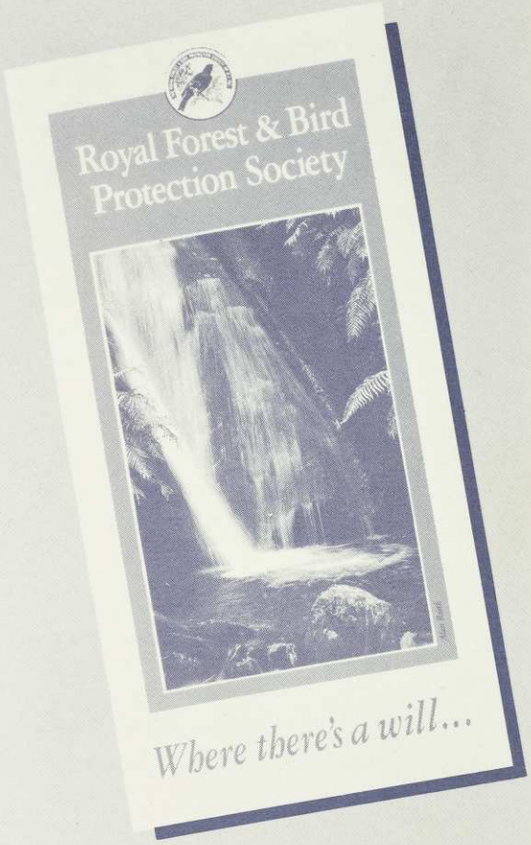
Being a member of the Society means being a part of this nation's most effective conservation lobby. You can be active in conservation campaigns . . . join others in national or local outings . . . or simply take pleasure in knowing you are playing an important role in helping to preserve our priceless natural heritage.

As well of course you receive 4 copies a year of New Zealand's finest natural history magazine.

WHO in the world

TAKES YOU
Off the Beaten track to uncover,
the mysteries of our natural world.
Tour with a small, personal group
of like minded people through distant
(and not so distant) lands
in search of knowledge, new
experience and adventure.





If you have any questions about the many ways in which you can give a gift to last, we have the answers . . .

Because of the many enquiries we receive about the ways in which a bequest can be made, we have prepared an easy-to-read pamphlet *Where there's a will.*

Here are some of the questions it will answer . . .

- How do you ensure a bequest is inflation-proofed?
- How best can you ensure your wishes are fulfilled and that your beneficiaries are protected?
- Can you specify *exactly* how your gift should be used?

Write to us today for a free copy of *Where there's a will.*

The National Secretary,
Royal Forest & Bird Protection Society,
PO Box 631,
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and have been doing so for the past 20 years

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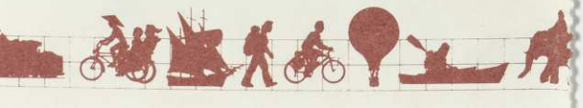


Tourism Comes to Whirinaki

IMAGINE TRAMPING through huge red beech forest, dripping with moss and rain, the water sloshing in your boots, then rounding a corner and finding a pixie village of tents nestling among the tree trunks. No zone of increasing devastation that so often heralds a hut, just a blink from wilderness to home comfort.

Such contrast is the flavour of the 5-day Whirinaki Wilderness Trek. It is luxury tramping. Hot showers and toilets hide discretely under the pungas. A cordon-bleu dinner with wine is waiting at day's end. But still it is a very real adventure. Trekking 39 kms through forest and stream in an untamed wilderness will be a source of pleasure and achievement to overseas visitors and New Zealanders ill-equipped to set off on such ventures by themselves.

The adventure begins on the Mohaka River, rafting rapids that are exciting but not terrifying, to the isolated Te Hoe Station. After a night on the farm, where owner Jim Haliburton has entertained those not inclined to rafting, the group is driven through a ravaged landscape to the remote Whirinaki Conservation Park. Local guides escort the party on the three-day trek, camping overnight at the tent villages. Emerging at Te Whaiti the group is welcomed onto the Murumurunga marae for a hangi and their last evening together sleeping in the meeting house.

The trek is varied and original. It is run by the Mohaka Development Company in conjunction with the Ngatiwhare people and the Department of Conservation.

The local guides and staff are an asset. They are genuine kiwis, proud of their wilderness and their heritage, and treat their charges as friends rather than paying customers.

In this grand landscape there is a real sense of wilderness and the commercial venture is careful to tread lightly and display an admirable respect for the environment. Rubbish is carefully controlled. Scroggin is provided on each walk, but not barley sugars, lest the wrappers be dropped! Would that other trampers follow this example!

We have destroyed the forests of the Central North Island until only remnants remain. It is good to see this precious forest being benignly used in a venture which will provide enjoyment and employment for many. This is an enterprise that deserves to succeed.

Ann Graeme

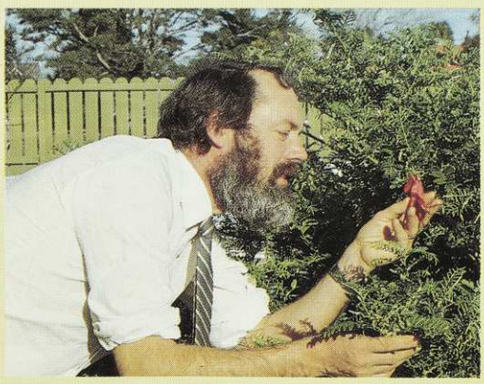
Plants to Protect

PLANTS (along with invertebrates) are the Cinderellas of the conservation world. While birds readily gain people's attention, plants are often overlooked.

A book just printed by DSIR Publishing aims to correct that imbalance and put more of a spotlight on our at-risk plants. *Threatened Plants of New Zealand* by David Given and Catherine Wilson points out that one out of ten New Zealand plant species are at risk of extinction in the wild. Wholesale destruction of forests, scrub and wetlands has seen whole populations dwindle to just a few individuals.

The new book replaces the *Red Data Book of New Zealand* but in fact there is no comparison between the two as the *Red Data Book* had no photos or maps and was not the useful field guide that *Threatened Plants* is.

Altogether 100 plants are featured, virtually all photographed in colour. Co-author David Given is New Zealand's foremost expert on threatened plants, having written an earlier book *Rare and Endangered Plants of New Zealand*. If the publicity for rare plants this book achieves helps advance long overdue rare plant legislation, the authors will no doubt be more than pleased.



Authors of the Threatened Plants of New Zealand, *David Given and Catherine Wilson.*

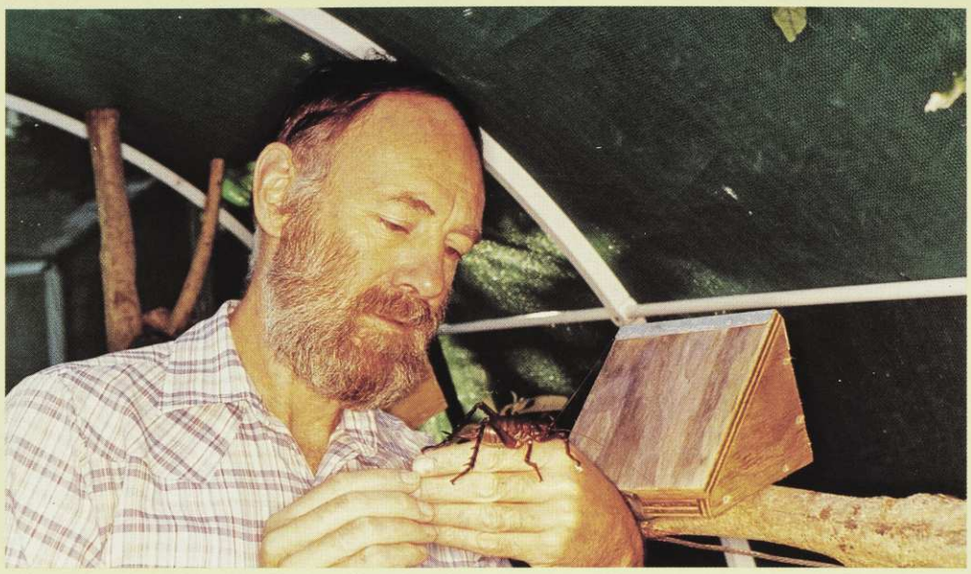
Giant Weta Breeding Success

IT WOULD NEVER BE the world's most popular species breeding programme. Nevertheless, when the plight of the Mahoenui giant weta became known in 1988, Forest and Bird members embraced the cause of weta conservation and provided funds for breeding boxes and a shade house.

That was the first stage in a drawn out process that finally saw a dozen weta hatch in DSIR scientist Dr Mike Meads' back garden this January. The success of the programme provides hope that the vulnerable species – at present confined to 460 hectares of King Country gorse for which the Department of Conservation has paid $30,000 – has a future.

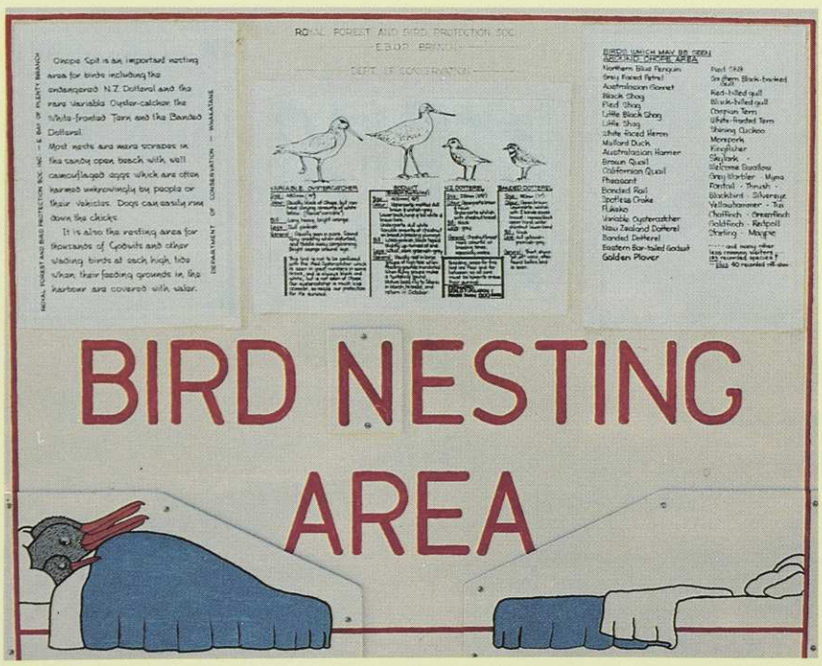
Breeding the giant weta has been a hit and miss affair. After keeping the adults in a sterile laboratory failed to encourage them to mate, Dr Meads moved them into more natural surroundings, including furnishing their new quarters with some Mahoenui gorse. By February 1989 mating had occurred but egg laying was proving a problem. At that point Dr Meads' garden sprinkler came to the rescue, and the damper conditions spurred the females into laying eggs.

However, weta fanciers had a longer wait than usual before the eggs hatched. Instead of the normal few weeks the process should take, 10 months passed before an elated Mike Meads could tell the world that Mahoenui offspring had arrived. These are likely to be released on predator-free offshore islands, offering the security of more than one population of the species.



Dr Mike Meads and one of the Mahoenui giant weta. He is standing inside the shade house and in front of a weta breeding box – both donated by Forest and Bird members.

An egg of the giant weta and one of the hatchlings just a few days old. Photos: Mike Meads



An Arresting Sight

IN AUGUST WE PUBLISHED a photo of Helen and Adrian Harrison's dotterel notice on Ohope Beach. This advertised the fact that the beach was a bird resting area and that people should stay clear.

Come spring the Harrisons decided to update the notice to reflect that time of the year (left).

The Forest Carpet

PLAUDITS FOR BILL AND NANCY MALCOLM'S recently published *The Forest Carpet* (Craig Potton Publishing) have come from no less an authority than David Galloway, co-ordinator of the Division of Lichens and Bryophytes at London's Natural History Museum. He writes that "the quality of the illustrations and book production make it something really special."

As in their earlier *New Zealand Alpine Plants Inside and Out*, the close-up photography in this new book is almost unbelievable in its detail and depth of field. Never again will readers see mosses, lichens, liverworts, hornworts, fork-ferns and lycopods as merely the little-noticed "lesser plants" of the forest world. The Malcolms' innovative cameras and provocatively entertaining text take the reader on intimate journeys to those parts of our native forests we usually just trample under foot with scarcely a second thought.

New Zealand's rainforests contain a spectacular abundance of bryophytes, forming a continuous forest carpet. Totally dependent on the forest environment, this carpet shrivels and dies immediately the protective canopy is stripped away. The text and superb quality of the illustrations in this book will enhance our knowledge and appreciation of these sensitive plants and the role they play in the forest ecosystem.

Spore-capsules of the lantern moss Dicranoloma robustum, *photographed at four times life size, from* The Forest Carpet. Photo: Bill and Nancy Malcolm

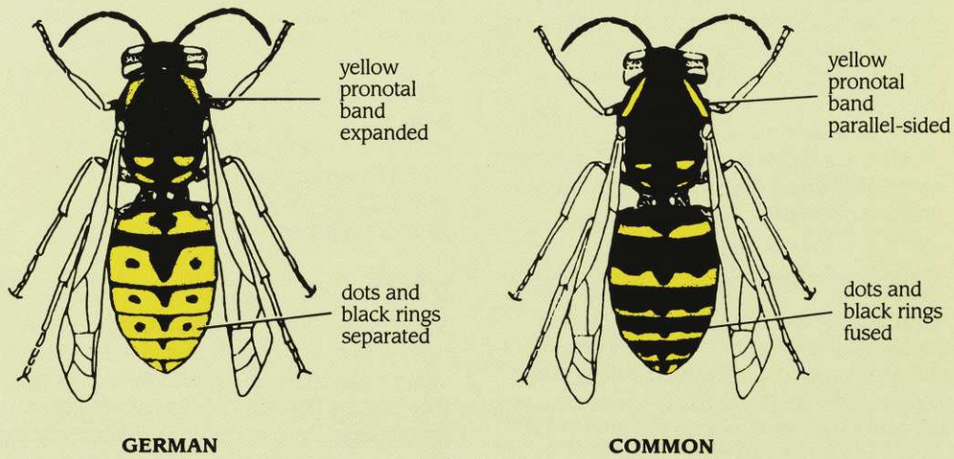
Taking the Sting Out of the Wasp Problem

ARE YOU INTERESTED in becoming a wasp collector for the DSIR? The department needs samples of wasps from as many locations in New Zealand as possible.

Two new species of wasps have recently become established in New Zealand. The European common wasp, *Vespula vulgaris*, is now the most abundant wasp in South Island honeydew beech forests. It outcompetes our native birds and insects for food, and is driving away trampers, picnickers and fishermen. The Asian paper wasp, *Polistes chinensis*, first reported near Auckland in 1979, has now reached the South Island. We need to know if this insect predator can survive in our forests.

In 1987, DSIR mounted a successful nationwide appeal for samples of wasps. Many Forest and Bird members were among the 3,700 wasp collectors we enlisted. The survey is being repeated this year to update knowledge of wasp species distributions. Scientists also need to find out what habitats the new species prefer, where they may outcompete the familiar German wasp, when and where each species cause the most problems. These are questions that must be answered before the DSIR can devise effective control strategies.

If you would like to assist in this research project (the NZ Lottery Grants Board and the Department of Conservation are already assisting with funding), please swat as many wasps as possible (20 would be ideal) from any one location and place them in a crush-proof container (eg. plastic film canister). You can send them by freepost (no stamp required). Please do NOT collect wasps from or very close to a nest.



There are two kinds of wasps in New Zealand: the German wasp which arrived in the 1940s, and the common wasp, which arrived only recently but is already widespread. Wasps usually live in underground nests. Their numbers peak in February-April, and this is when they cause most problems. Nests normally die out in late autumn and early winter, leaving the fertile queens to hibernate until the following spring. Graphic: DoC

If you sent us a sample in 1987, we hope you'll do so again – we do need repeat samples. We also need samples from areas that were not covered last time.

We need the following information: * your name and address (so we can reply with thanks); * location of sample (eg. distance/direction from closest town or NZMS map reference); * date when you collected the sample; * habitat (eg. native bush, pasture, city, orchard); * altitude (if possible); * any interesting observations on wasps.

If you send us samples from more than one location, please keep them in different containers and provide separate information for each.

Send samples to: FREEPOST WASPS, DSIR, Private Bag, NELSON.

Please do not bother your local DSIR or MAF office – direct ALL enquiries to: DSIR, PRIVATE BAG, NELSON. PH: (054) 81082.

Kay Clapperton

Parrot Crisis

PARROTS are among the most threatened group of birds, according to the International Council for Bird Preservation (ICBP). About a third of parrot species (103 species) are causing concern and 77 are in grave danger of extinction.

ICBP has launched a World Parrots in Crisis campaign to try and avert mass extinction of parrots. Two factors contribute most to the parrots' problems: their rainforest homes are being logged at a high rate, and the beautiful birds are sought after as pets. A pair of rare Spix's macaws may fetch as high as $80,000.

The Council is campaigning for a complete ban on the import of the 103 threatened species into the EEC. It would also like to see officials crack down on the wasteful parrot trade. In 1986 more than 600,000 parrots were traded worldwide and 80 percent died before they reached pet shops.

New Zealand's parrot species are some of our most threatened. They include the extremely rare kakapo, and the threatened kaka, kea and parakeet.

The orange-fronted parakeet, a colour variety of the yellow-crowned parakeet species. While not under threat to the same extent as other New Zealand parrots, this parakeet's numbers have been reduced in line with the reduction in native forest cover.

Diesel Pollution Solutions

SWEDISH CAR MANUFACTURER Volvo has invented a filter which reduces soot and other harmful particles from diesel exhaust by at least 80 percent. Buses and delivery vehicles are a major source of this kind of urban pollution because of their frequent stopping and starting. When accelerating or climbing up a hill, large amounts of soot particles are released.

The filter becomes full after 500 kms, after which it is plugged into an external electricity supply to burn off the soot with the aid of a platinum catalyst.

Environment vs Arms

THREE of the world's top environmental problems could be solved if just 9 percent of the world's annual military spending was channelled into saving the environment, according to the Worldwatch Institute. This would amount to $US774 billion, and should be spent on protecting soil from erosion, deforestation and energy efficiency/renewable energy.

The independent Worldwatch Institute says governments need to reassess their view of security. It points out that military power costs so much that it drains resources needed to protect the environment and may dramatically reduce national security.

Ethiopia is a good example: $50 million a year spent in the 1970s to offset desertification would have headed off the 1985 famine, which in the end cost $500 million in relief measures. Meanwhile the Ethiopian government was spending $275 million a year on its war against secessionist movements in Eritrea and Tigre.

The Institute looked at a number of trade-offs between military and environmental spending. One of the most telling is the money that should be spent to stop Third World desertification ($4.8 billion over 20 years). That's the equivalent of two days of global military spending.

Thatcher's Image Undone

MARGARET THATCHER'S RECENT CLAIM to "greenness" has been found wanting after it was revealed she is to refurbish reception rooms at 10 Downing Street with Brazilian mahogany. "Despite the Prime Minister's call for an end to destruction of the Amazon rainforest, the purchases for the White and Blue Room were personally ordered by Mrs Thatcher," said the *Sunday Times*.

Whales for Sale?

THE COMMERCIAL WHALING MORATORIUM is to be reviewed this year, fueling fears that Japan, Iceland and Norway will win the right to take whales for commercial reasons. Japan in particular has always been adept at gaining support from small and vulnerable nations.

However, those fears are balanced by the fact that there is a good core of conservationist commissioners on the International Whaling Commission, and a three-quarters majority is required to get the moratorium overturned.

The sad news to come out of last year's census of the great southern hemisphere whales is that the blue whale population, at between 200-1100 individuals, may be too low for recovery. Other figures which give no cause for optimism are : the fin whale (2000), the sperm whale (10,000) and the humpback (4000).

Hydrogen – Car Fuel of the Future?

HYDROGEN is being touted as the car fuel of the future, but much depends on the way it is produced. Hydrogen's advantages are that it emits no carbon dioxide or sulphur dioxides, two gases which are major contributors to the greenhouse effect and acid rain.

Hydrogen is most easily made by electrolysing water, but if the electricity used in the process is coal or oil-fired, there is no benefit to using the fuel. The Washington-based World Resources Institute argues that the electricity to make hydrogen could come from sunlight.

If a hydrogen-fuelled car was driven for 16,000 km a year, it would need 280 sq ft of solar collecting area. In the United States that is the equivalent of 0.5 percent of the country's entire land area to provide for every car.

Books Received

Birds of New Zealand: Locality Guide, by Stuart Chambers (Arun Books). For wealth of detail about how to view New Zealand birds, there has not been a publication yet to match this one. Chambers approach is via the bird; for example, if you want to know where to find a spotless crake, then he provides the reader with a dozen locations throughout the country. The book also includes a section on special bird places and the list of species found there, plus suggested excursions. The weakness of the book is that most of the named locations are ones visited by the author, with a resulting bias towards the upper North Island and selected locations in the south.

New Zealand Ferns and Allied Plants, by Patrick J Brownsey and John Smith-Dodsworth (David Bateman, $89.95). A much needed and long awaited guide to all our native ferns – well worth the wait for such a comprehensive publication. Colour and black and white photography, line drawings and easily understood descriptions for each species combine to make fern identification possible for everyone. People interested in learning about our native flora will find this book excellent value. Latin names are used throughout but redundant and common ones are also listed.

The brave new world of SUSTAINABLE DEVELOPMENT

By Gerard Hutching

Graphic: Ministry for the Environment

Around the world, many eyes of the conservation community are focusing on New Zealand. What is exciting their attention is the comprehensive reform of all laws governing land, air and water, a reform which has taken up much of the time of Ministry for the Environment staff over the last two years. Sustainability is widely viewed as the cornerstone of the new resource management law. But what is sustainability? How can it be put into effect? And will the new Resource Management Bill in its present form really protect the environment? Gerard Hutching reports.

AT THE BEGINNING OF 1989, Alan Miller from the Department of Conservation and Resource Studies of the University of California told a Ministry for the Environment seminar that New Zealand's attempt to establish in law the principle of sustainability "is utterly unique amongst the nations of the world." For that reason, he said, other countries were closely watching New Zealand's much vaunted legislation to see if it could give them a lead.

Spurred on by the deliberations of the Brundtland Commission which published the much heralded *Our Common Future*, governments around the globe are pondering on how to deal with what has been described as the ultimate crisis – the state of the world environment which threatens the continuation of life itself. The phrase the Brundtland Commission coined as the key to heading off ecological catastrophe – sustainable development – has become the environmental buzzword of the decade and generated heated debate over its meaning.

Sustainable Development – A Contradiction in Terms?

In an ecologically finite and entropy-bound world, belief in sustainable development has been likened to a belief in perpetual motion. Scientist and ecologist Paul Erhlich has neatly summed up the blinkered vision of humans: "Economists are the only major group of scholars who believe in perpetual motion. They believe in an infinity of resources."

The Brundtland Commission's definition of sustainable development, more or less adopted in the Resource Management Bill, states:

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Or, in the words of a Canadian speaker at a recent conference in Ottawa, sustainable development means "do unto the next generation as you would have the past generation had done unto you."

According to the Brundtland Commission, then, growth will be sustainable only if it is environmentally sound. However the Brundtland Commission's recipe for raising the living standards of the Third World appears on the face of it to be a recipe for ecological disaster – a five to ten percent increase in world industrial output by the middle of the next century. In his call for an annual growth rate of 3 percent, Prime Minister Geoffrey Palmer is one world leader who appears to believe that growth does not conflict with environmental sustainability.

Professor of Urban Planning at the University of British Columbia, Bill Rees, points out that the Brundtland Commission's definition has become in some quarters a justification for the status quo. Business especially has seized upon the concept to continue the business as usual approach. The better notion, according to Lees, is "sustainable environment."

"It becomes a real question whether the ecosphere can sustain even a doubling of the current rates of economic activity. I really do not think that a five to ten fold increase in the rate of material consumption by a much more massively demanding economy is on the ecological cards," says Lees.

He notes that many environmentalists have taken the Brundtland Report as a message to lower growth in the "overdeveloped" world and to think of ways to change the unequal division of wealth around the globe. But on the other hand, others, usually non-environmentalists, have taken the term "sustainable growth" to mean that the poorest countries will increase their material wealth while the wealthiest countries will not have to make any sacrifices.

The implications of increasing the world's middle class were dramatically shown by a 1983 study by N Keyfitz entitled "World Resources and the Middle Class". The world middle class is considered to be in the order of 800 million people at present. Most of those consume at rates 8-10 times higher than people in the developing world. This means that 800 million people have a global resources impact equivalent to 6.6 billion people in the developing nations. An expanded middle class of 1.6 billion would have a resources impact equal to that of 12.8 billion people in the developing world.

Sustaining What?

Another question that has been vexing those interested in the notion of sustainability is: exactly what are we trying to sustain when we talk of sustainable development? Is it the environment, jobs, economic progress? Is it all of them at once, or are these goals inevitably in conflict?

For example, sufficient work has now been carried out by scientists to allow us to predict the effects of logging of native forests on native species such as kaka. In Western Southland continued development – that is, logging – will obviously jeopardise the sustainability of kaka. On the other hand, the Ministry of Forestry continues to claim that the logging regime they have been operating in the Western Southland forests is sustainable because no more timber will be taken out than will be allowed to regrow. Meanwhile, people in the timber town of Tuatapere will argue that their community viability is at risk if logging is halted. The fact that there might not be any community left in a decade because of the high rate of cut is not an argument they wish to discuss – their concerns are more with the here and now.

Sustainability – For Whom?

Humans being humans, it is perhaps understandable that they have chosen to measure sustainable development in terms of the impact it will have on them. However, there are possibly 20 million other species on the planet, many of which have suffered because of human belief that nature must be "mastered." In the past 2000 years *Homo sapiens* has exterminated 3 percent of the Earth's mammal species. In the last 150 years exterminations have increased 50-fold. At this rate it will not be long before many of the remaining 4062 mammal species are gone. All over the world, plant and animal species are disappearing at the rate of 20,000 a year.

What is called for, argue some environmentalists, is a completely new way of looking at the world. The Brundtland Commission also agrees that humans are going to have to adopt a new ethical approach – one in which other species are valued for their own sake, in which rainforests are not mea-

THE RESOURCE MANAGEMENT REFORM – WILL IT FIT THE BILL?

Alistair White & Mark Bellingham

THE INTRODUCTION of this Bill serves as a milestone for resource management in New Zealand, and is intended as the first comprehensive and integrated review of the laws governing the management of our natural resources. Town and country planning, water and soil management, land, water, air and noise pollution, waste disposal, hazardous substances control, coastal management, mining, and geothermal consent laws are all dealt with in the new Resource Management Bill.

The new Bill promotes the concept of sustainable management as its purpose. However, its specific wording will not necessarily ensure that the management of New Zealand's natural and physical resources are indeed sustainable! The Bill appears more concerned with balancing destruction and protection of the environment, rather than providing a clear ecological perspective to ensure New Zealand's development is sustainable.

Mining

Under the new Resource Management Bill the Minister of Energy has sole responsibility for the granting of mineral and energy licences. The mining companies can use the courts to force their way onto private land or public conservation land against the wishes of the landowners. While mineral management programmes are now required, these will not necessarily be consistent with the sustainability objectives of the law.

Heritage Protection Orders

Areas or places of significance for their natural, scientific, historical or cultural importance can now be protected through heritage orders. These orders have stop-work notices, and enforce protection with compensation. This will give designated heritage sites better protection to survive against uncaring landowners, although the compensation provisions will ensure it is limited to small sites.

Pollution and Hazardous Substances

All discharge of contaminants to land, air and water must have a consent. The Bill also promotes the best practicable option (BPO) approach to minimise pollution. A Hazards Control Commission will be established with responsibilities to include monitoring, enforcement and advice to the Minister on regulations for standards and controls in the management of hazardous substances. This is a good step forward.

Coastal Management

Coastal management now becomes a shared responsibility between regional government and the Minister of Conservation. The Minister of Conservation will prepare national coastal policies. Coastal management plans are to be prepared by regional government and DoC, and require the approval of the Minister of Conservation

Water Management

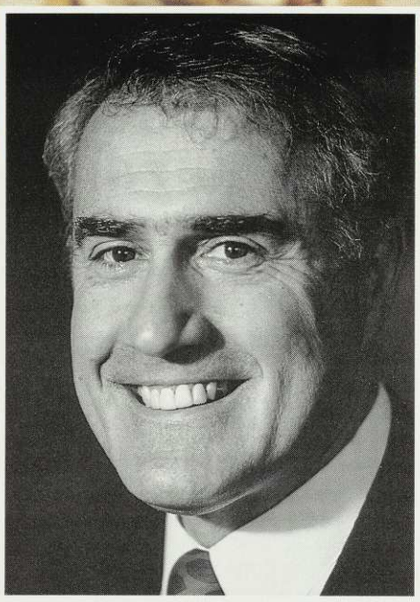
The Bill carries over existing water classifications, minimum flows and levels, and places them under regional resource management plans. National water conservation orders remain, but local orders have been lost.

Summary

Overall the new resource management law is a major step forward when compared to the existing system, especially regarding the protection of our coasts. The main drawbacks in the Resource Management Bill are:

- A muddled definition of sustainability which provides a let out for continued non-sustainable development.
- Loss of the Conservation Minister's veto over mining in national parks, nature reserves and other specially protected areas.
- Exemption of mining and mineral development from key principles of environmental protection.
- Lack of energy management or planning means no control on the forces behind the Greenhouse Effect or energy drain off from our unique geothermal systems.
- Loss of public comment rights on mining during a transition period before old district schemes expire.
- Loss of local water conservation notices to multiple-use water plans where development usually takes predecence.
- A tradeable water right system that could lead to reduced water flows in rivers and high local water pollution.
- National standards that are not binding on regional and local councils and can be overturned by these councils.
- A massive devolution of responsibility to local authorities without adequate safeguards to ensure high standards are set and enforced for environmental management.

What kind of a non-sustainable world are we bequeathing to our children? Future generations will not forgive us if we continue to allow native forests to be plundered and to end up as woodchip piles waiting to be shipped to Japan. Photo: Gerard Hutching



Geoffrey Palmer: backing sustainability and development.

sured in terms of their economic worth.

It is an ethic that native cultures have always known, expressed most eloquently by Chief Seattle in 1855 to US President Franklin Pierce:

"How can you buy or sell the sky, the warmth of the land? The idea is strange to us. We do not own the freshness of the air or the sparkle of the water. How can you buy them from us? Every part of the earth is sacred to my people. Every shining pine needle, every sandy shore, every mist in the memory and experience of my people. If I decide to accept your offer to buy our land, I will make one condition. The white man must treat the beasts of this land as his brothers. I am a savage and do not understand any other way. I have seen a thousand rotting buffaloes on the prairies left by the white man who shot them from a passing train. What is man without the beasts? If all the beasts were gone, men would die from great loneliness of the spirit, for whatever happens to the beasts will also happen to man. All things are connected. Whatever befalls the earth, befalls the sons of the earth."

There is a strong linkage between the concerns of the environmental movement and the spiritual beliefs of many native peoples.

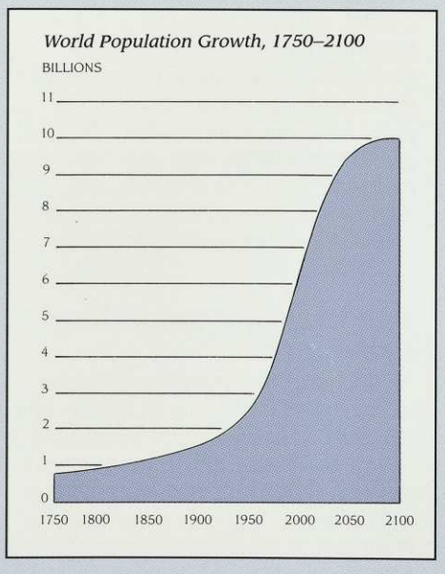
The beginning of the growth of that new ethical movement by Westerners can be traced back to last century, with the creation of the first national parks, and in the last two decades the trend has accelerated.

The Numbers Game

One of the keys to sustainability is the growth of human population, and that population's consumption of resources. It took a million years for the population to reach 2 million at the end of 1945. It soared to 5 billion in the 1980s and current predictions are that by 2050 there will be approximately 10 billion people. The United Nations estimates that the human population will eventually level out at 14 billion.

The present growth rate is clearly unsustainable as in perhaps 300 year's time it would leave only one square metre per person.

Effective birth control programmes for all societies must be clearly to the fore of any international moves towards environmental sustainability. Yet even in New Zealand there are those who argue for a dramatic increase in immigration to boost our economic growth.



Barriers to Sustainability

As the *Economist* magazine pointed out recently, given the right incentives and political will, humans could fashion a sustainable future. For example, in the field of energy, we are on the threshhold of a revolution, where more will come from less (see article on energy). However, says the *Economist* "there's the rub. The reason that countries do not pursue sensible economics is that powerful lobbies benefit from the foolish kind."

In the end, if countries do not become clean and green, environmental collapse will provide a check to growth, but at the risk of unimaginable suffering.

Ecological sustainability is a potent concept if set in the context of the limits to growth and the rights of future generations and other species.

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Sustainability of SPECIES and ECOSYSTEMS

We are the guardians of New Zealand's natural heritage of indigenous species and ecosystems. But can this heritage be sustained into the 21st century? And will the resource management law come too late to prevent a new wave of plant and animal extinctions? Forest and Bird conservation officer Mark Bellingham attempts to answer these questions.

NEW ZEALAND IS UNIQUE as the world's largest and most diverse land mass where plants and animals developed without the influence of terrestrial marsupials or mammals, especially humans. Birds and insects occupied the niches and habitats that warm-blooded animals have in other lands. Moa and takahe browsed our forests and giant weta were the mice of the forest floor.

Our country was cast adrift from Gondwanaland 80 million years ago, before marsupials swept across Australia, Antarctica and South America. Some of the distinctive Gondwanaland refugees in New Zealand include kauri, the podocarp trees, kiwi, moa and tuatara. Our wattlebirds (kokako, huia and saddleback), wrens (bush wrens and rifleman) and short-tailed bat have no close affinities with other animal groups. They are New Zealand in origin and may represent local biodiversity on the old Gondwana supercontinent.

Occasional immigrants arrived; some survived and developed their own distinctive New Zealand forms. Our robins and tomtits are probably derived from the Australian scarlet robin family, but once here they radiated out into different forms. The pukeko group arrived at least twice, the earlier invasion leaving us with the takahe and the latter with the pukeko, which is closely related to the cosmopolitan purple gallinule.

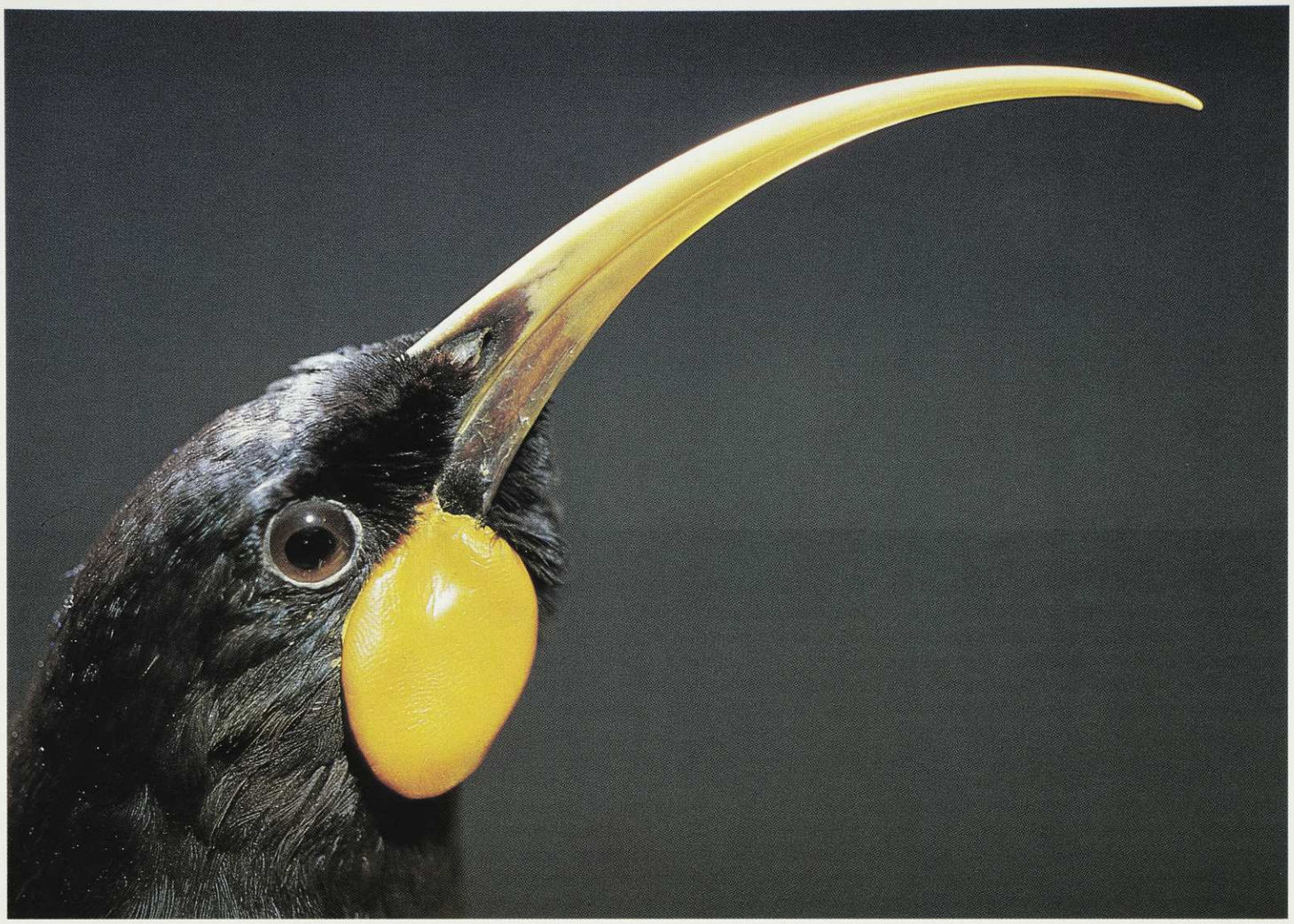
But most immigrants would have perished as New Zealand went through biota changes, as land rose and sank, sea levels changed and the climate fluctuated between sub-tropical through to sub-antarctic.

Gradual Change

New Zealand's physical environment and plants and animals have undergone considerable changes since the break off from Gondwanaland. These produced our landforms and New Zealand's indigenous life forms. Cataclysmic changes were usually local, while large scale changes, such as that from a sub-tropical to a sub-antarctic climate, took 20 million years. The gradualness of this change has allowed the surviving elements of our indigenous biota to avoid extinction.

To the first people who arrived in New Zealand from Polynesia, at least 1000 years ago, the new land had an abundance of wild food (birds, fish, shellfish, marine mammals and forest fruit), even if the climate was fairly poor for growing their traditional staple foods

The remnants of two once numerous New Zealand species which never made it into the 20th Century: the preserved skin and leg of a moa and the skull of a Haast's eagle (Harpagornis moorei). Photo: Rod Morris



The huia, one of the spectacular bird species lost in the last 100 years. Photo: Rod Morris

of taro, yam and breadfruit. These Polynesian immigrants also brought kiore and kuri (their rat and dog).

A thousand years later when Europeans arrived and colonised, New Zealand had lost 23 percent of its forests and 30 percent of its birdlife, the most notable loss being the various moa species. But with European settlement forest clearance accelerated, wetland drainage started in earnest and native animal species were exterminated at an ever-increasing pace.

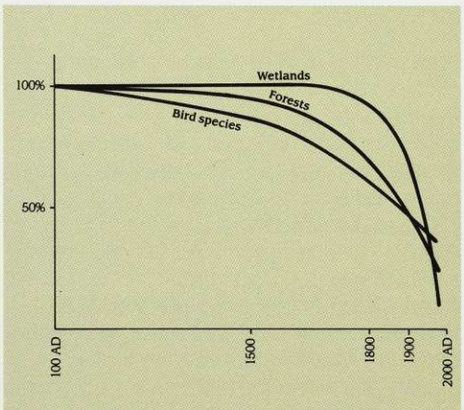
By 1900 some people were lamenting the loss of New Zealand's unique natural heritage and attempts were made to arrest the destruction. This saw the passing of laws for national parks, reserves, scenery protection, bird protection and better management of forests. But the forces of development and destruction still had their feet firmly on the accelerator, and the clearance of forests, wetlands, and tussocklands was accompanied by the continual introduction of exotic predators (rats, mustelids, hedgehog), browsers (possum, wallaby, deer, goats, rabbit, hare) and plants (*Clematis vitalba*, buddleia, marram, *Spartina*).

Conservation 1990

Despite the dramatic conservation advances of recent years, we still have the following situation:

- A land and water planning system that is biased towards development and destruction of indigenous natural values.
- No protection for the habitats of native wildlife.
- No protection for rare and endangered ecosystems.
- An unenforceable national wetlands policy.
- The destruction of New Zealand rainforests by export woodchipping driven by Japanese demand for hardwood pulp.
- An underfunded conservation sector which cannot control serious outbreaks of noxious animals (deer, thar, goat, possum) or is unable to purchase many threatened areas.

The past decade has seen some slowing down of the loss of natural ecosystems, in particular the end to forest clearance and wetland drainage incentives and an end to these activities by Government departments. But the onslaught has continued through the inadequacies of land and water planning for private land and because of the outdated attitude of the politicians, planners and engineers who keep it running.



The rate of New Zealand bird extinctions has increased in line with habitat destruction.

Resource Management Law

The new resource law could be a major breakthrough for our indigenous heritage. In its draft principles "regard must be taken of the importance of the maintenance of natural features and the effect on ecosystems, ecological processes and biological diversity." Our challenge now is to get these lofty words into national, regional and local planning systems for land, water and coastal use.

The new Heritage Order in our resource laws now gives us a chance to protect and preserve special features of our natural heritage that are threatened. But the large sums needed to compensate private landowners from destroying areas protected by such a heritage order will mean that these will only be used for small sites, which are generally insignificant to threatened native species and ecosystems.

It took conservation groups ten years to get some protection for forests, wetlands and coastal areas in the Town and Country Planning Act. We must hope the new planning system will prevent threatened species and ecosystems from being further compromised by so-called "balanced" decisions, which invariably favour development and destruction of natural heritage values.

Species and Habitat Protection

Changes to the planning system are not

A plague of possums threatens New Zealand's biodiversity as surely as logging, albeit at a slower rate. Scientists calculate that possums have destroyed 80 percent of the Southern Ruahine rata-kamahi forest. Since possum eradication on Kapiti Island, bird numbers have increased two and half times.
Photo: Rod Morris

enough. The Wildlife Act needs some urgent changes. Protected species need habitat protection and especially threatened plant species which comprise 10 percent of our higher plant flora. The Wildlife Service, Botany Division of DSIR and the Conservation Department have spent millions of taxpayers money documenting the habitats of these threatened species (and their decline). Habitat protection is needed to ensure we do not extinguish more of our natural heritage.

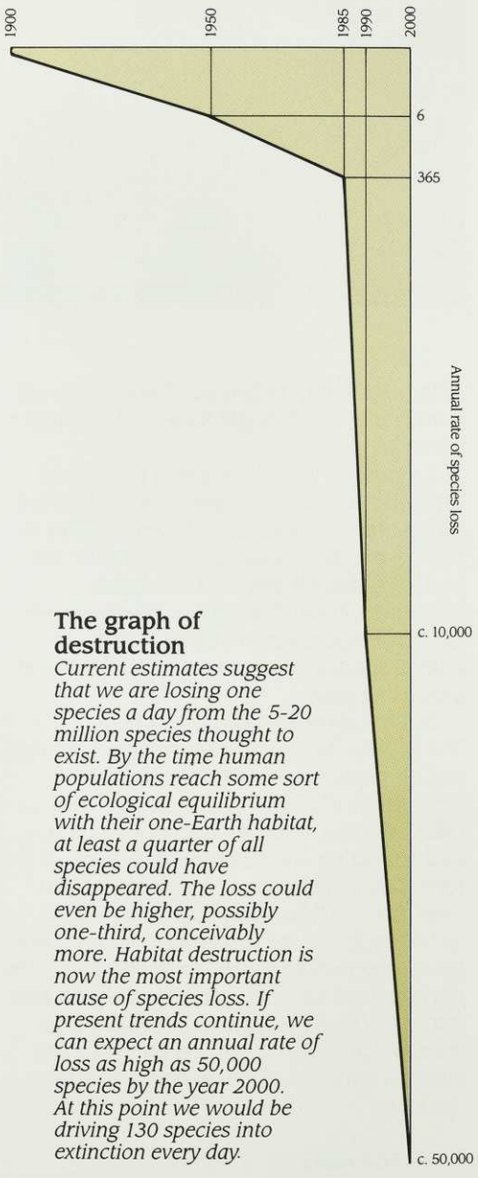
Exotic Plants and Animals

After several decades of controls on exotic animal imports, the floodgates are now being opened again, aided and abetted by the Ministry of Agriculture and Fisheries. We have seen marron crayfish and chinchilla smuggled into New Zealand, and applications to import exotic abalone, catfish, crocodiles, antelopes and many more. We can expect in the next few years a new onslaught on our natural ecosystems from exotic pests, especially on our waterways, as some of these speculative farming ventures fail and the animals are released (for example, ferret releases from failed fitch farming, see *Forest & Bird* November 1989). Goat and deer escapes (the latter into Northland forests) are further examples of a mounting problem.

This situation will be exacerbated if some New Zealand deerstalker elements and would-be game managers in officialdom are able to relax control provisions for noxious animals, such as thar and deer, and have them recognised as "game animals." This could prevent the eradication of deer and other noxious animals from threatened ecosystems in Fiordland or Northland or from islands, such as Great Barrier or D'Urville, or thar from the Southern Alps. It also ignores the fact that deer, goats, possums and other wild animals are pests which threaten New Zealand's biodiversity. Quite simply, control and, where achievable, extermination programmes, are vital to prevent some of our native species from becoming extinct or to head off unacceptable degradation of natural areas.

Hope for the Future?

In the last 150 years, one of the greatest uncontrolled experiments in natural history has occurred in New Zealand and in the process exacted a terrible toll in the rate of species and habitat loss. DSIR botanists have described the conversion of lowland New Zealand from natives to exotics as an event unparalleled in world botany.



The graph of destruction
Current estimates suggest that we are losing one species a day from the 5-20 million species thought to exist. By the time human populations reach some sort of ecological equilibrium with their one-Earth habitat, at least a quarter of all species could have disappeared. The loss could even be higher, possibly one-third, conceivably more. Habitat destruction is now the most important cause of species loss. If present trends continue, we can expect an annual rate of loss as high as 50,000 species by the year 2000. At this point we would be driving 130 species into extinction every day.

A similar toll has been wrought on native animals in those formerly indigenous ecosystems. From the few studies our scientists are carrying out (on kiwi, kaka, kokako or yellow-eyed penguin for example), we know that such ancient and unique birds are continuing to decline. Arresting that decline will take a mammoth effort and mean species will have to be managed – not an inviting thought perhaps, but if predators or possums and deer continue to menace native animals, management is the only option for many mainland species. New Zealand must reverse the trend of destruction of our species and ecosystems. We must take a deliberate step to protect our natural values and to enhance those ecosystems and natural areas that remain.

Perhaps we could give the original inhabitants of New Zealand a special 1990 celebration gift by:

- giving legal protection to threatened plants and the habitats of all threatened species.
- having binding national policy statements for the protection of native habitats, ready for when the resource management law is passed in July.
- a nationally co-ordinated and properly funded eradication and control programmes for pests such as possums and goats.
- Removal of the moratorium on commercial hunting of thar.

This would help ensure that our obligation to pass on New Zealand's treasures to future generations is observed. Our failure to do so will not be forgiven.

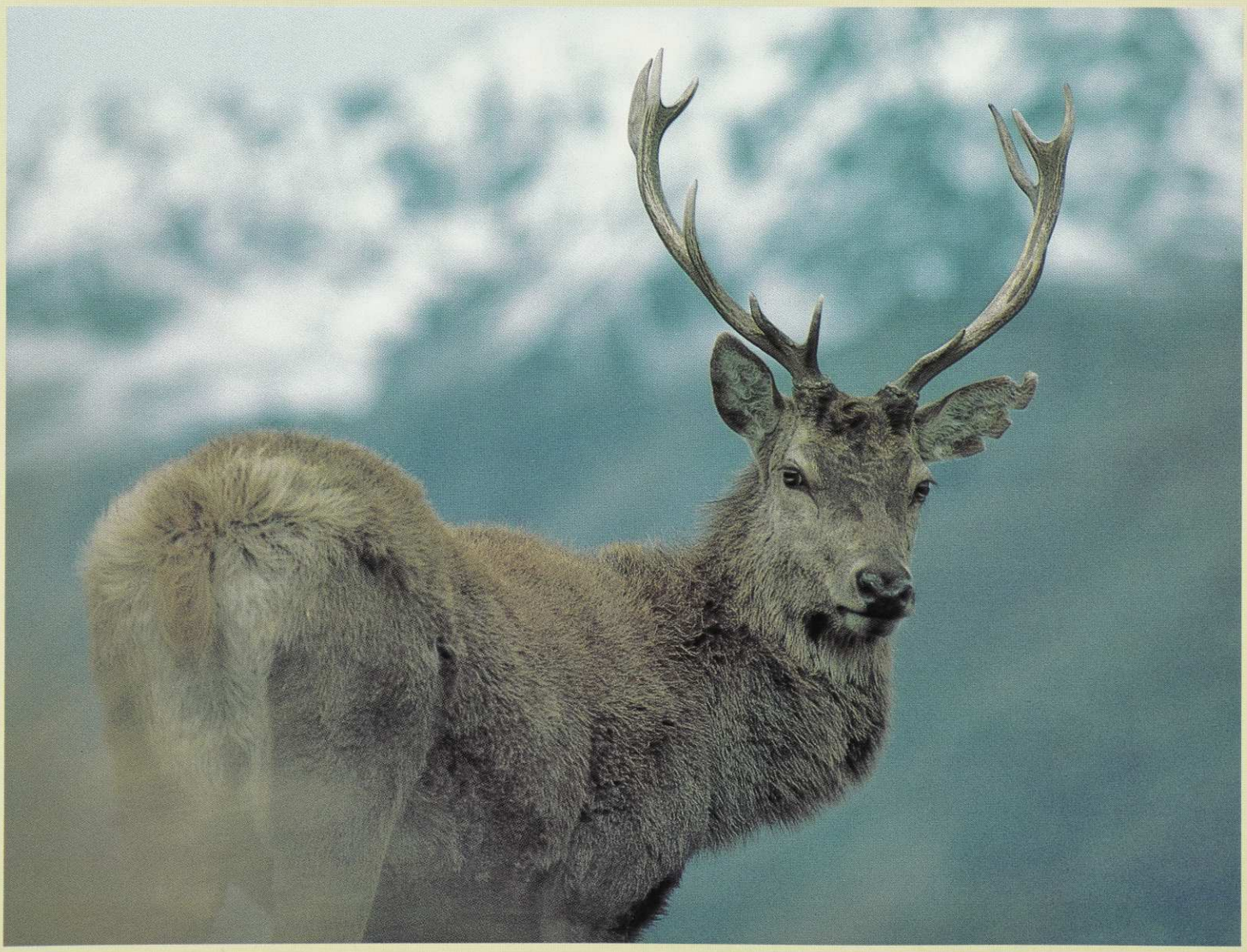
No cause for mirth: the extinct laughing owl, one of the few nocturnal bird predators New Zealand had. Photo: Rod Morris

Deer: Game or Pest?

DEER ARE A NOXIOUS PEST. Some claim they merely duplicate the browsing moa, but New Zealand's vegetation evolved with the moa and in a biologically-balanced relationship. Deer have virtually exterminated many palatable native plants from our forests. In Fiordland, for example, only two colonies of the endangered tussock *Chionchloa spiralis* remain following deer browsing.

Deer threaten our bird species too. In Pureora deer have eliminated most of the kokako food species from the lower forest tiers. In Northland's deer-free forests, kokako in Puketi feed right down to the ground as plant food species still grow in the lowest forest tiers. Kokako are found in lower densities in deer-plagued forests of Pureroa, Puketi and Rotoehu.

In Fiordland deer feed on prime takahe food plants, and by selective browsing kill off tussocks important to the takahe.



Claims that the status of deer should be upgraded from that of pests to protected game animals are hotly disputed by conservationists.

Towards ENERGY SUSTAINABILITY in New Zealand

by Bill Brander and Molly Melhuish

ENERGY IS THE LIFEBLOOD of modern society, which would collapse without a continuous supply of oil, gas, coal and electricity. It has long been recognised that our voracious appetite for finite reserves of fossil fuels would never last. The message of recent years is that the waste products of excessive energy use will place a much earlier limit on the use of fossil fuels than will resource depletion.

Fossil carbon which took up to 200 million years to accumulate is being discharged into the planet's atmosphere, which is no thicker, in proportion, than a film of dew on an apple. The buildup of carbon dioxide and other gases now threaten to destroy the very land and life support systems on which humans and many other species depend.

NZ Energy Options

We New Zealanders, although lucky to have significant hydro and geothermal resources, rely on fossil fuels for the balance of our electricity, almost all our transportation, and most of our heating requirements in commerce and industry.

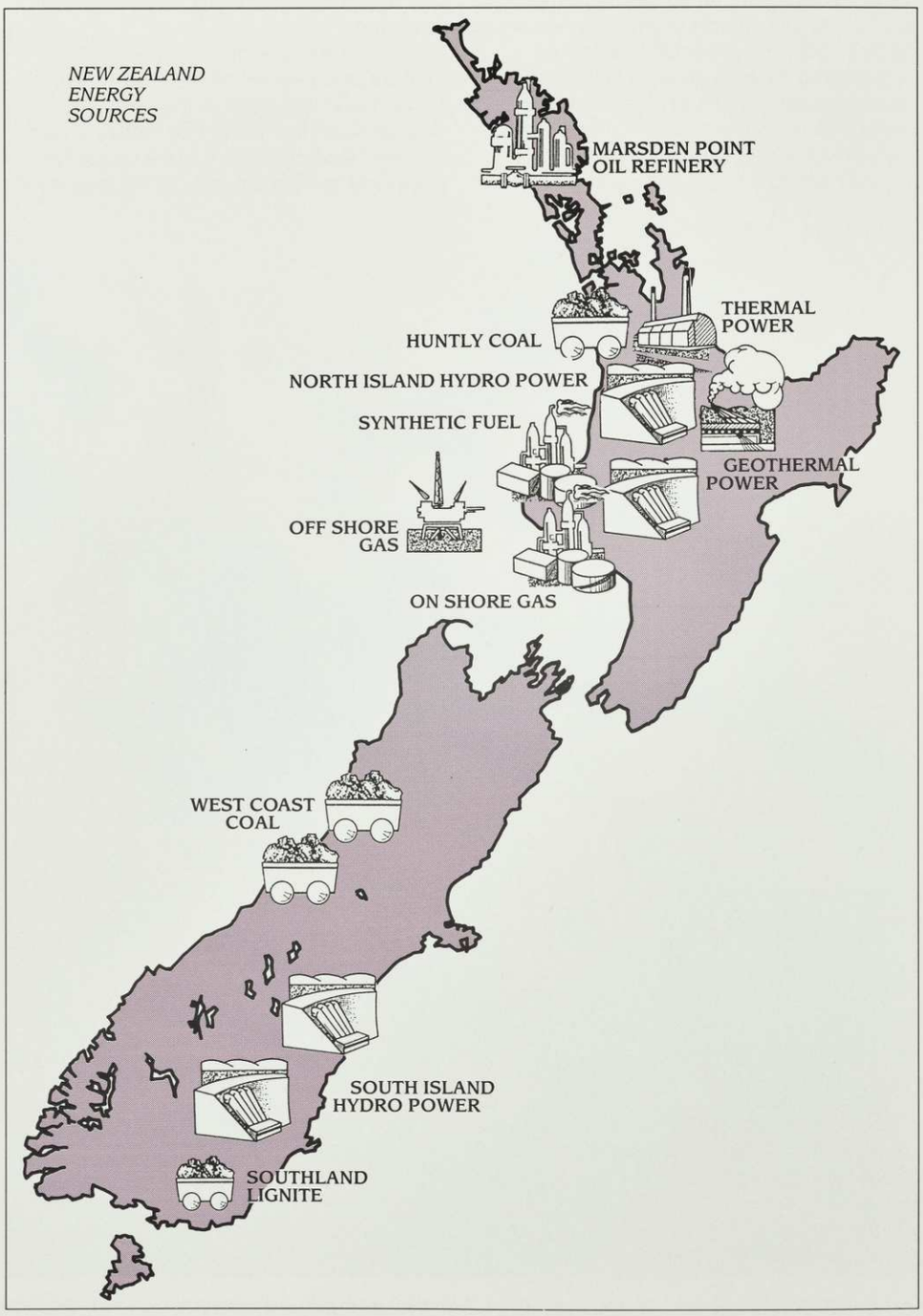
In the last 20 years New Zealand's primary energy consumption has more than doubled, and electricity generation has grown by a factor of 2.3. During this period we have become increasingly dependent on fossil fuels, particularly Maui gas. Spurred on by Electricorp's advertising, electricity consumption grew by 2.5 percent in 1988-89, compared to an average of 2.0 percent per year in the previous three years. If this trend continues unchecked, new power stations will need to be built, leading to price rises as well as adverse environmental impacts.

New Zealand is one of the few OECD countries which has continued to increase its energy intensity (that is, to use more energy to produce a dollar of Gross Domestic Product (GDP). Over 15 years our energy intensity rose 16 percent, as a result of the "think big" projects and the substitution of cheap energy for labour, while the OECD's decreased 20 percent.

We are now at a crossroad. We could take the "business as usual" path, which would lock us into unavoidable dependence on new energy projects or imports at a time when the low-cost sources are running out. North Island open cast coal would be depleted early next century. The Maui field may be depleted within 15 years under the present gas allocation regime, if the reserves are at the low end of current estimates. In a decade or two this route will lead inevitably to giant coal mines in the Waikato and possibly Southland and Taranaki. Promoters of big industry would undoubtedly renew the call to develop nuclear power.

The other path, described as the "soft path" by American energy efficiency expert Amory Lovins, is marked by different signs, blindly ignored by mining and power engineers. The signs mark the needs which energy provides – warmth, hot water, light, mobility. The path is the route of least resistance – the cheapest way to meet those needs. It recognises energy efficiency as a fuel in its own right – an alternative to new power stations, oil wells and pipelines. A fuel that reduces pollution, protects the environment from further development projects, and can generate jobs and extra disposable income wherever energy is consumed.

Such a path lengthens the lifetime of our fossil fuels, makes the most of our existing hydro electricity, and permits an orderly transition to renewable resources. The path recognises not only the social cost of damaging the environment but also the cost of denying to our descendants the fossil fuels and unpolluted atmosphere that we have enjoyed.



The future for the Southland countryside? If present rates of power consumption continue without corresponding energy efficiency or conservation measures being introduced, unsightly open cast lignite coal mines such as this may soon dot the southern landscape.

This path is not without problems. It involves valuing our resources to reflect the social costs of their use rather than pricing them at the cost of extraction. It requires energy suppliers to make difficult changes to corporate goals. Profits must be decoupled from energy sales, and sought instead from cost savings through increased efficiency. The total power tariff might be higher than before, but the customer's power bill will be less.

The focus of development must move from doing more with more to doing more with less. Although challenging, these problems are certainly more manageable than those which are likely to result from pursuing "business as usual".

The Potential For Energy Efficiency

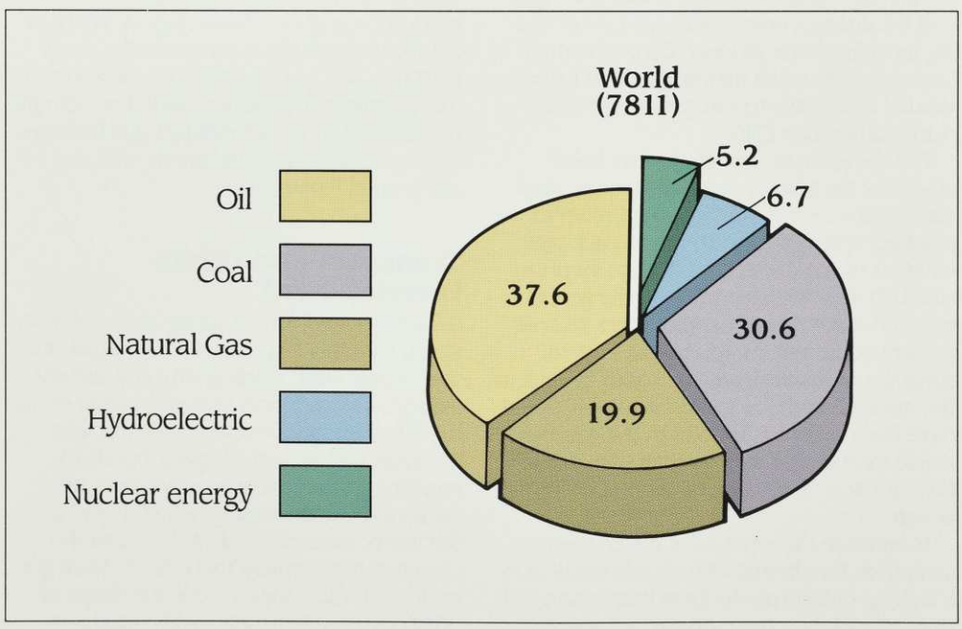
Energy efficiency is like eating a lobster, Lovins told New Zealand audiences. Almost half of it comes in large chunks; the other half in little pieces that are just as nice. Energy efficiency can be marketed, just like energy, but perhaps by different sellers. Lovins advocates that markets be set up to sell "negawatts" – watts saved because energy-efficient equipment is sold – in competition with megawatts.

Some negawatts cost less than nothing, for example long-life fluorescent light bulbs which use a quarter to a sixth the energy and last up to 12 times as long as ordinary incandescent bulbs. In commercial buildings, they save more than their capital cost by eliminating the need for frequent bulb replacements.

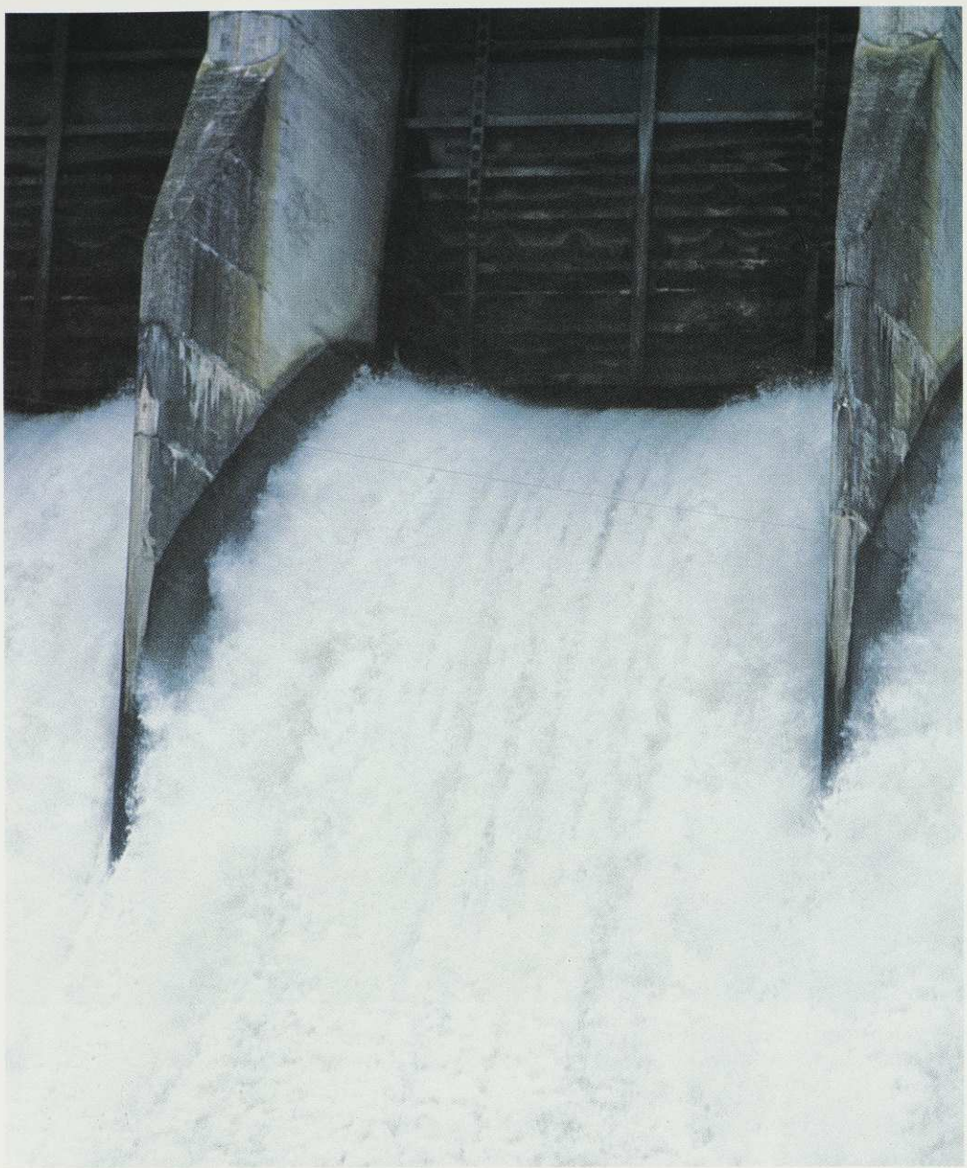
We do not yet know the full potential of the energy efficiency resource. Despite the hundreds of millions of dollars spent on exploration and assessing the megawatts available from energy resources, relatively little has been spent on assessing the "negawatts" available in our homes, offices, industries and transport. What has emerged from a few New Zealand studies and a growing base of overseas research indicates that negawatts are becoming cheaper and better every year, rather like personal computers.

Avoid Fuel Conversions

One of the best ways to improve the energy efficiency of the economy is avoid unnecessary fuel conversions. For example, using natural gas directly for space and water heating is twice as efficient as generating electricity for the same purposes. Even though gas appliances are less efficient than electrical ones, the loss of energy in generation (about two thirds) and distribution (about 10 percent) far outweighs the appliance losses.



Percentage consumption by fuel in 1987 (million tonnes oil equivalent)



Hydro power provides 80 percent of New Zealand's energy needs. While hydro is a favoured form of energy, there is also a limit to the number of dams the public is prepared to allow to damage the environment. Photo: Energy Management Group

Yet deregulation of the electricity industry has allowed several electric power boards to plan their own gas-fired power stations, at a time when we have a large oversupply of electricity.

The Motunui synthetic petrol plant costs the taxpayer $280 million to waste Maui gas. Half the energy content of the gas is lost during the conversion process. Consequently, it takes twice as much natural gas (and carbon dioxide emissions) to run cars on synthetic petrol rather than CNG.

The depletion of natural gas has been driven by the take-or-pay clause in the Maui Gas Contract which required the Crown to pay for a specified quantity of gas each year whether or not it was used. It is no surprise so much was allocated to electricity generation and synthetic petrol production (over 60 percent of our natural gas output in 1988) since they are sufficiently inefficient to deplete the resource at the required rate. But it would have been cheaper just to burn the gas to waste through the flare stack than to waste half of it at a capital cost of about 2 billion NZ dollars.

Meanwhile the removal of government incentives for alternative fuels has resulted in a halving of CNG use in three years and a halt to its provision in new service stations. All this at a time when other countries are setting up CNG programmes and drawing on New Zealand experience.

An underlying cause of this debacle is the failure to set resource charges. Prices for natural resources are based on the cost of extraction and do not reflect their long-term scarcity nor the environmental impact of their production and use. As a result, at Waihapa Petrocorp flares gas at a rate similar to our CNG use, and gas suppliers have less incentive to leakproof their pipework. For example, the Wellington Gas Company's gas leakages reached a high of 22 percent in 1982 and are still around 9 percent.

Transport and Urban Development

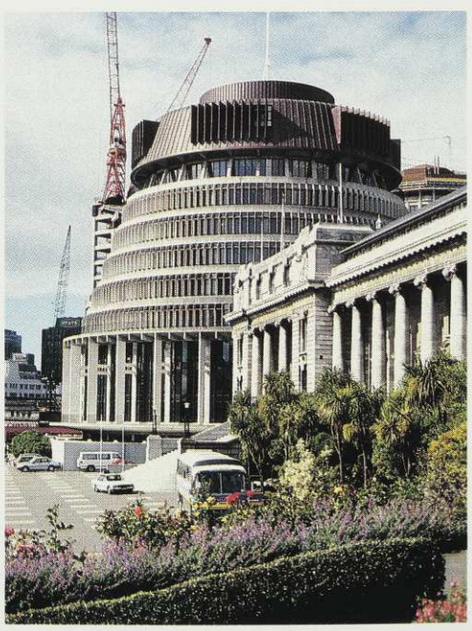
Besides avoiding unnecessary energy conversions, the other main source of "negawatts" and "negajoules" is improving end-use efficiency. Road transport uses 63 percent of our fossil fuel energy. Developing an efficient transport system is the biggest hurdle to reaching a sustainable energy future. Key issues to be addressed at national level are the use of more efficient vehicles and the choice of replacement fuels. At the local government level, issues include the shape of urban development, alternative modes of transport, and reducing the need to travel.

The structure of our cities has a profound influence on transport energy use. Recent studies have shown that cities with low petrol use have a high population density, high use of public transport, and modest road development. The differences are remarkable: in low density Houston, petrol consumption per capita is more than twice that of Toronto, six times that of London, and nearly nine times that of Tokyo. Auckland, the only New Zealand city studied so far, has twice the petrol consumption per capita of European cities but half that of typical American ones.

As our cities became flooded with traffic, transportation planning was caught on a treadmill of congestion, road building, sprawl, congestion and more road building. The resulting investment in roads and parking has entrenched cars as the dominant mode of transport. Public transport could not follow the move of urban development to the city fringe. This approach has left a legacy of unsustainable liquid fuels consumption, air pollution, excessive land use requirements, and massive public expenditure on the car and its tarsealed "habitat". It has also deprived those without cars of their access to city, town and countryside.

Local governments need to recognise it is sometimes counter-productive for alternative modes to compete with cars. Empty buses serving low density areas use more energy than the few cars they displace. But in higher density areas where a good public transport system can be made accessible to all, it is counter-productive to widen roads, erect parking buildings, and encourage cars to compete.

A positive approach by local government would foster sustainable transportation by integrating land use planning policies with public transport initiatives. One example is promoting higher residential densities close to main centres, along public transport corridors, and around interchanges.



The Beehive uses three times as much energy as efficient high rise buildings.

Every capital works decision by local and regional governments shapes the patterns of energy use in our towns and cities for decades to come. Energy use must be a priority consideration in planning new motorways, buildings, subdivisions, and business areas.

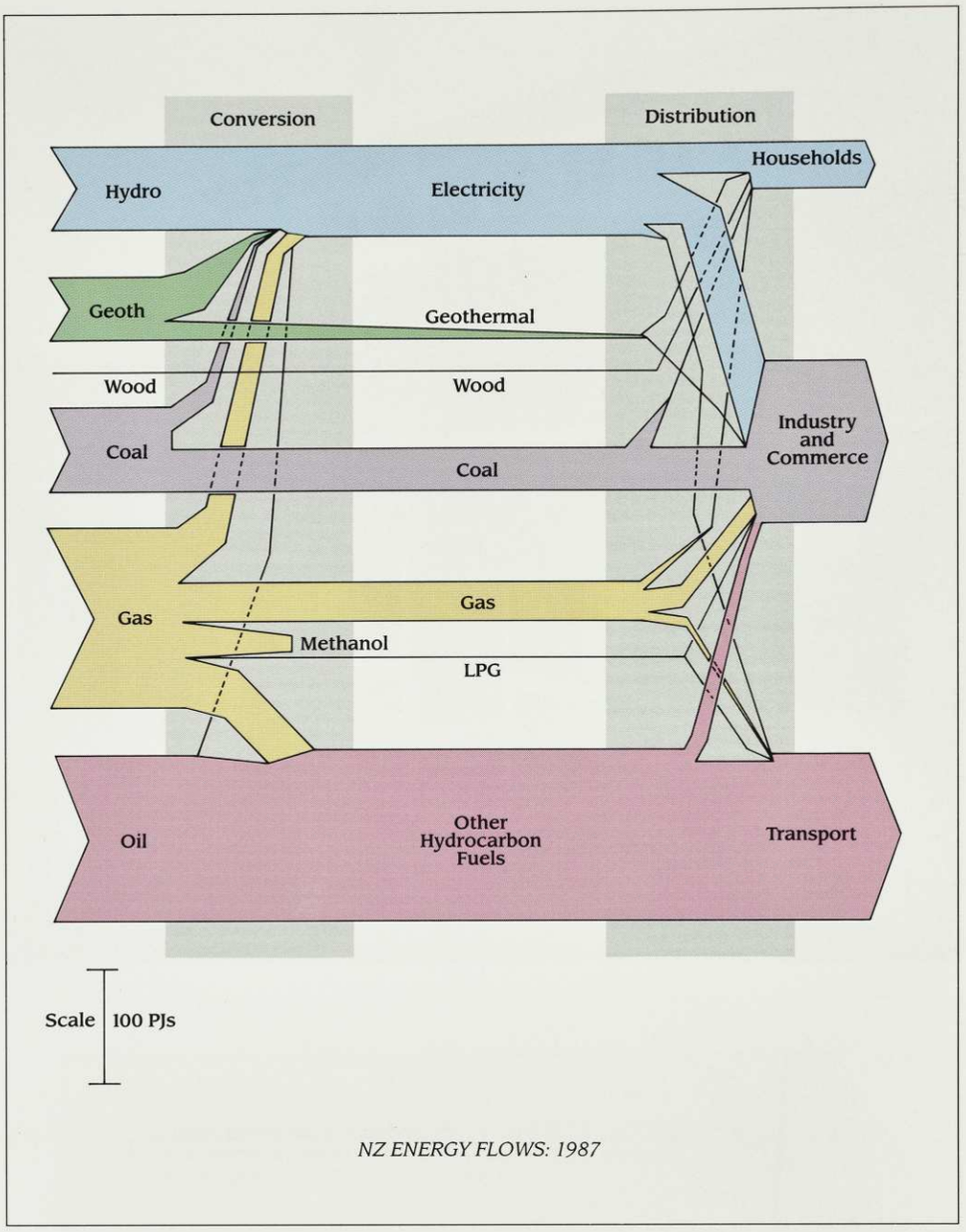
Buildings Efficiency

New Zealand cities have many commercial buildings which use three times as much energy per square metre as their more efficient counterparts. Acres of glass with no external shading ensure that, without large refrigeration and heating systems, the occupants will overheat in summer and freeze in winter. All the lights remain on regardless of occupancy and daylighting simply because one remote switch lights up an area the size of the average home. Good design can slash running costs and minimise comfort, for little or no increase in capital cost. Once built, however, many opportunities for cost-effective improvements are lost until major refurbishments.

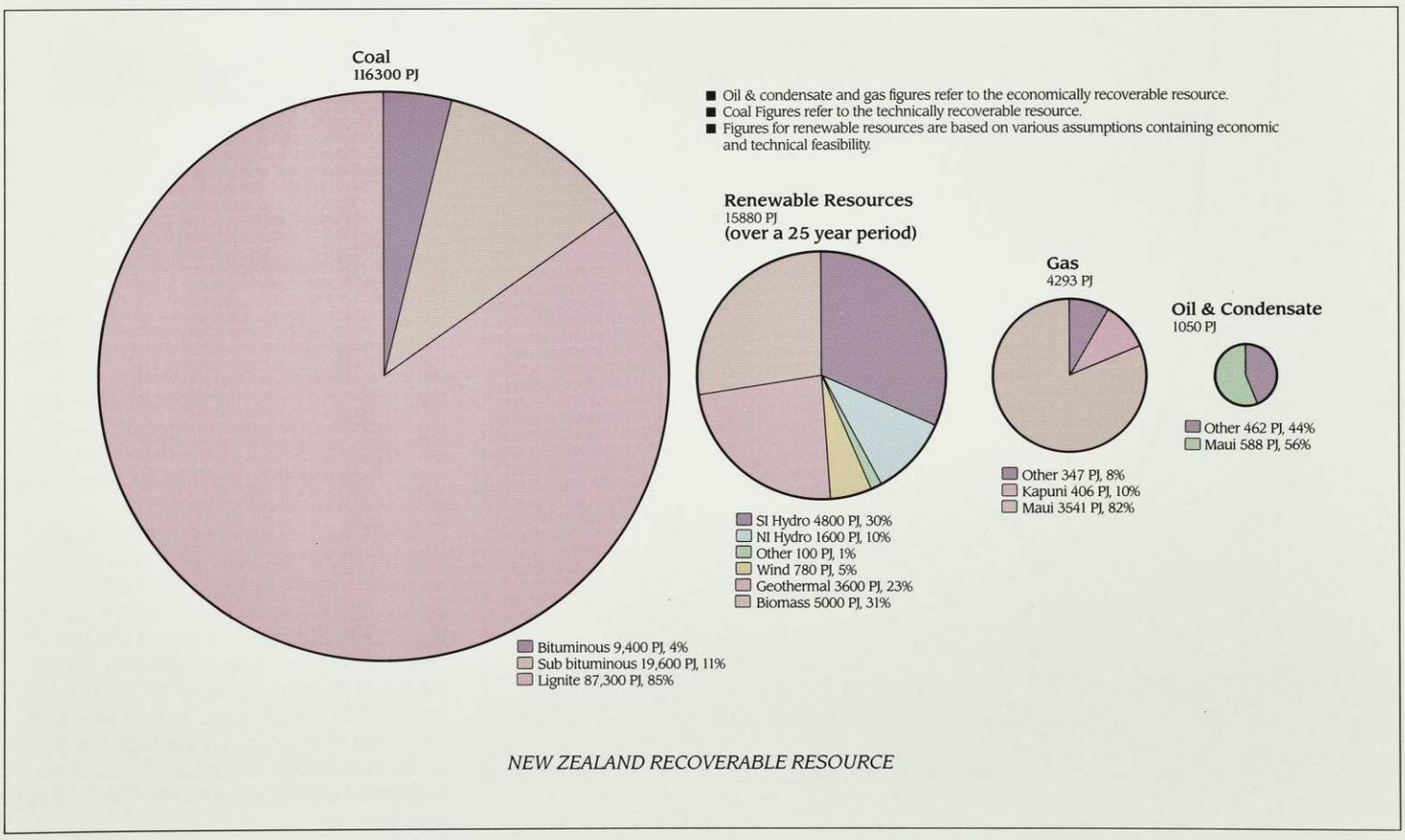
The present situation is set to deteriorate as the new uniform building code being prepared by the Building Industry Commission will not contain provisions for energy efficiency because the Commission considers resource management issues outside its terms of reference. Overseas experience shows that government needs to give direction to prevent the energy efficiency of building stock from declining, and locking a country into high running costs for the decades that the buildings stand.

Wright and Baines have estimated the economic "reserves" of conserved energy in New Zealand homes. They calculate that a number of simple electricity management measures applied throughout the country, have the economic potential to provide energy equivalent to the output of 12 power stations the size of the now scrapped Luggate dam.

New and not so new technologies offer the opportunity to slash energy use. Miniature fluorescent lamps could replace incandescent bulbs and reduce the nation's peak electricity demand. High efficiency shower heads, spray taps and hot water cylinder blankets can cut the home hot water heating bill dramatically. In homes the widespread use of these items



NZ ENERGY FLOWS: 1987



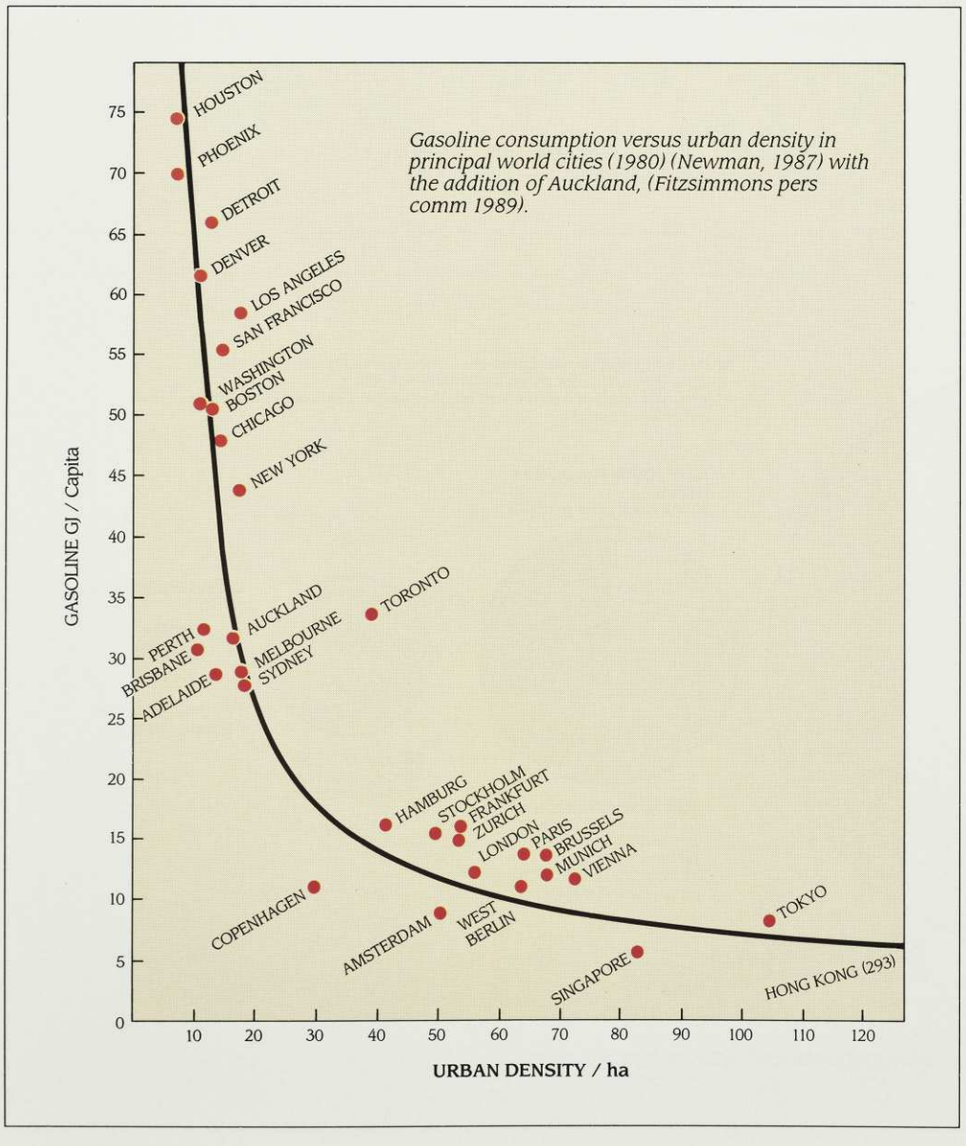
NEW ZEALAND RECOVERABLE RESOURCE

A home built for the sun, with solar panels and direct gain. It has been estimated that such simple efficiency measures in New Zealand homes would free up energy equivalent to 12 power stations the size of the scrapped Luggate dam. Photo: Energy Management Group

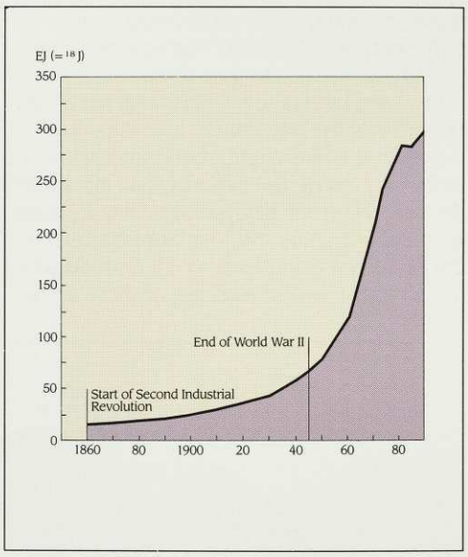
would be cheaper than building new power stations. But just try finding them in the hardware store.

Some new refrigerators use a third the electricity of others. But now that the government-labelling scheme is inoperative, we lack the information to weigh efficiency in our purchasing. Low-income householders may require paybacks of months, not years, and tenants (commercial as well as household) are seldom willing or able to invest to save on their energy bills.

Similarly in industry there are many choices available in the efficiency of equipment for raising heat and providing mechanical power. Where both heat and power are required together they can be co-generated at an efficiency of 80-90 percent rather than in inefficient centralised power stations. Scandanavian pulp mills are run this way, the operation of the mills providing virtually all power. But most businesses would require any investment in energy efficiency to pay back in 2-3 years, and many would want a 1-year payback.



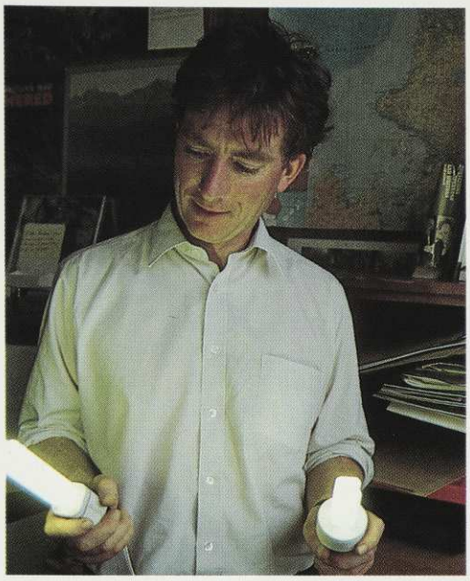
Gasoline consumption versus urban density in principal world cities (1980) (Newman, 1987) with the addition of Auckland, (Fitzsimmons pers comm 1989).



Selling Negawatts For Fun And Profit

Energy efficiency technology is now sweeping American and European markets – since 1979 the United States has obtained more than seven times as much energy from savings as from new energy supply. But most governments as well as businesses are still more interested in "corporate socialism" than in level market playing-fields.

Were it not for perverse corporate goals, energy supply companies and local supply authorities would be the organisations best able to sell energy efficiency technology. The main reasons consumers do not buy into the energy-efficiency menu are the lack of information in the market place, and the quick paybacks usually required by householders and small businesses. Energy suppliers have all the information needed, and can afford substantial capital investments with long payback periods.



Author Bill Brander with energy efficient light bulbs. The price of the bulbs at approximately $50 each is prohibitive, but would fall if there was sufficient demand.

Energy suppliers, however, are generally too impatient to pick out lobster from the menu; they go for the biggest fish (dams and coal-fired power stations) only, and eat them whole. One answer favoured by American electricity regulators is for central government to require authorities to implement all cost-effective conservation options before starting to build new power stations. In response, one company, [Southern California Edison], simply gave away efficient light bulbs and other power savings equipment, to save the administration cost of loans schemes. This was cheaper than burning fuel in existing power stations, and so saved money for both the company and the consumer.

In deregulated and supposedly competitive New Zealand, a different approach is more politically acceptable. Independent businesses can buy the cheapest conservation options and re-sell them in competition with electricity suppliers. Indeed electrical supply authorities can and should invade their rivals' territories and buy negawatts from the most wasteful users, and resell them at a profit. Gas companies could play the same game to undercut the profitability of their electricity-selling rivals.

Best of all, New Zealand's energy efficient/greenhouse abatement campaign, "Climate for Change", could fund itself by direct selling of energy-efficient equipment, thus abating fossil fuel use directly, and eating into electricity sales (and expansionist power planning) at the same time.

At the moment, such opportunities are suppressed by pricing behaviour which amounts to predatory pricing: wherever electricity sales are at risk, suppliers tend to charge high "supply charges" for connecting a consumer to the grid, and set per-kilowatt-hour charges just below those of the nearest competing fuel. Furthermore the retail shops owned by power boards do not sell the best efficiency options: recent inquiries to two such shops disclosed that one salesperson never heard of miniature fluorescent bulbs, and the other said they were not carried because "there was no demand for them".

All that may be needed is vigorous enforcement of the Commerce Act, brought about by a strong campaign backed by conservationists and small business interests alike. Heavy regulation, whether to limit carbon emissions or charge taxes to penalise such emissions, may be needed only as a last resort if competition is successfully evaded by energy suppliers.

Bill Brander is with Works Consultancy Services, specialising in energy management. Molly Melhuish has been an energy analyst for many years and is the editor of Energywatch. *Both Bill and Molly are involved with the "Climate for Change" coalition. They are also both Forest & Bird members.*

GLOBAL TRENDS IN ENERGY USE

OIL, COAL AND NATURAL GAS supply 88 percent of world fuel consumption. The use of these fuels became the burning environmental issue of the 1980s. Even without acid rain and climate change, world economic order is threatened by the imminent depletion of our oil and natural gas reserves. Coal is more abundant, but less versatile, and because of its higher carbon content makes a greater contribution to the greenhouse effect per unit of energy produced.

Most of the world's fuel consumption occurs in the developed nations. The USA alone uses 24 percent of the world's fuel. Its average per capita consumption is 50 times that of the poorest nations.

If the projected world population in 35 year's time were to have an average per capita energy use equal to the industrialised nations today, world consumption would grow to over 5 times present levels. Such a world would require the oil output of at least three new Saudi Arabias, massive increases in coal production, and hundreds of nuclear power stations the size of Huntly. Even if this growth is logistically feasible using the current mix of supply technologies, it would shatter the world economy and ecological support systems.

One may well ask whether, without massive reductions in the material wealth of the rich, there is any possibility of a better living standard for the world's poor. Fortunately there is. Instead of focusing on supply we can look at what causes our appetite for energy.

The impact on the biosphere of world energy use depends on the product of 5 equally important factors:

- World population
- The stock of material possessions per person
- The throughput of resources to maintain these possessions
- The amount of energy to produce this throughput
- The environmental impact per unit of energy used

The factors at the top of this list involve very important social decisions while those toward the bottom are very strong functions of technology.

While the world must face these decisions, use of the right technology can buy time. A number of studies have shown that per capita energy use in the industrialised countries could be more than halved without cutting living standards and using technologies which are cost-effective. At the same time the living standards in developing countries could be raised to those in Western Europe. Even with the projected world population growth, energy use in the year 2020 would be not more than 10 percent above present levels.

This is not just theoretical. Japan used 6 percent less energy in 1988 than it did in 1973 even though its GDP grew by 46 percent over the 15 years. The savings have further sharpened Japan's commercial edge. As a result of its lower energy intensity (the amount of energy to produce a dollar of GDP) Japanese exports are estimated to be 2 percent cheaper than American ones.

Clearly both the responsibility and capability for limiting climate change and slowing resource depletion lies with the developed nations. Indeed the concept of sustainable energy use is meaningless for those in the world on the edge of starvation.

Change involves action at every level. It is now in the interests of developed nations to transfer efficient technology to the developing world. These countries have a low per capita fuel consumption, but because of their low efficiency, their economies are more energy-intensive than the wealthy nations. Unless they leapfrog the energy intensive phase of development, climate change and rapid resource depletion seem inevitable. At the national level governments need to remove barriers like information and market distortions which prevent efficiency competing on equal terms with supply. Local authorities need to examine ways to make cities more accessible without reliance on massive quantities of liquid fuel. Energy institutions need to sell their customers efficiency rather than more supply. Consumers need to link their desire for a sustainable future to the goods they purchase and their own use of energy.

Delaying action could be catastrophic. The US Environmental Protection Agency estimates that, if responses to global climate change are delayed until the year 2010, then the long term global temperature rise could increase by 30-40 percent.

GARBAGE

Living in a throwaway world

By Andrea Lomdahl

One of the real limits to growth in the future will not be lack of resources, but the capacity of the environment to deal with waste in all its forms. New Zealand is now learning from the festering rubbish mountains of Europe and North America, but short term thinking still dominates our attitude to waste.

RECENTLY I MADE ONE of my regular pilgrimages to the local landfill to dispose of the household waste products which I had not been able to recycle or fit into the plastic rubbish bags the local council provides. Recycling facilities at the landfill are rather limited, consisting simply of three bins in which to put green, brown and clear glass containers. One would think that people would find this system fairly simple to follow, but I discovered when I went to recycle my bottles that the different colours of glass had been well mixed up in the bins, and all sorts of other unsavoury rotting rubbish had been thrown in as well.

I have observed on many other occasions that the valiant recycling efforts that manage to get off the ground in our society are often thwarted by ignorant behaviour of this sort. This set me thinking about the problems of dealing with the huge amounts of the waste we generate, and how one might encourage some sensible reduction in this waste quantity. It is clear firstly that we should all take a hard look at ourselves and our own wasteful habits.

Golden Rules

The four principles of dealing with rubbish should be: use less, re-use, recycle and dispose of safely – in that order.

We are all part of a disturbingly wasteful consumer society that seems determined to use the Earth's resources as fast as possible. We readily bow down to the demands of fashion, changing our clothes, car, household fittings and anything else we think might not measure up to the standards set by our neighbours. That is of course if we have the money to do so. Otherwise we simply wish we had the money to be wasteful like everyone else.

I attended the inaugural conference of the Institute of Waste Management recently, and one of the speakers, Alastair Gunn of Waikato University, said in response to a question, that in his view the meaning of life to most children was "shopping". No doubt the remark was somewhat tongue-in-cheek, but there is also a considerable amount of truth in it. On the one hand we berate the Government and local authorities for not doing enough about "The Waste Problem", and on the other hand we bring up our children in the same image of ourselves, that is as materialistic consumers.

We all think environmental problems should be solved, but preferably by others, and that gets me back to recycling. It takes a little bit of effort to separate out the brown, green and clear bottles, and obviously some people are not able to make this effort. There are also those who would deliberately thwart such initiatives by throwing in any old rubbish, and very little can be done about these people.

Everyone's Responsibility

It takes an effort to make recycling successful, and this effort must in part at least be at an individual level. Each one of us must take responsibility in some small way for the global environmental crisis, for it is simply the outcome of the collective selfishness and greed of many millions of people.

This is not to say, however, that all levels of government should not be making much more effort to promote waste reduction and reuse and ensure wastes are managed properly. Politicians are certainly raising environmental issues regularly at present as these issues are popular ones. It is to be hoped that very soon the actions on resource conservation start following the words.

One example is the report on "Packaging and the New Zealand Environment" produced recently by the Ministry for the Environment. It was generally a well-written report which outlined some useful initiatives, but it backs away from the real interventions needed to have a strong impact on the way we manage waste. It sets a target for a 20 percent reduction in solid waste volumes by

In the late 1980s the plastic milk bottle was unleashed on the public. Unhappy environmental groups in Auckland combined to form Save Our Bottles and last year vented their displeasure on the Auckland Milk Company. Photo: New Zealand Herald

1993, but it does not give any convincing ways for achieving this target.

There are very good reasons for actively encouraging waste reduction and recycling. We thereby conserve resources, promote a conservation approach, reduce pollution associated with disposal of waste, and, most importantly to some, we can save money by reducing the quantities of refuse that need to be disposed of in expensive landfills.

There are also plenty of opportunities for recycling, for example glass, plastics, paper, aluminium cans, other metals, oil, solvents, textiles. In some cases such as oil and scrap steel, government changes to cost structures have indirectly worked against recycling.

Last year 10 million litres of lead-contaminated oil was dumped or burned in New Zealand because it was supposedly more economic to buy new oil from the Middle East rather than collect it from around the country for recycling.

Deregulation of the scrap industry has been good and bad news for recycling. Good quality scrap steel is vigorously pursued and often exported, whereas unprofitable low grade steel is often neglected, although to the credit of both landfill operators and the scrap metal industry, some efforts are being made to recycle unprofitable or marginally profitable scrap steel.

Before 1983, all car batteries were New Zealand-made and recycled to recover and re-use lead. The industry was protected by special licences and by duties on imported batteries which cannot be recycled. The licences and duties have now been lifted and imported batteries have flooded into the country. In 1983, 4644 batteries were imported but this rose to 72,543 in 1988. Today few batteries are recycled – many are probably sitting in sheds, backyards or at the tip leaking lead and other toxic chemicals into the environment.

Recycling Wrongs

If the opportunities are there, and the reasons are there, what is going wrong? There are a number of successful recycling ventures, but many others have been attempted and subsequently abandoned because there was no money in it. There are a number of reasons for this, including the fact that prices do not reflect the true value of raw resources, and that true costs of landfilling are often not reflected in setting landfill charges. There are also technical difficulties in reusing many wastes, and often a lack of information and awareness about waste reduction and recycling. There are also the difficult problems of individual selfishness and laziness I have already mentioned.

A United States pilot study has shown that much more waste can be recycled than is done currently. New Zealand's waste recycling record is nothing to be proud of in comparison to Japan, for example, which recycles 50 percent of its waste.

Barry Commoner of New York's City University carried out a study to get the most out of people's garbage. He showed that you can recycle 84 percent of people's rubbish. The people involved in the study kept three different containers in their homes – one for food scraps, another for recyclable paper, cans and bottles, and a third container for non-recyclables – and the containers were picked up by trucks with separate compartments. The food scraps were taken to a composting plant, and the other products recycled.

Rubbish Mountain

In the United States, and other countries running out of landfill space, such an approach might have to be compulsory in the years to come. In 15 year's time when a New York landfill site is full, it will be the highest point on the eastern seaboard between Maine and Florida!

Even if we became a far less wasteful society there will inevitably still be wastes that will need to be landfilled. There are very good public health reasons for removing refuse away from people in a clean efficient manner and landfills should be recognised as very useful amenities.

Landfilling of refuse which cannot be reused can be regarded as a type of recycling in itself. Proper selection and management of landfill sites and proper planning for the use of completed sites can result in conversion of poor quality land (not wetlands or important shrublands!) into useful land and facilities. Former landfill sites can be used as parks and industrial land, and lead the way into the development of residential land.

It has been interesting to note that as the standard of landfill management has improved so that these facilities have been changed from dumps to landfills, the opposition to their construction has increased rather

than decreased. This is not surprising if one considers the past record of the old dumps.

Landfills require close control of leachate, litter, and fires. They must be carefully operated with good cover and tight control of the tipface, and they should be well-screened from view. Access roads to the landfill should be kept clean. There is now a new imperative on landfills for control of landfill gas. This gas can be dangerous and cause explosions, and methane, its main constituent, is a very serious contributor to the greenhouse effect. The gas can also smell and be toxic.

Most people accept the need for landfills, particularly if everything has been done to reduce and reuse the wastes prior to landfilling, but no one seems to want these facilities anywhere near them. The only way around such attitudes is for the operators of these facilities to improve their records and demonstrate to the public that the landfills can be run without causing nuisances and environmental degradation.

Hazardous Wastes

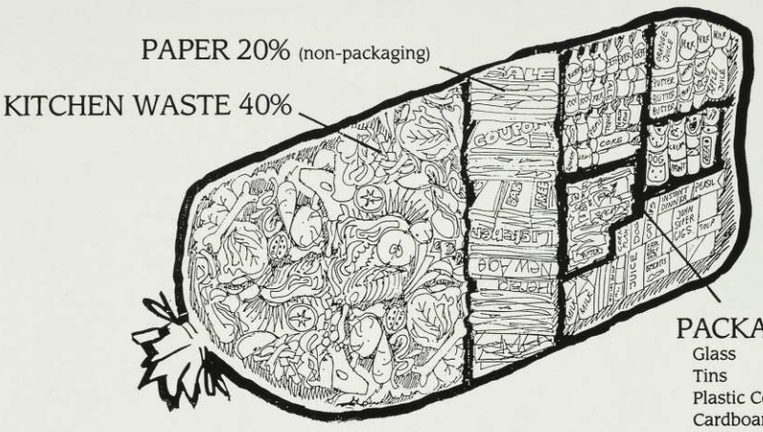
Another matter which needs urgent attention is the disposal of hazardous waste. Over the last few decades the chemical industry has thrived, producing a whole range of products which have become eagerly accepted by our consumer society. Many of these products are very useful and contribute much to our present standard of living. Many others may be of doubtful use. The production of hazardous waste is a problem that has crept up almost unsuspectingly on this thriving industry. Disposal of these wastes and the clean-up of contaminated sites are now presenting enormous and costly difficulties and much environmental degradation has occurred.

In New Zealand the amounts of hazardous waste being generated are not large, but they present some difficult disposal problems and these wastes are not generally being properly managed. The main types of industry which produce hazardous waste in New Zealand are the timber treatment, metal finishing, chemical processing, tanning, and petroleum/oil industries. These and other industries produce a wide range of wastes, including heavy metals (for example arsenic, chromium, cadmium), acids and bases, cyanides, pesticide wastes, phenols and other organic substances such as PCBs.

In Auckland the degradation of the Manukau Harbour with contaminants such as the pesticide chlordane, and contamination of sites in Penrose and Onehunga and elsewhere has focused attention on the problems of hazardous waste disposal. There are around 2500 industries in the Manukau catchment. 160 of these have been required to upgrade their work practices or facilities to prevent pollution.

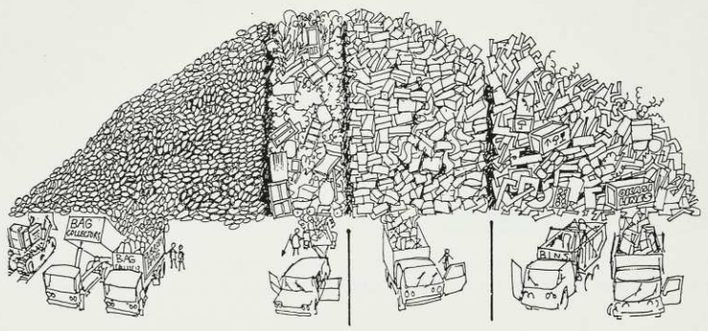
Controls to deal with hazardous waste could take the form of licensing disposal sites, a manifest system for transport of hazardous wastes to ensure such wastes do not get "lost" en route, strong penalties for unsatisfactory disposal, and an effective programme for notifying and cleaning up contaminated sites. Clear guidelines and a good advisory service are also needed. The Government has decided to set up a Hazards Control Commission to manage hazardous chemicals and other hazardous substances such as genetically modified organisms.

Inside the Domestic Rubbish Bag



Glass	25%
Tins	12%
Plastic Container	19%
Cardboard	20%
Paper/Plastic Film	24%

Stacking Up NZ's Rubbish Mountain



Source: Tong & Associates

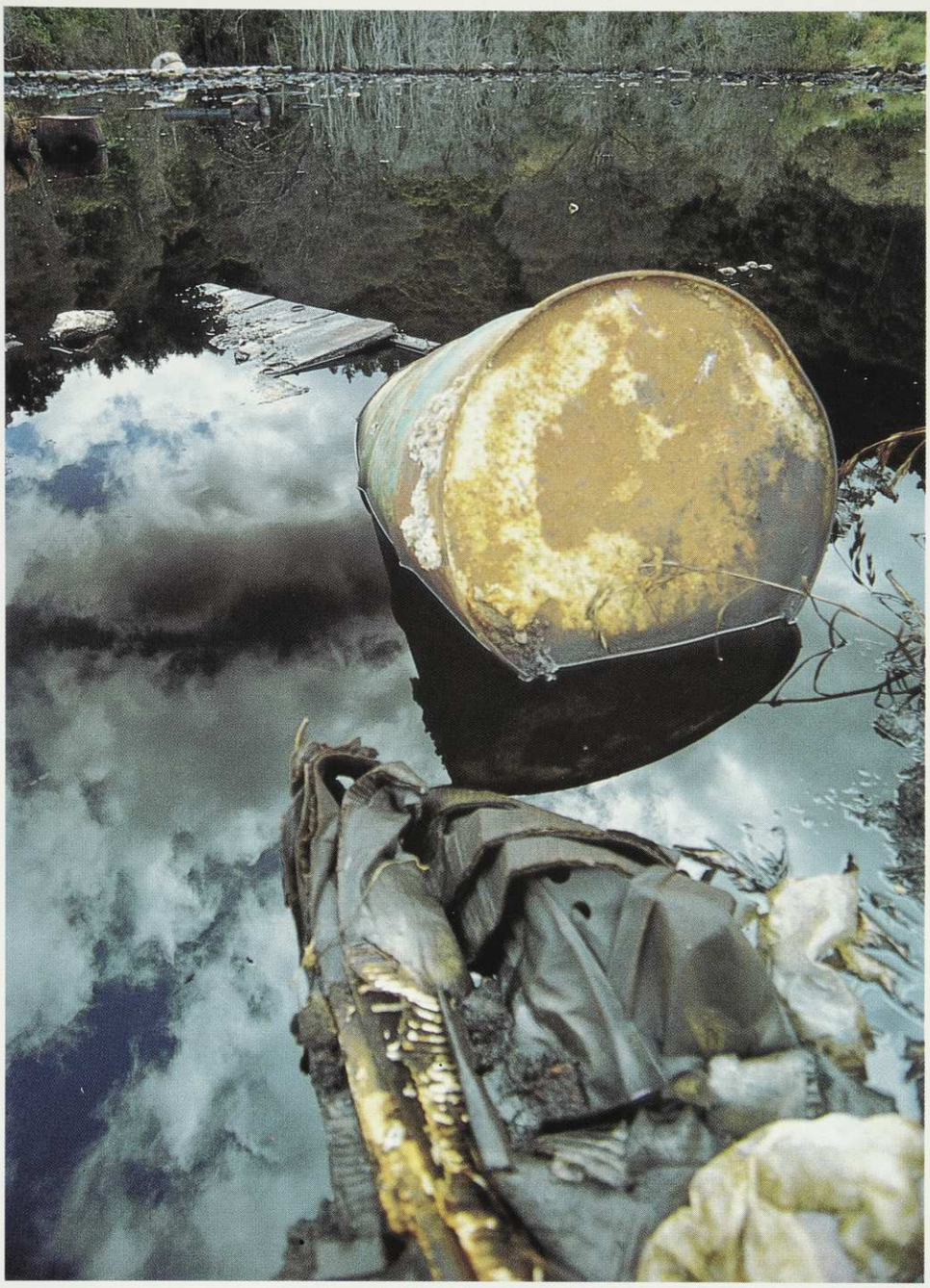
Rates of Return

MOST FOREST & BIRD MEMBERS will recall the days when they could return a soft drink bottle to the dairy and receive a refund. For many children collecting and returning bottles provided an important source of pocket money.

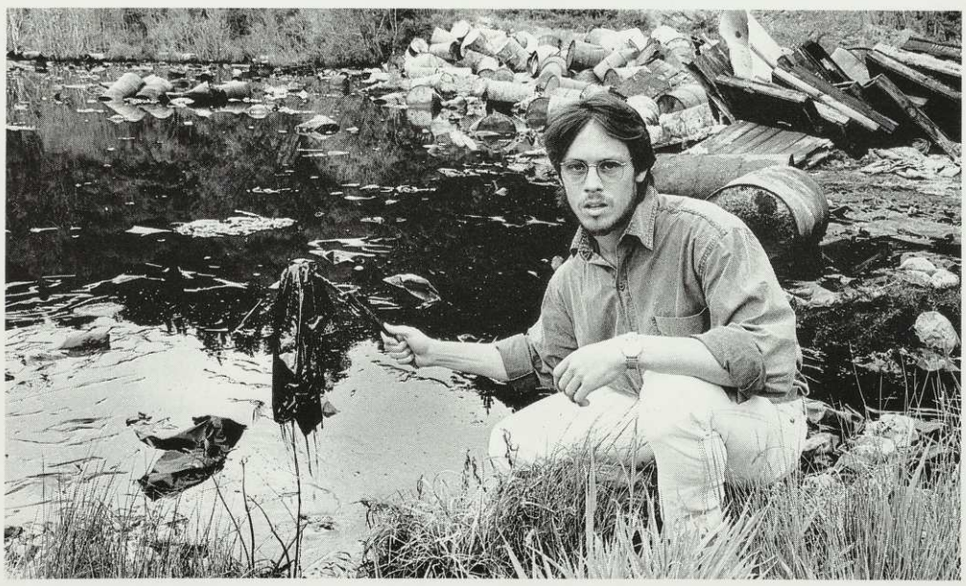
Today, thanks to government reluctance to intervene in the marketplace, such incentives are history. The Ministry for the Environment has promised to review the waste problem in December 1991 to decide whether a mandatory deposit-refund system should be started.

Meanwhile, across the Tasman, South Australia is living proof that such a system works. It has the highest beverage container recycling rate in Australia. It is also the only state with mandatory deposit-refund legislation on the books. Deposits of 5c to 10c on small containers and 20c on larger ones are refunded when the containers are returned. The result? Recycling rates of more than 85 percent for bottles and 90 percent for cans. By comparison, the return rate on cans in New Zealand is a trifling 20 percent. Figures for bottles are unobtainable.

In addition, the South Australian system appears to cater for enthusiasts of the "more market" approach. As Geoff Inglis, director of policy in the SA Department of Environment and Planning points out: "The legislation gives people an incentive to collect containers. It is a direct example of the polluter pays principle. Industry runs it and generally makes it as efficient or inefficient as it chooses."



The Lower Hutt City Council chose to dump thousands of litres of oil in its Silverstream tip because it would cost nothing. This was despite an Auckland oil refining company offering to take it – provided the council paid transport costs.



Oil and water do not mix - that's according to the Lower Hutt City Council which claims the 80,000 litres of oil recently dumped in the Silverstream tip will not find its way into the groundwater. Not necessarily so says Forest and Bird conservation officer Sean Weaver who has voiced concern over this disgraceful practice. Photo: Evening Post

Action Needed

If our ever-diminishing resources are to be conserved and serious pollution of our environment avoided, then much more satisfactory management of our waste is needed. We need firstly to look at ourselves and curb our own untidy and wasteful habits and the consumer drive which is behind such wastefulness. There must be more to life than shopping! We must then look to our political leaders to give some clear direction for sound waste management, with some practical initiatives which encourage maximum waste reduction and reuse, with environmentally sound disposal of wastes that cannot be reused.

Local authorities are in a good position to start waste reduction and recycling programmes. A catchy name for a programme that has been successfully tried overseas is the "4R Programme" – reduction, recycling, reuse, recovery. This would involve:

- Careful analysis of the waste stream to understand where reduction and reuse can be best practised.
- Careful and hard examination of ways to reduce waste.
- Identifying, publicising and promoting recycling opportunities.
- Promotion and establishment of collection systems.
- Examination of "separation at source methods", with door-to-door collection of different recyclables.
- Promotion of "waste reduction at source" in industry through such methods as better housekeeping, process modification and internal recycling.
- Provision of assistance to recycling industries.
- Setting up recycling centres.
- Establishing well-managed recycling at landfills with appropriate receptacles which are clearly marked.
- Setting up programmes in schools both for education and fundraising reasons.
- Production of a recycling handbook which is updated regularly.
- Establishment of a regional waste exchange.
- Giving awards for good waste reduction and reuse initiatives.
- Ensuring the region's local authorities and the regional authority reduce and recycle their own wastes responsibly.
- Lobbying central government to take much needed national initiatives such as the imposition of product charges, and mandatory deposits where appropriate, the provision of carefully-targeted subsidies and grants, and provision of advice and encouragement.

Only those wastes that cannot be dealt with by the 4Rs should then be sent for disposal. This disposal should be carried out in an environmentally sound fashion.

Sustainability and LOCAL GOVERNMENT

by Alan Hallett

IMAGINE A COMPANY which spends more than ICI each year, which employs more people than Postbank and whose assets are greater than Air New Zealand's – then consider the effect that a company like that would have on the economy of a single region. Imagine the influence that this company could have in promoting sustainability, if it chose to do so, just on these economic grounds. Now add to this economic weight the statutory powers of a local or regional government ...

The 'company' we have been talking about is the Wellington City Council, which by itself and through its 'subsidiaries' spends about $330 million per year, employs 3,000 people and owns assets worth $1.5 billion. If it was a company, these figures would put it as one of the top 50 in New Zealand. Admittedly it is one of the country's largest councils but nevertheless this demonstrates the role that all councils can play in working towards sustainability. The 86 local authorities created by the recent local government reorganisation will all have considerable economic and statutory powers and they could, if they wish, have a considerable effect.

The last few years have also seen their statutory powers being significantly strengthened. The present government believes very strongly that regional and local authorities should play a larger role than before and they have been given or are about to be given, several major new powers and reponsibilities as a result. The most important of these as far as sustainability is concerned is the reform of the resource management laws.

Large Role for Councils

The upshot of this will be a new law by the middle of the year which gives regional and local councils a dominant role in the management of resources. Regional councils will be responsible for management of water, soil and geothermal resources, natural hazards, pollution control and the control of hazardous substances and will be concerned with coastal management. Local councils, meanwhile, will continue with land use management through the District Scheme (or whatever replaces it), noise control and hazards mitigation and they will also be responsible for hazardous substances and air pollution control at a local level, where this is appropriate. On this basis, councils are certainly going to have a large role to play.

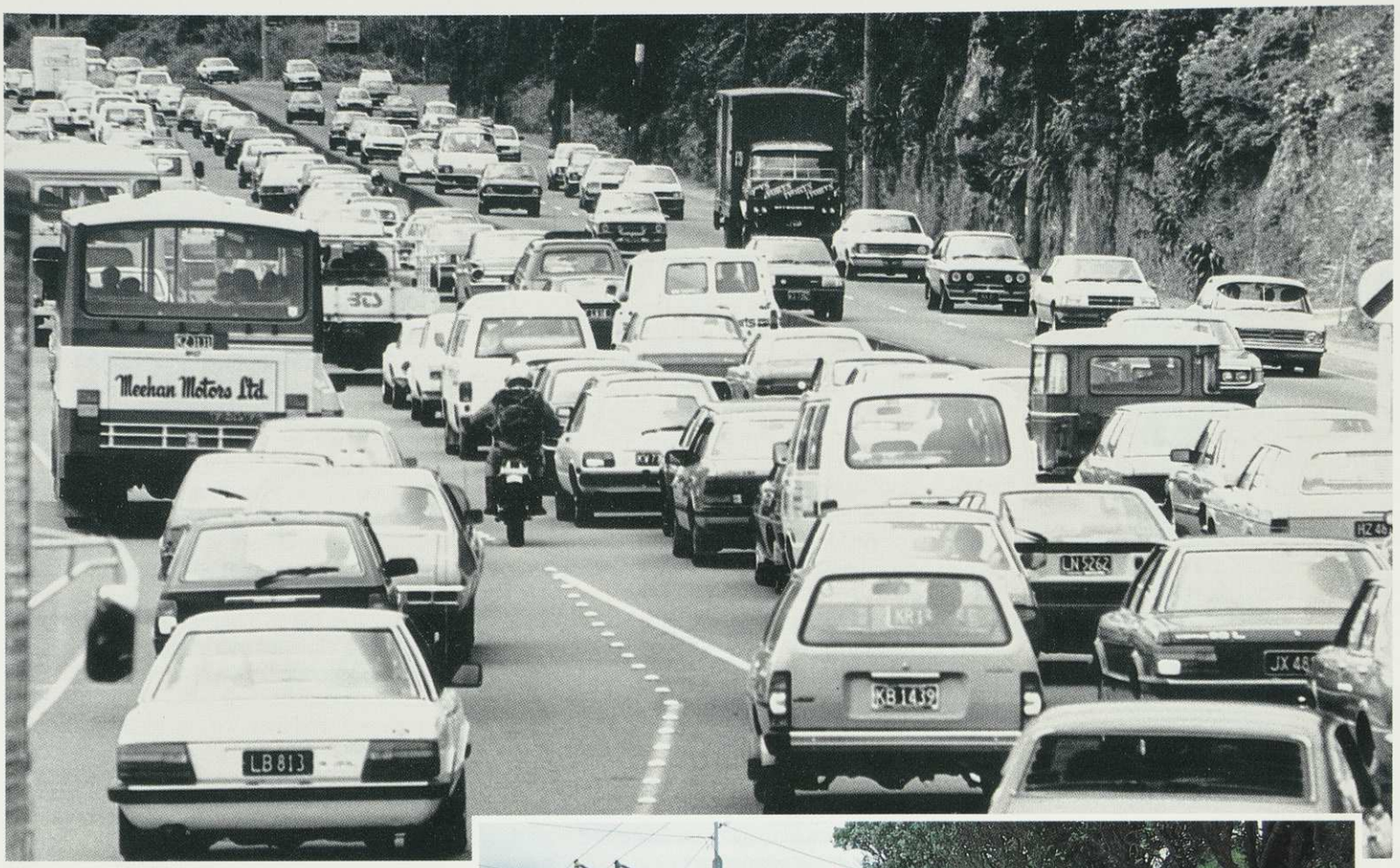
Since one of the key issues for sustainability is the question of resources and the way in which they are used, we could expect that the new law will address it – and so it proves.

Sustainability is the basic and overriding principle, but the problem is that it is likely that it will remain as just that – a principle – unless local authorities accept the responsibility to put it into effect... and most councils are under great pressures which don't allow them to.

The demands on them to promote economic growth and resource exploitation within their areas are enormous. Competition with other regions for investment employment opportunities and so on puts great pressure on them and most of them therefore feel that the first council to start down the sustainable path will therefore be at a severe disadvantage compared with the rest – so they don't. Furthermore, the people who tend to get onto councils also tend to be the people who are least likely to promote sustainability and who think nothing wrong of resource exploitation. Fortunately the recent local body elections have seen a scattering of new councillors elected who could help steer councils into new directions.

In these circumstances, it is highly probable that councils will not adopt sustainability issues seriously – and if they don't, central government will do very little to correct them. From what we know about RMLR at the moment, there will be no requirement for councils to be judged on their performance nor will there be adequate mechanisms to ensure that councils do address sustainability. In the absence of these, what will be important, as always, is the political will of the people on the councils. If it isn't there – and it seems that it might not be – our efforts to achieve sustainability are going to be hampered.

Through planning controls, local government can ensure attractive, historic buildings are retained. Public Trust Building, Wellington. Photo: Alan Hallett



Local councils have a vital role to play in issues such as transport. They can either allow commuting cars to clog up city roads or invest in energy efficient public transport.

Responsibility for Transport

Apart from RMLR, local authorities will have several other new responsibilities, in particular for regional transport. The effects of the way we use our transport are now becoming more and more well known – the transport sector uses about 30 percent of the total fuels burnt every year just to move around. If you add to this the fuels required to provide all the support services, like constructing and maintaining roads, building vehicles and making the materials they are built from, this figure rises to over 50 percent.

Not only does this represent a serious drain on the fossil fuel resources we have, it also contributes over half the carbon dioxide produced every year to the greenhouse effect and global warming. The obvious way to do something about both these problems is to promote a system in which people use their cars less, public transport more and don't travel so far – and this is where regional and local governments come in.

A new transport law has just come into operation in New Zealand which will have a profound effect on transport issues. Regional governments have again been given a large part to play and they will now control the provision of all transport facilities within a region from roads to public transport. Here again, there is a good opportunity to encourage sustainability by promoting a better public transport system instead of more facilities for private motorists.

In particular, the Regional Passenger Transport Committee, an offshoot of the regional council, will have the responsibility for deciding which public transport routes there should be, their timetables and the fare structure which will operate within the region. The question is going to be whether these committees accept the challenge of designing a public transport system that genuinely attempts to provide services that people can use as an alternative – or whether they merely bow to the existing ethos and carry on providing for cars.

In addition to their role in the planning of public transport within their region, councils will also be responsible for deciding which companies operate services. All public transport operators will have to compete for the right to operate on a route and it will be the regional council's job to decide which operators get which routes. If they chose to, there would be nothing stopping them from preferring companies which show a concern for sustainability. Again we come down to the question of political will!

However, even if a better public transport system is created, new routes and timetables that encourage people to use them don't automatically mean that people will use them. And there is still the problem of encouraging people to reduce the length and frequency of their car trips. One answer to these questions lies in planning and the District Scheme – and how local councils plan their planning.

Mixed Land Use Planning

The way that we plan our land can have a considerable impact on transport requirements. One of the keys lies in what is called mixed land-use planning. By zoning to ensure residential, shopping, employment and recreational facilities are within easy reach of each other, peoples' main needs can be satisfied within the area in which they live. They won't therefore have quite the same reasons to make long journeys as before.

Planning can also be used in other ways to promote a more sustainable use of transport. Many people don't use public transport because there isn't anything within a reasonable distance so the thing to do is plan areas

of high population density along public transport routes so more people are able to use them. Incentives could also be given to new industrial developments to ensure that they are near bus or train routes, or that they provide their own transport to them. And there are many other things that could be done to encourage the use of public services.

As operators of transport services too, local councils also have a role in ensuring that they are provided sustainably. Bus fleets powered by electricity have a far smaller effect than, say, diesel buses. CNG is another better fuel – some councils have recently been converting their bus fleets to run on it. The Auckland Regional Council, for example, has done this at a cost of about $8,000 per bus and expects both to make a profit as well as to run them more cleanly. The technology for using hydrogen made from water as a fuel is also available.

Local councils also have a significant role to play in recycling schemes. New Zealanders produce, on average, about two-thirds of a tonne of waste per year, which is then just taken away to the tip and buried – a huge waste of resources when a considerable part of it can be recycled. Glass, paper, plastic, aluminium and ferrous metals can all be recycled, if not actually used again without reprocessing, and all organic waste can be composted. Estimates of the proportion that can be reclaimed vary but more than 50 percent is probably achievable for domestic refuse and something less than this for industrial waste. This represents a very worthwhile resource which can be created without further use of raw materials.

Local councils, of course, as the bodies responsible for waste collection and operation of landfill sites themselves, can do a great deal towards the encouragement of better recycling. Very few councils in New Zealand have accepted this responsibility and, in those that have, the schemes they chose to operate have generally failed – either through a lack of commitment or a lack of planning. However, failure is not inevitable. A number of councils in Australia are operating successful long-running schemes and are even making a profit in the process.

A linked issue is the methane formed in landfill sites and sewage farms by breakdown of the organic matter dumped in them. Methane is one of the most active greenhouse gases with an effect some 30 to 40 times that of carbon dioxide, and volumes are produced every day from these sites. Some councils, in fact, have a serious problem from the sheer amount of gas that is produced, so much that there is a real danger of explosions. In the interests of safety as well as sustainability, the gas needs to be trapped.

Methane can also be burnt as a fuel – it is actually the main constituent of CNG – and we can therefore produce both energy and convert it to carbon dioxide at the same time. Although the carbon dioxide is still a greenhouse gas, it is not nearly so effective and so the demands of sustainability are satisfied on two counts. By using it as a fuel, we are able to avoid using up other, non-renewable, energy resources and also have less effect on global warming.

Several local councils in New Zealand, Christchurch for example, are already using landfill methane to power heating boilers, council vehicles and so on. Others are looking at doing so, such as Wellington with their new sewage plant, but many more could be and should be. The technology is very simple – where gas bubbles off at sewage plants and landfill sites, bores are sunk into the ground. All that is then necessary is some sort of collection and storage system and that's it – the gas can be used as and where it is needed, providing a good cost-saving as well as a resource.

This article has touched on just a few of the areas in which local and regional councils can have an impact on sustainability – there are of course many more, probably as many as there are areas in which they operate. Energy management and the promotion of energy efficiency, land restoration, recycling and waste reduction, and a number of others are all issues that councils can have an effect on. And let's not forget their economic power and the way they can use it to encourage local industry and others to adopt sustainability – perhaps by setting an example themselves!

Aesthetic Values

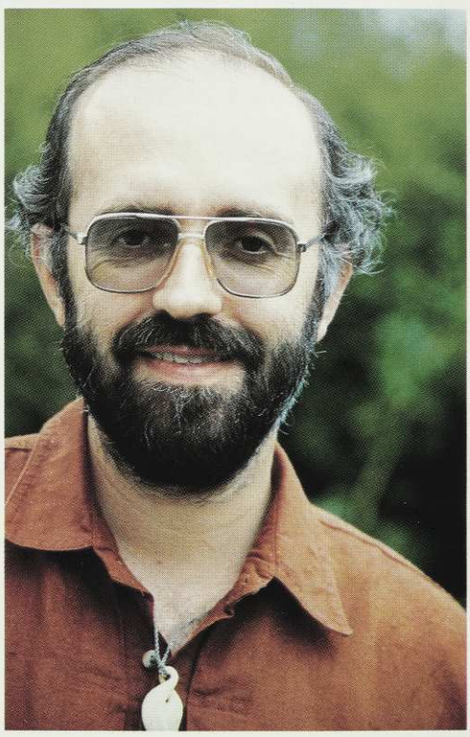
There is one area, though, that is not often considered and it has to do with the attractiveness of the cities that many of us live in. Aesthetic values are obviously less important than issues that affect the state of the earth and whether we can live on it at all. However, our personal environment is an important one if we are to stay living in cities and the centres of most of them are fast becoming deserts as far as people are concerned. A visit to the central business districts of Auckland, Wellington and Christchurch shows how little they have been treated as places for people by developers.

The Terrace in Wellington, for example, has become a sunless canyon with high-rise buildings down its entire length with very little to commend it all all. The beauty and history of buildings such as His Majesty's in Auckland have been lost – and it's still happening. Plans have been published for a redevelopment on the site of the MLC Building in Wellington, a beautiful example of a style that will soon go forever – and so the list goes on.

Some councils, of course, have recognised this and made sure that central city parks and open spaces have been kept; others have ensured that buildings are retained for their aesthetic values – Napier, for example, with its Art Deco buildings. Many others have done none of these things and we are the worse for it. Sustainability covers all our needs and the need to enjoy our surroundings is as profound as any other. Aesthetic values have a tremendous importance in our lives and if we are unable to love and feel content in our environment, we will have very little urge to do anything about the wider concerns around us.

Local and regional governments have, then, a significant power to promote sustainability – but the question is still whether they will. A quick look at the make-up of most councils, particularly regional ones, shows that they consist of mainly men, mainly older men with a history of successful business life – the "grey hair, grey suit" brigade as a friend of mine puts it – precisely the people least likely to respond to the needs of sustainability. And this is going to be a problem if we want seriously to start dealing with the problems of sustainability. Political will is the crucial question, no matter what current legislation dictates.

Local authorities have to start showing this will – and we can all play a part in persuading them to do so. Start letting them know what you expect from them; phone and write letters to your councillors and ensure that they know where your vote goes; write submissions on issues that come up; and so on. (The new RMLR Act will probably help here as it is expected to make it easier for people to propose changes to the District Scheme). Eventually councillors will start to listen, even if it's only because their votes are being threatened, and then we can really start!



Allan Hallett is a computer consultant who has been active in environmental movements in the UK and New Zealand. He helped form the Wellington Green Alternative and is behind efforts to set up a green political structure throughout the country, the success of which he believes is crucial to attaining sustainability.

Behind the FARM GATE

Farmers in New Zealand are little different from farmers elsewhere. While many subscribe to a conservation ethic, all too often their farm practices are non-sustainable. Farmers cultivate land too fragile to support crops, causing soil erosion; they irrigate wastefully, causing water tables to drop; and they readily spray their crops with pesticides and fertilisers which are injurious to health. Nigel van Dorsser takes a philosophical look at New Zealand agriculture.

Studies in Wairoa, near where this photo was taken, have shown that such slips may take up to 50 years to recover, and then they will have only 70-80 percent the productivity of uneroded land. Photo: R Blakely

RECENTLY A COLLEAGUE asked me: Can our present rate of production continue beyond our great grandchildren's time? Will the soil we use now be in as good condition if not better then? My colleague was really asking: is New Zealand agriculture sustainable? My reply was that sustainable agriculture will be achieved when conservation is integrated with production.

More than half of New Zealand's land area is used for agriculture; about 35 percent of our total land is "improved" pasture, cropping land or orchards. Combined, these account for about 70 percent of our overseas earnings.

The desire for profit and Government policies are the two forces which have mainly affected agricultural land. Over the last two decades, and especially during the Muldoon era, farmers were invited by incentives and taught by Ministry of Agriculture officials that they should increase production by whatever means were most expedient.

During these buoyant times land values soared to levels far in excess of what farmers could earn off their farms, and many farmers were able to borrow heavily at low interest rates. Non-interest bearing Land Development Encouragement Loans were handed out to farmers to cut bush and scrub from marginal areas, and often vital habitat for species such as kiwi. When combined with suspensory Livestock Incentive Loans, fertiliser subsidies and supplementary minimum prices (SMPs), the damage done to steep hill country was often critical. There was scant regard for water run off or soil conservation.

Government policies have now changed. Subsequently many farmers have gone out of business, unable to service their huge debts. We are left with a legacy of steep hill country insufficiently protected from major storms, and many farmers who have no funds to invest in soil conservation. Cropping rotations have intensified, with consequent depletion of soil structure and fertility levels.

Maximum production continues to remain the ultimate goal for most farmers: either because they are forced to in order to pay off their debts, or simply because they are still infected with the maximum production mentality. What all this adds up to is:

- The soil is perceived as something used for business, not as a living system. When farmers speak of "asset maintenance" they are not referring to the topsoil, its fertility or the stability of the agroecosytem, but rather

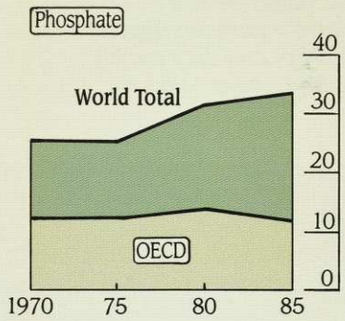
the Ford Falcon!

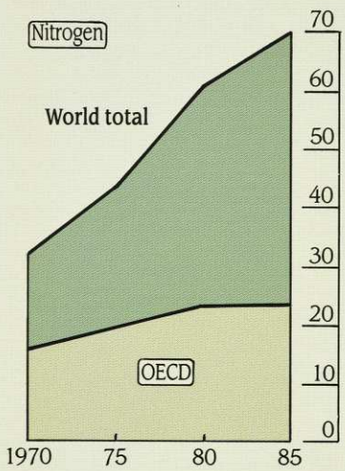
- Any area of land that does not directly generate income is often considered undesirable, even embarrassing.
- If environmental considerations stand in the way of profit, they are avoided, often despite the long term economic benefit. Examples include the loss of potassium from disposal of dairy effluent into waterways, and the loss of carbon compounds from burning crop residues.
- Much research has gone into developing technologies to combat problems which are more the fault of inappropriate land use and management. Instead of analysing the agroecosystem and questioning whether pests and disease are the result of poor nutrition, the use of mono cultures, the wrong species or stress, farmers typically look for a chemical solution. Universities and government research bodies appear to support this approach and have been the "trailing edge" in many ways, simply responding to cries for "cost effective symptom overpowering technology."

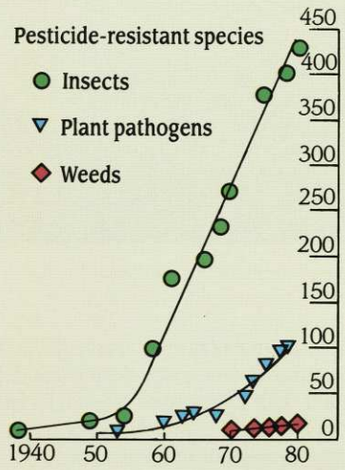
A MAF scientist wrote in 1983 "everyone knows that what any farmer is really interested in is profit per hectare." Even if that is the case, there are many ways of achieving realistic levels of profit but in an environmentally sensitive and resource conserving fashion. Some of these include not burning crop residues, avoiding soil fallowing over periods of high rainfall in order to minimise leaching losses, conserving soil by minimal cultivation, using appropriate vehicles (motorbikes rather than tractors for everyday transport, for example) and so on.

The "profit per hectare" mentality has had unfortunate side effects. Take the case of DDT. Much of New Zealand's grasslands were treated regularly with DDT during the 1950s and 60s. Now, nearly 20 years since most pastoral spraying with the chemical ceased, approximately 25 percent of New Zealand's and 40 percent of Canterbury's lamb exceeds

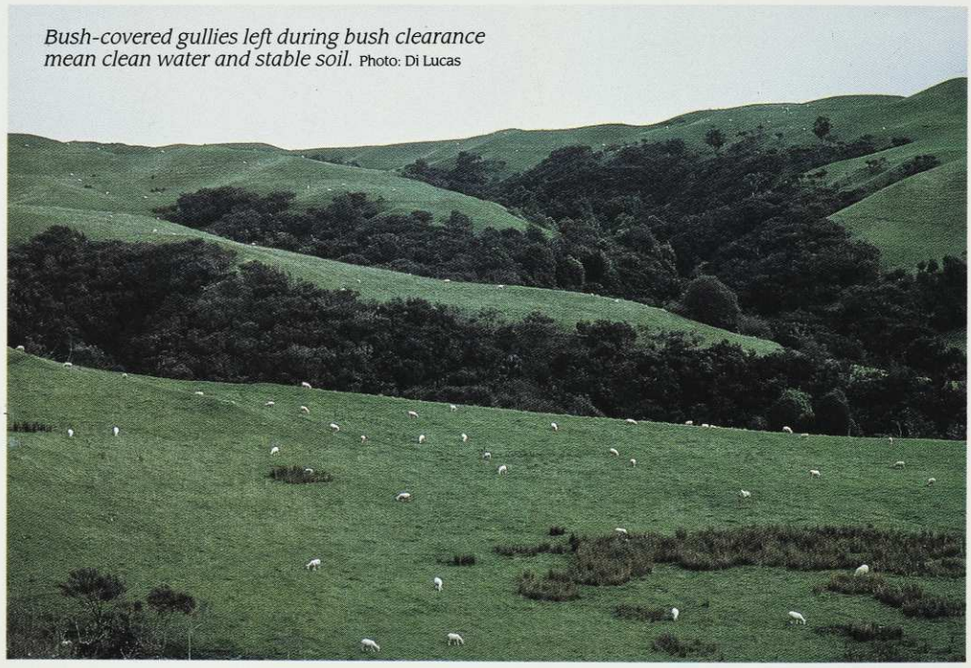
World Fertiliser Use in Tonnes

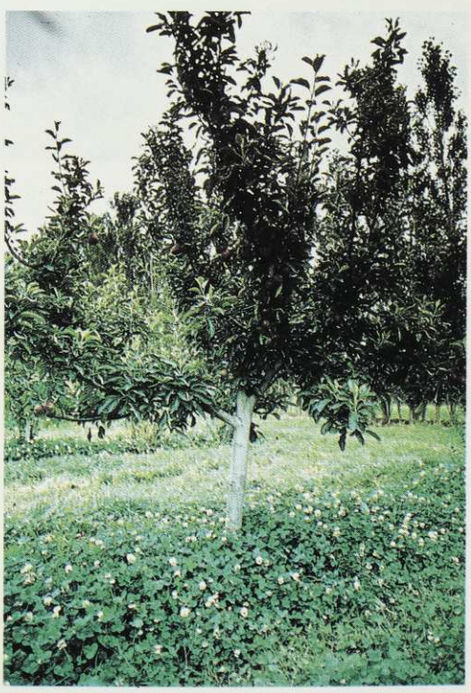






Bush-covered gullies left during bush clearance mean clean water and stable soil. Photo: Di Lucas

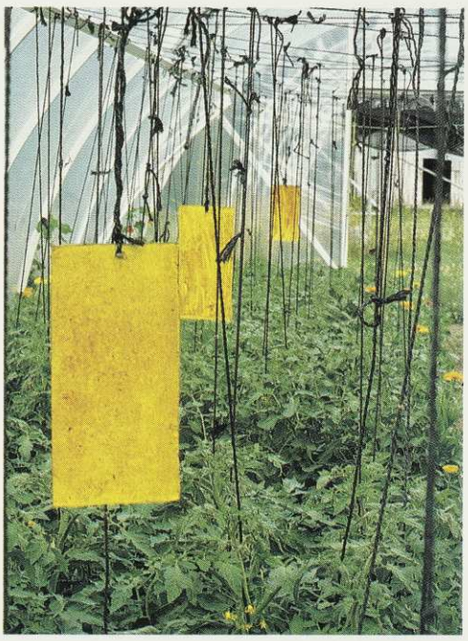




Two contrasting methods of dealing with pests: on the one hand encouraging ground cover for predatory mites and thus reducing the need for pesticides; and herbicide is sprayed under fruit trees, destroying an overwintering site for beneficial mites. Photos: Lincoln University Entomology Dept

Left: *Lessons learned too late: note the band aids in the form of exotic pine trees, applied after all native cover had been destroyed.* Photo: Di Lucas

Below Left & Right: *Working with nature: Cabbages, interplanted with dill plants to reduce aphid attack on the cabbages. Whitefly in glasshouses can be controlled with yellow sticky boards.* Photos: Lincoln University Entomology Dept.



the European Community maximum residue level for DDE (the breakdown product of DDT).

New Zealanders are rightly proud of their record as efficient food and fibre producers, but claims that New Zealand is "clean and green" and our produce fresh and natural are to a degree unfounded. On average 3,500 tonnes of pesticides per year are used in this country. A large proportion of these pesticides are applied to comply with the requirements of overseas consumers, who are more interested with the way that food looks, rather than how healthy it is.

Growers often must follow spray schedules supplied by producer boards which have a monopoly over exports, protected by law. Failure to spray might mean crops are rejected for export. The other side of the coin is that produce with spray residues above the importing country's maximum residue levels is also turned away.

The Ministry for the Environment's recent pesticides report concluded that, given New Zealand's levels of pesticide use, problems such as residues in domestic food, groundwater and soil contamination, spray drift and pest resistance were inevitable.

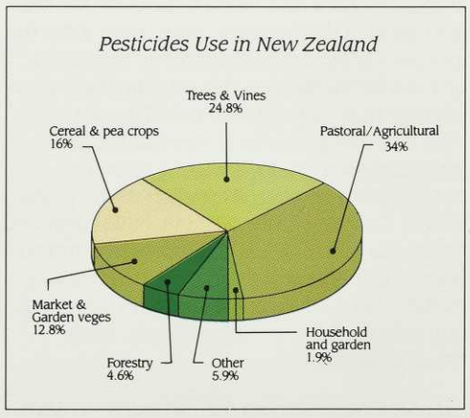
Every year around the world up to 20,000 people die from pesticide poisoning, almost all of them in developing countries, while a further 1 million suffer seriously.

Perhaps up until now most conservationists have been content to see conservation in terms of setting aside areas of bush and not bothered themselves with what goes on behind the farm gate.

Such attitudes are changing fast. It is inevitable that the green consumer tide sweeping around the world will soon wash up on New Zealand's shores. Farmers will not change unless consumers start to demand organic produce, and once supermarkets see there is money in selling food with a Biogro or Demeter label on it, they will help accelerate the trend.

Commercial agriculture is a legitimate land use essential for the well being of urban New Zealanders. But until the community recognises that agriculture must be sustainable to be viable, it will not have a guaranteed future.

Nigel van Dorsser is a self-employed agricultural consultant from Christchurch, integrating soil, plant and animal nutrition. He is also an organic farm inspector.



FOREST & BIRD INTERVIEW

Lady Peg Fleming

The late Sir Charles Fleming and Lady Peg Fleming. Photo: Chris McLean

Last year, the Royal Forest and Bird Protection Society was awarded the inaugural Charles Fleming Award for environmental work. This award, a medal, handed out by the Royal Society of New Zealand, commemorates the achievements of scientist and conservationist, Sir Charles Fleming, who died in 1987. Forest and Bird's Education and Extension Officer Andrea Lomdahl talks to Lady Peg Fleming about her husband and how he would have felt about Forest and Bird being the first recipient of this award.

Andrea Lomdahl: Sir Charles was one of NZ's first conservation knights and his leadership inspired a generation of conservationists. Forest and Bird is greatly honoured to receive this award. Do we deserve it?

Peg Fleming: Yes, you do deserve it. I know that Charles would have been very pleased that the Royal Society awarded Forest and Bird this medal. In the early days Forest and Bird had a big membership but its attraction was the weekend outings and summer camps it arranged and the journal. It had no political clout. Charles couldn't bear that, knowing that New Zealand needed dedicated people with knowledge of its extremely important flora and fauna to fight for the preservation of their environment. Here were the people. He became a member of the executive and from then on the structure began to change quite rapidly until now Forest and Bird has become a very important environmental action group, speaking with the backing of a large cross section of the population. Charles would certainly have approved of the way the Society has diversified into so many new issues. Not only are they fighting to save our native forests, but they are speaking out on all conservation fronts, even marine resources.

AL: Sir Charles began the campaign to save the Mamaku kokako forests with his *Listener* editorial "Mammon on the Mamaku". What are your thoughts and how would Sir Charles have felt about the Tasman Accord which now protects the remaining Mamaku forest for the kokako?

PF: I feel as though the Tasman Accord is like a memorial to Charles. When he was young he used to go for holidays to Rotorua with his family. He used to take his push bike and ride up into the bush to enjoy the robins and other bush birds. That was when he developed his great love for the Mamakus.

Later he got to know a group of local farmers and Catchment Board chaps who used to write to him and let him know what was going on behind the screen of native bush along the roadsides, showing their great concern. Charles and I had shares in Forest Products, inherited from our fathers who bought shares in this new company after the slump of the early thirties. It was hoped it would help New Zealand industry and bring work to the unemployed. Together with other shareholders from this group of Hauraki Plains men he wrote to the company to tell them we were concerned their clearfelling operations were ignoring soil and water conservation values and that there was a need for native forest reserves. The water coming out of those streams where logging was taking place was full of silt and destroying river life. The day the Accord was signed, Conservation Minister Philip Woollaston unveiled a memorial to Charles at Waimeha Lagoon, Waikanae. I think he purposely planned the two events to happen on the same day, knowing how important the Mamakus were to him. Charles would have been so pleased.

AL: How did Sir Charles develop his love of nature and interest in science and conservation?

PF: It started when he was very young. Neither of his parents was involved in science but they gave him a lot of encouragement. Each summer his family spent time at Takapuna Beach, Auckland where he collected shells on the reef. It was there he developed his interest in marine biology. On his eighth birthday his parents gave him the book he had asked for – Suter's *Manual of New Zealand Mollusca.*

Charles went to King's Primary School and there was one teacher there who used to take the boys to the reefs near Auckland. He noticed that Charles had a special interest in conchology and one day asked a friend, Dr A W B Powell, conchologist at the Auckland War memorial Museum, to come along on one of these trips. Charles vanished away from the main group, that was typical of him when he was young; he used to vanish and do his own thing. When he came he came back, he'd found a nudibranch, which Dr Powell was keen to have when he realised that it was a new species. Charles had quite enough knowledge at the Primary School age to know that he had made a new discovery and he wasn't going to give it up. That was when Powell recognised Charles' special talent. From them on Charles became involved in Powell's Shell Club at the Museum and here he met Bob Falla (Later Sir Robert) another man who was to shape his future life.

Powell took Charles to the Chatham Islands and the Waverley on the West Coast on shell collection expeditions and at 17 he was invited to join the "Will Watch" expedition to the Three Kings and other islands with Dr Powell, Dr Falla, geologist Professor J A Bartrum and Graham Turbott, Geoff Baylis and others. This expedition, in the first term of Charles 7th form year at Kings College, made him determined to leave school and go to University. He finally got his own way.

At varsity we did the same subjects, zoology, botany, geology and chemistry, but Charles had a BA degree as well. I had had ambitions to be a PhysEd teacher, but Charles soon changed that. The expeditions and trips we did were far more interesting and after my first year of a BA degree I changed to science and completed my BSc the same year as he did.

Scientific research was always Charles' greatest joy and his interests were exceptionally broad but when he saw his precious Mamaku forest being clearfelled and replaced with *Pinus radiata* he realised that he must put a lot more of his energy into conservation.

AL: Did Sir Charles realise his effect on up and coming conservationists?

PF: I think he was amazed at the number of young people he influenced. He never expected to do so but was relieved and pleased when he found some young people getting behind him and that was terrific because Charles often was fighting battles on his own, a lone voice crying in the wilderness. When the Native Forest Action Council came into action, Charles supported them in every way he could, especially he tried to guide them. The Environmental Defence Society followed them, and many other conservation organisations now under the umbrella of ECO came on the NZ scene. Charles' correspondence became terrific as he tried to give help and advice to all who sought it.

I think I was the optimist and Charles the realist. He understood issues and tried to guide everything in the right direction. He was a very shy person and it used to be a strain for him to get up and speak in public. It used to cost him a lot of sleep and worry yet he always rose to the occasion. Many people thought that the heart attack he had about 20 years ago was a result of the fight over Manapouri. He felt things very intensely and the sight of Lake Monowai nearby filled him with horror.

Well, to return to the mention of the Memorial at the Waimeha Lagoon. The brass plate on the lovely greywacke boulder reads "In appreciation of the contribution made by the late Sir Charles Fleming to the Waikanae Community." A very touching tribute from a small community much loved by our family. The lagoon where the memorial stands is now a Wildlife Reserve. Here Forest and Bird has erected a "hide" which is enjoyed by everyone, even the swallows. Many young families visit it regularly to see the ducks, swans, shags and dabchicks. It is serving an important educational function. Charles worked to save this lagoon and wetland area from being drained and filled for beach housing. Another of his concerns was the estuary at the Waikanae river mouth, the main spawning ground for the fish of the coast. After a battle with developers who thought they could control the river mouth to low water mark, the main part of the estuary was designated a Scientific Reserve now under the management of DoC.

Forest and Bird President Dr Alan Mark receives the Royal Society's inaugural award for environmental work - the Sir Charles Fleming medal - from Royal Society secretary Dr Graeme Stevens. Photo: Otago Daily Times

AL: What are your memories of Sir Charles' public statements on conservation?

PF: I think one of Charles' most powerful speeches was at the 1985 Environmental Forum. He felt so strongly about the need for a really good Department of Conservation. Towards the end of the meeting he rose to speak. Many present will remember. The subject was the scatter of isolated "green dots" (groups working on conservation) through the existing departments of government and the proposal to being them all together in one nature conservancy or Department of Conservation. Charles' final plea to the Environmental Forum was – "If Government could form this big green dot then this little green dot will die happy."

Three daughters and six grandchildren along with me have been influenced by his thoughts – as our oldest daughter puts it – "Life in the Fleming family fostered a deep love of the outdoors; birds, trees, lakes and hills of New Zealand and a lifelong dedication to conservation and wildlife preservation."

CHIONOCHLOA SPIRALIS

Fiordland's Forgotten Tussock

by Bill Lee and Roger Lavers

The bluffs overlooking Takahe Valley in the eastern Murchison mountains support a plant species that is as rare and threatened as the more familiar takahe which lives in the adjoining alpine grasslands. Both species are listed as "endangered" in the IUCN Red Data Book for New Zealand but to date the tall snowgrass* Chionochloa spiralis *has received little of the attention given to its famous neighbour. Bill Lee and Roger Lavers highlight the importance of this neglected and vulnerable species in Fiordland National Park.

CHIONOCHLOA SPIRALIS, so named because of the characteristic spiral curling of the dry, old attached leaf sheaths, was first collected from Takahe Valley in 1955 by Ken Miers while he was studying the newly rediscovered takahe. Some five years later, Margaret Bulfin collected the tussock at the "Head of Lake Monk Valley" in the Cameron Mountains in southern Fiordland, and it was these specimens that were used in the formal description of the new species by Victor Zotov in 1963. For the next two decades no new sites were discovered, and only one field collection was made, in 1974, from plants in Takahe Valley, for biochemical analyses of leaf waxes. These three collections of *Chionochloa spiralis* are the only ones known, and all are in the Botany Division, DSIR Plant Herbarium, at Lincoln.

However, recently, one of us (Roger Lavers) discovered plants of *Chionochloa spiralis* growing at the entrance to one of the Luxmore caves, on the basin below Mount Luxmore. This new site, and an examination of the plants in Takahe Valley, have provided more detailed information on the species' ecology.

Chionochloa spiralis is an erect, tall tussock grass with sharp, richly-green, narrow, drooping leaves up to a metre long. Its most distinctive feature is the old leaf bases which fracture to produce a pile of chaff at the foot of the tussock. In wet conditions the leaf bases appear little different from most other tussock grasses, but when dry, they become tightly curled, forming a frizzy mat around the emergent leaves.

In the Murchison Mountains, *Chionochloa spiralis* is restricted to narrow ledges on bluffs in the subalpine beech forest that border the Point Burn and Takahe Valleys. These bluffs are formed of limestone that was deposited 30 million years ago in the Upper Oligocene. The tussock occurs as either scattered plants or in clusters of several plants, that grow on a rich, black, friable soil with a pH around 7. Chemical analyses of plants collected in the field show extremely high concentrations of calcium in both seeds and leaves.

Little is known about the soil conditions at the Lake Monk site. However, it is possible that *C. spiralis* is growing on calcareous soils there, since the plants were collected from rocky outcrops, and units of thinly bedded, metamorphosed, impure limestone and marl are found in the area, surrounded by the more widespread granite and other igneous rocks of the region. Although of greater antiquity (320 million years – Lower Paleozoic) than the limestone further north on Mount Luxmore and in the Murchison Mountains, these rocks could also produce highly calcareous soils.

At present we suspect that *Chionochloa spiralis* is the only plant species restricted to calcareous soils in eastern Fiordland, and together with *Celmisia inaccessa*, may represent the full calciole (limestone-loving) flora in Fiordland. Why *Chionochloa spiralis* should have a strong association with these soils is unknown, although it is unlikely that it has a special requirement for some feature of calcareous soils as it will grow in garden loam. It is probable that *Chionochloa spiralis* is unable to compete with the fast growing tussock species which grow on other fertile soils in Fiordland.

While it is possible that *Chionochloa spiralis* will be discovered at other localities in eastern Fiordland on calcareous soil, it is unlikely that it will be widespread. Tertiary limestone outcrops within the altitudinal range of *Chionochloa spiralis*, occur intermittently for around 80 km from the Kaherekoau Range in the south to the Murchison Mountains in the north, with sizable bluffs on Mount Titiroa and Mount Luxmore. The extent of the Paleozoic calc-sediments is far greater, and offers the possibility of as yet undiscovered populations of *Chionochloa spiralis* in areas west of the Cameron Mountains in southern Fiordland.

Fiordland is a major centre for *Chionochloa* snowgrasses, having over half the 20 currently described species, and with four species largely restricted to the region (*Chionochloa spiralis, Chionochloa acicularis, Chionochloa ovata, Chionochloa teretifolia*). There are no major threats to *Chionochloa acicularis* and *Chionochloa teretifolia*, which are extensive and largely unpalatable to deer. *Chionochloa ovata*, a species of alpine bluffs in western regions, which is highly palatable, is currently showing a marked recovery following the reduction in deer in alpine

C. spiralis *survives only on inaccessible bluffs such as these in Takahe Valley. Elsewhere deer (inset) have eaten the palatable species out.* Photos: Roger Lavers

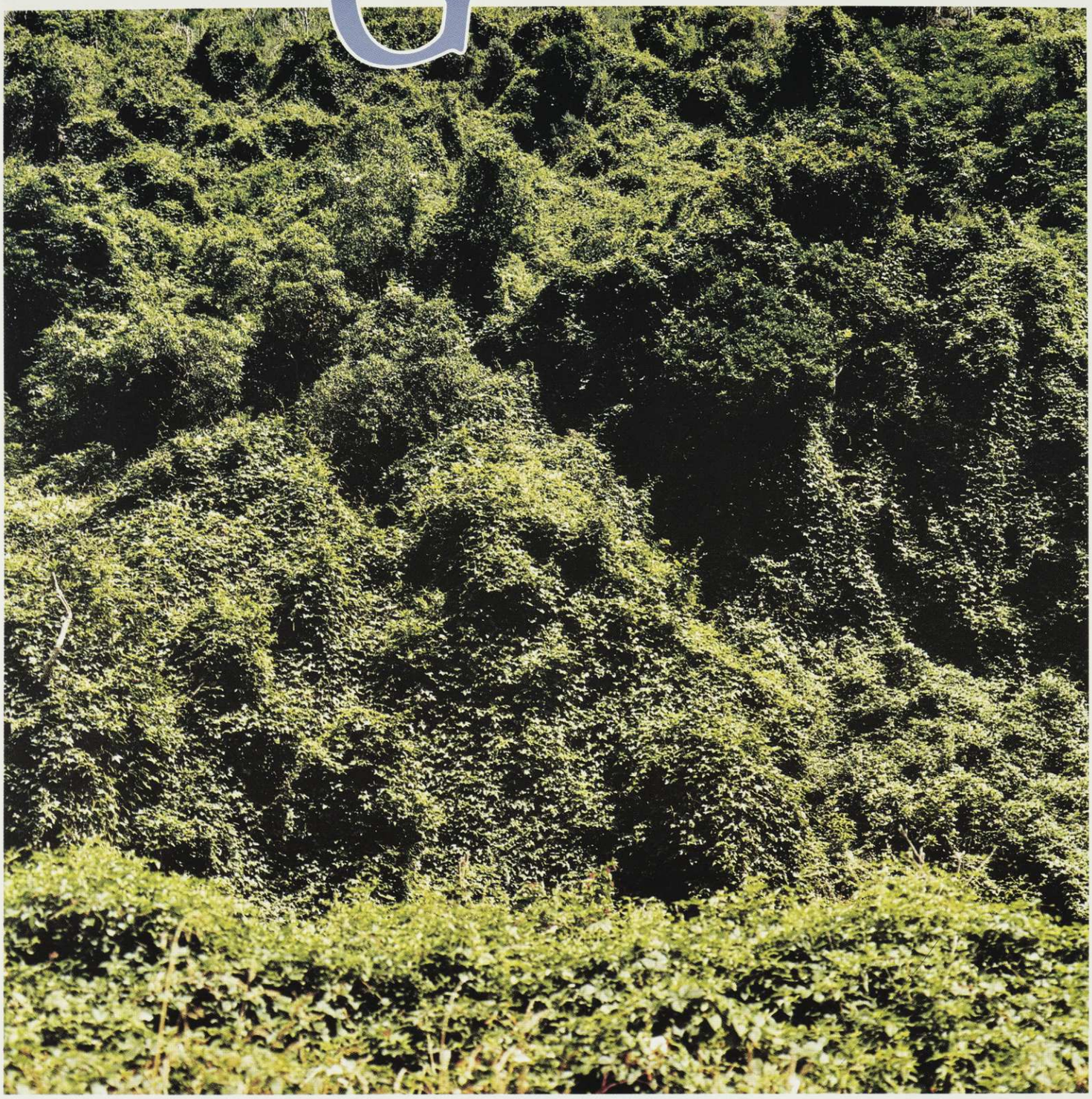
The lone Chionochloa spiralis *remaining in front of the Luxmore Caves in Fiordland.* Photo: Lloyd Homer, Geological Survey

grasslands. *Chionochloa spiralis* is perhaps the most palatable, and today plants are rarely found within reach of deer. On accessible sites deer have eliminated tussocks leaving old dead bases with occasional shoots beyond their reach. While limestone bluffs offer potential refugia, it is clear that the full range of *Chionochloa spiralis* has been significantly reduced by grazing animals. On Mount Luxmore, a lone, precariously perched plant of *Chionochloa spiralis* was found above treeline on the banks of a small stream cut into the limestone, a remnant of a former community decimated by deer.

Hunting pressure on deer in the Special Takahe Area is helping to preserve *Chionochloa spiralis* in the Murchison Mountains. The Department of Conservation is also growing the tussock at a nursery near Te Anau. One possibility is that these plants might be re-established with the solitary plant at the entrance to the Luxmore Caves to focus public attention on our most threatened tussock species.

Bill Lee is a botanist with DSIR Botany Division, Dunedin. Roger Lavers is a former wildlife officer with the Wildlife Service who has worked for many years on takahe preservation.

Getting to grips with



Kim: "Oh! These poor trees! I want to get them saved!"

Richard: "When I was little, I never thought about it, but now it's so bad, I think we might have to kill everything and start again."

Abie: "At first I felt overwhelmed, but when I saw what others can do, I thought, why can't we?"

Chris: "I think it's a good idea for us to get in there; we should continually plant more trees."

Bridget: "It made me feel good getting in there. I am prepared to go up and clear in my own time."

Aaron: "It's good for us to get out and work. I think it is good fun."

THESE COMMENTS are from primary and intermediate children I talked to during their involvement in the Marsden Valley Project.

Marsden Valley is in the hills behind Stoke, a suburb of Nelson City, and within a few kilometres of five primary schools: Stoke, Enner Glynn, Nayland Primary, Birchwood, Tahunanui; and two intermediate schools: Broadgreen and Waimea Intermediate.

The idea of an educational, environmental project in this area came from a class visit to the upper valley to explore a coastal forest remnant. The children were shocked at the tangled mess of old man's beard (*Clematis vitalba*) and of banana passionfruit spread over dead trees. Many were keen to do something about the problem. All seven schools – supplying 650 children – agreed to become involved.

Because of the size of the task it was decided the project should be a community one, including parents, children, Forest and Bird members, the Department of Conservation, and local authorities. A representative committee has been set up to oversee the project, which is to run for four years. The main objectives are to control problem plants in the area, and to begin restoring the reserve land to its original condition.

The project, now in its second year, has generated lots of enthusiasm and local support. Everyone involved has been delighted with the practical conservation results

Old Man's Beard

by Earle Norriss

achieved to date.

To begin with, class groups explored the area. Four main problem plants were identified: old man's beard, banana passionfruit, blackberry and gorse.

Many other weeds were present, but it was decided to focus on the four common ones. The children discovered the fun of finding, collecting, sorting and identifying plants – a very necessary activity as many were totally unfamiliar with plant recognition. Initially, one group of 13-year-olds confused blackberry with black nightshade and a group of parents confused old man's beard with

Opposite: *A general view of old man's beard infestation on slopes adjacent to the school project area.* Photo: DoC

Right: *Tahunanui school children gazing at one of the few remaining mature podocarps in the area, providing them with a glimpse of the nature of the valley's original forest.* Photo: Earle Norriss

Below: *Children looking at the tangle of vines they are about to clear.* Photo: Earle Norriss

kawakawa! The samples of the four problem plants were put in bags supplied and appropriately labelled by the Conservation Department and taken back to school where they were reidentified, studied and then destroyed.

All groups decided that old man's beard was the worst problem plant in the area, with banana passionfruit second. One 11-year-old commented:

"I don't like putting banana passionfruit second, because I like eating passionfruit, but I can see I will have to, because it smothers the trees like old man's beard."

Another activity was to measure the annual growth rate of an old man's beard vine. After some practical mathematics, children found that vines in the Marsden Valley were growing an average of about 90 cm a month during the growing season.

Classes of children then climbed into the head of the valley to inspect the fringe of infestation. Here a coastal remnant forest is regenerating and slowly spreading. Children were able to observe that gorse, which had covered the slope after early burning, was being choked out by colonising natives such as manuka, kanuka, mahoe and matipo.

The children decided that these would be the appropriate trees to plant in areas cleared of problem plants, as this was the natural and most effective way to encourage the restoration of the original native forest.

Some classes wrote to the Conservation Department with suggestions on the best ways to solve the problem, and these ideas are being acted on.

Martin Conway, the local Queen Elizabeth II Trust representative, is propagating colonising natives; Eric Eden, in charge of the noxious plant unit attached to the Tasman District Council, has arranged for clearing and spraying of a badly infested area in the reserve, and schools have been given manageable strips in this reserve to clear, plant and look after.

The Nelson City Council (which now owns the reserve) and the Conservation Department, have provided sufficient equipment to enable all children and adults in a group to be actively involved. All 650 children will plant at

The real work begins. Each of the Nelson schools is responsible for keeping their strip of land free of weeds once the hard work has been done.
Photo: DoC

least one or two colonizing native trees each on cleared ground this year. Each school strip is to be labelled, as are individual plants with type and planter's name.

All classes returned to the area in November to clear away unwanted regrowth. This year the strips will be extended.

A working day for adults was organised by the Nelson branch of Forest and Bird in April, and they tackled the problem plants in the head of the valley. It was encouraging to see about 50 people, aged 14 to 80 plus, making good progress in helping to save a diverse coastal forest remnant. Another further successful work day was needed in November.

Through these efforts, Marsden Valley can regain its original charm. Children have observed mature pukatea, matai, titoki and many other coastal natives; they have also observed seedlings on the forest floor, which, given a chance, will grow to maturity. Marsden Valley is thought to have the most southern stand of pukatea in New Zealand.

Perhaps past attempts to control old man's beard have failed because they tended to be "one-off" attempts at solving the problem. It is the view of those involved in the Marsden Valley Project that with a co-ordinated community effort over a period of time the problem in this area can be controlled.

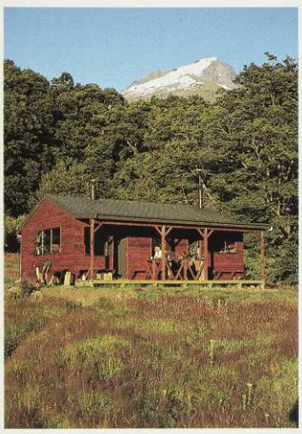
Earle Norriss is a district adviser with the Department of Education in Nelson. He has been an active Forest & Bird member for many years, having played a large part in the founding of the Ashburton and the Waitaki branches.

Going bush?

Back Country Huts give a good deal of comfort.

There are literally hundreds of huts in the New Zealand back country, on mountain ridges, by sparkling streams and just around the next corner.

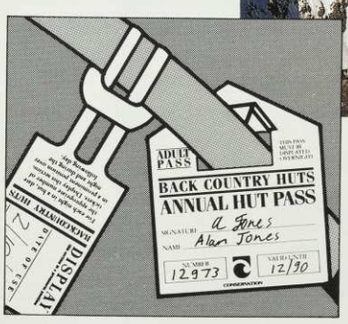
The Department of Conservation and some outdoor recreation clubs maintain those huts for the comfort of people enjoying our great outdoors. For that a small charge is made depending on the facilities provided. The money raised goes towards maintaining the huts. Those costs are high. The huts may not rival the Ritz (the views are better) but their isolated sites make them expensive to maintain.



There are three categories of hut: $4, $8, or $12 a night. Children 11 and over are charged half price. Buy your tickets in advance; they're sold at Department of Conservation offices, visitor centres and shops displaying this sign:

Alternatively, you can now buy an annual hut pass. These cost $60 ($30 for children) and last for a year. Passes can be used in more than 500 $4 and $8-a-night huts and can be bought at DOC outlets or by mail order from the department.

Use a pass or buy tickets and remember to put your ticket butt in the box in each hut. You're not just buying shelter and comfort, you're also making an indirect contribution to real conservation work. Spending your money on hut maintenance allows us to spend more protecting wild and scenic places or caring for threatened species.



CONSERVATION

Saline-loving plants of Central Otago

by Neville Peat

Lepidium matau, *one of New Zealand's rarest plants, in full flower at the Galloway Station saline area near Alexandra.* Photo: Neville Peat

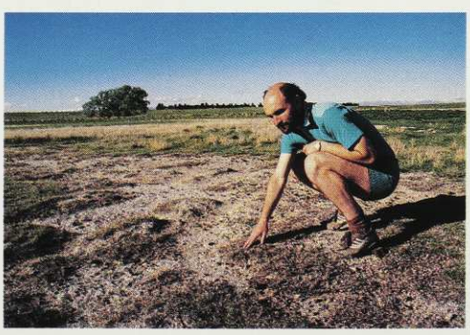
Few people place salt pans in a New Zealand landscape. But in the semi-arid, range-and-basin topography of Central Otago, saline soils do occur, harbouring distinctive plant and invertebrate communities, as Neville Peat, of Dunedin, reports.

WHAT'S A RESPECTABLE COAST-DWELLING (saltmarsh) glasswort like *Sarcocornia quinqueflora* doing in the Maniototo Valley, 70km from the sea?

Savouring the salty soils, that's what.

Clumps of it spread out over ground that would otherwise be bare of vegetation, too salty certainly for the ryegrass and clover which the farmer would prefer to see growing there.

Central Otago once had extensive salt pans. Through cultivation, irrigation and oversowing, these areas are now much reduced in number and extent. But the most resilient of them survive, a few hectares or square metres here and there.



DoC scientist Brian Patrick examines outcrops of the glasswort, Sarcocornia quinqueflora *at Belmont in the Maniototo Valley.* Photo: Neville Peat

They show up as patches of dirt, sometimes silky white. You might mistake them for random examples of wind or water erosion. But the plants around them know differently – small, ground-hugging, specialised plants and very distinctive. They tend to shrivel under the freezing winters but come again in spring.

Probably the most distinctive plant of Central Otago's saline areas is *Atriplex buchananii*, which spreads its small leaves and delicate stems across the most salty and arid-looking sites.

The rarest plant of these salt-tolerant communities, however, is a native cress, *Lepidium matau*, a relative of the coastal Cook's scurvy grass (*Lepidium oleraceum*). Only about 30 plants of the species have been found, and it is known from only one site – a sloping half-hectare on Galloway Station near Alexandra. Part of the site forms the shoulder of a road (Crawford Hills Road to Moa Creek). This plant's creamy flowers dominate the foliage in spring.

L. matau rates among New Zealand's most endangered plants.

Two related species, *L. sisymbrioides* and *L. kirkii*, less rare but nonetheless vulnerable, are also associated with the salty areas of Central Otago.

Botanists recognised last century that salt pans harbour distinctive plant communities, but the entomological values of the saline areas of Central Otago were virtually unknown until a scientist with the Department of Conservation in Dunedin, Brian Patrick, undertook a systematic survey of the most prominent sites in 1987-88.

Mr Patrick, who is a moth specialist, rediscovered a species of moth which had been lost to entomology for 50 years – *Paranotoreas fulva*. A small day-flying moth with orange and grey wings, it is now considered by Mr Patrick to be the species most characteristic of Central Otago saline areas. Its larvae feed on *Atriplex buchananii*. Adults are often found "sunbathing" on the bare, slick earth.

Several other moth species associated with the saline areas are found only in Central Otago.

The study is fitting together the pieces of a distinctive ecology. Fauna linked to plants, plants linked to saline soils. But where did the salt come from in the first place?

DSIR soil scientist Gary Beecroft, of Dunedin, says the salinity derives from the crumbling and weathering of the ancient schist and greywacke rocks of Central Otago and the Upper Waitaki, which also bears a few salty patches.

The salts became concentrated and buried in the sediments of inland lakes which formed some 50 million years ago when the region was a peneplain.

Then, while still a peneplain, long before the block mountain ranges were hoist up along fault lines, the region (or a good part of it) was flooded by the sea.

Mr Patrick and others believe the salt-tolerant plants endemic to Central Otago today

could be descendants of the plants which inhabited the old coastline, and it is possible some of the fauna might trace their origins similarly.

As further evidence he cites the presence of case-moth species, *Scoriodyta suttonensis*, in Central Otago. Its larvae feed on algae on the conspicuous tors. The genus consists of seven species and is characteristic of coastal rocks. Four species are found around the South Island coast and two more in the Cook Strait areas. Since they have apterous females which never leave the larval case and the larvae feed on the same tor or group of tors, the species is effectively immobile and its occurrence in Central Otago may be the result of a marine transgression.

The sea retreated, the ranges rose up, and over time, the salts deposited in the sediments were borne by water to the surface by the process of capillarity.

Central Otago's saline soils represent a soil type now rare in New Zealand, and according to Mr Beecroft, one which will soon disappear if left unprotected.

He and fellow soil scientist Peter McIntosh are working in conjunction with DoC to produce a register of the best remaining sites, including descriptions of their soils and geology. This register will provide baseline data for future monitoring.

Only one site – Belmont, in the Maniototo, the glasswort refuge – is covenanted so far. But a management agreement for a site in the Upper Clutha Valley (Pisa Flats), has just been negotiated between DoC and the landowner Tom Gilmore. The agreement will ensure the site is not irrigated or cultivated, and grazed only sparingly.

At a third site, the Sutton Salt Lake near Middlemarch, the owners have put in fencing to keep stock out.

"By and large, farmers are supportive of conservation measures," says Mr Patrick, "because the areas in question are small – the biggest would amount to only 10 hectares even with a buffer zone – and they are not significant agriculturally.

"Farmers also know that sheep like to gnaw at salty outcrops, which is not good for them. It ruins their teeth and thus their productive capacity."

DoC is negotiating with the owners of several sites about formal protection.

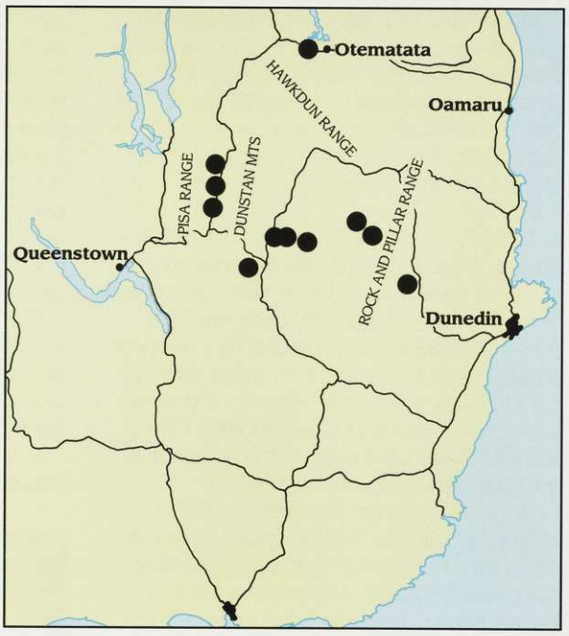
In the case of two sites, at Galloway Station (Alexandra) and Patearoa in the Maniototo, Mr Patrick recommends interpretive signs be erected to emphasise the biological and historical importance of salty areas in the Central Otago landscape. Both sites are alongside roadways.

The Patearoa site contains healthy colonies of *Lepidium sisymbrioides, Cotula maniototo* and *Carmichaelia monroi*. Two other plants typical of saline areas also occur here – *Lepidium kirkii* and *Apium filiforme*.

Altogether, Mr Patrick has identified eight sites worthy of protection, with an additional two identified by the PNA scheme in the Upper Clutha that have salty soils but no native halophytes.

As far as natural and conservation values go overall, however, all of these places are clearly worth their salt!

Reference: Patrick, B.H. Lepitodptera of salt-pans of Central Otago. *Department of Conservation, Dunedin. 1989.*



Salt-tolerant survivor: Atriplex buchananii *on a parched saline area in the Manuherikia Valley near Alexandra.* Photo: Neville Peat

Michael Beattie points out a plant of Lepidium sisymbrioides, *in flower on his family's Patearoa farm, Maniototo Valley.* Photo: Neville Peat

The bright-yellow flowers of the cushion plant, Myosotis uniflora, *add colour to an expanse of Craspedia daisies next to the saline area on Tom Gilmore's Pisa Flats farm.* Photo: Neville Peat

A Green Equity by Professor John Morton

FOREST AND BIRD has set its course ... "from 1990 onwards ... towards a sustainable future." If all humanity could become as sensible as the Berliners, and we left behind our paranoia about armaments, we could muster the will and resources to repair our planet. It could still be done: and beside it, no other task ultimately matters.

From now on, it will be ecology that must set the ground rules of our economics. Sustainability requires this; and so it must be that through the 1990s all our politics must be green.

The great sustainable that we live by, with all our vaunted growth economy, is the green molecule of chlorophyll and the energy it captures from the sun. Sustainability hangs for the future on the way we look after the earth's green cover.

All our land law will need to develop this recognition. But alongside law there will be the code of "equity" that since medieval times has intervened into English law, to mitigate its harshness, and the selfishness of individuals. It is equity that takes account of conscience, and of obligations beyond ourselves.

At the earliest times a robber chief could have grabbed land and held it by main force. But from the dawn of the English law we inherit, there has been a civil code, where a person has behaved conscionably, to respect another's title to land. For centuries the ordinary title has been a "fee simple", a holding from the Crown that I could do what I liked with (so it was assumed), from the centre of the earth up to the vault of heaven!

Or not quite. In the days before I was allowed to make a "will of lands", I owed a duty to my heir-at-law (generally the eldest son) who would one day possess the land. During my life, he could bring an action to restrain me, if he saw me "wasting" or spoiling the land, as by clear-felling the trees, draining the waters, or – in our modern notion – "re-contouring."

Soon, in historic time, equity was to invent the notion of the "trust". Though in law I might seem to hold the fee simple, I really held the land for the benefit of others: infants, children unborn, or a charity. Equity would see that I didn't use it for my own enrichment, and would hold me to my obligation towards the beneficiaries.

As more centuries passed, it became common to borrow money on the security of land. Still today there is an arrangement in law by which the money-lender (mortgagee) takes my title deeds. But his power over the land is limited. As long as I hold the option to pay the money back, I have – as it is said – "an equity of redemption".

In our own lifetime we've seen the growth of town and country planning, based on the doctrine that a whole community has an interest in what I am allowed to do with my land. And so do future generations unborn.

Thus, the owner of private beech forests in Nelson is not to get away with the statement: "This is a good piece of dirt, but it will never be profitable until I can get the trees off it". Planning exists indeed to mark out the things an individual owner (during a life-tenure so much shorter than the life of trees) cannot safely be allowed to do.

We hold or occupy land, in effect, with an "equity" to consider the interests of others. English "town" planning began in the early 1900s, with the laudable aim to restrain ugly ribbon development. With World War II it increasingly became "country" planning. There were County Agricultural Committees, to ensure that valuable farm land was kept husbanded and properly productive.

Today, and really for the first time, land use planning is looking to obligations not just to other human beings, but to the biosphere itself, whose rules we're inescapably bound by. Our own brief fee simple is far shorter than the life of the soil or a forest, even a single tree. There must be an equity to sustain the land, so the people of the future may inherit it, unspoiled and still productive. Or where communities are fragile, scarce or unique, not in the economic sense productive, the conservation need may entail total preservation.

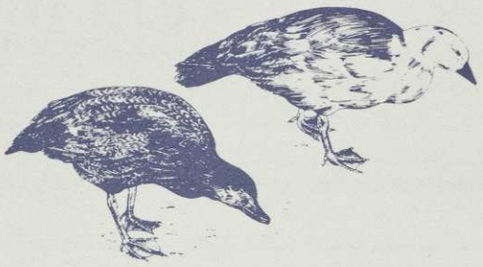
The land use – whether predominant or conditional – that I am to be allowed, must henceforward be set out, for each region or catchment, in a land use plan, prepared with the best ecologic and economic foresight.

It won't be good enough – in the current parlance – to "put more market into planning", to let the polluter or the exploiter pay for the damage done, at a price some of the big operators might not find prohibitive. This is the narrow vision of the common law: that everything has its price and the appropriate remedy is "damages". Equity would in contrast hold some things beyond price, and would intervene to stop the damage being done. Among the remedies would be injunctions, to prevent some things, even to compel others.

There have been some judicial pointers to the way a "green equity" might be shaping up. Those owners that wanted to drain the Whangamarino wetlands were first, by Barker J., found entitled to compensation when this environment was protected under the soil and water code. The Court of Appeal (by the judgement of Cooke, P.) overturned this, and found the owners had been deprived not of a right but of a "privilege" to which they were not, by any exercise of ownership, indefeasibly entitled.

The best, most far-seeing contribution the resource management reform could make, would be a declaration that any title to land – freehold or leasehold – is to be held subject to an equity for its sustainability. And where – with public consensus and by proper authority – measures are imposed to protect the environment, no right of compensation will arise, if these should curtail the owner's opportunity of maximum profitability.

Professor John Morton is a former member of the Society's executive and a distinguished life member.



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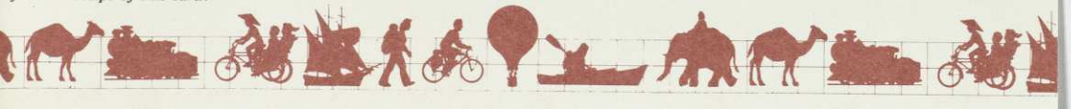

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FLEMING CONSERVATION AWARDS

This year the Queen Elizabeth II Scholarships were re-named in honour of the memory of Sir Charles Fleming who gave so much of his life to conservation. A total of $10,000 was awarded, $3,000 of this being a new award, the Reader Award for research into endangered birds.

The following people received Fleming Scholarships:

Russell Death from Canterbury University for his study of the effect of disturbance on stream ecosystems of human activities.

Christopher Jowett who will study predation of the Mahoenui giant weta, to complement other work currently being done. He is working towards his MSc in Environmental Science.

John Rich at Lincoln College is studying management strategies for the Manganui-a-te-Ao River ecosystem.

Julienne Alley is hoping her studies will be of use in tackling the serious goat problem.

Wayne Linklater, working towards an MSc at Canterbury University, will study the forest-stream relationship.

Andrew Kliskey, studying for a PhD at Otago University, will look at the management of wilderness areas, and the pressures put on them by recreation and tourism.

Fran Hyland is studying for a PhD at Victoria University. She will look at regeneration of miro trees, investigating possible reasons for their scarcity.

Angus McIntosh from Otago University will study the effects of introduced species of fish on the native fish populations in streams in Otago.

Shelley Dean will study the behavioural factors which affect the reproductive rate of red-billed gulls, especially at Kaikoura Peninsula.

These people have received help from the Reader Award:

Dale Towers will gauge the success of artificial nesting sites for breeding grey teal ducks, working for an MSc at Waikato University.

Alan Cooper, studying for a PhD at Victoria University, will make DNA studies of moa bones and apply the knowledge to the conservation of kiwis.

Ron Moorhouse will study the ecology of the North Island kaka on Kapiti Island for a PhD at Victoria University.

John Lees — Friend of the Forest

John Lees loved nature and was passionate about its protection. His recent death is keenly felt by conservationists and particularly the Eastern Bay of Plenty Forest and Bird branch, of which he has been chairman and national councillor for the past 10 years.

John was a leader in conservation long before it became respectable. In the '60s he organised a major though unsuccessful petition against logging in the river catchments of the Urewera, which subsequently led to major flooding in Whakatane. Then he directed his energies to the protection of Whirinaki forest, a bitter campaign that was not for the fainthearted.

Charlie Llewellyn, a long time F&B member and friend of John's, recalled how John was black-listed from entering the forest by permit.

"One day John and I were approaching Rogers Hut (in Whirinaki) at dusk. There was a big dog barking and a voice from inside the closed hut door shouted "If you're a greenie ---- off!

"I would have gone away," admits Charlie, "but John just walked in saying, 'I'm a tramper'".

By morning they were on the best of terms with the hostile helicopter pilot who later visited John in Whakatane!

Whirinaki became a Conservation Park and John worked on the Park Advisory Committee from its inception until his death.

More recently he persistently and successfully opposed the building of a seawall at the Whakatane Heads, considering it an unnecessary and potentially disastrous ecological blunder.

John never lost his cool, nor hassled anyone, but his enormous enthusiasm and curiosity and love of nature were irresistible and won him many friends.

His legacy is in the Whirinaki Conservation Park and the many people he introduced to conservation. These include his daughter Annette, a noted conservationist who is working on South Pacific rainforest conservation.

Ann Graeme

Letters

Dear Sir
I was interested to read the paragraph on page 6 of the August issue concerning events in the United Kingdom. I am glad to tell you the report was a little premature. It is true that former Environment Secretary Nicholas Ridley had asked the Nature Conservancy Council to look at the possibility of "selling off" nature reserves currently in the ownership of the NCC. There does not appear to be any enthusiasm for this course of action from any quarter and no actual proposals have been brought forward by the Government. Consequently the "sell off" proposals, if there were any, have been shelved. I must also take you up on the comment in the magazine suggesting that the role of the RSPB may change from being nature advocates to reserve managers. The RSPB has no intention of allowing that to happen. Far from damaging the RSPB's role as nature advocate, the ownership of land supports it. One is able to speak with the experience of managing land for birds, while the existence of nature reserves provides a presence from which to generate increased support for RSPB. Finally, may I compliment you on the outstanding quality of your magazine, which I find both interesting and stimulating reading.
Yours etc
David Gordon, Director of Finance, Royal Society for the Protection of Birds, United Kingdom.

Dear Sir,
Coming from a farming background I found your article on the ferret and the poor controls placed on their farming enlightening and rather concerning. For my part, I had always thought that this animal was classed as "noxious" in New Zealand and treated accordingly.
J.W. Parsons, Auckland.

SOCIETY'S LODGES AND HOUSES

Ruapehu Lodge, Whakapapa Village, Tongariro National Park

Set in a privileged position within the National Park this lodge is available for MEMBERS ONLY, and is an ideal location for tramping, skiing, botanising and exploring.

The comfortable lodge holds 32 people in four bunk rooms, and provides all facilities. You need bring only food and bedding. Private parties are restricted to 10 members.

Bookings and enquiries should be made from P O Box 631, Wellington (04) 728-154. The lodge is very popular, and bookings may be made six months in advance, if secured with a 20% deposit. The rates are reasonable, and fluctuate seasonally.

Full payment is required four weeks prior to occupation, after which time there is no refund for cancellation.

Turner Cottage, Stewart Island

Turner Cottage, is on Stewart Island and is a two-roomed dwelling furnished for three people. For details write, enclosing a stamped, addressed envelope, to: "Turner Cottage", C/- Mr W. Fisher, P.O. Box 44, Stewart Island.

William Hartree Memorial Lodge, Hawke's Bay

The lodge is situated 48km from Napier on the Puketitiri Road and 8 km past Patoka, amid the 14ha William Hartree Memorial Scenic Reserve.

The Lodge accommodates 10 people. Extra mattresses and pillows are available to sleep up to 20. The lodge has a fully equipped kitchen, including refrigerator.

Visitors supply their own linen and cutlery. The nearest store is 8km away. No animals are permitted.

For rates send a stamped addressed envelope to the Booking Officer, Mrs Colleen MacKay, 3 Plunket Street, Tamatea, Napier, Telephone (070) 444-219.

Tautuku Lodge

Tautuku State Highway 92, South East Otago. Situated on the Royal Forest and Bird Protection Society's 550 ha Lenz Reserve 32 km south of Owaka. In a bush setting, and many lovely beaches nearby providing a wonderful base for exploring the Catlins. 3 well appointed buildings, the Lodge, the Coutts cabin and an A-frame sleep 10, 5 and 2 respectively.

Information and rates on application to the caretaker: Miss M. Roy, Papatowai, Owaka, R.D.2. Phone (0299) 58-024. Stamped addressed envelope with inquiries please.

Tai Haruru Lodge, Piha, West Auckand

A seaside home situated in Garden Road, Piha, 38km from central Auckland. Eight minutes' walk from the Piha store, with right-of-way access to the surfbeach and close to bush reserves and walking tracks in the Waitakere Ranges.

The lodge is fully equipped and sleeps six to eight persons. It has a large lounge with open fire, dining area, and modern kitchen.

You will need food supplies, bed linen, towels, and tea-towels.

Different rates apply for winter and summer, for rates send a stamped, addressed envelope to the Booking Officer, Mrs B. Marshall, 160 Valley Road, Henderson, Auckland. Telephone 836-5859.

Waiheke Island Cottage, Onetangi, Waiheke Island

The cottage has comfortable bunk accommodation for eight people and has a stove, refrigerator, and hot water. Adjacent to a 49ha wildlife reserve, belonging to the Society it is in easy walking distance from shops and beach. It is reached by ferry from Auckland City (two or three returns daily) and by bus or taxi from the island ferry wharf. Everything is supplied except linen and food. No animals are permitted.

Different rates apply for winter and summer. For rates send an addressed envelope to the Booking Officer, Mr D. McLean, 55a Queens Drive, Oneroa, Waiheke Island. Telephone Waiheke 6494.

Bushy Park Lodge

Kai Iwi, 24km northwest of Wanganui on sealed road off S.H.3.

Historic homestead, fine grounds and view. 89 ha of virgin bush with tracks and trees identified.

Accommodation: for 16 in six bedrooms, single and double beds, electric blankets, heaters and vanity units. Six extra folding beds. Bedding, linen and towels supplied. Showers, drying cupboard, kitchen with electric stoves, microwave, refrigerator, deep freeze, cutlery and crockery. Bring own rations. Milk may be ordered.

Reduced adult rates Sunday to Thursday nights except long weekends and school holidays (GST included). Open 7 days a week.

A bunkhouse for 12 is available for group bookings. It has kitchen facilities, mattresses and pillows. Toilets and showers are in the adjacent stables building.

Bookings and Information leaflets: Manager, Bushy Park Lodge, Kai Iwi, RD8 Wanganui. Telephone Kai Iwi 879. STD (064) 29-879.

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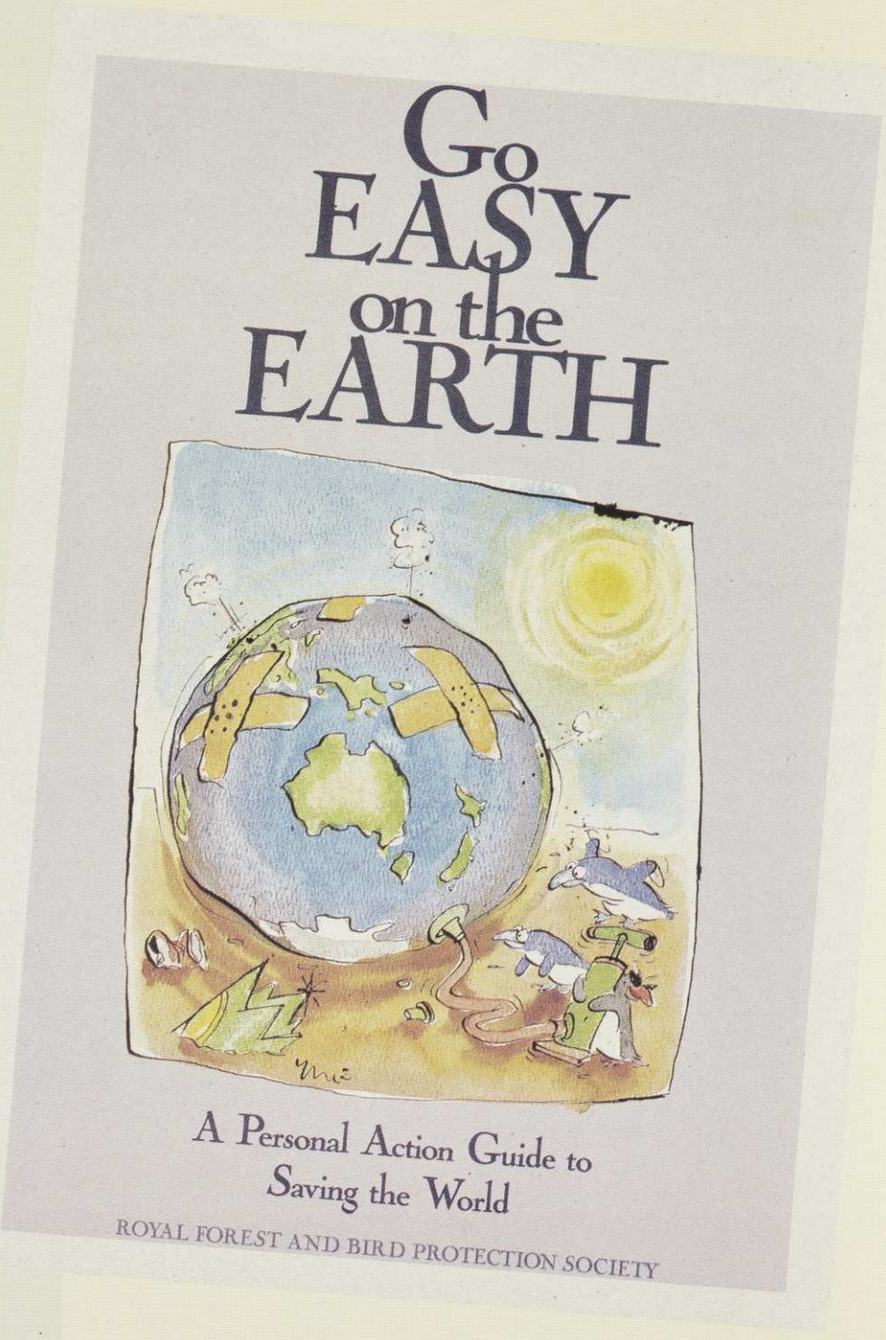

So much has been talked about being "green" in the last year that Forest and Bird decided to do something about helping people look after the environment. The result is **Go Easy On the Earth**, written by education and extension officer Andrea Lomdahl with cartoons by Mike Yule.

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A recent photograph of a minke whale surfacing in Palliser Bay near Wellington to inspect a fishing boat. There are two colour forms of this species in New Zealand waters; the one pictured is the rarer, lighter coloured form. Japanese whalers will kill at least 400 minke whales in Antarctic waters in 1989/1990 for "scientific purposes." Photo: David Woods