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1970

Edward ('Teddy') Goldsmith

1928–

The Ecologist

During the 1960s, the careers of the Goldsmith brothers, James and Edward ('Teddy'), could not have been more different. James went into big business, first dealing with pharmaceutical then food supply industries. Teddy became a globe-trotting philosopher, an anthropologist who had begun to believe that the survival of tribal peoples and the environment were inseparable. To develop these ideas, in 1970 Teddy Goldsmith launched a new magazine he called *The Ecologist*. As editor until 1990 and then again from 1997 until 1998, Goldsmith has been fighting to expose the myriad forces ravaging the planet – from genetic modification to nuclear power and from industrial pollution to habitat loss.

The Ecologist came to prominence in 1972 with its special issue *Blueprint for Survival* which sold 500,000 copies in 17 languages. Goldsmith became one of the founders of the Ecology Party (now the Green Party) in the UK, the first in the world.



In 1975, Goldsmith began teaching courses in ecology and related subjects at Michigan University. The following year, working with Denis de Rougemont, Jean-Marie Pelt, Jacques Ellul and Edouard Kressman, the French-speaking Goldsmith set up Ecoropa (Ecologica Europa) while also taking part in France's first environmental campaigns. Goldsmith's bilingual activities enabled him to launch a French edition of *The Ecologist* and to write a book, *La Médecine à la Question*, published in 1981. While creating versions of *The Ecologist* in Spain, Brazil, India and New Zealand, Goldsmith co-authored such books as *The Social and Environmental Effects of Large Dams*, *The Earth Report* and, with James Lovelock, *Gaia: The Thesis, the Mechanism and the Implications*.

Following publication of his tenth book, *5,000 Days to Save the Planet*, Teddy Goldsmith received the Right Livelihood Award and was also made a Chevalier de la Légion d'Honneur for his services to France.

“ Why aren't more people angry? Modern man is wrecking the planet and doing so at an increasingly rapid rate. ”

 www.theecologist.org

1970

Oren Lyons

1930–

You are the environment

Chief Oren R. Lyons, or Jo Ag Quis Ho, was born into the Turtle Clan, one of six clans of the Hautenosauna nation. He was raised in the traditional ways of the Iroquois on the Seneca and Onondaga reservations in New York state.

During the 1960s, having graduated from Syracuse University College of Fine Arts, Lyons became a successful commercial artist in New York City. He also exhibited his paintings of Native American life.

In 1970, Oren returned to Onondaga where he became a leading advocate for Native American causes, including human rights and the environment. He has taken part in the meetings of Indigenous Peoples of the Human Rights Commission of the UN for many years and helped to establish the Working Group on Indigenous Populations in 1982. He serves on the Executive Committee of the Global Forum of Spiritual and Parliamentary Leaders on Human Survival and is a principal figure in the Traditional Circle of Indian Elders, an annual council of traditional grassroots leadership of the major Indian nations of North America.

In 1990, he was the negotiator between the government of Quebec, New York state, and the Mohawk nation in the violent 78-day stand-off at Oka. Mohawk Indians had taken up arms against plans to allow development on ancient burial sites. The following year he led a delegation of 17 American Indian leaders to meet with President Bush Sr in Washington DC.

In 1992 he was invited to address the General Assembly of the UN and open the International Year of the World's Indigenous People at the United Nations Plaza in New York. During that year he also organised a delegation of Native Americans to the Earth Summit in Rio de Janeiro and was invited by Maurice Strong to address the national delegations. He has been a tireless advocate against deforestation, pollution of rivers and hazardous waste dumping.

Among the awards he has received are the Ellis Island Congressional Medal of Honour, the National Audubon Award, the First Annual Earth Day International Award of the UN, and the Elder and Wiser Award of the Rosa Parks Institute for Human Rights.

“ The environment isn't over here. The environment isn't over there. You are the environment. ”

1970

William D. Ruckelshaus

1932–

An attorney takes charge

In July 1970, a law to establish an Environmental Protection Agency (EPA) in the US was passed in response to the growing public demand for cleaner water, air and land. Prior to the establishment of the EPA, the US government had not been able to take coordinated action on harmful pollutants.

The first Administrator of the EPA was a brilliant, 38-year-old Indianapolis-born attorney called William D. Ruckelshaus. Initially, he concentrated on developing the new agency's organisational structure, going on to enforce actions against several polluted cities and industrial polluters. Ruckelshaus also set health-based standards for air pollutants and standards for automobile emissions, requiring states to submit air quality plans to the new agency.

Ruckelshaus had read *Silent Spring* by **Rachel Carson**. In 1972, defying his scientific advisers and intensive lobbying by pro-pesticide advocates, he banned the use of dichlorodiphenyltrichloroethane (DDT) for nearly all purposes in the US.

In April 1973 he was appointed Acting Director of the Federal Bureau of Investigation and, in the same year, Deputy Attorney General of the US Department of Justice. Ruckelshaus and his boss Elliot Richardson famously resigned their positions within the Justice Department rather than obey an order from President Richard Nixon to fire the Watergate special prosecutor Archibald Cox who was investigating official misconduct on the part of the president and his aides.

After working for the forest products firm Weyerhaeuser Company, in 1983 Ruckelshaus was asked by Ronald Reagan's Chief of Staff James Baker to return to the EPA to deal with a crisis caused by mass resignations over mishandling of the Superfund law which was attempting to deal with abandoned toxic waste. During his second term at the agency, 1983–85, Ruckelshaus oversaw the removal of another harmful pesticide,

ethylene dibromide (EDB) from US agricultural use. He reaffirmed the EPA's commitment to a federal–state partnership to restore and protect the Chesapeake Bay, and helped introduce tighter controls on hazardous waste management.

In his sixties, Ruckelshaus served on US President Bill Clinton's Council for Sustainable Development, as Chairman of Enterprise for the Environment and as special envoy to the Pacific Salmon Treaty between the US and Canada. He is currently chairman of the board of the World Resources Institute and serves on the boards of many non-profit organisations.



“ Nature provides a free lunch, but only if we control our appetites. ”



1970

Sylvia Earle

1935–

Outspoken advocate for marine conservation

In 1970, the US Navy, the Department of the Interior and NASA organised an all-female research expedition, where aquanauts lived for two weeks in an underwater laboratory, 15 m deep, off the Virgin Islands. During this time they experienced an underwater earthquake. Leading the project was 35-year-old marine biologist, Dr Sylvia Earle. To the surprise of Earle and her colleagues, the publicity surrounding this adventure made them into celebrities. Like astronauts, when they returned to land they were given a ticker-tape parade and a White House reception.

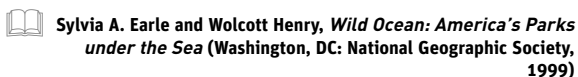
As a result of the publicity, Earle was increasingly in demand as a public speaker. She became an outspoken critic of marine issues such as overfishing, pollution and habitat loss. Linking up with undersea photographer Al Giddings, Sylvia began to write for *National Geographic* and to produce books and films about deep-sea exploration.

In the 1990s Earle was Chief Scientist at the National Oceanographic and Atmospheric Administration where, among other duties, she was responsible for monitoring the health of North America's water. From 1998 to 2002 she led the Sustainable Seas Expeditions, a five-year programme to explore and study the US national marine sanctuaries sponsored by the National Geographic Society and funded by the Goldman Foundation. An expert on the impact of oil spills, she was called on to lead several research trips during the Gulf War and following the spills of the ships *Exxon Valdez* and *Mega Borg*.

In 1992 she founded Deep Ocean Exploration and Research (DOER) to design, operate, support and consult on manned and robotic sub-sea systems.

To date, Earle has led more than 60 deep-sea expeditions, totalling 7,000 hours underwater. She was named *Time* magazine's first 'Hero of the Planet' in 1998.

“ I want to share the exhilaration of discovery and convey a sense of urgency about the need for all of us to use our talents and resources to continue to explore the nature of this extraordinary ocean planet. ”



1970

Denis Hayes

1944–

Earth Day

In 1969, Denis Hayes, a graduate student at Harvard's Kennedy School of Government, read a news report of a speech by US Senator Gaylord Nelson calling for a series of campus 'teach-ins' on the environment. Following a meeting and a long discussion with Senator Nelson, Hayes decided to drop his Harvard studies in order to organise the national effort. Hayes hired a staff of experienced organisers, named the campaign 'Earth Day' and urged students, in addition to campus teach-ins, to organise rallies in their communities to protest against growing environmental problems. He also enlisted teachers, labour, and a wide variety of civic organisations.



On 22 April 1970, an estimated 20 million Americans of all ages and from all walks of life participated in the Earth Day celebrations from coast to coast. Millions of schoolchildren picked up litter, while hundreds of thousands of college students held teach-ins, rallies, and demonstrations. Congress adjourned for the day so that all its members could return to their districts to attend rallies. The singer and activist **Pete Seeger** was a keynote

speaker and performer at the event held in Washington DC. Actors Paul Newman and Ali McGraw hosted the huge rally held in New York.

Earth Day, and the subsequent poll defeats of seven of a 'Dirty Dozen' members of Congress named by Hayes and his staff, led directly to the passage of landmark laws on clean air (1970), clean water (1972), and to protect endangered species (1973). US President Richard Nixon, no environmentalist, felt compelled by the size of the rallies to quickly create the Environmental Protection Agency so as to not surrender this new environmental agenda to the Democratic Party.

During the Carter Administration, Hayes headed the federal Solar Energy Research Institute. Then, after teaching engineering at Stanford University and practising law in Silicon Valley for several years, in 1990 he directed the first international Earth Day, involving an estimate 200 million people in 141 countries. In 2000, Hayes returned to chair the 30th anniversary of Earth Day (which was finally able

to expand into China), and he remains chairman of the network coordinating Earth Day activities worldwide. More than 180 nations now take part in what is now the world's most widely observed secular holiday.

Today, Hayes is president of the Bullitt Foundation in Seattle, which gives millions of dollars a year to promote models of sustainable development in the Pacific Northwest. *Time* magazine selected him as one of its 'Heroes of the Planet', *Look* magazine named him one of the 100 most influential Americans of the 20th century, and the National Audubon Society included him in its list of the 100 Environmental Heroes of the 20th century.

“ The sunshine that strikes American roads each year contains more energy than all the fossil fuels used by the entire world. ”



www.earthday.net

1971

Nicholas Georgescu-Roegen

1906–1994

Father of bio-economics

In 1971, Nicholas Georgescu-Roegen, a brilliant, Romanian-born economics professor at Vanderbilt University in Nashville, Tennessee, was the first to formally demonstrate the thermodynamic foundations of the economic process. His book *The Entropy Law and the Economic Process* demonstrated that the second law of thermodynamics plays a central role in production theory, with implications for the sustainability of economic growth. He argued that the entropic nature of the economic process, which degrades natural resources and pollutes the environment, constitutes a real and present danger. The Earth is entropically winding down naturally, and economic advance is accelerating the process. Humans must learn to ration the meagre resources they have so profligately squandered if they are to survive. Although generally ignored by mainstream economists, this work became a cornerstone in the fields of ecological and evolutionary economics.

Far from being pessimistic, Georgescu-Roegen emphasised the difference between a rich life and the life of a rich person. Today, his work is gaining influence and his insights are being grafted into the new field of evolutionary economics.

“ In the perspective of entropy, every action of a human or of an organism, and even every process of nature, can lead only to a deficit for the overall system. ”



Nicholas Georgescu-Roegen, *The Entropy Law and the Economic Process* (New York: iUniverse, 1999)

1971

José Lutzenberger

1926–2002

Protecting the natural environment of Brazil

During the 1960s, José Lutzenberger was working as an engineer for the German chemical firm BASF. One day Lutzenberger asked the owner of an apple orchard if he wasn't afraid to eat apples after they were sprayed with BASF's herbicides and pesticides. The owner replied that he didn't eat the fruit himself but only sold it to other people. When he heard this, Lutzenberger immediately resigned from BASF and returned to the town of his birth, Porto Alegre in Brazil.



In 1971 he founded Agapan, Brazil's first environmental organisation. Agapan quickly made a name for itself by leading a successful campaign to stop air pollution at a Norwegian wood pulp factory in Porto Alegre. The campaign forced the company to sell up to a Brazilian concern which installed anti-pollution equipment. In 1987, Lutzenberger started a second environmental organisation he called Gaia to focus on global issues.

Lutzenberger was one of the first to denounce the destruction of the Amazon rainforest with the 1976 publication of his book *The End of the Future: A Brazilian Ecological Manifesto* and by appearing as narrator in a BBC television documentary series on the subject. 'Today in my country, Brazil, we are flooding thousands of square kilometres of pristine rainforest to make electricity for three mills that export aluminum', he lamented.

In 1990 Lutzenberger agreed to become Environment Minister in the civilian government of President Fernando Collor. In the two years he spent in office, Lutzenberger worked to reverse long-standing government policies that favoured corporate interests and encouraged exploitation of the Amazon. Overcoming strong opposition from miners and loggers, he helped carve out a 93,000 km² Amazon sanctuary for the Yanomami Indians and pushed for rigorous enforcement of laws to punish industrial polluters. He was also instrumental in the decision by Brazil to sign the Antarctic Treaty and join the International Whaling Commission. He even arranged for Britain's **Prince Charles** to visit the Amazon in the royal yacht *Britannia*, hosting an environmental gathering on board. **218**

In May 1992, Rio de Janeiro became the venue for the biggest ever UN conference on the environment – the first Earth Summit – but Lutzenberger did not attend. His sharp tongue and confrontational tactics offended many of Brazil's most powerful interests, including the military which accused him of wanting to hand the Amazon over to international supervision. He also tangled repeatedly with

the national forest service which he saw as corrupted by logging companies. In March 1992, less than three months before the Earth Summit that he had lobbied to have held in Brazil, he stepped down and returned to activism. He attended the parallel alternative summit in Rio and gave a passionate speech warning of the dangers from the transnational biotechnology corporations which were beginning to take over seed companies.

Over the next ten years, Lutzenberger devoted his energies to promoting sustainable agriculture, giving courses on organic farming around the globe.

“ We must learn to look at Nature, at Creation, as something sacred of which we humans are only a part – or we will have no future. We need a new, actually very old, holistic ethics, an ethics of reverence for life in all its forms and manifestations. ”



www.fgaia.org.br

1971

Roger Payne

1935–

Recording whale song


In 1967 Dr Roger Payne dropped his research on the sound world of owls and bats when he discovered, with colleague Scott McVay, that the eerie sounds made by humpback whales are actually recognisable ‘songs’ – long, complex sequences of repeated phrases. In 1971, Payne set up the Whale Conservation Institute (WCI) in Lincoln, Massachusetts, and the Ocean Alliance and began to conduct detailed research on whales and how to preserve their marine environments.

The January 1979 edition of *National Geographic* included a record called ‘Songs of the Humpback Whale’. Some 10.5 million copies of the album were printed – the largest single pressing in the history of the recording industry. Writing about whale song in the same issue of the magazine Payne warned: ‘Pollution will soon replace the harpoon as the next mortal threat to whales and, ultimately, humanity.’

Since then, Payne has come to be regarded as an eloquent spokesman for whales and their welfare. He has led over 100 expeditions to study every species of large whale in the wild. His longest continuous study has been of the behaviour of more than 1,000 individual Argentine right whales (*Eubalaena australis*).

Payne has authored many books and articles on whales, also presenting television documentaries, with his work reported in more than 35 films. He co-scripted an IMAX film, *Whales*. In the wake of ‘Songs of the Humpback Whale’, a new recording, ‘Whales Alive’, was released in 1989, presenting songs composed by whales but arranged and played by humans.

“ Whales are humanity’s canary in the coal mine . . . As ocean pollution levels increase, marine mammals like whales will be among the first to go. ”

 www.oceanalliance.org

1971

Peter Raven

1936–

A steward of botanics

In 1971, Peter Raven, for nine years a professor of botany at Stanford University, moved to St Louis to take charge of the 100-year-old Missouri Botanical Garden. He has been there ever since. Under his direction, it gradually became one of the leading tropical plant research faculties in the world.



The northern Andes, Colombia, Ecuador and Peru are home to at least one-fifth of the world’s biological diversity, including perhaps 60,000 species of plants, endangered by development and poorly studied. Raven organised his staff at the Missouri Botanical Garden to catalogue threatened species and to work alongside these nations to help them develop their own plans to protect their natural resources. To do this, Raven increased his staff from 85 to 354 employees and, thanks largely to donations, the garden’s budget from \$650,000 to \$20 million. Today, it is a world-class centre

for botanical research and education.

Raven has authored more than 400 articles and 16 books, including *Biology of Plants* (now in its seventh edition). During his tenure as Home Secretary to the US National Academy of Sciences, Raven was instrumental in convening two landmark conferences, in 1986 and 1997.

Time magazine, in its 1999 Earth Day issue, declared Raven one of its ‘Heroes of the Planet’ who is ‘doing extraordinary things to preserve and protect the environment’.

Among the Missouri Botanical Gardens’ more recent additions is the Climatron, a geodesic dome covering half an acre and housing some 1,200 species of plants in a natural, tropical setting.

“ . . . we humans are causing a mass extinction of species greater than the extinction that wiped out the dinosaurs 65 million years ago . . . This should be front-page, red-banner headline news, but it’s not. The UN and

every country around the world should be calling for emergency conferences, but they're not. ”

1971

Biruté Galdikas

1946–

The battle to save the red ape

In 1968, while Biruté M.F. Galdikas, a German of Lithuanian origin, was working on her PhD in anthropology at the University of California at Los Angeles, she met the British anthropologist Dr Louis S. Leakey. She proposed that he help her study

- ◆ **116** Bornean orangutans (*Pongo pygmaeus*) in the wild, as **Jane Goodall** had done with
- ◆ **212** chimpanzees. Leakey finally agreed and Galdikas joined Goodall and **Dian Fossey** as the third of ‘Leakey’s Angels’.

In 1971, Galdikas arrived at one of the world’s last wild places, Tanjung Puting Reserve in Indonesian Borneo with her husband, the photographer Rod Brindamour. Conditions were harsh – the couple encountered numerous poachers, legions of leeches and swarms of biting insects. Within a few years, she gave birth to a son, Binty, who was raised among the orangutans and dubbed ‘the child of the rainforest’.

Although Rod decided to return to Canada with Binty when the relationship ended, Galdikas stayed in Borneo for over 30 years, devoting her life to the study of the majestic ‘red ape’. Her work made many valuable contributions to the scientific understanding of Indonesia’s biodiversity and the rainforest as a whole, while also bringing the plight of the orangutan to the attention of the rest of the world.



The orangutan

By the late 1990s Galdikas had set up Orangutan Foundation International and written books such as *Orangutan Odyssey*, as well as continuing her work with the Indonesian government on conservation. In 1999 she opened an Orangutan Care Centre just in time to look after the numerous young orangutans orphaned as a result of the devastating Borneo fires of 1997 and 1998 and the continuing illegal destruction of the rainforest by loggers, gold miners and poachers. In addition, a 76,000 hectare wildlife reserve was set up in Kalimantan Tengah province.

Recently, Galdikas has been living and lecturing in British Columbia, Canada, although she still spends half the year in Borneo with her second husband Pak Bohap, a Dayak rice farmer, tribal president and co-director of the orangutan programme in Borneo.

The orangutan remains threatened, perhaps more than ever, as the demand for biofuel crops destroys more of their habitat. Galdikas fears that, in 20 years' time, there may be no orangutans left in the wild.

“ . . . it's a victory here, a loss there, a victory there and a loss here. But if we weren't doing what we're doing now, the forests and where we work would've been gone a long time ago – long time ago. I mean there's so many foresters arrayed against the forest. ”



www.orangutan.org



Biruté Galdikas, *Reflections of Eden: My Years with the Orangutans of Borneo* (New York: Back Bay Books, 1996)

1972

Arne Naess

1912–

Deep ecology

By 1969, Arne Naess was a highly respected professor of philosophy at the University of Oslo in his native Norway. He was also a passionate mountaineer, leading the first Norwegian Himalayan expedition in 1950. He once built a mountain hut at an altitude of 3,600 m.

In the late 1960s Naess, who had been in the Norwegian resistance during the German occupation in the Second World War, engaged in direct non-violent environmental action. In 1970, together with a large number of demonstrators, he chained himself to rocks in front of Mardalsfossen, a waterfall in a Norwegian fjord, and refused to descend until plans to build a dam there were dropped. Although they were removed by police, the demonstrators were eventually successful and the dam never got built.

Heavily influenced by **Rachel Carson**, Naess coined the term 'deep ecology' in 1972 and helped give it a theoretical foundation. He believed that evidence-based ecological science cannot answer ethical questions about how we should live. For this, he thought, we need ecological wisdom. Deep ecology sought to develop this by focusing on deep experience, deep questioning and deep commitment, creating an interconnected system that is what Naess would call an 'ecosophy' – an evolving but consistent philosophy of being, thinking and acting in the world that embodies ecological wisdom and harmony. Naess rejected the idea that beings can be ranked according to their relative value. In this respect deep ecology supports the view

75 expounded by Aldo Leopold in *A Sand County Almanac* that humans are not a superior species with the right to manage and control the rest of nature.

“ The right of all forms [of life] to live is a universal right which cannot be quantified. No single species of living being has more of this particular right to live and unfold than any other species. ”



Arne Naess and David Rothenberg, *Ecology, Community and Lifestyle: Outline of an Ecosophy* (New York: Cambridge University Press, 1990)

1972

Mostafa Kamal Tolba

1922–

The great negotiator

Leading the Egyptian delegates who attended the 1972 UN Stockholm Conference on the Human Environment was Dr Mostafa Kamal Tolba, a 50-year-old former microbiology professor and government minister. Immediately after Stockholm, Tolba became the deputy director of the newly formed UN Environment Programme (UNEP) and, two years later, its executive director, the post he was to hold for the next 17 years.

Tolba's great strength has been his ability to persuade sharply diverging governments and interest groups to agree to a whole series of pioneering environmental treaties. In Vienna (1985), Montreal (1987) and in London (1990), he managed to achieve consensus on prototype models for dealing with global environmental issues and on effective mechanisms for the transfer of technology and funds to developing countries. His leadership has brought the environment to the forefront of global thinking. Tolba believes that environmental decisions are inseparable from socio-political decisions and he has applied this in all his consultations with political leaders. His negotiating skills and scientific knowledge contributed to UNEP's most widely acclaimed success: the historic 1987 agreement to protect the ozone layer – the Montreal Protocol. At the Earth Summit in Brazil in 1992, he was at the helm of the negotiations when the Conventions on Climate Change and Biological Diversity were agreed. He also successfully worked for treaties to protect the Mediterranean Sea, the Red Sea and the Gulf of Aden. During the Iran–Iraq conflict he often brought the warring parties together to discuss common environmental interests.

Under his leadership, UNEP continually punched above its weight within the UN family, acting as the catalyst spurring governments, businesses, academia and non-governmental organisations to meaningful action.

Since 1994, Tolba has presided over the Centre for Environment and Development, a non-profit organisation based in Geneva and his native Cairo, which finances projects in less developed countries through an endowment fund.

“ Achieving sustainable development is perhaps one of the most difficult and one of the most pressing goals we face. It requires on the part of all of us commitment, action, partnerships and, sometimes, sacrifices of our traditional life patterns and personal interests. ”



Mostafa Kamal Tolba, *Global Environmental Diplomacy: Negotiating Environmental Agreements for the World, 1973–1992* (Cambridge, MA: MIT Press, 1998)

1972

Arthur H. Westing

1928–

Environmental hazards of chemical warfare

In 1972, Dr Arthur H. Westing, a PhD graduate from Yale and former fellow at Harvard, now working for the Guggenheim Fellowship, published his first book on the way in which chemical warfare could destroy the environment. Over the next 30 years, in publication after publication, Westing pointed out the ecological consequences of chemical warfare – detailing the damage from chemical and biological weapons on both humans and their surroundings.

In the 1960s, US military forces unleashed on Vietnam the largest chemical warfare operation in history, in the form of an aerial spray – Agent Orange – designed to defoliate the trees hiding ground movement along the Ho Chi Minh trail. In all, 71 million litres of herbicide containing 51 million kg of active ingredients were used in the region's forests and croplands. In one book, Westing reported that around 100,000 hectares, some 1 per cent of the forest lands of Vietnam, were completely obliterated by bombing and that a further 5 million hectares, over 40 per cent, were damaged. Apart from the use of Agent Orange, a significant cause of tree mortality was shrapnel because it gives access to fungus and decay.

By the 1990s Westing and his team, based in Putney, Vermont, were delivering a steady stream of books such as *Environmental Hazards of War: Releasing Dangerous Forces in an Industrialized World*. Westing worked as consultant on environmental security for the UN Environment Programme, World Bank, the Red Cross and the government of Eritrea.

But now Westing went one stage further. In his edited book for the UN Environment Programme, *Transfrontier Reserves for Peace and Nature: A Contribution to Human Security*, he reasoned that, if natural reserves could be established across political and military frontiers, warring sides might consider working together to

reduce the damage he had been chronicling for so long. By 2001, there were 169 transboundary protected areas located in 113 countries.

“ The notion of security, whether national or international, is now widely recognized to extend beyond military security to embrace social security, which, in turn, cannot be achieved without an underpinning of environmental security. ”



Arthur H. Westing (ed.), *Transfrontier Reserves for Peace and Nature: A Contribution to Human Security* (Nairobi: UNEP, 1993)

1972

David McTaggart

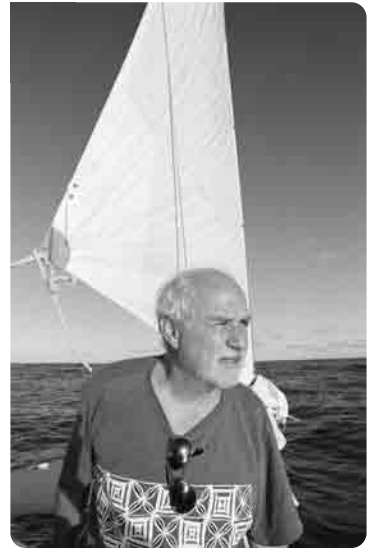
1932–2001

The shadow warrior

During the early 1970s, David McTaggart, a semi-retired Canadian business contractor, was sailing his yacht *Vega* from his new home in New Zealand when he encountered a problem. The French government had decided to cordon off a vast swathe of international waters in order to conduct their nuclear testing programme in the Pacific. Outraged that any government could exclude him from any part of his beloved ocean, McTaggart renamed his yacht *Greenpeace III* and, with crew members from that fledgling organisation, sailed right into the zone surrounding Moruroa Atoll, where the tests were being conducted. He observed international law in establishing his anchor position, but ignored the French government's unilateral declaration of the area as an exclusion zone. The presence of *Greenpeace III* at a position downwind from the planned blast forced the French to halt the test. Deciding to teach McTaggart a lesson, the French Navy rammed his yacht.

The following year, undaunted, and having repaired *Greenpeace III*, McTaggart was back to the exclusion zone. *Greenpeace III* was boarded and McTaggart claimed to have been brutally beaten up by French sailors, a charge that the French government denied. However, Anne-Marie Horne, one of McTaggart's crew, had secretly photographed the beating. In 1974, following worldwide publication of her photos and after lengthy litigation, McTaggart's campaign forced the French government to announce the end of its atmospheric nuclear testing programme.

In 1977 McTaggart began organising new support throughout Europe for Greenpeace, by then established in nine countries. In 1979 he forged an international



alliance between separate factions of the organisation and united them under his chairmanship as Greenpeace International. McTaggart was a driving force behind Greenpeace campaigns to save the whales, stop the dumping of nuclear waste in the ocean, block the production of toxic wastes, end nuclear testing and protect the Antarctic from oil and mineral exploitation. He came to be known as ‘the shadow warrior’.

By the 1990s McTaggart had retired to Italy where he was developing organic olive oil on his farm in Umbria. In March 2001 he was killed in a head-on car crash on a country road near his home. He was 68. Among the hundreds of tributes was this from his colleague, Kieron Mulhavey: ‘David was probably the single most exasperating, infuriating, obnoxious, obstinate person I ever met; he was also probably the most brilliant, energetic and charismatic. I wish everyone . . . could have had the opportunity to get to know the extraordinary benefits of being sucked up in the whirlwind that was David McTaggart.’

“ Keep the number one thing in mind: you’re fighting to get your children into the 21st century, and to hell with the rules. ”



www.greenpeace.org



David McTaggart, *Shadow Warrior: The Autobiography of Greenpeace International Founder David McTaggart* (London: Orion, 2002)

1972

Donella H. Meadows

1941–2001

Limits to growth

In 1972, Donella (‘Dana’) Meadows, a 31-year-old protégé of Jay Forrester, the inventor of systems dynamics, was part of the Massachusetts Institute of Technology team that produced the global computer model World3 for the Club of Rome. This provided the basis for her to be lead author on the bestselling book *Limits to Growth*, which made headlines around the world and started a debate about the limits of the Earth’s capacity to support human economic expansion. It was translated into 28 languages.

In the early 1990s, Meadows attended a North American Free Trade Agreement meeting where she realised that a very large new system for a regional trading bloc was being proposed with few levers in place to exert control. Inspired, in 1997 she proposed 12 leverage points to intervene in complex systems. She started with the observation that there are places within a complex system (such as a firm, a city, an economy, a living being or an ecosystem) where a ‘small shift in one thing can produce big changes in everything’. She claimed we need to know about these shifts, where they are and how to use them. Meadows argued that, although most people

know where these points are instinctively, they tend to adjust them in the wrong direction. Better understanding, she said, would help solve global problems such as unemployment, hunger, economic stagnation, pollution, resource depletion and conservation issues.

In 1981, together with her husband Dennis, she founded the International Network of Resource Information Centres (INRIC), a global process of information sharing and collaboration among hundreds of leading academics, researchers and activists in the broader sustainable development movement.

For 27 years Meadows lived on a small, communal, organic farm in Plainfield, New Hampshire, where she worked directly on sustainable resource management. In 1999 she moved to Vermont where she founded the Sustainability Institute, combining research in global systems with practical demonstrations of sustainable living, including the development of an ecovillage and organic farm. She taught at Dartmouth College for 29 years and for 16 of these wrote a weekly column called 'The Global Citizen', commenting on world events from a systems point of view. It appeared in more than 20 newspapers and she received a nomination for the Pulitzer Prize in 1991.

She died on 21 February 2001 at the age of just 59 after a brief fight with cerebral meningitis. Her work is widely recognised as a formative influence on hundreds of other academic studies, government policy initiatives and international agreements.

“ Speak the truth. Speak it loud and often, calmly but insistently, and speak it, as the Quakers say, to power. Material accumulation is not the purpose of human existence. All growth is not good. The environment is a necessity, not a luxury. There is such a thing as ‘enough’. ”



www.sustainer.org



Donella H. Meadows, Jorgen Randers and Dennis L. Meadows,
Limits to Growth: The 30-Year Update
(White River Junction, VT: Chelsea Green, 2004)

1973

Ernst Friedrich Schumacher

1911–1977

Small is beautiful

In 1955, Ernst Friedrich Schumacher, a German-born British economics adviser, travelled to Burma as a consultant. While there, he developed the principles of what he called 'Buddhist economics' based on the fact that 'production from local resources for local needs is the most rational way of economic life'.

Returning to England and resuming his post as Chief Economic Adviser to the British National Coal Board, Schumacher continued to refine his theory until, in

1968, his article about Buddhist economics was published in a magazine that he had co-founded called *Resurgence*. In subsequent articles for that magazine, Schumacher pioneered what is now called ‘appropriate technology’ – environment- and user-friendly technology matched to the scale of community life. He founded the Intermediate Technology Development Group (now Practical Action) in 1966.

In 1973 Harper & Row published Schumacher’s book *Small is Beautiful: Economics as if People Mattered*. Sales were slow at first, but then Schumacher agreed to go on a lecture tour of the US. His visit coincided with the 1973–1974 energy crisis during which the price of oil rose several times. *Small Is Beautiful* became an overnight bestseller. Ultimately, 800,000 copies were sold and the book was translated into

many languages. According to *The Times Literary Supplement*, it is among the 100 most influential books published since the Second World War.

In his sixties, Schumacher travelled the world, speaking and promoting his ideas. He set up the Schumacher Institute for developing countries to design appropriate technologies that do not rely on Western manufacturers. In early 1977 Schumacher again toured North America where an estimated 60,000 people heard him speak on ‘the right size for the right society’.

His death in Switzerland on 6 September 1977 from a heart attack tore him away at the very time his ideas were close to a breakthrough. Soon after, friends and co-workers set up E.F. Schumacher Societies, first in England and later in the US. The first Schumacher Lecture took place in 1978.

In 1991 a Schumacher College for ecological studies was set up at Dartington, Devon, in the south-west of England. This is now part of the Schumacher Circle which includes the Intermediate Technology Development Group, Soil Association, New Economics Foundation, Green Books, Centre for Alternative Technology and *Resurgence* magazine.

“ The system of nature, of which man is a part, tends to be self-balancing, self-adjusting, self-cleansing. Not so with technology. ”



www.schumacher.org.uk



E.F. Schumacher, *Small is Beautiful: A Study of Economics as if People Mattered* (New York: Vintage, new edn 1993)

1973

Ivan Illich

1926–2002

The energy saver

In 1969, an Austrian-born priest called Ivan Illich, who was running the Centre of Intercultural Documentation in Cuernavaca, Mexico, decided to abandon the priesthood. The following year Illich published *Deschooling Society* in which he argued that a modern, technological economy prevents people from learning about reality.

Soon after, the world encountered its first fuel crisis. Illich's response, a book entitled *Energy and Equity*, made the former priest one of the most important theorists of the radical ecology movement. In it, he examined the question of whether or not humans need any more energy than is their natural birthright. The work, as with some of his other polemical writing, remains as radical today as it was at the time.

“**Relieve our dependence on foreign fuels by developing ‘ecologically friendly’ energy extraction technology, or send an army to pacify the fuel-rich region in question. Both of these paths, seemingly at odds with each other, take as fundamentally true a certain proposition, that in no circumstances should we use less energy than we already use. In this conception, all human problems must be solved by the impressment of still more ‘energy slaves’ to meet the expanding demand of human masters.**”



www.davidtinapple.com/illich



Ivan Illich, *Energy and Equity* (New York: Marion Boyars Publishers, 1974)