

Nuclear Mendacity

An Antidote

Christopher Gifford

Christopher Gifford is a Chartered Engineer who worked as HM Inspector of Health and Safety in mining and quarrying for 25 years. His work involved enforcement of the Ionising Radiations Regulations and some joint activity with the Nuclear Installations Inspectorate on human factors in high risk industries following the Chernobyl disaster in 1986. He is the author of Nuclear Reactors: Do We Need More? (Socialist Renewal £2). Here he reviews Helen Caldicott's authoritative and accessible study, Nuclear Power Is Not the Answer (New Press, \$15.95).

Helen Caldicott is an Australian paediatrician whose interest in nuclear reactors and the associated nuclear weapons clearly stems from her knowledge of the medical effects of radiation in human reproduction and disease. She founded the organisation Physicians for Social Responsibility. Her expertise is not confined to medicine. In the writing of seven books about nuclear technology and nuclear weapons she has studied uranium mining and the processing and enrichment of the mineral into reactor fuel and material for weapons. She was nominated for a Nobel Peace Prize by Linus Pauling, himself twice a Nobel Laureate. This account, all of it guided by industry specialists with ample references and end-notes, is mainly about the United States and Britain.

Caldicott describes in a readable way how reactors work and what dangerous materials are routinely released in the process and in nuclear accidents. Reprocessing is also described with the resulting proliferation of plutonium and atomic weapons. When she has described the present range of more than 30,000 nuclear weapons, many of them targeted and many of them hydrogen bombs, which can be 1,000 times more destructive than a Hiroshima type atomic bomb, she has an uncompromising word for the whole business. It is simply madness.

All of that is before the consequences of terrorist attacks on nuclear installations are considered. The possible consequences of foreseeable accidents and attacks have not been described to us by the regulators nor by the operators who are required by British and European law to tell us what plans have been made for our evacuation, transport, shelter and treatment.* It is easy to understand why. In the worst scenarios large parts of Britain become suddenly uninhabitable. Even diminutive

*The regulations dealing with foreseeable emergencies are the Radiation (Emergency Preparedness and Public Information) Regulations 2001 SI: 2971.

accounts of that would not fit alongside a policy of building more nuclear reactors to counter global warming.

The industry's history of claims that it is safe, economic, peaceful and now necessary is the history of its mendacity. During the third of our recent government energy reviews, the new leader of the opposition in the British Parliament declared that safety was no longer an issue and the grateful then Prime Minister, even with his better information about the vulnerability to terrorism, took no exception to that claim.

Nuclear waste is not stored safely in the United Kingdom, as our Department of Trade and Industry claimed a few years ago. No one who had read the reports of the Nuclear Installations Inspectorate could make such a statement. Nor is the amount of such waste in Britain 10,000 tonnes, as the DTI reported. That amount was soon to be contradicted by the government's Committee of Radioactive Waste Management (CoRWM). Helen Caldicott deals effectively with the worldwide question of waste. She begins with the 250 million tonnes in the United States alone of radioactive tailings, finely divided, largely untreated and currently being ingested by local populations. We can forget about what can be fitted into double-decker buses when we read her quoted estimate that all America's radioactive waste loaded into railroad cars would form a train longer than the Equator.

The book is most topical in the chapters on the costs of electricity generation in nuclear power stations, the claims for new designs of reactors, and the 'carbon free' process that we must have to counter global warming. The new designs are just designs; not yet built, certainly not tested, and not yet appraised by our regulators. On the economic costs of generation, Helen Caldicott describes the subsidies and waivers of insurance and waste management costs in the United States that make claims of economic operation false. Similar conclusions have been reached in the United Kingdom. To test the claim of economic generation in the UK we need only to know that in three recent government energy reviews, two contradictory and the other judged misleading and unlawful in the High Court, none quoted the current cost of nuclear electricity. It is a matter of commercial confidentiality for the private sector operator recently supported by £4bn of taxpayers' money.

In her examination of the carbon dioxide emissions in the nuclear industry, the author sounds more like an engineer than a doctor of medicine. It is indeed her first chapter. She compares the energy units involved in uranium mining and milling, in transport, in processing, in waste management and in construction with the transmission losses and the useful output of a nuclear power station, of necessity built miles away from large populations where waste heat might otherwise be used. Her broad conclusion is that nuclear power stations presently cause one third of the carbon dioxide emissions of gas fired power stations.

But that is not all. For the future much depends on the availability of high grade uranium ore bodies. When inevitably lower grade ore would have to be mined and crushed, we could arrive at a position of parity between nuclear and fossil fuelled electricity. The logistics are impressive. For a large reactor requiring 162 tonnes of natural uranium per year to be refined from an ore body with only 4 grams of

uranium ore per tonne of hard rock (an unworkable low grade ore but it illustrates the point), 80 million tonnes of rock would have to be mined and crushed using 5.5 gigajoules of energy per ton of rock. The energy used in those processes is mainly diesel oil and the energy used would exceed the electrical energy generated by the power station by a factor of three. The authors quoted believe that parity between uranium fuelled and fossil fuelled generators would be reached when the ore concentration is about 0.01%.

In chapters on nuclear energy and nuclear weapons proliferation, any stranger to the subject, perhaps a young person soon to be a first time voter, is bound to be impressed and perhaps confused by the contradictory objectives of the International Atomic Energy Agency (IAEA), which exists to promote the development of atomic energy, and the signatories of the nuclear weapons Non-Proliferation Treaty. The United States in the 1980s was the first to encourage Iran to develop a nuclear power programme, including uranium enrichment facilities, but now we read of plans by the US Strategic Command to attack Iran to destroy the facilities nearing completion. Iran's development is not illegal, although there has been some concealment no doubt to preclude attacks by Iraq and Israel, but the IAEA director, Dr Mohamed ElBaradei, mindful of the past concealment, still reports that his inspectors find no evidence of work to produce a nuclear weapon.

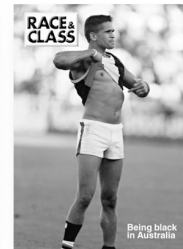
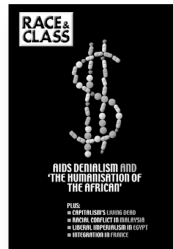
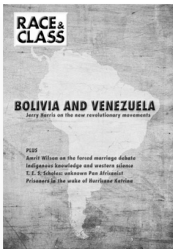
Every enrichment facility is capable in time of producing uranium sufficiently enriched to make a uranium bomb, and every reactor produces in its spent fuel the transuranic element plutonium of which only a few kilograms is sufficient to make a plutonium bomb. The world inventory of weapons grade plutonium is likely soon to exceed 100 tonnes. Plutonium in spent fuel now exceeds 1,500 tonnes and, on proposed trends, by 2050 could exceed 20,000 tonnes. Russia currently assists Iran to build its first reactor. China has assisted Pakistan to produce weapons, and the United States has supported India in the development of weapons to 'contain China'. Political instability in Pakistan is such that a terrorist organisation could gain possession of a weapon.

Helen Caldicott explains that one millionth of a gram of plutonium is a carcinogenic dose capable of inducing a fatal lung cancer. From bomb tests, reactor accidents, legal and illegal discharges from reprocessing plants, and mismanagement, it is already ubiquitous in our environment and in the teeth of our children.

The claim that renewable energy sources are not sufficient to replace both nuclear and fossil fuels is one of the recurring claims made in support of nuclear industry expansion. Some 'green' defectors, such as Sir James Lovelock, even George Monbiot, have aided the industry in this without sufficient inquiry. Helen Caldicott quotes research findings that do not underestimate the magnitude of solar radiation, tidal energy, geothermal heat, and wind energy, among others. That we have done so little about developing renewable energy is something that our present government has to explain because we have been reminded since E F Schumacher's early writings that use of non-renewable sources leads inevitably to shortage and exhaustion.

The land between the Rockies and the Mississippi has been described as the Saudi Arabia of wind energy and, in energy terms, exceeds the equivalent of all of America's electricity. Not even a fifth of it need be harnessed, of course, because there are other sources and solutions such as solar energy, hydro-electricity, geothermal energy, biomass, the recovery of energy from waste, energy conservation, local generation and the use of waste heat from power stations. Photovoltaic solar panels on fifty square miles of land could also collect all the electricity the US needs. Helen Caldicott could have quoted similar findings in Europe where the Bosch company has identified 100 sites for tidal generators on the coast of Europe each capable of producing the electrical output of a nuclear power station.

Helen Caldicott is upbeat on what can be done, and is being done, in the United States at state government and local level. The federal government, like the UK government, remains committed to the bomb and its further development, to the weapons industry and to the nuclear lobby. Her book will help to change that commitment, perhaps into more timely action on climate change.



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