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Brave Nuclear World

You remember 1974. In 1974 the Central Electricity Generating Board wanted authorisation to order 32 1300-megawatt light water nuclear reactors. The Department of Energy told the Royal Commission on Environmental Pollution that it might be necessary to have in operation by 1990 the equivalent of some 55 more of the largest nuclear reactors licenced for construction in the UK. The UK Atomic Energy Authority told the Royal Commission that by the year 2000 there might be in operation in the UK 104,000 megawatts of nuclear power stations, of which 33,000 megawatts would be fast-breeder reactors. That was 1974 - less than five years ago.

At the time, Britain had about 5,000 megawatts of nuclear power in operation, with about the same amount still under construction. The official prognostications foresaw this increasing eightfold by 1990, and twentyfold by the year 2000. Friends of the Earth (FoE) challenged both the wisdom and the credibility of such projections, wildly out of touch with any plausible British reality. At the time, as FoE energy specialist, I also happened to be writing for Penguin Books a Pelican Original entitled *Nuclear Power*. Again and again I stumbled on the official assertion that we faced a choice: either a lot more nuclear electricity or "drastic changes in life-style". This seemed to me a false dichotomy. We were clearly going to have "drastic changes in life-style" whichever choices we made. Even before I had completed the first draft of the Penguin book I had begun to reflect on the "changes in life-style" which might *accompany* increasing reliance on nuclear electricity. The prospects seemed far from reassuring.

As the relevant material coalesced and came into focus it assumed the shape of a new book. By early 1975 even the title had emerged: *The Fissile Society*. However, having confided this title to my colleagues I then had to defend it for nearly two years to keep them from appropriating it, because the new book proved disconcertingly difficult to write. As tentative deadlines came and went I wrote and scrapped and wrote and scrapped, getting nowhere. The book eluded me. Then, in late 1976, a realisation dawned. I was attempting to write an analysis of what might be happening 20 years hence, around the turn of the next century. But all the material on my desk was *historical*. The developments and trends being analysed were already happening, indeed had been happening for years. Once I understood this, I wrote *The Fissile Society* in six weeks.

The typescript of the book was already in the hands of the editor when my telephone rang, at 11.15 in the evening. It was my Poland Street FoE colleague Czech Conroy. "I know it's taboo to call at this hour, but just listen." The paragraph he read over the phone made my neck prickle.

Assuming, then, that we are capable of learning as much from Hiroshima as our forefathers learned from Magdeburg, we may look forward to a period, not indeed of peace, but of limited and only partially ruinous warfare. During that period it may be assumed that nuclear energy will be harnessed to industrial uses. The result, pretty obviously, will be a series of economic and social changes unprecedented in rapidity and completeness. All the existing patterns of human life will be disrupted and new patterns will have to be improvised to conform with the nonhuman fact of atomic power.

Procrustes in modern dress, the nuclear scientist will prepare the bed on which mankind must lie; and if mankind doesn't fit - well, that will be just too bad for mankind. There will have to be some stretchings and a bit of amputation - the same sort of stretchings and amputations as have been going on ever since applied science really got into its stride, only this time they will be a good deal more drastic than the past. These far from painless operations will be directed by highly centralized totalitarian governments. Inevitably so; for the immediate future is likely to resemble the immediate past, and in the immediate past rapid technological changes, taking place in a mass-producing economy and among a population predominantly propertyless, have always tended to produce economic and social confusion. To deal with confusion, power has been

centralized and government control increased. It is probable that all the world's governments will be more or less completely totalitarian even before the harnessing of atomic energy; that they will be totalitarian during and after the harnessing seems almost certain. Only a large-scale popular movement toward decentralization and self-help can arrest the present tendency toward statism. At present there is no sign that such a movement will take place.

Thus Aldous Huxley, in his Foreword to *Brave New World*, written in 1946: 30 years earlier. I could scarcely credit the passage, because I had just finished a typescript describing developments uncannily similar to Huxley's prophetic vision, actually in progress for some 20 years. The following morning I telephoned Huxley's publisher, Chatto & Windus, and was given permission to use Huxley's paragraph as the epigraph for *The Fissile Society*.

The Fissile Society opens with a brief reminder of the conventional wisdom: that energy demand will continue to increase, and can be met only by nuclear electricity and fast breeder reactors - that otherwise there will arise the aforesaid "drastic changes in life-style". The book describes the distinctive characteristics of grid electricity: that it cannot be stored, and must be produced instantaneously in precisely the quantity required by the aggregate of users at any given moment; and that generation and distribution of electricity from fuel costs some three-quarters of the heat value of the fuel. The book then chronicles the historical development of the British electricity system, and the British nuclear establishment, recalling the extraordinary track record of electronuclear activities in Britain - too soon, too large, too expensive, ill-advised and even worse executed, a history which has been rewritten continuously as one discreditable episode follows another. Separate chapters are devoted to more detailed dissection of the influences of electronuclear technology on planning, finance, employment, and social organisation. The argument is developed in considerable detail, with many specific examples from British experience. Here a few general observations will have to suffice.

The size of power station - especially nuclear station - now considered "economic" regularly takes ten years or more to build; but forecasts of electricity use more than six years hence are no better than guesses. In such a context, planning is not so much an act of foresight as an act of faith. The result is a system which is inflexible and brittle, in which mistakes are hard to correct, and in which attempts to resolve acute problems may aggravate chronic problems: witness the present state of the UK power-station building industry, and its likely prospects. Nevertheless, because of the nature of the electricity supply system - a natural monopoly providing an essential commodity - the electricity industry can obtain access to capital with full government support, even for very dubious investments, on terms far more generous than those available to the householder or small business. This asymmetry distorts the allocation of resources between a monolithic supply industry and its smaller customers, who might collectively be able to make far better use of the resources to improve their energy utilisation with insulation, new plant and other conservation technologies.

The electricity supply industry prides itself on its "productivity": in the last decade it has reduced its workforce by nearly 30 per cent while increasing its output well over 30 per cent. In effect it has substituted capital for people. Up to a point this is of course commendable; but there comes a time when such substitution is eliminating not human drudgery but human skills. Taken to its logical conclusion such "productivity" would eliminate people completely; the technology would take over, on its own terms. New electricity industry jobs now arise mainly in building power stations, not in operating them: short-term and nomadic employment which may be briefly beneficial to a locality but is ultimately disruptive.

Most disturbing of all is the vulnerability of an electronuclear system, at every stage from planning through operation. It seems fundamentally unwise for a community to come to rely to a more than limited extent on an energy supply system which can be interrupted instantaneously over a wide area, by misjudgment, mishap or malevolence. If the electricity system incorporates nuclear capacity, and especially if that nuclear capacity includes fast breeder reactors fuelled by plutonium, the authorities will almost certainly have to resort to extreme measures to ensure the security of the system. The penultimate chapter of the book concludes thus:

In a country with the historic libertarian tradition of Britain such measures are unlikely to be universally accepted without dissent. The consequent social polarisation (between the authorities and the general public) could create precisely the conditions most likely to provoke the confrontation to which the energy system would be most vulnerable. To say the least, the prospect does not appear to be one of durable social stability. It is rather of a social system subject to steadily mounting stresses within, and vulnerable to catastrophic disruption: a fissile society.

The concluding chapter indicates the policy implications of this analysis, pointing out that we must willy-nilly begin where we are, with a great deal of nuclear hardware and nuclear material already on hand, and problems a-plenty whatever we now decide: especially the problem of the proliferation of nuclear weapons. A postscript takes issue with the alarmist official allegation that only nuclear electricity can keep us from freezing in the dark, and insists that we have a wide range of feasible and plausible options, long overdue to receive their share of attention and funding.

I had been seconded for the first six months of 1976 to FoE's research affiliate, Earth Resources Research, to write the book. But the long struggle to discover the true meaning of the material meant that the typescript was only delivered in early 1977. By the time the book was ready to appear the whole FoE energy team was working 36-hour days preparing our case against the expansion of oxide fuel reprocessing at Windscale. *The Fissile Society: Energy, Electricity and the Nuclear Option* was published on 9 June 1977, only five days before the opening of the Windscale inquiry. Since it was published by Earth Resources Research rather than by a commercial publisher it was given very limited distribution and virtually no advertising. It received a number of thoughtful reviews, but was inevitably and understandably buried in the avalanche of copy emanating from Whitehaven. This was for me doubly frustrating. In the first place, of course, I had hoped the book would find an interested readership. More particularly, however, I wanted to see whether the analysis in the book would stand up against the criticism it seemed sure to provoke. Unfortunately, for whatever reason, the anticipated criticism failed to materialise. The book which I had thought to be a polemic positively demanding a rebuttal elicited only a lofty silence.

In October 1977 FoE and the Atomic Energy Authority co-sponsored a two day conference at the Royal Institution, on "Nuclear Power and the Energy Future". I contributed a paper to one of the sessions, retracing in outline the arguments of *The Fissile Society*. However, my co-contributor, Dr Norman Franklin, Managing Director of the Nuclear Power Company, shrugged my comments aside in uncharacteristically testy fashion, implying that they needed no answer.

Eventually the book was reviewed in the December 1977 issue of *British Nuclear Fuels Ltd News*, the company's staff newspaper, by Len Brookes of the AEA, back to back with *Energy or Extinction?* by Sir Fred Hoyle. Len Brookes waxed rhapsodic over Sir Fred; but for me he had little use. "*The Fissile Society*) has almost no interesting factual material. It is almost entirely an unstructured deluge of unconnected attack... full of begged questions and unsubstantiated assertions... Many of the things that he says are inaccurate or misleading..." The review went on to make its own unsubstantiated assertions, frequently inaccurate and misleading, and begged the question I had hoped it would answer: if the analysis in *The Fissile Society* is wrong, why is it wrong? The factual content, *pace* Len Brookes, is copious, drawn from primary sources like the Annual Reports of the AEA, the CEGB and BNFL, Select Committee reports and other official documents, and it is, to me at least, not only "interesting" but absorbing and thought-provoking. There may nevertheless be something fundamentally wrong with my interpretation of the facts. If so, I wish someone would tell me what it is. If not, we'd better do something about it, while we still can.