Atomic Albion

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The last time nuclear power was controversial, or at any rate the subject of intense public debate, *Lobster* had not long started, Margaret Thatcher was crushing the miners' strike and Duncan Campbell was the go-to journalist for all things secret state.

It was a deeply paranoid time, book-ended by the mysterious deaths of two anti-nuclear campaigners – Hilda Murrell, March 1984 and Willie McRae, April 1985 – and accompanied midway through by the BBC screening of *Threads*, a documentary drama about the catastrophic effect of a nuclear war on the north of England.[1] More followed after the miners capitulated: a first ever TV screening of Peter Watkins's *The War Game* (July 1985), the BBC broadcast *Edge of Darkness*, a drama series whose plot featured much about the secret state (November 1985), and the disastrous nuclear accident at Chernobyl (April 1986). The same decade saw the government provide much derided advice on how to 'survive' a nuclear strike in the pamphlet *Protect and Survive*;[2] some, but not all, local authorities took part in *Operation Square Leg*, an exercise designed to test what would happen to their areas in the event of a nuclear attack; and Raymond Briggs's graphic novel *When the Wind Blows* became a runaway best-seller, with an animated film version appearing in 1986.

Looking back, we can see why those who doubted the efficacy of nuclear

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[1] Hilda Murrell was a 78-year-old protestor against the construction of Sizewell B power station, whose nephew had served on HMS *Conqueror* during the Falklands war. Willie McRae, 58, was an SNP activist and lawyer campaigning against a nuclear waste disposal site in Galloway. The director of *Threads*, Mick Jackson, also directed *A Very British Coup* (1988).

[2] *Protect and Survive* was originally distributed to local authorities in 1976 but only became widely known – and the subject of derision – some years later. Central government knew from the mid-50s that there was no effective way of protecting the civilian population from nuclear as opposed to atomic weapons.

power failed to stop its onward march. Campbell and other commentators did not have access to sufficient information to swing the political debate their way; Arthur Scargil was an effective champion for coal, and, as it happens, accurate in deriding nuclear power, but came across as an arrogant, ideologically-driven bully; and Tony Benn, though correct in his critiques, was hampered by having been earlier in his career a keen advocate of technology and a member of four Labour governments that embraced nuclear power.

Not that it was all paranoia. Anyone growing up in the 50s and 60s would also remember the 'atoms for peace' era, when anything seemed possible and valiant efforts were made to adapt nuclear power for a variety of civilian uses. Much of this was enmeshed in the boundless optimism of the time: cities on the moon; a manned mission to Mars in nuclear-powered rockets (both by the 1980s); nuclear-powered cars (wholly impractical due to the requirement for a concrete shield, five feet wide, between the reactor and the driver); and, nuclear-powered merchant ships, of which four were built.[3]

What we didn't have in the 80s was an itemised, site by site inventory of the UK nuclear industry, complete with costings and time scales for commissioning and decommissioning. This book provides a lot of basic information and brings welcome clarity to a subject that is both difficult (how many of us understand nuclear physics?) and shrouded in secrecy.

Since the UK committed to nuclear in 1946, 58 reactors, of various types, have been built. Of these 34 were primarily for civilian use.[4] The remainder were military. It has been more than thirty years since the UK added a new reactor to the grid (at Sizewell, in 1995) and 27 of the 34 designated for civilian use have now been decommissioned, leaving 7 in service. Two new reactors, both at Hinkley Point, are under construction.

This activity has been spread across 15 discreet locations, of which 12 provide electricity for domestic use, and 3 (Winfrith, Sellafield, and Dounreay) are reserved for military use and on-going research. Peak nuclear occurred in 1988 when 32 civilian reactors were in service. The number has declined gradually ever since.

It is often thought this pro-nuclear policy was driven by Thatcher. This is not correct. Her governments were the beneficiaries of considerable investment during the Attlee, Macmillan, Wilson, and Heath eras with 21

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[3] Of these the *Savannah*, built by the US as a cargo-liner in 1962, proved uneconomical and was decommissioned in 1971. Russia operates the *Sevmorput*, a cargo and container carrying vessel built in 1988.

[4] This division is not a neat one, however, as some of the military reactors occasionally provide small, ancillary, amounts of power to the grid. Their purpose, though, is non-civilian.

nuclear power stations commissioned between 1959 and 1971, and a further 9 added by 1983. Given lead–times for these projects, it is clear Thatcher, though a supporter, had little to do with it.

This boom was accompanied by wide-eyed exceptionalism. Wylfa in Anglesey boasted the largest Magnox reactors in the world and in 1965 Minister of Power Fred Lee MP proclaimed the advanced gas cooled reactor 'the greatest breakthrough of all times'. Repeatedly chosen because it was British, it was massively expensive, uneconomic, and underpowered. The French preferred the pressurised water reactor (which the UK Admiralty selected to power its nuclear submarines) with the result that France leads nuclear technology today, with both the UK's two new stations using the European pressurised reactor.

Looked at in the cold light of day, nuclear provides more problems than solutions. A mixed oxide plant at Sellafield proved a costly failure (it was closed in 2011), and much hope is pinned on small nuclear reactors, of which only five experimental versions exist elsewhere in the world. According to the International Atomic Energy Authority, 'Their economic competitiveness is still to be proven in practice.' A fast breeder programme is ruled out as too expensive, even by the generous levels typical for atomic energy, and whilst continual reference is made to nuclear fusion, it remains unclear whether such a process exists, or even if it does, whether it can be made to work in an economic fashion.

This book reminds us that building a nuclear power station is so expensive that in the 21st century thus far only one, in Finland, has been completed. Successive UK governments have made increasingly frantic attempts to get their cost off the accounts. Ideologically driven privatisations of the Central Electricity Generating Board and British Nuclear Fuels Limited have brought in private sector money as the UK seeks to stop paying for nuclear whilst continuing to enjoy its supposed benefits. As usual, the involvement of third parties has been cack-handed.

Much of the infrastructure so expensively paid for by UK tax payers is now owned by foreign companies. The manufacture of nuclear fuel, undertaken at Springfields, near Preston, since 1946, ended up with Toshiba, who filed for bankruptcy with the work being transferred to Westinghouse Electric UK, a subsidiary of the giant US conglomerate. George Osborne and David Cameron outsourced the construction of new power stations to the Peoples Republic of China, a decision seemingly put on hold in 2021, after widespread criticism.

At the time of writing the new station at Hinkley Point C is being built by EDF (owned by the French state) who now run all the UK's nuclear power

stations. Its cost has escalated to £45 billion. The attraction of these arrangements to foreign governments, or corporations – like Hitachi, also considered at one point – is that they get the construction costs back from future electricity contracts. Putting them in this position gives them, of course, considerable leverage over the electricity tariffs that are set. Why any country, outside of Africa, and other bits of the developing world, would trade away control of their national infrastructure, and ultimately their sovereignty, tells us a lot about the priorities of the UK (or rather, specifically, English) political class in the last half-century: a religious adherence to running a low tax economy, trumps everything.

Safety has always been a key argument against nuclear. After all, what happens if there is an explosion, or accident, at a coal, oil, or gas-powered station? People may be killed, there would be damage, and pollution (some toxic) but nothing insurmountable. Nothing that can't be cleared up. Remedying the situation would be expensive, but entirely manageable. This is certainly not the case with nuclear installations.

Most of us are aware of the serious nuclear accident that occurred at Windscale/Sellafield on 10 October 1957. It avoided being disastrous by the slimmest of margins. Had a catastrophic explosion occurred – detonation of the reactor – the north and midlands of the UK would have been rendered permanently uninhabitable. The author posits in such circumstances, cut off from the rest of the UK, Scotland would have become independent by default, with the government of England and Wales, crowded with refugees and economically bankrupt, asking to become US dependencies. As he remarks in his opening chapter on Sellafield, 'There is an alternative history of Britain.'

Safety is one problem, though efforts can always be made to improve it. Nothing can be done, though, about the problems caused by nuclear waste. As early as 1976 the Royal Commission on Environmental Pollution recommended that no new nuclear plants be built until plans were agreed and implemented to store long-term waste.[5] These findings have never been put into practice. Instead, the UK has enthusiastically assumed a role as a nuclear reprocessing centre for Europe, and much of the rest of the world. These activities take place at Sellafield, where continuing accidents (some minor, some not so, few reported) cause despair to neighbouring countries. The Norwegian government has even volunteered to run Sellafield rather than allow the UK government to 'run something so dangerous on a shoestring budget and without transparency'.

None of this prevented Mrs Thatcher from trilling in 1989 that nuclear was

[5] <https://www.rcep.org.uk/files/reports/05-air/1976-05air.pdf>.

‘the most environmentally safe form of energy’. The reverse is true. The UK may have decommissioned 27 power stations, but this process takes 75-100 years post-closure. Most of us will never live to see these sites vanish from the landscape.

As noted, there is still no ‘Geological Disposal Facility' where waste can be stored below ground in sealed steel containers. The cost of building and maintaining one would be incalculable, and – unsurprisingly – nobody wants one in their neighbourhood. Even if one were provided, the waste takes so long to decay that it would still be dangerous when our solar system has collapsed, and our planet has ceased to be habitable.

Reading this inevitably makes one speculate about how significant the ‘up-side’ (providing domestic electricity) has been from nuclear, compared to the well-documented ‘downsides' (radiation, pollution, long-term storage). Various figures are available, but it seems that nuclear provided about 15% of total UK electricity generating capacity at its peak. Which sounds acceptable until you realise that ‘electricity generating capacity’ is always set at more than the country would need if every home, office, and factory were occupied and operational. It is usually about 10-20% more than the maximum likely to be used, so that demand can be met and power stations ‘switched out’ for maintenance, repairs, and upgrades. It is also helpful to build in over capacity to deal with circumstances where part of the network ceases to function because of winter storms, strikes or other forms of conflict. The 15% provided by nuclear, then, was a 15% that usually wasn’t needed, and could have been provided by less lethal and cheaper methods.

The argument against nuclear weapons, for which a smaller number of reactors, and various installations are needed, is not determined by purely mathematical considerations about cost and capacity. If the state thinks it prudent to have these in its defensive armoury, to fend off existential threats, then it should accept the cost of doing so, and be prepared to pay for their construction, maintenance, and decommissioning. This is a perfectly logical moral/strategic choice. Given the number of other countries with such weapons today, it might indeed be wise to have a few of ones own.

Had the UK decided to concentrate its nuclear activities purely within the military area, Tom Bolton would have been visiting far fewer sites on his journey around the UK. Government spending on nuclear would have been significantly lower, and the on-going costs of decommissioning and storage much less. Military nuclear, if one is inclined toward it, is thus a price worth paying. Civilian nuclear is a waste of money, and a route the country should never have gone down. In the last few years, a considerable lobby has urged a

reboot of civilian nuclear, citing the extravagant requirements of Artificial Intelligence (AI) and data centres as a justification for this. Such arguments should be resisted, as indeed should the unregulated private sector-led AI that is being offered. Why should the state pay for this?

Had the Callaghan cabinet acted on the findings of the 1976 Royal Commission on Environmental Pollution, and, in the absence of a waste storage facility, stopped further use of civilian nuclear power, the UK would presumably have used oil, gas and coal to generate electricity until renewables took over. There would have been a slower withdrawal from fossil fuels. Tony Benn – Secretary of State for Energy 1976-1979 – would have argued that an expansion of investment in wind, solar and tidal energy was possible. The sovereign wealth fund that he advocated, raised via a levy on offshore gas and oil extraction, would have paid for this. Instead, Callaghan and his colleagues took no such decision, and dismissed the notion of a sovereign wealth fund after a derisory half hour discussion.[6] There is an alternative history of Britain here, too.

The importance of this book cannot be overstated. It provides a comprehensive guide to the British nuclear industry, with a wealth of information (notably costings and construction/decommissioning timescales) to help the reader understand the immense implications of the country's commitment to this form of energy. It works on multiple levels: as a geographical guide, an architectural guide, a narrative history, a political guide, and even, by virtue of including in its narrative details of the local legends that abound in these remote locales, as a folk-horror work.

This is a definitive compendium, and likely to remain so for some time.

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Simon Matthews's new book, A Study in Failure: Churchill at the Admiralty 1939-1940*, is published by Oldcastle Books on 10th May.*

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[6] See Tony Benn, *Conflicts of Interest: Diaries 1977-80* (London: Hutchinson, 1990) pp. 280/81