

## **Energetic attention**

*Financial Times, 27 February 1975*

From Mr Walter C Patterson

Sir, Maybe I've not been paying attention, but your back page piece headed "Coal price rise brings fear of lower electricity demand " (February 24) leaves me somewhat confused. You say that CEGB chairman Arthur Hawkins has "warned" that the coal price rise, industrial recession, warm weather and energy conservation could lead to a fall in electricity demand. No one welcomes an industrial recession, to be sure. But was it not the electricity industry which was pressing for consumers to pay the full economic price for energy? And is not the electricity industry the largest consumer - that's right, consumer - of energy in this country? Is it not also true that the warm weather this winter has done more for our balance of payments than any industrial activity? And is not the whole point of the Government's "Save-it" campaign an attempt to cut energy demand, electricity included? Or have I not been paying attention?

Walter C Patterson  
Friends of the Earth  
9 Poland Street London W1

## **Plutonium:non-treaty traffic in raw weaponry**

*Guardian, 21 April 1975*

Sir, On May 5 1975 there will open in Geneva one of the most important conferences of this or any year. Some 83 nations, parties to the Non-Proliferation Treaty to limit the spread of nuclear weapons, will meet to review the present status of the NPT. The UK is - with the US and the USSR - one of the three "depository nations" for the NPT : in effect one of its sponsors.

Article III Section Two of the NPT prohibits any nation party to the Treaty from supplying "special fissionable material" - for instance plutonium - to "any non-nuclear weapon state for peaceful purposes": unless the material is "subject to the safeguards required by this Article."

I understand that the UK supplies plutonium to nations, among them Japan and Italy, which have not ratified the NPT and are not subject to - "the safeguards required by this Article" - that is, safeguards applied by the International Atomic Energy Agency. (Bilateral safeguards do not fulfil the terms of the Treaty, but merely by-pass it.)

It is therefore clear that the UK - a depository nation - is itself violating the Treaty. My colleagues and I have tried in vain to ascertain where in the Government or the Civil Service the responsibility for the present policy resides.

If a depository nation can thus casually disregard even the most undemanding obligations under the Treaty, the Geneva review conference will be a waste of time. As the weapons spread, time will be something we can ill afford to waste.

Yours sincerely  
Walter C Patterson  
Friends of the Earth Ltd  
9 Poland St London W1



### **Doubts on the nuclear dustbin deal**

*Guardian, 17 March 1976*

Sir - To no one's surprise the Government have given British Nuclear Fuels Ltd approval to complete a contract for the reprocessing of oxide fuel from Japanese nuclear reactors. In so doing, they say, "The Government have given full consideration to the safety and environmental implications of accepting more work of this kind." It must be hoped that the said "full consideration" of safety is not exemplified by the equivalent consideration given to the basic economics of the contract.

Consider how matters now stand. We do not know how much it is costing to rebuild the present plant, nor how much the two new plants will cost, nor who is to pay for them - even if we overlook the cost overruns long since endemic in the nuclear industry. Figures stated in the past six months have ranged from £400 millions to £900 millions; only an innocent could accept the latter as a true upper limit,

Much has been made of the Japanese advance payment; but it will cover less than one-fifth of this latter sum.

How much will come from the Treasury? At least half? Three-quarters? BNFL's self-financing has always been a mystery; is it not past time we were allowed a peep at its capital accounts, unobscured by reference to "assets used for defence purposes"?

Again, we have been assured repeatedly that the company has decades of experience of reprocessing, and that it is an "established technology." This will not do. True, the reprocessing of uranium metal fuel - "Magnox" fuel - has been carried out for years at Windscale. But oxide fuel - the type now under discussion - is much more radioactive, a quite different material; and no one *anywhere in the world* has been able to reprocess oxide fuel successfully on a commercial basis.

Those who have tried have failed spectacularly. If BNFL *do* manage to get a plant to work, no one knows what it will cost to operate. Even senior BNFL officials, including chairman Sir John Hill and former chief executive Dr Norman Franklin, have admitted in print that the recovered uranium and plutonium will not be worth the cost of recovering them - even if they *are* used, which at the moment they are not.

However, Mr Con Allday, now BNFL chief executive, argues that in any case it is worthwhile simply to transport the Japanese fuel hither and store it at Windscale; indeed shipments are to begin arriving in 1979, although it is not even proposed to have the relevant plant operating before 1985. If we are not to be a permanent nuclear "dustbin," let us at least concede that we are to be a temporary one, while the fuel is at its

most radioactive. It may be "good business," but it does not require building a massively expensive and intricate plant which may not work.

Other questions likewise remain. What of the 40 tonnes of plutonium we propose to return to the Japanese? Can we guarantee its security against misuse? Is Britain's action not a *de facto* disavowal of its responsibilities under the Non-Proliferation Treaty? I posed all these questions during the public debate at Church House, Westminster, in mid-January; they were left unanswered. Throughout the history of British nuclear activities it has been standard operating procedure to release as little information as possible, and to deflect embarrassing questions with anodyne reiterations that all is well.

However, all is patently *not* well. It is time that the British nuclear establishment acknowledge their mounting problems. Otherwise they are bound to find themselves in progressively deeper difficulty, from which even the lavish public funding to which they are accustomed may not rescue them. Certainly they should not now be striving to make their problems even more acute by embarking on headlong expansion at Windscale. I draw no particular pleasure from saying "I told you so." But I have no doubt whatever that my opportunities in this context will in due course prove grimly abundant.

Yours sincerely  
Walter C Patterson  
Friends of the Earth  
9 Poland Street London W1

*Guardian, 26 March 1976*

Sir - Alas, despite the letter from Mr Allday of British Nuclear Fuels Ltd (March 20 1976) I am no wiser as to the costs of reprocessing. He avers that the vagueness on this point does not affect the proposed Japanese contract, which is to be "cost-plus." Is the same criterion to apply to reprocessing for our own beloved CEBG? What will that do to electricity bills? Or will it be buried elsewhere in accounts, laundered through the Treasury? On past performance the electronuclear devotees are scarcely entitled to have us join them in yet another leap of faith.

Yours  
Walter C Patterson  
Friends of the Earth Ltd  
9 Poland Street London W1

### **Minding the nuclear fast breeder**

*Guardian, 26 June 1976*

Sir,- Undoubtedly the most unexpected contribution to the National Energy Conference was that by Sir Brian Flowers, speaking as chairman of the Royal Commission on Environmental Pollution (*Guardian*, June 23). Previous speakers had recited like a litany their faith in the eventual virtues of the plutonium-fueled fast breeder reactor. It is doubtful whether many of them had more than a tenuous idea of what this technology implies. Sir Brian, however, is not only Chairman of the RCEP, and Rector of Imperial College. He is also – a point overlooked by many commentators, and certainly not stressed at the Conference – a part-time Member of the United Kingdom Atomic Energy Authority. His words are therefore worth repeating: "We (the RCEP) believe that nobody should rely for something as basic as energy on a product that produces in quantity a by-product as dangerous as plutonium, unless he is absolutely convinced there is no reasonable alternative course of action. I am bound to say that we have not been convinced that this is the case by the evidence submitted to us."

The Government have indicated that they expect to announce this autumn their decision as to whether to build a full-scale demonstration fast breeder power station. However, the RCEP report, of which Sir Brian offered a foretaste, is not expected to be published much before that time. For the Government to stampede through a decision on a commitment as irrevocable and perilous as that to the fast breeder reactor, without adequate public information or discussion, would make a mockery of Tony Benn's brave declaration that "there are no more secrets in the Department of Energy".

Yours sincerely  
Walter C. Patterson  
Friends of the Earth  
9 Poland Street,  
London W1

### **The debate over the fast reactor**

*The Times, 8 July 1976*

From Mr Walter C Patterson

Sir, The United Kingdom Atomic Energy Authority is on record, in its evidence to the Royal Commission on Environmental Pollution, as favouring a programme which would have 33 GW of fast reactor power stations in operation in the United Kingdom by the year 2000. It is therefore understandable that the authority should be upset by the article by John Surrey and his colleagues (Business News, June 28 1976). But unless the authority can provide a better rebuttal than that by Mr R L R Nicholson (Business Letters, July 5), the case against the fast reactor remains, if not unassailable, at least unassailed.

In questioning the likelihood of an "energy gap" Mr Surrey and his colleagues point out the predominant role played by road transport in increasing energy demand since 1960.

Nicholson pounces on their failure "to distinguish between fuel for private cars and for road transport as a whole" as if this somehow affected their argument. Is Mr. Nicholson suggesting that the authority would like to see plutonium-fuelled Minis, powered by the fastest reactors on four wheels? If not, it is difficult to plumb his reasoning.

Mr Nicholson brandishes the magic word "efficiency", as if everyone agreed on its meaning. I suspect that Mr Surrey and his colleagues would not endorse Mr Nicholson's implied import in the given contexts. Certainly, their study of large energy users, to which Nicholson alludes, does not lend itself in any way unambiguously to the interpretation he fathers upon it.

Finally, when it comes to "misleading remarks on the technical side" Mr. Nicholson wins hands down. He asserts that the operating temperatures of fast reactors are "no higher than those of most thermal reactors, and a good deal lower than some". The design outlet temperature of the Prototype Fast Reactor is 562 C. The outlet temperatures of Magnox, Light Water and Heavy Water Reactors are more than 250 C lower, mostly well below 300 C. The only reactors with higher outlet temperatures are Advanced Gas-cooled Reactors and High Temperature Reactors - which are to say the least thin on the ground. Who is misleading whom?

Yours sincerely  
Walter C Patterson  
Friends of the Earth  
9 Poland Street, London

## **Nuclear debate**

*Observer*, 8 August 1976

Last week Sir John Hill declared himself unhappy about a "balanced" debate on nuclear power, wondering whether flat-earthers should get equal space with round-earthers. Interpreting this metaphor I confess myself unsure as to which side of the nuclear debate is which. In my article of 25 July I raised a number of specific substantive points, to which Sir John's response makes little explicit reference. Instead we are offered yet again a catalogue of generalities, buttressed by expressions of confidence that it will all come out right in the end: another promise of nuclear jam tomorrow. Even so, among the generalities are some which must be challenged.

For instance: the nuclear stations operating today in Britain produced not 12 per cent but slightly less than 10 per cent of our electricity last year, and therefore less than 1 per cent of the total energy we use. These stations were all ordered from 13 to more than 20 years ago. The cheap electricity they are now producing, with their capital nearly written off, is of course welcome. But that tells us absolutely nothing about the cost of electricity from nuclear stations yet to be built.

Again: the power of the Prototype Fast Reactor is hardly "being raised steadily". The recent public expenditure statement, despite other cuts, allocated another £10 million to equip the PFR with three new steam generators to replace the three which have plagued its operators for more than two years.

I make no apology for reacting with emotion to the prospect of a world attempting to cope with ever more separated plutonium. Many of Sir John's colleagues in the nuclear industry do not share his airy sanguinity about the potential for nuclear terrorism, governmental or otherwise. On purely economic grounds, as one long concerned with the rational management of our finite round earth, I have yet to see a persuasive case for the fast reactor. There are far better ways to spend money for energy. But if I am to be a flat-earther I must admit to profound - indeed "emotional" - apprehension lest the plutonium enthusiasts sail right off the edge, and take us with them.

Walter C Patterson  
London W1

## **The Hazards of Nuclear Power**

*Times*, 16 September 1976

*From Mr Walter Patterson*

Sir, Mr Ghalib's fondness for the fast reactor (September 10) is scarcely unexpected. However, as one-time managing director of The Nuclear Power Group, main contractors for the Prototype Fast Reactor, he must know that his dismissal of the security problems of plutonium in tonne quantities is, to say the least, an oversimplification.

He says "Where is (separated plutonium) to be found? Nowhere." This will not do. Separated plutonium is by no means necessarily - as he seems to imply - plutonium metal. Nuclear weapons experts now agree that plutonium compounds such as the oxide could be used directly for bomb manufacture.

In any case it is entirely possible to reduce the oxide to metal if desired - even on a kitchen table: so says Theodore Taylor, one-time top fission bomb designer for the old United States Atomic Energy Commission.

It is likewise possible to separate plutonium from uranium oxide, with straightforward chemistry. If the radioactivity of fresh plutonium fuel is a health hazard I for one was not so informed, when standing next to a new PFR element in the Windscale plutonium fabrication plant; process workers spend years in the company of plutonium fuel pins, with no shielding.

There is also a curious inconsistency in the argument, advanced by Sir John Hill and others, that terrorists would kill themselves if they tried to handle the material, but that the general public would suffer only limited ill-effects, long delayed, if it were scattered about. Terrorists, it must be added, do not appear to place their own well-being high in their priorities.

That said, I must correct a misapprehension which Mr Ghalib and his colleagues seem to share. If the fast reactor looked either necessary or promising, I would have to grapple much harder with the above problems. However, my fundamental objection is that the fast reactor - far from being "an assured source of energy" - may continue to be such a drain on our efforts that it deprives us of the many preferable energy options now open to us.

If our planners cannot soon shake off their nuclear obsession we shall lose out yet again on the opportunities offered by clean coal technology, solar heating and cooling, heat pumps, and the many other imaginative conceptions now scrambling after the crumbs from the nuclear banquet.

Yours sincerely,  
Walter C Patterson  
Friends of the Earth Limited  
9 Poland Street,  
London W1V 3DG

### **The nucleus of unanswered questions**

*Guardian, 3 December 1976*

Sir, According to Sir John Hill, Chairman of the Atomic Energy Authority and of British Nuclear Fuels Ltd., "the public debate last year over whether Britain should reprocess other countries' nuclear waste culminated this January in the debate at Church House chaired by Mr Benn (Secretary of State for Energy)" (*Guardian*, November 26 1976).

As a participant in the Church House debate, I must take exception to Sir John's assertion that it represented in any way a "culmination." The key issues I raised at that debate have never been adequately addressed in official responses, either at that time or since. My colleagues and I are thus greatly relieved that Mr Peter Shore, Secretary of State for the Environment, has decided to give further consideration before granting approval to plans for the expansion of reprocessing at Windscale.

Perhaps Mr Shore will have more success than we have had in getting direct and unambiguous answers to several direct and unambiguous questions about the plans. Among such questions are the following :

What, precisely, needs to be done to improve facilities for reprocessing Magnox - that is, metal - fuel? In particular, is the intention merely to reconstruct part of the existing plant in building B205. or rather to build an entire new plant for metal fuel?

How many new plants for reprocessing oxide (as distinct from metal) fuel are to be built ? Sir John Hill is on record to the effect that two plants are proposed, one to reprocess British domestic oxide fuel and one to service foreign customers. A similar view has been expressed by United Reprocessors, of which BNFL is a one-third partner, in *Nuclear Engineering International* (April/May 1976). However, when I alluded to this in a broadcast on Border TV on April 26, Mr Peter Mummery, General Manager of Windscale, challenged me on camera, claiming that my reference to two new plants was incorrect. Nothing in the frankly tenuous planning application filed by BNFL casts any clearer light on the matter.

Where is the capital to come from for these various plants? How much will have to come from the Treasury? On September 15 Sir John Hill referred to the £100 millions loan agreement signed between BNFL and a consortium of banks, calling it "an indication of the confidence which the private sector has in the future success of the company." Since the loan is to be underwritten 100 per cent by a British Government guarantee, it does indeed indicate the private sectors confidence - or lack thereof.

Why is plutonium to be recovered from British oxide fuel? Oxide fuel does not have to be reprocessed. Sir John Hill and other senior authorities are on record that the value of the recovered uranium and plutonium be lower than they will cost to recover by reprocessing, making the entire proposition economic nonsense.

What is to become of plutonium from overseas fuel? Is it merely to be returned to overseas customers? How does BNFL propose to guarantee that such separated plutonium is not diverted for weapons-manufacture? Ritual reference to safeguards applied by the International Atomic Energy Agency will not suffice. The IAEA has neither the resources, the staff nor the powers to exert the stringent control required.

Surely we are entitled to know at least these particulars. It is no longer satisfactory simply to give nuclear entrepreneurs a rubber stamp and a blank cheque.

Yours sincerely,  
Walter C. Patterson  
Friends of the Earth  
9 Poland Street London W1

### **The grim scars of 'science fiction'**

*Guardian, 15 December 1976*

Sir, Like many others I was taken aback to read of the nuclear disaster in the Soviet Union described by Dr Zhores Medvedev in the *New Scientist* (November 4). I was also taken aback that Sir John Hill, Chairman of the UK Atomic Energy Authority, should respond in uncharacteristically intemperate language, calling the description of the disaster "rubbish" and "science fiction" (*Guardian*, November 8), scarcely appropriate terms to direct at a man of Dr Medvedev's standing and integrity.

As it happens, there is a well-known mechanism by which such a disaster might occur in conditions like those outlined by Dr Medvedev. A sudden influx of water into a borehole or trench containing sub-critical fissile material could cause a steam explosion, whose effect could certainly be at least visually akin to a volcanic eruption.

Precisely such a hazard was identified at the Hanford reservation of the US Atomic Energy Commission only five years ago. Work costing several million pounds is still in progress using shielded excavators to remove soil contaminated with several hundred kilograms of plutonium from disposal trench Z-9, as I described in my recent Penguin book, *Nuclear Power*.

I sent Dr Medvedev a copy of the book, and have just received from him a fascinating letter whose striking detail carries absolute conviction. He concurs that the Soviet disaster might well have had similar origins. He also points out an aspect of the disaster which I misconstrued on a BBC broadcast on December 8.

The description offered by Professor Leo Tumerman (*London Evening Standard*, December 7) at first suggests blast damage : "Only chimneys remained of the towns which once were there." However, he then adds that "There were trees and grass" - and trees would not have survived an accidental nuclear weapons explosion. Dr Medvedev offers a grimly convincing alternative explanation.

He suggests that it was necessary to destroy the villages to prevent the return of the villagers, and to render the area uninhabitable. If this seems over-dramatic - "science fiction" - recall that the Italian authorities now face a precisely equivalent problem, with the victims of the Seveso disaster who cannot understand why they should be prevented from returning to their apparently innocuous homes and villages.

Walter C Patterson  
Friends of the Earth London W1

### **Atomic waste plant**

*Times, 19 January 1977*

*From Mr Walter Patterson*

Sir. Friends of the Earth would agree emphatically that "Windscale, Belvoir and Such" (January 8) involve considerations of national, and indeed international, importance, calling for a major policy hearing. It might then, for instance, be possible to ascertain from British Nuclear Fuels Ltd the basis for their allegations that delay in approving an oxide re-processing plant at Windscale will cost BNFL overseas contracts. BNFL and the French firm of Cogema are partners in United Reprocessors, a joint marketing organization formed in 1971, which also includes the West German firm of KEWA. When in early 1976 Cogema took an interest in the Japanese contract - still, by the way, unsigned, despite frequent reports to the contrary - they did so not as a competitor but as BNFL's Partner. Did BNFL have any choice but to split the contract fifty-fifty? Surely they would have been obliged to do so whenever their partner wished to participate. The same would presumably apply to KEWA - except that KEWA do not have a reprocessing plant, or any clear prospect of financing one.

To claim that BNFL will "lose" overseas contracts requires that they identify a competitor for the business. No such competitor exists. No one except United Reprocessors wishes to become involved in an undertaking with such doubtful prospects. On the contrary, those who are involved, like Allied General and Nuclear Fuel Services in the US want out, as quickly as possible. A major policy hearing might help to establish why. BNFL think otherwise.

Yours sincerely,  
Walter C Patterson  
Friends of the Earth Ltd  
9 Poland St W1

### **Nuclear colonialism**

*Guardian, 27 March 1977*

In his otherwise incisive article on nuclear exports last week Nigel Hawkes omits a key point. Referring to the controversial deal between West Germany and Brazil he says that Brazil regards nuclear power as the only possible alternative, "a conclusion most American policy-makers would agree with".

The claim is at least debatable. In 1975, in the United States, Westinghouse sold only three reactors, General Electric only one. Neither Babcock and Wilcox nor Combustion Engineering sold any, and General Atomic went out of the reactor business. In 1976, in the US, B and W sold three; no one else sold any.

In West Germany, Kraftwerk Union has lost money every year since its establishment in 1969, and expects to continue losing money into the 1980s; in 1976 AEG Telefunken finally bailed out of its debilitating KWU partnership with Siemens. The French programme has been cut back steadily, as have the Canadian, the Japanese and many others.

This collapse of domestic markets for nuclear power has been the mainspring of the recent desperate enthusiasm for nuclear exports to countries like Brazil. Such exports are invariably lavishly funded by the exporting Governments, through export credits: thus providing from domestic taxpayers a last minute additional subsidy to the floundering nuclear industry.

Brazil and other Third World customers are being coaxed to submit to technological colonisation grossly inappropriate to their real needs, on behalf of a technology whose economic credibility looks increasingly precarious.

It is certainly true that - in the words of the International Institute for Strategic Studies - "it would be illusory to think that nuclear weapons proliferation could be severely limited by imposing controls on the sale of nuclear power facilities"; there are many other deeply difficult problems. But their resolution will be further impeded by the travelling salesmen of the civil nuclear industry, hawking their dubious bargains to all comers.

Walter C Patterson  
Friends of the Earth W1

### **Fuel for the Future**

*Financial Times, 22 September 1977*  
*From Mr W Patterson*

Sir -- The *FT's* coverage of the Windscale Inquiry has been admirably detailed and dispassionate throughout - please accept our thanks. Your Science Editor, however, apparently prefers to view the proceedings in Whitehaven from his vantage point in Cannon Street, in order not to confuse his preconceptions - especially those about Friends of the Earth. In his article of September 12 Mr Fishlock avers that FOE failed to answer when Mr Justice Parker asked how FOE "would fuel Britain if his tribunal turned down the Windscale plans. Provide me with precise details of availability, costs and costs in terms of damage to persons, property or the environment".

Only the previous week FOE had in fact responded to this request, providing five sessions of evidence on precisely this point. Mr Gerald Leach, of the International Institute for Environment and Development, submitted a 51-page dissertation on the opportunities for short-term improvement of energy use in Britain; and Dr Peter Chapman, of the Open University Energy Research Group, submitted a proof initially 111 pages in length discussing longer-term energy strategy. Both submissions included costings and economic and political analyses at least as extensive as those provided by British Nuclear Fuels in support of its application.

We hope that other readers less emotionally committed to the nuclear option will consider the proposals we and our colleagues are advancing. We believe they merit serious attention.

Walter C Patterson  
Friends of the Earth  
9 Poland Street,  
London W1

## **Nuclear Reaction**

*Guardian 17 January 1978*

Sir, The *Guardian* leader about choice of nuclear reactor (January 12 1978) hits the nail right on the thumb. Advocates of an early British commitment to buy a pressurised-water reactor have always stressed that only such commitment would entitle them to see the data required for evaluation of PWR safety. This has undoubtedly been the strongest single plank in the case for an early British commitment. Yet, as your leader notes, "Siemens are now reported to have offered the (nuclear) inspectors all the information they need without any commitment to buy." From this your leader draws a conclusion which can only be called perverse: "If safety is the sticking point, this offer robs the objections (sic) to PWR of much of their force."

On the contrary, it robs the promoters of their key argument. Let them instead accept Siemens's offer and start doing their homework. They may then learn enough about PWR safety to present a defence less tenuous than hitherto. They may also find out enough about PWR economics to know why Siemens is so desperate to get Britain into the same foundering boat.

Walter C Patterson  
Friends of the Earth London W1

## **Optimum fuel use**

*Times, 8 February 1978*

*From Mr Walter C Patterson*

Sir, Professor Danckwerts (January 31) asks Friends of the Earth "Which is it to be - drowning or the hateful use of atomic energy?". The official answer is "both": all the fossil fuel possible, plus large quantities of nuclear heat - which will exacerbate any carbon dioxide "greenhouse" effect.

Friends of the Earth see little point in throwing a drowning man a uranium lifebelt. Instead, FOE energy policy - extensively described in our many publications - stresses that we have barely begun to optimise our use of energy

Accordingly, FOE advocate a major shift of investment away from additional wasteful supply, into improved efficiency: thermal insulation of buildings, upgrading of process plant and a programme of small-scale total-energy facilities.

Such a policy sets the stage for gradual introduction of ambient energy technologies, matched in location, scale and thermodynamic character to their tasks. Only such technologies can safeguard the long-term stability of planetary systems.

Yours sincerely  
Walter C Patterson  
Friends of the Earth 9 Poland Street W1

## **Management of Plutonium**

*Financial Times*, 22 November 1978

From Mr W. Patterson

Sir -- Management of the world's accumulating plutonium will be difficult enough without misleading comparisons.

David Fishlock (November 16) cites the International Atomic Energy Agency to the following effect: "From 5,000 tonnes of spent fuel is extracted about 30 tonnes of plutonium. The capital cost of storing this plutonium is estimated at \$8m, compared with \$140m-\$280m to store the equivalent amount of spent fuel. Operating costs, put at \$1m year to manage the plutonium, would be ten times as high for spent fuel." Whether these estimates are or are not sound, they do not compare like with like.

The capital and operating costs of storing spent fuel are the total post-reactor cost; but the total cost of storing separated plutonium must also include the capital and operating costs of reprocessing, and of management of the other wastes thus created. As the Parker Report conceded, such costs are likely to exceed the value of recovered uranium and plutonium; they may well do so by a substantial amount. It is entirely possible that the complete comparison of cost will in fact favour storage of spent fuel - although, as Mr. Fishlock notes, this option will likewise face other complications.

Walter C. Patterson.  
Friends of the Earth,  
9 Poland St, London

## **Fast Burn**

*Guardian*, 1 June 1979

Sir -- Charles Cook (May 28) says that the fast reactor development programme of the UK Atomic Energy Authority "is short of funds. Between £5 and £6 millions a year have been spent on the breeder by the industry since 1974, but the AEA would now like to see this doubled in preparation for the next stage."

According to the AEA's latest Annual Report, for 1977-8, the sum explicitly identified as annual expenditure on fast reactors (page 13) was £55.8 millions - and similar sums were spent in preceding years. If the AEA is capable of underestimating by a factor of ten the amount it is already spending on the fast reactor, the implication for future expenditure is awesome. In any case, the money in question is coming not from "the industry," but from you and me, the taxpayers, in the annual parliamentary grant to the AEA.

If the AEA is "short of funds," and would like to see its fast reactor expenditure doubled, let us not forget whose pockets must be rifled.

Did I hear something about *cutting* public expenditure?

Yours sincerely,  
Walter C Patterson  
Friends of the Earth  
9 Poland Street  
London, W1V 3DG

### **Fast reaction**

*Guardian 18 June 1979*

Sir, - Pace Mr Nicholson of the UK Atomic Energy Authority (Letters, June 12), Charles Cook's May 28 article about the fast breeder reactor said - I repeat - "the development programme is short of funds."

Mr Nicholson says that "the £ 5-6 millions per year spent in industry is devoted to design and development of CFR (the commercial fast reactor) and is separate from the AEA's R and D spent on fast reactor systems."

I have always assumed that the entire fast breeder development programme of the AEA is in support of the design represented by the existing PFR and the proposed CFR. Does Mr Nicholson intend to suggest that the AEA as yet *another* fast reactor up its sleeve?

Walter C Patterson  
Friends of the Earth London W1

### **Power bill**

*Guardian, 9 November 1979*

Sir, So the Confederation of British Industry is virtually unanimous in its "backing" for nuclear energy (*Guardian*, November 6 1979) Does this "backing" extend to actual money? Would CBI members now perchance pick up the annual tab for the UK Atomic Energy Authority - £129 million last year - or the billion pound overruns on the first AGR programme, or the ballooning costs of ordering superfluous nuclear stations, like Torness and Heysham B to keep the reactor-builders from collapse, or the £40 millions for the accident at Hunterston B? Or must the rest of us continue to support the nuclear lame duck in the style to which it is accustomed, while it flounders from one cock-up to another?

Yours  
Walter C Patterson  
Friends of the Earth London W1

### **Radioactive waste**

*Financial Times 10 December 1979*

*From Mr W Patterson*

Sir, David Fishlock remarks (November 29 1979) that the activities of the Radiochemical Centre near my home in Amersham "prompt no outcry from the local chapter of Friends of the Earth." He asks, with heavy irony, "Can it be that people believe there are two kinds of radioactivity, benign and malevolent?"

The answer, as he should know, is of course "Yes." The radioisotopes prepared at the Radiochemical Centre are created for a positive purpose, for radiotherapy, research and industrial applications. The radioisotopes created in the core of a power reactor are a waste product which progressively diminishes the value and utility of the fuel. To a nuclear power engineer such radioactivity is nothing but a dangerous liability. Mr. Fishlock goes on to assert that "There is, of course, no qualitative difference whatever between the radioactivity emanating from medical activities and from nuclear reactors." On the contrary, there is a substantial qualitative difference, not least between the proportions of the various radioisotopes involved, the types of radiation they emit, and the concomitant biological implications. Much more important, however, is the total quantity of radioactivity involved. One single power reactor operating for a year produces many orders of magnitude more radioactivity than the Radiochemical Centre has handled since it opened.

I cannot imagine that the Radiochemical Centre will be overjoyed at his suggestion that it is "a prolific producer of radioactive waste" in the same league as nuclear power reactors. If, as Mr Fishlock suggests, the radiochemists are to assist in correcting the public's "grave misperception" about radioactive waste, perhaps they might start by correcting Mr Fishlock's.

Walter C. Patterson  
Friends of the Earth  
10 Chesham Road Amersham Bucks

### **A sensible nuclear debate**

*Times, 23 October 1980*

*From Mr Walter C Patterson*

Sir, I agree with my long-time friend Ian Fells (October 15) that "some way must be found to examine the future of our energy supplies in engineering, economic, social and political terms so that people co-operate to solve the problem instead of persevering in their counter-productive entrenched positions". However, he also says: "Without nuclear energy the world can neither reduce its dependence on Middle Eastern oil nor the prospect of ever deepening recession because of the rapidly rising oil price".

As Professor Fells well knows, this view, which he takes as axiomatic, is anything but. Indeed, it is regarded by many as precisely one of those "counter-productive entrenched positions" he deplores; see, among others, the report from the International Institute for Environment and Development, *A Low Energy Strategy for the United Kingdom*, by Gerald Leach et al., and the report from the Harvard Business School, *Energy Future*, by Stobaugh and Yergin.

By all means let us cooperate to examine the future of our energy use - not merely supply. But let us not commence by defining contrary views as irrelevant. A root cause of much present public disquiet about the role of nuclear electricity in energy policy is precisely this tendency on the part of nuclear advocates to start the "discussion" by assuming its outcome. Given the nuclear industry's track record of over-optimism and misjudgement, are we really condemned to depend on it to rescue us from Opec and recession? If so, we are in deep trouble indeed.

Walter C Patterson  
International Editor  
*The Bulletin*  
United Kingdom Office  
10 Chesham Road Amersham

### **Miscellany**

*Guardian 16 September 1981*

Sir, The proposed gas-gathering pipeline would have provided a direct and immediately valuable contribution to Britain's energy resources; without it a significant part of these resources will be lost forever. The Government has rejected the proposal (*Guardian*, September 12, 1981) because Government guarantees for financing the project would have added to the public sector borrowing requirement.

Can we please be told why the Government sees no difficulty in giving such guarantees to British Nuclear Fuels Ltd, whose investment programme has at best a tenuous and very long-term relevance to the energy resources of this country? Why not let the private sector finance our nuclear programmes, too?

Could it be that without ironclad Government guarantees, private finance would not touch nuclear investment with a bargepole? Why does the Government's financial ideology, elsewhere so uncompromising, become so spineless when applied to nuclear proposals? Does nuclear exposure make Mrs Thatcher wet?

Yours  
Walter C Patterson  
Friends of the Earth Ltd London W1

### **Power lines crossed on the nuclear reactor programme**

*Guardian, 22 November 1982*

Sir, John Lyons says that those opposed to the civil use of nuclear energy have been "losing the argument". Which argument has he in mind?

In 1974 the UK nuclear promoters were talking about ordering 41,000 megawatts of nuclear stations by 1982. They have instead ordered 2,000 megawatts; and the Parliamentary Select Committee on Energy in 1981 came within a whisker of recommending that even those stations should be cancelled as uneconomic.

In the mid-1970s the UK nuclear promoters were postulating electricity demand growth which would require dozens of new nuclear stations on line by the year 2000. In 1982 the nuclear industry has abandoned this argument completely; new stations are now said to be necessary only as replacements for older plants, which will be shut down.

British Nuclear Fuels Limited in the mid-1970s planned to embark on immediate construction of an oxide fuel reprocessing plant at Windscale to service overseas customers. In 1982 construction of the plant has still not commenced; and the Central Electricity Generating Board has not yet signed a contract with BNFL for the services of the plant, because of the high costs involved.

In 1975 the UK Atomic Energy Authority told the Flowers Commission they could envisage a nuclear programme which would have 104,000 megawatts of nuclear power in operation by the year 2000, of which 33,000 megawatts would be fast breeder reactors. In 1982, even Sir Walter Marshall concedes that at most one fast breeder reactor station might be built before turn of the century. All these developments were correctly anticipated and foretold by nuclear critics.

The nuclear critics have, to be sure, been "losing" the lobbying. The decision of the Secretary of State not to provide any funds for Sizewell B objectors is only one of many indications of this. But when it comes to substantive arguments and actual events, nuclear promoters have been the losers, hands down. If Mr Lyons thinks otherwise, he has not been paying attention.

Yours sincerely  
Walter C. Patterson  
Friends of the Earth London W1

## **Why Britain chooses nuclear power with punch**

*Guardian 12 December 1983*

Sir, Con Allday of British Nuclear Fuels declares (December 9 1983) that "Suggestions that we dropped Windscale in favour of Sellafield for public relations reasons and that we in some way wanted to disguise Windscale are too ridiculous to warrant comment". But a question remains.

The reprocessing plant and radioactive waste facilities whose performance has attracted so much attention of late are all part of what Mr Allday himself describes as the Windscale Works, still so-called. Why then the corporate and government insistence on referring to "Sellafield" rather than to the actual installation involved? In any case, developments in recent weeks have established "Sellafield" in nuclear folklore almost firmly as "Windscale". Shall we soon be hearing official apologia for the latest nuclear difficulties at St Bees?

Yours sincerely

Walter C Patterson

10 Chesham Road Amersham Bucks

## **On Nonproliferation**

*In response to "What the Treaty Says" (Letters, May 16, 1984) International Herald Tribune*

I suggest that Arend Meerburg read the Treaty on the Nonproliferation Of Nuclear Weapons. It is a model of clarity.

According to Article III, Section 1, **"Each non-nuclear-weapon state party to the treaty undertakes to accept safeguards. . . . The safeguards required by this article shall be applied on all source or special fissionable material in all peaceful nuclear activities within the territory of such state, under its jurisdiction, or carried out under its control anywhere."**

Article III, Section 2, then declares that **"each state party to the treaty undertakes not to provide: (a) source or special fissionable material, or (b) equipment or material especially designed for the processing, use or production of special fissionable material to any non-nuclear-weapon State for peaceful purposes, unless the source or special fissionable material shall be subject to the safeguards required by this article."** The "safeguards required by this article" are defined in its first subsection and they are full-scope safeguards, on "all peaceful nuclear activities."

No sophistry by eager and unscrupulous nuclear exporters can disguise the simple and ugly truth: nuclear commerce with non-nuclear-weapons states that do not accept full-scope safeguards contravenes the clear-cut commitment embodied in the treaty.

To be sure, as Mr Meerburg asserts, there appears to be a "general understanding" to the contrary among those more concerned to promote nuclear power than to control its misuse. But they cannot cite the nonproliferation treaty in their defence. Paul Leventhal - in "The Chinese Nuclear Deal Should Set an Example" (May 10) - was right.

Walter C Patterson

Amersham England

## **Problems of plutonium**

*Observer, 9 December 1984*

Sir - You attribute a remarkable comment to Con Allday, chairman of British Nuclear Fuels (Business, 2 December 1984). Your reporter Steve Vines notes that there is no question of the Government selling more than 49 per cent BNFL to private investors, and goes on to quote Mr Allday, thus: 'This is because in the public mind we are dealing with something closely associated with weapons, and public acceptability demands government remaining in ultimate control'.

What does Mr Allday mean, 'in the public mind?' What about the mind of Defence Secretary Michael Heseltine and the Chiefs of Staff? They are going to be surprised and dismayed if after all these years, BNFL proposes to stop producing weapons-plutonium for them - just at the moment when the military are so keen on a whole new generation of nuclear weapons.

Perhaps, in his enthusiasm to attract buyers, Mr Allday just momentarily overlooked the fact that BNFL throughout its entire corporate existence has manufactured weapons-plutonium in its reactors at Calder Hall and Chapelcross, and separated this plutonium in its reprocessing plant at Windscale.

Indeed only a month ago one of Mr Allday's staff conceded to the Sizewell inquiry that Euratom has been trying for 10 years without success to get its safeguards inspectors admitted to the Windscale reprocessing plant. BNFL has refused them admittance on the grounds that both so-called 'civil' and military plutonium are going through the plant at the same time.

Walter C Patterson  
Amersham

## **"Its own worst enemy"**

*Financial Times, 28 July 1987*

*from Mr Walter C. Patterson*

Sir, David Fishlock (July 25) gives "anti-nuclear campaigners" too much credit. The difficulties British Nuclear Fuels encountered in reprocessing Magnox fuel in the early 1970s did nothing to "launch nuclear fuel reprocessing into the public arena"; BNFL kept not only the public but even the specialist trade press like *Nucleonics Week* in the dark about these difficulties.

Not until the Windscale inquiry of 1977 was it possible to piece together the full story, when Friends of the Earth (FOE) cross-examined BNFL witnesses.

I know of no basis for Mr Fishlock's assertion that "anti-nuclear campaigners recognised that they could halt Magnox reactor operations if they could prevent reprocessing of its fuels". On the contrary, the focus of controversy from 1975 onwards was the proposed Thermal Oxide Reprocessing Plant (THORP) - for oxide fuel, not Magnox fuel. Subsequent developments have borne out essentially all the criticisms put forward in evidence by FOE. Reprocessing oxide fuel is unnecessary and uneconomic, and complicates nuclear waste management; BNFL's cost-plus contract to reprocess fuel from advanced gas-cooled reactors (AGRs) may help to make the AGRs fully as unappetising to potential investors as the Magnox units were acknowledged to be.

But the nuclear industry's difficulties are entirely of its own making. If it had listened to the critics, instead of attempting to discredit them, it might not now be in such a terminal mess. The nuclear industry has always been its own worst enemy; the harm it has done itself may now be irreparable.

Walter C. Patterson  
Amersham, Buckinghamshire

## **Off course**

*Guardian, 11 August 1987*

Sir, UK Atomic Energy Authority chairman John Collier, defending the fast reactor, says (Letters August 7 87) that in 1986 the Prototype Fast Reactor had "its best operating year yet, generating 960 million units of electricity." The PFR is rated at 250 megawatts. Operating for a full year it would generate 2,190 million units of electricity. Mr Collier is saying that after 13 years of operation the PFR's best performance is less than 44 per cent of its capacity. If this is what the AEA considers, in Mr Collier's words, "well on course for technical and commercial viability," they are easily satisfied.

Mr Collier says he does not dispute "the generally held view that commercial fast reactors will not need to be deployed until the early decades of the next century." The reason they will not be "needed" is that they are technically and economically unable to compete with other energy technologies that are more reliable, cheaper and safer.

Yours sincerely  
Walter C Patterson  
10 Chesham Road  
Amersham Bucks

**Problem in store**

*Guardian, 23 August 1988*

Somebody must explain to W. L. Wilkinson of British Nuclear Fuels (Letters, August 19 1988) that reprocessing is not an "alternative" to "direct disposal of unprocessed fuel". Reprocessing is not "disposal".

Reprocessing severely complicates disposal. BNFL is constructing at Sellafield an array of facilities whose role is to restore the by-products of reprocessing back into forms that might at length be acceptable for disposal. Moreover, BNFL is already committed to long-term storage of concentrated radioactive waste. It has some 1400 cubic metres of this waste, stored as a liquid in tanks at Sellafield, not to mention more than 1000 tonnes of foreign oxide fuel, some of it resident at Sellafield since the end of the 1960s.

As and when BNFL brings its Windscale Vitrification Plant into service, it will be converting the liquid waste back into solid form, as massive blocks of radioactive glass. And what will it do with the glass blocks? It will store them, for decades, in a facility yet to be built. Long-term storage of intact spent fuel is no more difficult, nor more expensive. No plans exist for actual disposal of any of Britain's concentrated radioactive wastes.

As to the eventual fate of the plutonium in spent fuel, Mr Wilkinson asks if Friends of the Earth are "happy to accept the environmental and safety hazards of disposing of spent fuel intact with all the plutonium they contain". The prospect is certainly unappetising. But does he really consider his alternative more appealing - shipping the plutonium around the world by tens and hundreds of tonnes, as an article of commerce? Better, surely, to store it under stringent supervision, in as inaccessible a form as possible - preferably intact spent fuel, protected by its radioactivity - while we mull over the ugly problem we have brought upon ourselves.

Walter C Patterson  
Amersham Bucks

**Definition of a dent in power policies**

*The Independent, 24 April 1990*

From Mr Walt Patterson

Sir: According to Richard North ("Still friends of the earth after all these years", 20 April), "Friends of the Earth never really dented the nuclear industry when it was a main target".

In October 1973, when the Central Electricity Generating Board announced a programme to order at least 32 1300-megawatt Westinghouse pressurised-water reactor (PWR) nuclear stations by 1982, my colleagues and I, at Friends of the Earth, launched a campaign against the proposal.

By April 1990 only one PWR at Sizewell B, had been ordered; and if economic sanity prevails, it will be abandoned. If Richard rode his bike over a dent that size he'd never be seen again.

Yours sincerely,  
Walt Patterson  
Amersham Buckinghamshire

© Walt Patterson 2007