

Nature and Nuclear Power, the hills and valleys will be thankful and every creature rejoice!

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A canary, alive and singing in the coal mine, gave miners confidence that the air was safe to breathe. But today our problem is not carbon monoxide in a mine but carbon dioxide in the atmosphere and oceans. The Industrial Revolution was built on fossil fuel, its high energy density and reliability. Now, faced with climate change, we should give it up! But what should we use instead? And where is the guidance, as unequivocal as that of the canary, that should give everybody confidence in its safety?

It is a curious reaction to suppose that our problems can be solved by going back to pre-industrial-revolution sources like wood, wind and water. These were weak and unreliable then, and remain so. To harvest enough energy today their plants have to be built on a huge scale and the environmental damage they do is plain for all to see. How can vast flooded rivers, hillsides and meadows plastered with solar panels and the destruction of virgin forest be described as “green”? But the unreliability of “renewables” is an even greater failure and one that will not be bridged by an advance in energy storage on the scale needed. Secondary energy sources such as hydrogen or batteries are not “pre-charged” and have to be filled from a primary energy source.

The only other available pre-filled source known to physical science is nuclear. Fission using uranium or thorium has an energy density a million times that of coal, so little fuel is needed and little waste generated. As a result power plants can be made compact and robust with a negligible impact on the environment.

The only snag has been that nuclear frightens people, delaying construction and deterring investors. But does the evidence justify their concern? In the light of the official radiation safety regulations many tens of thousands were expected to die from the Chernobyl accident. The surrounding area was expected to be uninhabitable for a very long time and was left deserted except for wild animals roaming at will in the radioactive environment. Like a canary left in a gas-filled mine many were expected to die. But over the years many reports have told that the area has become a wildlife park in all but name. Pictures taken by BBC (shown), National Geographic and others show animals thriving unmolested by humans.

So what went wrong? Do the animals know something that we don't? “*But they know nothing!*” Dr Watson might say, to which Sherlock Holmes might reply “*Quite so. But may be something that we think we know is not in fact the case.*”

That radioactivity and its radiation are relatively harmless was confirmed by the human casualty figures from radiation at Chernobyl. Instead of thousands the list comprises 28 early firefighters and 15 fatal cases of child thyroid cancer. The story was repeated at Fukushima. Of course the tsunami



A UK Government Report showing a field at Abingdon, Oxford completely hidden by solar panels



was very exciting – that kind of news sells – and I watched in fascinated horror like everybody else. But the nuclear accident was quite different. Although it was labelled a disaster in the highest category, nobody at all was affected by the radiation. Just as at Chernobyl the serious damage was social and economic. In particular, alarmed authorities in Japan, Germany, USA and around the world turned off nuclear power stations and burnt fossil fuels instead. This disaster continues at the expense of the environment.

The popular worry about nuclear technology is simply mistaken. It is about a thousand times safer than regulations suggest. Many benefit from the use of quite high doses of radiation in clinical medicine as pioneered by Marie Curie to diagnose and cure cancer. The draconian regulations were introduced to appease popular concerns about radiation, inflamed by the nuclear arms race at the time of the cold war. How that happened is another story. Today it is important that young people learn the truth about nuclear science and what it can do to benefit the economy and the environment.

The only realistic mitigation of climate change is the deployment of nuclear power on a grand scale. Running steadily it can provide waste heat and, at times of reduced demand, make hydrogen for chemicals, transport and domestic gas. We cannot do it? Of course we can! We should build modular power stations on a production-line basis, as US shipyards built Liberty ships in WWII. Many designs for such modular power stations are already in competition to come to market. Those investors who choose nuclear will be running the new industrial revolution. Better still, the curse of the renewables will be lifted from the fish in the rivers, the birds in the air and the grass in the meadows.

25 January 2019