

The Dangers of Radiation: Deconstructing Nuclear Experts

What these people have in common is ignorance

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Since the Fukushima accident we have seen a stream of experts on radiation telling us not to worry, that the doses are too low, that the accident is nothing like Chernobyl and so forth. They appear on television and we read their articles in the newspapers and online. Fortunately the majority of the public don't believe them. I myself have appeared on television and radio with these people; one example was Ian Fells of the University of Newcastle who, after telling us all on BBC News that the accident was nothing like Chernobyl (wrong), and the radiation levels of no consequence (wrong), that the main problem was that there was no electricity and that the lifts didn't work. "If you have been in a situation when the lifts don't work, as I have" he burred on, "you will know what I mean." You can see this interview on youtube and decide for yourself.

What these people have in common is ignorance. You may think a professor at a university must actually know something about their subject. But this is not so. Nearly all of these experts who appear and pontificate have not actually done any research on the issue of radiation and health. Or if they have, they seem to have missed all the key studies and references. I leave out the real baddies, who are closely attached to the nuclear industry, like Richard Wakeford, or Richard D as he calls himself on the anonymous website he has set up to attack me, "chrisbusbyexposed".

I saw him a few times talking down the accident on the television, labelled in the stripe as Professor Richard Wakeford, University of Manchester. Incidentally, Wakeford is a physicist, his PhD was in particle physics at Liverpool. But he was not presented as ex- Principle Scientist, British Nuclear Fuels, Sellafield. That might have given the viewers the wrong idea. Early on we saw another baddy, Malcolm Grimston, talking about radiation and health, described as Professor, Imperial College. Grimston is a psychologist, not a scientist, and his expertise was in examining why the public was frightened of radiation, and how their (emotional) views could be changed. But his lack of scientific training didn't stop him explaining on TV and radio how the Fukushima accident was nothing to worry about. The doses were too low, nothing like Chernobyl, not as bad as 3-Mile Island, only 4 on the scale, all the usual blather. Most recently we have seen George Monbiot, who I know, and who also knows nothing about radiation and health, writing in The Guardian how this accident has actually changed his mind about nuclear power (can this be his Kierkegaard moment? Has he cracked?) since he now understands (and reproduces a criminally misleading graphic to back up his new understanding) that radiation is actually OK and we shouldn't worry about it. George does at least know better, or has been told better, since he asked me a few years ago to explain why internal and external radiation exposure cannot be considered to have

the same health outcomes. He ignored what I said and wrote for him (with references) and promptly came out in favour of nuclear energy in his next article.

So what about Wade Allison? Wade is a medical physics person and a professor at Oxford. I have chosen to pitch into him since he epitomises and crystallises for us the arguments of the stupid physicist. In this he has done us a favour, since he is really easy to shoot down. All the arguments are in one place. Stupid physicists? Make no mistake, physicists are stupid. They make themselves stupid by a kind of religious belief in mathematical modelling. The old Bertie Russell logical positivist trap. And whilst this may be appropriate for examining the stresses in metals, or looking at the Universe (note that they seem to have lost 90% of the matter in the Universe, so-called "dark matter") it is not appropriate for, and is even scarily incorrect when, examining stresses in humans or other lifeforms. Mary Midgley, the philosopher has written about Science as Religion. Health physicists are the priests. I have been reading Wade Allison's article for the BBC but also looked at his book some months ago. He starts in the same way as all the others by comparing the accidents. He writes:

More than 10,000 people have died in the Japanese tsunami and the survivors are cold and hungry. But the media concentrate on nuclear radiation from which no-one has died – and is unlikely to.

Then we move to 3-Mile Island: There were no known deaths there.

And Chernobyl:

The latest UN report published on 28 February confirms the known death toll – 28 fatalities among emergency workers, plus 15 fatal cases of child thyroid cancer – which would have been avoided if iodine tablets had been taken (as they have now in Japan).

This is breathtaking ignorance of the scientific literature. Prof. Steve Wing in the USA has carried out epidemiological studies of the effects of 3-Mile Island, with results published in the peer-review literature. Court cases are regularly settled on the basis of cancers produced by the 3-Mile Island contamination. But let us move to Chernobyl. The health effects of the Chernobyl accident are massive and demonstrable. They have been studied by many research groups in Russia, Belarus and the Ukraine, in the USA, Greece, Germany, Sweden, Switzerland and Japan. The scientific peer reviewed literature is enormous. Hundreds of papers report the effects, increases in cancer and a range of other diseases. My colleague Alexey Yablokov of the Russian Academy of Sciences, published a review of these studies in the Annals of the New York Academy of Sciences (2009). Earlier in 2006 he and I collected together reviews of the Russian literature by a group of eminent radiation scientists and published these in the book Chernobyl, 20 Years After. The result: more than a million people have died between 1986 and 2004 as a direct result of Chernobyl.

I will briefly refer to two Chernobyl studies in the west which falsify Wade Allison's assertions. The first is a study of cancer in Northern Sweden by Martin Tondel and his colleagues at Lynkoping University. Tondel examined cancer rates by radiation contamination level and showed that in the 10 years after the Chernobyl contamination of Sweden, there was an 11% increase in cancer for every 100kBq/sq metre of contamination.

Since the official International Atomic Energy Agency (IAEA) figures for the Fukushima contamination are from 200 to 900kBq/sq metre out to 78km from the site, we can expect between 22% and 90% increases in cancer in people living in these places in the next 10 years. The other study I want to refer to is one I carried out myself. After Chernobyl, infant leukaemia was reported in 6 countries by 6 different groups, from Scotland, Greece, Wales, Germany, Belarus and the USA. The increases were only in children who had been in the womb at the time of the contamination: this specificity is rare in epidemiology. There is no other explanation than Chernobyl. The leukemias could not be blamed on some as-yet undiscovered virus and population mixing, which is the favourite explanation for the nuclear site child leukemia clusters. There is no population mixing in the womb. Yet the “doses” were very small, much lower than “natural background”. I published this unequivocal proof that the current risk model is wrong for internal exposures in two separate peer-reviewed journals in 2000 and 2009. This finding actually resulted in the formation in 2001 by UK Environment Minister Michael Meacher of a new Committee Examining Radiation Risks from Internal Emitters CERRIE. Richard Wakeford was on this committee representing BNFL and he introduced himself to me as “BNFL’s Rottweiler”. No difference there.

Wade then turns to a comparison of contamination:

So what of the radioactivity released at Fukushima? How does it compare with that at Chernobyl? Let’s look at the measured count rates. The highest rate reported, at 1900 on 22 March, for any Japanese prefecture was 12 kBq per sq m (for the radioactive isotope of caesium, caesium-137).

A map of Chernobyl in the UN report shows regions shaded according to rate, up to 3,700 kBq per sq m – areas with less than 37 kBq per sq m are not shaded at all. In round terms, this suggests that the radioactive fallout at Fukushima is less than 1% of that at Chernobyl

But the IAEA themselves, not known for their independence from the nuclear industry, report that contamination levels out to 78km were between 200 and 900kBq/sq metre. And Wade has been rather selective with his data, to put it kindly. The UN definition of radioactively contaminated land is 37kBq/sq metre just as he writes, but actually, in all the maps published, the inner 30km Chernobyl contamination exclusion zone is defined as 555kBq/sq metre and above. This is just a fact. Why has he misled us? In passing, this means that there are 555,000 radioactive disintegrations per second on one square metre of surface. Can you believe this is not harmful? No. And you would be correct. And another calculation can be made. Since the IAEA data show that these levels of contamination, from 200,000 to 900,000 disintegrations per second per square metre, exist up to 78km from Fukushima, we can already calculate that the contamination is actually worse than Chernobyl, not 1% of Chernobyl as Wade states. For the area defined by a 78km radius is 19113 sq km compared to the Chernobyl exclusion zone of 2827 sq km. About seven times greater.

Now I turn to the health effects. Wade trots out most of the usual stupid physicist arguments. We are all exposed to natural background, the dose is 2mSv a year and the doses from the accident are not significantly above this. For example, the Japanese government are apparently making a mistake in telling people not to give tap water containing 200Bq/litre radioactive Iodine-131 to their children as there is naturally 50Bq/l of radiation in the human body and 200 will not do much harm. The mistake is made because of fears of the public which apparently forced the International Commission on Radiological

Protection, ICRP, to set the annual dose limits at 1mSv. Wade knows better: he would set the limits at 100mSv. He is a tough guy. He shoots from the hip:

Patients receiving a course of radiotherapy usually get a dose of more than 20,000 mSv to vital healthy tissue close to the treated tumour. This tissue survives only because the treatment is spread over many days giving healthy cells time for repair or replacement. A sea-change is needed in our attitude to radiation, starting with education and public information.

But Wade, dear, these people are usually old, and usually die anyway before they can develop a second tumour. They often develop other cancers even so because of the radiation. There are hundreds of studies showing this. And in any case, this external irradiation is not the problem. The problem is internal irradiation. The Iodine-131 is not in the whole body, it is in the thyroid gland and attached to the blood cells: hence the thyroid cancer and the leukaemia. And there is a whole list of internal radioactive elements that bind chemically to DNA, from Strontium-90 to Uranium. These give massive local doses to the DNA and to the tissues where they end up. The human body is not a piece of wire that you can apply physics to. The concept of dose which Wade uses cannot be used for internal exposures. This has been conceded by the ICRP itself in its publications. And in an interview with me in Stockholm in 2009, Dr Jack Valentin, the ex-Scientific Secretary of the ICRP conceded this, and also made the statement that the ICRP risk model, the one used by all governments to assess the outcome of accidents like Fukushima, was unsafe and could not be used. You can see this interview on the internet, on www.vimeo.com.

Why is the ICRP model unsafe? Because it is based on "absorbed dose". This is average radiation energy in Joules divided by the mass of living tissue into which it is diluted. A milliSievert is one millijoule of energy diluted into one kilogram of tissue. As such it would not distinguish between warming yourself in front of a fire and eating a red hot coal. It is the local distribution of energy that is the problem. The dose from a singly internal alpha particle track to a single cell is 500mSv! The dose to the whole body from the same alpha track is 5×10^{-11} mSv. That is 0.000000000005mSv. But it is the dose to the cell that causes the genetic damage and the ultimate cancer. The cancer yield per unit dose employed by ICRP is based entirely on external acute high dose radiation at Hiroshima, where the average dose to a cell was the same for all cells.

And what of the UN and their bonkers statement about the effects of the Chernobyl accident referred to by Wade Allison? What you have to know, is that the UN organisations on radiation and health are compromised in favour of the nuclear military complex, which was busy testing hydrogen bombs in the atmosphere at the time of the agreement and releasing all the Strontium, Caesium, Uranium and plutonium and other stuff that was to become the cause of the current and increasing cancer epidemic. The last thing they wanted was the doctors and epidemiologists stopping their fun. The IAEA and the World Health Organisation (WHO) signed an agreement in 1959 to remove all research into the issue from the doctors of the WHO, to the atom scientists, the physicists of the IAEA: this agreement is still in force. The UN organisations do not refer to, or cite any scientific study, which shows their statements on Chernobyl to be false. There is a huge gap between the picture painted by the UN, the IAEA, the ICRP and the real world. And the real world is increasingly being studied and reports are being published in the scientific literature: but none of the authorities responsible for looking after the public take any notice of this evidence.

As they say on the Underground trains in London: Mind the Gap. Wade Allison and the other

experts I refer to need to do just this for their own sake. The one place that this gap is being closed rapidly and savagely is in the courts. I have acted as an expert witness in over 40 cases involving radiation and health. These include cases where Nuclear Test veterans are suing the UK government for exposures at the test sites that have caused cancer, they include cases involving nuclear pollution, work exposures and exposures to depleted uranium weapons fallout. And these cases are all being won. All of them. Because in court with a judge and a jury, people like Wade Allison and George Monbiot would not last 2 minutes. Because in court you rely on evidence. Not bullshitting.

Joseph Conrad wrote: “after all the shouting is over, the grim silence of facts remain”. I believe that these phoney experts like Wade Allison and George Monbiot are criminally irresponsible, since their advice will lead to millions of deaths. I would hope that some time in the future, I can be involved as an expert in another legal case, one where Wade Allison, or George or my favourite baddy, Richard Wakeford (who actually knows better) are accused in a court of law of scientific dishonesty leading to the cancer in some poor victim who followed their advice. When they are found guilty, I hope they are sent to jail where they can have plenty of time to read the scientific proofs that their advice was based on the mathematical analysis of thin air.

In the meantime, I challenge each of them to debate this issue with me in public on television face to face, so that the people can figure out who is right. For the late Professor John Gofman, a senior figure in the US Atomic Energy Commission until he saw what was happening and resigned, famously said: “the nuclear industry is waging a war against humanity.” This war has now entered an endgame which will decide the survival of the human race. Not from sudden nuclear war. But from the on-going and incremental nuclear war which began with the releases to the biosphere in the 60s of all the atmospheric test fallout, and which has continued inexorably since then through Windscale, Kyshtym, 3-Mile Island, Chernobyl, Hanford, Sellafield, La Hague, Iraq and now Fukushima, accompanied by parallel increases in cancer rates and fertility loss to the human race.

There is a gap between them and us. Between the phoney scientists and the public who don't believe what they say. Between those who are employed and paid to protect us from radioactive pollution and those who die from its consequences. Between those who talk down what is arguably the greatest public health scandal in human history, and the facts that they ignore.

Mind the Gap indeed.

Watch the recent interview with Christopher Busby on [GRTV](#).

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