

Pages 287 to 304 from *Wolves of Water* by Chris Busby.

I made this extract by scanning the pages from the copy I cut up to make the index. That's why you see highlighter and notes. The index is at www.llrc.org/wolvesindex.htm.

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A major exercise to validate this data [on childhood cancer in Wales] is being carried out . . . it is intended that this exercise will explore why the rates reported for Wales in this publication are higher than those in regional registries in the UK.

Cancer Registration in Wales 1984-88 (1994, Cardiff: Welsh Office)

12.1 A long and complicated story begins

Nowhere is the story of the cover up of the relationship between illness and radiation more obvious than in the story of the Wales Cancer Registry and its leaked data.

Wales is important as a study area. There are two reasons why Wales is an interesting laboratory for examining the effects of radioactive pollution and health. It rains more than in England and so there was more exposure to global weapons fallout in the 1960s and then again exposure to Chernobyl fallout in 1986. In addition, its coastline is situated on the Irish Sea, which is contaminated with fine radioactive Plutonium-bearing silt from Sellafield, and is West-facing, into the prevailing winds. There are two nuclear power stations in Wales, and one of these - Trawsfynydd - is the only inland nuclear power station in the UK. But it is the pollution from fallout and Sellafield that is by far the greatest component of exposure. Much of my early study was of the overall time trend effects of the weapons fallout. It was later on, after 1995, that I was able to look more closely at the effects in terms of area, and this was made possible by the acquisition of the Wales Cancer Registry small area datafiles. These were crucial to our understanding of the situation, but they were also crucial to those who wished to cover up radiation effects. In this chapter I will tell the story of how the release of these files, and what they showed, was dealt with by the various organisations whose job it is to protect the public but whose real agenda seems to be to airbrush any evidence that we are all being systematically poisoned. It is a long and complicated story, but I need to put at least the main points down, because it is a major feature of my long chess game with the nuclear establishment and their supporters.

The story began in 1994 with the publication, in Wales, of *Cancer Registration in Wales, 1984-88* by the Welsh Office. This was a regular publication by Wales Cancer Registry (WCR) a division within the Welsh Office responsible for obtaining, collating and ordering cancer data as one of the UK regional cancer registries. Two earlier publications in this series covered the period through for 1974 to 1984 and 1984-86. I was studying these in connection with the work I had been doing on the 4.5-fold excess of bone and other cancer in Wales, which I

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believed was caused by the weapons fallout (Busby 1995 BMJ). The 1994 publication showed a sharp increase in cancer in Wales after Chernobyl, but it also drew attention to high levels of childhood cancer. These high levels, it said, were being examined and validated by the Childhood Cancer Research Group in Oxford. This outfit is the operation of Dr Gerald Draper, who has made himself the foremost expert on childhood cancer in the UK. Draper originally joined Alice Stewart's research group in the 60s when she was obtaining the childhood cancer data, which became the Oxford Survey of Childhood Cancers, but moved off to set up his own operation (the CCRG) with mysterious amounts of government funding. Alice told me a few years ago that she did not trust him and thought that his agenda was suspicious. After all, she asked, why did the money for this research not come to her, since she had started the whole thing off?

In 1995, the arguments about bone cancer in Wales (see Wings of Death) had resulted in pressure to meet with WCR to ask what was going on. I had a letter about cancer in Wales published in the British Medical Journal [Busby, 1995BMJ]. The Director of WCR, Mary Cotter, had replied to this, also in the BMJ [Cotter, 1995]. Apparently, a WCR bone cancer revalidation had shown that the excess we were arguing was caused by Strontium-90 was a mistake. However, I had made a presentation to the Welsh County Councillors in Bangor, and they exerted pressure for us to have a meeting with the Medical Officer of Health for Wales, Dr Deidre Hine and the Cancer Registry directors, Mary Cotter (Medical) and Reg Fitzpatrick (Statistical). This meeting went ahead, with Richard Bramhall, myself and Stuart ^{ERR} Kemp of the Nuclear Free Local Authorities (NFLA). At this meeting we asked several searching questions about how the bone cancer revalidations had been carried out. We received no reply, but instead a prepared lecture on the work of the cancer registries. I interrupted this and asked if we could have the data down to small areas, as, if I were correct about the fallout, the cases would be in the wet areas. No, we couldn't have the data to small areas, said Mary Cotter. 'Why not?' I asked. 'Because it would enable you to identify individuals', she replied. 'But how could I identify an individual if I knew that there were five cancers in a population of 1200 people in an area near Bangor? Why should I wish to?' This argument is now a common one. There was one other conversation we had, which is worth recording. While we were talking about validation of the bone cancer figures, she told me how careful they were to ensure accuracy. The childhood cancer excess reported by WCR in their 1994 report had been extensively revalidated, she said, by Gerald Draper of CCRG. The figures were accurate: the excess was real.

Regarding the small area data Deidre Hine, the Medical Officer for Wales was quite supportive, 'Can you not give data to a small area which is larger than one in which people can be identified?' Eventually, it was agreed that WCR would give us data to the County District level, for all the different cancers by 5-year age group and sex and year from 1974 to 1989, the latest year that they had processed. County Districts are quite large areas, and so this wasn't going to help us much. To

our surprise, shortly after this, there appeared in the mail a floppy disc from WCR. The files on it were compressed and when I tried to open them, there was not enough space on the PC that I then had, and it locked up. I described the data and how we acquired it and used it in Chapter 5 where I reported the results of the analysis but I will briefly repeat the story here as it is relevant to the political implications, the cover-up and the arguments, which is the aspect I turn to here.

The data in A2218EXE was for the sixteen years 1974 to 1989. There were numbers of cases for all the ICD9 cancer sites, by sex, 5-year age group, 194 small areas annually from 1974 to 1989. In principle this gave $50 \times 2 \times 14 \times 194 \times 16 = 4,345,600$ cells, over 4 million numbers to deal with in one file. No wonder smoke came out of the computer. Buried in all these numbers was the answer to what we were looking for. In 1996 I decided to see if I could obtain a more user-friendly version, split down by counties. I contacted the Welsh Office in May 1996, shortly after we (the Low Level Radiation Campaign) had organised a symposium at the Houses of Parliament on radiation effects. What's happening about cancer data? I was put through to Heather McGrane, of the statistical division, who explained that they were gathering the data whilst it was decided what to do about a new cancer registry. She agreed to let me have a new file, extracted differently county by county and to let me have the extra year 1990. This file duly arrived in June. It was titled A2883EXE and was extracted by Hugh Warren on 12th June. By 1996 Richard Bramhall, Molly Scott Cato and I had set up the Low Level Radiation Campaign and obtained some financial support from the Goldsmith Foundation, but we were not able to examine the files properly until 1997.

12.2 Ireland pays to study the data.

In 1996 I had been invited by Fergus O'Dowd (related to 'Boy George'), the Mayor of Drogheda, on the east coast of Ireland to give a presentation on low level radiation. I took Molly and my daughter Rosa, then aged 2. There was a great deal of argument and energy about Sellafield; the locals were greatly exercised about the imposition of radioactivity on the coast and in the fish and shellfish. The Radiological Protection Institute of Ireland sent their director Tom O'Flaherty to make soothing noises. BNFL sent Richard Wakeford to attack me (which he did with great gusto but little science). The high spot was when the Minister Avril Doyle said that she would support research into whether there were any effects. Unfortunately, Ireland had no national cancer registry so figures were unavailable. I was standing with Grattan Healy, who was a researcher for the Green Party MEPs Nuala Ahern and Patricia McKenna. Both had made a major platform of their election the existence of Sellafield as a threat to the Irish constituencies they represented. Grattan said, 'Why don't you ask her if she'll fund studying your Welsh Data? So I jumped up and put the question in front of all the assembled and

angry people. She agreed to look into it. Later when I talked with her she picked up Rosa (as politicians do) and had chocolate smeared all over her face and nice suit. She seemed a nice person, and took it very well. Later I received a letter from Emmett Stagg, her colleague and the Minister for Energy. I wrote an outline of a protocol for a collaborative study. He passed this to his civil servants, who were negative and dismissive. What did emerge was that there had indeed been one study of childhood leukaemia in eastern Ireland, conducted by researchers from University College Dublin. This had been carried out by the Irish Department of Health in 1986. It showed the existence of an excess leukaemia mortality risk in the 0-14 year old children in a coastal strip 3 miles wide on the east coast and south coast for the period 1971-86. Although this was a statistically significant finding, the committee who published the report were not alarmed. They did, however, suggest the founding of a national cancer registry, and also that an epidemiological programme enquiring into incidence, trends and causation of cancer be undertaken. Nothing had been done to follow up this work, and Emmet Stagg resigned shortly after this exchange. But in the autumn of 1997, the litigants in a court case against BNFL, four individuals from County Louth named Mark Deary, Constance Short, Mary Kavanagh (Plate 15) and Ollan Herr (Plate 33) managed to obtain a High Court ruling in Dublin that they could take BNFL to court law for polluting the coast of Ireland. The State agreed to fund the research needed for this case and I was approached to see if I would look at the Welsh data. This was the breakthrough that was needed. By the end of 1997 I had obtained a new PC and software able to cope with the file conversions. We set to work, in January 1998, to look at the data.

In the event, the State did not pay for the study until long after we had been working on it. The initial work was all done on the cheap, although we were later able to pay for the results to be checked independently. There were very few mistakes. The first cheque, for part of the work, appeared in June 1999, 18 months after we began. I was helped initially by a succession of recent graduates who I employed to attack various aspects of the case. Because there was no money from Ireland, I had to pay them with promises and handouts. As I mentioned earlier, one of them, Bruce Kocjian (Plate 23), who was a mapping expert, worked at the PC in the attic room where we lived whilst the builders were removing the window. He sat in front of the PC for three weeks in freezing weather, in a sleeping bag, typing in gloves with the fingers cut out. It was like a scene from Chekov or Dickens. For a while, he slept in a tent in the woods; this was winter. Luckily he was Scottish and inured to cold. Alasdair Stocking, who sorted the data worked in the local Internet café, and did the work between serving cups of coffee. Mapping was done by Helen Rowe and Evelyn Mannion. The small Areas of Residence were coloured with coloured pencils on photocopied enlarged maps pasted together like a giant jigsaw on card. I still have them. They look quite beautiful. There was no question of digitised maps or GIS in those days (too expensive), although we eventually

moved to more advanced technology (thanks to ebay). I have always been cynical about such technology anyway. Very often it is such super art that obscured the findings, or else is used to show results that are very weak or non-existent.

12.3 First meeting with the new Wales Cancer Intelligence and Surveillance Unit WCISU.

At the beginning of this study the first problem was the identification of the exact boundaries of each of the small Areas of Residence (AORs). I list some of these in Table 12.3.1, together with the wards that make them up and their 1981 census populations. This was the first problem we came up against. No one in the Welsh Office knew what these AORs were all about, or had heard of them or their designations. They seemed to be something that Wales Cancer Registry had used, and a hangover from their early period of operation in the 1980s. I contacted the new cancer registry, WCISU. 'What are the geographical and ward boundaries of the AORs?' I asked. I spoke with Helen Beer, a researcher there who apparently was looking at exactly the same thing, since WCISU had the same problem of dealing with the WCR data. 'We don't know either', she said, 'We are talking with the statistics department about this'. I decided to come and see the WCISU and ask about the data and the AORs. I also did a great deal of phoning round. A Green Party colleague, Mal Evans, worked for the Welsh Office mapping department. He was unable to help. I talked with the Statistics people there. They couldn't help. After a great deal of research I eventually struck lucky. There was someone at the Office of National Statistics at Fareham in Hampshire who knew what these names represented in terms of wards. John Walsh sent me a table where the AOR names were lined up with ward names, parishes and communities. It was then a relatively simple (though tedious and lengthy) matter to collect together the census wards and assemble the populations. This was something that WCISU never achieved. In 2002, when I was involved in looking at cancer near the town of Mold in North Wales, where there is a cluster owing to pollution from the government war gas repository at Rhydymawyn, it became clear that WCISU had no idea at all what the AORs comprised and still do not. I return to this.

Ignorance of AORs
My meeting with the WCISU introduced me to their Director, Dr John Steward. Steward was affable and full of bonhomie. He would help us in every way. He introduced himself as someone who had always been interested in radiation and health and told me he was the author of a study of cancer and leukaemia near Trawsfynydd (*Report A-EMJ-28 Investigation of the incidence of cancer around Trawsfynydd and Wylfa nuclear installations*, 1994). This was quite interesting since, if it were so, he must have known the composition of the AORs all along since the Trawsfynydd report used these same AORs. Why then did both he and Helen Beer say they knew nothing about the AORs? Perhaps he had

forgotten. Without these AOR designations I was stuck: no research on the WCR files could be carried out.

Steward also gave me a copy of a paper by Ray Cartwright that found excess child leukaemia near estuaries [Alexander *et al.*, 1990]. Cartwright has since got into considerable trouble over this paper, as I will relate. Steward also told me that the data that I had been given by WCR had been wiped from the mainframe computer. This was rather extraordinary, and I said so. He agreed, and had no explanation. He smiled the whole time.

The populations of the AORs had to be constructed from the 1981 census, but this was now possible since I had their make-up from John Walsh. Luckily, 1981 fell in the middle of the period we were studying. The work crawled along slowly. It dawned on me what I had been leaked and what it could show. I began to feel paranoid about these discs. After all, if the data was wiped from the mainframe, and the whole of WCR had been sacked, someone was taking a great deal of trouble to ensure that whatever cat was out of the bag should be knocked on the head. I made several copies of the original discs and sent them to as many people as possible. I kept one of the original discs; the other I sent to Richard Bramhall who lodged it in a solicitor's safe, where it still is. It seemed to me that there might be some question about veracity, about altered data. This was prescient. My own disc mysteriously disappeared from my house shortly after this.

Table 12.3.1 Some AORs in Clwyd and their ward composition.

Wales Cancer Registry AOR	Civil parish	County/Local Authority
71AA BUCKLEY UD	Argoed	Buckley UD pt
	Ewloe Wood	Buckley UD pt
	Bistre East	Buckley UD pt
	Bistre West	Buckley UD pt
	Ewloe Town	Buckley UD pt
	Pentrobin	Buckley UD pt
71AC CONNAHS QUAY	Central Ward	Connahs Quay UD
	Golftyn Ward	Connahs Quay UD
	South Ward	Connahs Quay UD

12.4 Two sets of data: a Sea of Troubles

The first dataset, A2218 EXE, was a text file, with the left hand column giving, by year, the AOR and cancer site, and the rest of the columns the number of cases in each 5-year age and sex band (Appendix A). The final two rows after the AOR, gave totals for all malignancies and all leukaemias, because this is what I had asked for. The cancer sites were designated by their ICD9 code, for example, Breast cancer is 174; lymphoma is 202. In this code, 204, 205, 206, 207 and 208 are all types of leukaemia. So there were two places in the data where leukaemia was tabulated, in the row 'all leukaemias' and also in the row alongside the specific leukaemia type, e.g. 204 is acute lymphoid leukaemia. I approached the problem of what to do with this in two ways. First I added all the leukaemias. Second I used only the ICD 204-208 leukaemias. I thought that the 'all leukaemias' file was a shadow file that had been kept apart from the others, particularly since it seemed to have cases mainly in North Wales. The second dataset A2883 did not contain these 'all leukaemias' rows. It was most mysterious but also very interesting. It seemed to confirm what Wales Cancer Registry had been saying in their 1994 report, but placed the children near the sea, near the radioactive pollution in North Wales. We were at the position in late 1998 to know that there was a statistically significant sea coast effect in both adult and childhood cancer. Over the 16-year period, children in the coastal strip had more than twice the chance of being diagnosed with cancer than the national average rising to almost 4 times in the last four years of the period. For brain tumours, the relative risk over the whole period was almost 5-times the national average in the coastal strip. The data for child leukaemia from the combined data showed high levels of childhood leukaemia in north Wales coast - up to 4.5 times the expected number of cases with the distinctive trend which I described in Chapter 6. If we used only the ICD column data, the effect was still there although the actual values were much lower, with the coastal strip relative risk falling to 1.5 although the effect was higher ($RR = 2.4$) in the latter half of the time period.

I reported these results at the Standing Conference on Low Dose Radiation in Bromley in 1998. Shortly after this I was approached by BBC Wales who wanted to make a documentary. This was produced by John Fraser Williams and was in the series, *Week in Week out*. It was titled *Sea of Troubles* and was transmitted in February 1999. It made a big splash. Unfortunately, it focused mainly on child leukaemia since the BBC saw this as a good storyline. In fact, because the numbers are much larger, the adult cancers are much more horrifying. Between 1974 and 1989 more than 3500 adults died in the coastal strip from cancer that was related to where they lived and some environmental effect.

In the TV programme John Steward (Plate 12) was interviewed and denied the existence of elevated leukaemia in children in north Wales. The Welsh Assembly contacted COMARE to ask for an investigation. Steward was asked to

do a study by COMARE to back up his assertion that there was no child leukaemia excess. No one seemed to be interested in the childhood cancers, or the adult cancers. Steward sent an emissary to Aberystwyth, one David Adams Jones, ex-director of the Scottish Cancer Registry and an epidemiologist who had been involved in the Dounreay child leukaemia cluster work. Adams Jones turned up for a meeting with the Green Audit team (myself, ~~Bruce Keefian~~ and Molly Scott Cato). We naturally asked for the data they held. Adams Jones said that there was no WCR data on the computer so they did not have the data we had. He wanted our files. We refused. We wanted the WCISU files. He refused. Impasse.

Why did we refuse? Because if he had our files, Steward would know where the cases contributing to our excesses lived and he could then adjust his adjusted files to fit with our files. But if he didn't know where our cases were, he wouldn't know which cases to remove from his files to get the relative risk down to below statistical significance. If he let us have his files, then we would see which cases he had removed and go and find the people. He has never let us have his files, even after being asked to give them to us by COMARE. Steward decided on a way forward. We had used as a covariate the mean distance of the AORs we had received from WCR. At this time Steward refused to deal with the AORs, which were made up of the 1981 census wards and would not give us the numbers of cases he had in the AORs. Instead, Adams Jones suggested we define strips in terms of 1991 census wards, and WCISU would then aggregate the cases into these strips. Why not, I thought. At least we would get some information and maybe using simultaneous equations figure out what WCISU was up to. So I put Evelyn Mannion to the task of aggregating the census wards into strips at various distances parallel to the coast. This took some time but eventually the strips were constructed and sent to Steward. Steward analysed risk of child leukaemia 0-4 and 0-14 in the 'Busby Bands'. They also examined childhood cancer 0-14 and brain tumours in children 0-14. They did not find anything. Their paper actually showed fewer children with leukaemia in the coastal strip than inland. For brain tumours and all malignancies there was a weak coastal effect. They presented their results to COMARE at their 55th meeting in March 1999.

sea coast effect
= WCISU.

12.5 COMARE discusses the issue.

The furore in the Welsh Assembly caused by *Sea of Troubles* resulted in their asking COMARE to investigate. Several MPs, including the Chair of Plaid Cymru, Dafydd Wigley, asked for an enquiry. Of course, as MP for Caernarfon, one of the coastal towns identified in the coastal strip, he already had concerns about the high level of cancer there. This is local knowledge and has nothing to do with official figures. Asking COMARE to investigate is rather like asking the Mafia to consider a report of organised crime, and the result was as predictable. John Steward's

* errors - not Brun - Bramhall.

cover-up by the
our side of the evidence
(Cotterill)

WCISU childhood cancer study for Wales, analysing the Busby Bands was presented in person by him. At no time did COMARE ask us to present our side of the case, nor were we to see Steward's paper until after the Press Release by the Welsh Assembly, which rubbished our position. Unluckily for COMARE, not everyone on that committee was as convinced by Steward, and the minutes were leaked to us. The confidential minutes of the 55th meeting held on 18th March 1999 arrived on my doorstep in a brown envelope. They made interesting reading. They began with an account of Steward's presentation. This concluded with Steward accusing us of scientific fraud. Not all the members went along with the belief that there was no effect. For example:

leaked

7.13: Professor MacMillan asked whether it was possible to be sure that there was no coastline effect on the incidence of leukaemia. Professor Clayton also thought it was premature to say that the coastline effect does not exist. He would support further coastal analysis. . . Professor Boddy commented that the public would think that COMARE were not carrying out their duties unless further action was taken to address Dr Busby's hypothesis.

The Chairman asked the committee whether they would wish to recommend a further study to test the hypothesis. At this point, Roy Hamlet (the secretary) steps in:

7.16 Dr Hamlet said that this would raise Dr Busby's credibility and would open the door to others to lean on COMARE to recommend research.

The final report on the issue from COMARE concluded that Steward's analysis was correct and that there was no problem. They apparently did this by asking Gerald Draper to compare the figures with his own Childhood Cancer Research Group figures. These data apparently agreed with Steward's and not with those of WCR that we had used. By this time, however, we had been able to look at Steward's totals and had worked out that he had taken 15% of the children with cancer off the WCR database as published by WCR. The total numbers given by WCR were the same as the total numbers we had in our A2883 EXE file, and the results we had for the analysis of this file showed an excess of leukaemia, brain tumours and all cancer in children in the coastal strip. I wrote to Bryn Bridges pointing out that Steward had removed children from the data. He ignored this. COMARE released their conclusions to the Welsh Assembly and Jane Hutt, Health Minister, released it to the Press on 21st July 1999.

National Assembly Health Secretary Jane Hutt announced today the results of an independent examination of the claims made by Dr Chris Busby and colleagues of Green Audit, which concludes there is no higher incidence of leukaemia among children living along the north Wales/Irish Sea coastline.

Cover-up by withholding
Welsh Assembly report

Although we were specifically excluded from seeing Steward's paper on which this was based, they had to send it to the media, and did so with a covering letter that it should not be given to us. This was unheard of. Naturally, all the newspapers faxed us the report and asked for our response. I went on the air saying that it was a cover-up. And, as I will relate, it clearly *was* a cover-up, since by late 2003, the TV company HTV had put a researcher in charge of investigating the children. Was there a cancer excess? Yes indeed. But what had happened to it?

12.6 Steward's report: a tale of two studies

*cover-up by
boy's stats*

ref? Results of a preliminary study to test the Irish Sea proximity hypothesis of Busby *et al.* by Steward JA, Adams Jones D, Beer H and John G was presented as a re-run of the Green Audit study on which the TV program was based, but with WCISU data. It was not. In order to dilute out or remove the effect, every trick in the book was used. They used wrong populations, different distances from the sea, different age groups and removed cancer cases from the data. For the 0-14 age group and all malignancy we could compare directly with the WCR cases published in their various reports. These numbers agree exactly with the WCR data in the small area files used by Green Audit. The essential differences for 0-14 year olds are given in Table 12.6.1

Table 12.6.1 Comparing the Green Audit and WCISU studies of childhood cancer 0-14 in Wales by distance from the coast.

Green Audit study (WCR data)	WCISU study (WCISU adjusted data)
Period 1974-89	Period 1974-89
All malignancies	All malignancies
1981 census wards	1991 census wards
800 metre closest strip to coast	5km closest strip to coast
Significant excess found in coastal strip. RR in 800 metre strip = 1.4 ($p = 0.01$); RR = 2.2 in 0-4s	Non-significant excess found in coastal strip of 5km; RR = 1.1
1981 population of 564,870 children aged 0-14 and 169,200 aged 0-4	1991 population 569,900 children 0-14 and 204,800 aged 0-4 (21% higher than 1981 population)
Total cases 0-14 in WCR data was 1188	Total cases 0-14 in WCISU data was 1006; 182 cases or 15% less.

So what did they do to remove the result?

- First they used the wrong populations. Census populations are only available for 1981 and 1991. How can it be proper to use 1991 populations for a study covering 1974-89? Clearly the 1981 populations fall in the centre of the study period, so why not use them? In the 0-4 year olds, where the effect is largest, the 1991 populations are 21% higher than the 1981. So this would reduce any cancer excess in this age group by 21%, since the population is the denominator of the rate.
- Second, they increased the width of the coastal strip. We made very clear that the effect was located inside 2km from the coast and was highest in the 800m proximal strip. This is where the exposure to the Plutonium in the sea spray is at its maximum. By extending the width of the strip to 5km, any proximal effect is diluted *at least* by a factor of two.
- Finally, since even these shenanigans clearly were insufficient, they just took the cases off the WCR database. 15% of the 0-14s were removed from the WCR published data, the same data we were studying, agreeing in totals exactly. These involved 182 children. The children were taken from the coastal strip. How do we know this? Because we can see it by comparing their results with ours, setting up simultaneous equations for the AORs and the 'Busby Bands' and subtracting.

This final item where Steward *et al* removed the 182 cases from the total children with cancer given in the Welsh Office publications for 1992 and 1994 has been the subject of continuing demands by Green Audit for an explanation. Even COMARE were eventually bounced by us into asking Steward to give us the data. Of course, he refused. Eventually, very recently, he has come up with an explanation (2003). The cases were removed because they were adults who had been misclassified as children by WCR. Gerald Draper repeated this nonsense to me at a recent radiation workshop in Oxford. How come, I asked, these misclassifications only occurred for children living near the contaminated mud banks of the north Wales coast? The 182 cases include 50 cases that Steward had removed from his own April 1998 published database, which was published before the TV programme, and the level of argument meant he had to go back and take out some more cases. When I phoned and pointed this out, there was general consternation. I don't think many people have had this early version of the WCISU data, which was such a hostage to fortune.

The correspondence and argumentation over these issues of whether there were excess cancers in North Wales's coastal wards have continued to surface regularly since 1999, and became part of the CERRIE process also (which I shall describe later), since a major plank of our contribution to the CERRIE debate was

came up by
deleting patient
records

+ by withholding
data

the existence of excess risk near contaminated coastal areas. COMARE eventually decided that the child leukaemias in the shadow 'all leukaemias' file was an artefact of some sort. They tried every method to explain how the file came about. They asked me for the data; I refused to give them the entire file until I saw Steward's data for reasons that I have already described, but in the interests of truth and accommodation I gave them two years of data, 1984 and 1988. These two years taken together showed high levels of childhood cancer in the towns near the Menai Strait, as I show in Tables 12.6.2 and 12.6.3 where I compare with the numbers that underpinned the Sellafield cluster.

Extraordinarily, COMARE did not comment on the numbers of cases and risks in the north Wales area shown by these two files but said that they just wanted them to see if they could find the source of the problems with the shadow leukaemias. They were unable to solve the problem, and merely concluded that there was some error at the Wales Cancer Registry end. They accused me of using incorrect data and publicly called for the withdrawal of our claims, as we were 'scaremongering'. I refused to withdraw the reports. COMARE had never looked at the high levels of adult cancers in north Wales, nor had they succeeded in obtaining data from Steward, nor any explanation from WCISU as to how the children they had taken off the database had been originally misclassified. The whole process stank to high heaven of cover-up. We were to find that this was exactly what had happened from an unexpected source. Just as Yorkshire TV had been the first to discover the leukaemias near Sellafield in 1983, now Harlech TV in Wales was to do the same for the children of the coastal communities of north Wales.

The government-funded watchdogs, COMARE and SAHSU, set up in the wake of the Black report, were seen to not only be useless, but actually to represent an operation hand in glove with the nuclear industry. At a CERRIE meeting in 2003 discussing the Welsh leukaemias, and where now the Chair, Dudley Goodhead, was asking me to release the WCR files, I mentioned that I had already given two years of data to COMARE so that they could check. Richard Wakeford, BNFL's chief epidemiologist said, 'Ah but those two years were chosen by you because they exhibited a high risk for child leukaemia!' He was right, but how did he know this, unless COMARE had sent him the data? This links them all together. Are we surprised?

Table 12.6.2 Observed and expected numbers of childhood cancer cases in some Areas of Residence near the Menai Strait in the two years 1984 and 1988 combined. These are two of the years for which Wales Cancer Registry reported high levels of cancer in North Wales in their 1994 publication.

AOR	All maligs 0-4	Expect	Obs/Exp (RR)	p-value
74CA Bangor	4	0.17	23.5	0.0000
74CE Caernarfon	1	0.15	6.4	
74JL Aethwy	1	0.26	3.8	
74JJ Menai Bridge	0	0.044		
74JC Beaumaris	0	0.028		
74CN Ogwen	0	0.086		
74AC Conway	0	0.176		
74AE Llandudno	2	0.202	9.9	0.01
All AORs	8	1.122	7.13	0.0000

Table 12.6.3 Observed and expected numbers in 1984 and 1988 of all malignancy, all leukaemia and brain tumours in 0-4 and 0-14 age group in the AORs in Table 13.3, compared to Seascale and coastal villages.

Site and age	Observed	Expected	Relative risk	p-values
All malignancy 0-4	8	1.12	7.1	0.0000
All malignancy 0-14	12	1.4	8.6	0.0000
All leukaemia 0-4	3	0.44	6.8	0.0000
All leukaemia 0-14	3	1.02	2.9 2.9	0.08
Leukemia 0-4 + shadow file	5	0.44	11.3	0.0000
Leukemia 0-14 + shadow file	7	1.02	6.9	0.0000
Brain 0-4	2	0.15	13.2	0.0000
Brain 0-14	3	0.48	6.25	0.0000
Seascale + coastal villages All maligs. deaths 0-14 1963-82 (a)	4	1.36	2.9	0.04
Seascale + coastal villages All leukaemia 0-14 in children born 1950-83	3	0.32	9.35	0.004

* errata.

12.7 Raising the dead: **Byd ar Bedwar**

So there we are. That is how it is done. Airbrush the data, remove the children who were ill or died in areas that are inconvenient for industry. In the case of adults, comparisons of the WCISU publications and those of WCR showed that besides the children, WCISU had also removed 3000 cases from the WCR data inherited by them. There is an interesting cartoon I saw in a French anti-nuclear magazine. Two guys are looking through a fence into a nuclear site where a lorry is tipping some stuff into a hole. One says to the other, 'What's that? Nuclear waste?' The other guy says, 'No! Cancer data.' WCISU had raised the dead, bringing the cancer patients back to life at the stroke of a Tippex brush.

But now there is the denouement. As St Mark says:

For there is nothing hid, which shall not be manifested; neither was any thing kept secret, but that it should come abroad. [Mark 4:22]

In 2002, Linda Parry, a young researcher for the Welsh Language Channel S4C based in Bangor, decided to start digging. Her friend had died from non-Hodgkin lymphoma and she had become concerned about the levels of cancer on the north Wales coast, particularly around Caernarfon and the Menai Strait between the island of Anglesey and the mainland. The Menai is particularly contaminated with material from Sellafield. Wielding a Geiger Counter over the mud there will convince you that you are inside the Chernobyl exclusion zone. Over two years, Linda managed to interview the parents of many children diagnosed with leukaemia and various cancers. She contacted the Low Level Radiation Campaign and Green Audit in the autumn of 2003. We collected her data together and analysed what we had in early 2004. The results were alarming. And this time there could be no argument about the cases. We knew where they were. Our 2000 report to the Irish Court Case, which used the WCR data, had identified the towns of Bangor and Caernarfon as having significant excess childhood leukaemia and brain tumours between 1974 and 1989. This area was one where Steward had to have removed the cases to reduce the coastal risk. Linda Parry's data showed a 21-fold excess of leukaemia in Caernarfon and 18-fold excess of brain and spinal tumours in the same town. In the 34 wards that back the Menai Strait, the leukaemia risk in children 0-4 was 6 times greater than the national average and 3.4 times the national average, if the Caernarfon cases were excluded. I show the numbers in Table 12.7.1

For brain and spinal tumours, the Menai Strait wards had more than 4-times the national expected numbers of cases between 1996 and 2003. There was an 18-fold excess of brain and spinal tumours in children in Caernarfon over the same period. These were just the cases found by Linda. It is unlikely that she got all of the children. There is more. Interestingly, WCISU published figures for cancer in Wales from 1992 to 2001 in 2003. These figures show rates for adults and although there are high levels of leukaemia in Wales, the highest in Europe, the

high levels are not recorded as being in North Wales. For the whole of Wales, the numbers published show that there are no significantly high levels of leukaemia in children 0-4. In fact, although, according to WCISU the adult leukaemia in the whole of Wales from 1992 to 2001 is the highest in Europe, $RR = 1.5$ we are to believe that childhood leukaemia age 0-4 is exactly the same as in England, indeed to an astonishing degree: according to their data $RR = 1.00$.

Table 12.7.1 Childhood cancer in towns and wards near the Menai Strait as obtained through interviews by Linda Parry of HTV Wales televised as a documentary *Byd ar Bedwar*, Feb 10th 2004, Producer Tweli Griffiths.

Site, age group, period	Pop	Observed	Expected	RR	p-
<i>Leukaemia 0-4. (2000-03)</i>					
Caernarfon	528	3	0.142	21	0.0000
34 Menai wards	3824	6	1.02	5.8	0.0006
<i>Leukaemia 0-14 (1996-2003)</i>					
Caernarfon	1655	3	0.56	5.4	0.02
34 Menai Wards	12417	11	4.17	2.6	0.004
<i>Brain+ 0-14 (1996-2003)</i>					
Caernarfon	1655	5	0.28	18	0.0000
34 Menai wards	12417	9	2.1	4.3	0.0003

So, following this new information we are justified in asking a few more questions of those who were responsible for examining the levels of cancer in Wales, Dr Steward and the WCISU, and also a number of other players in this drama, including COMARE, Dr Gerald Draper of CCRG, and Dr Ray Cartwright of the Leukaemia Research Fund who will appear later on in this book.

By 2005 Steward had struck back again, but this time he made a fatal error. Clearly the TV documentary was an important piece of evidence and had scared everyone in the area. The analysis on which it was based had been peer-reviewed and presented in September 2004 at the International Conference of *Children with Leukaemia* in London. (Busby *et al* 2004). Steward and co-workers carried out a study for the Welsh Assembly and launched it in 2005 (Steward *et al* 2005). Steward could not deny the children, as we had their names. But these children were diagnosed recently, after 2000. Steward argued that this was a temporal cluster and caused by chance. With regard to the earlier cases which we had found in our Irish State report he now agreed these existed also, but had to get rid of their significance as it made nonsense of the claim that the children with cancer after

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WCU error remain

2000 were a chance cluster. So he reduced their statistical significance and Relative Risk by altering the base population by a factor of three. He did this by misapplying the ward population aggregates for the AORS. In fact, the way he effected this was so absurd and bizarre that it was easy to demonstrate the error. He used the population of Caernarfon wards plus Bangor wards plus Ogwen wards to represent the population of the town of Bangor (Busby and Howard 2006, Busby and Bramhall 2006). His calculation was farcical and desperate. Nevertheless, no one looked at it, COMARE rubber stamped it. The Assembly Government, the National Health Services for Wales organisation and COMARE all underwrote it and in a Press Release and COMARE statement, slated Green Audit for having made a mistake in the populations. We were asked to be more careful and not indulge in scaremongering. The laugh was that it was Steward and his gang who had made the mistake, in this instance it wasn't just taking a few children off the database, it was a complete howler.

I made a formal complaint to the Royal College of Physicians, to COMARE and to the *Journal of Public Health*. My letter with Vyvyan Howard to the *Journal of Public Health* was peer reviewed and accepted. It was published earlier this year (Busby and Howard 2006). COMARE apparently met to discuss their mistaken support of WCISU and eventually a letter accepting that there was a serious mistake made by WCISU was sent to me. But no apology. The new Chair of COMARE, Alex Elliott, quickly glossed over the howling error and went on to ramble on at tedious length about how the latest data from Steward showed there was no problem. What's this? More nonsense? Is there no end to the slipping and sliding? Well, no, actually there doesn't seem to be. Steward now has decided that in fact the children who he agreed earlier lived in Bangor and Caernarfon now seem to live elsewhere. And then here's the really extraordinary move. Steward decides to study only the towns themselves individually (rather than the Menai) and concludes that each town individually (Bangor and Caernarfon and Colwyn Bay) have too few children with leukaemia to demonstrate statistical significance. The RCP enquiry under their Chair, Prof. Rod Griffiths carried on for six months after the initial complaint and eventually resulted in a letter to me saying that the college's legal advisors recommended that they do not pursue it. I wrote an angry response to Griffiths who replied saying he sympathised and would put pressure on the editor of the *Journal of Public Health* to let me have a space to say all this. He advised me to complain to the General Medical Association who have criminal investigation procedures and can kick people out of their jobs. I shall.

The final scary thing is that following the publication of our letter pointing out Steward's mistakes, the Welsh Assembly clearly came under pressure from the North Wales Councils and various important individuals up there. The responded by commissioning a report on the possibility of radioactivity from Sellafield being the cause of the excess child leukaemias and brain tumours (even though they had maintained there weren't any). The study was up for tender. Who do you think

made the winning bid? Who did the study? Who was paid £93,000 of public money to show that the doses (yes) were too low? Westlakes in Cumbria, the research subsidiary of British Nuclear Fuels, BNFL. Can you believe this? Their report was the basis for a recent press statement by the Welsh Assembly Health Minister that people in north Wales should not believe Green Audit, or HTV. All was well. No one was being poisoned by BNFL.

cover-up by
limiting scope of studies

12.8 Decide on your own scenario.

Lately, there have been children's novels that give alternative scenarios, and so, in the spirit of modernity, I will place the sequences of events chronologically and leave you to draw your conclusions. Chernobyl occurred in 1986. No problem for health, said NRPB and the nuclear establishment. The radiation will soon disappear. Wrong on the second count (it is still there and sheep movements are still restricted in some parts). Wrong on the first count also. The fallout was highest in North Wales, contaminating the grassland and washing to the sea to join the material from Sellafield in the estuaries and coastal sediments. In the late 1980s, sea-to-land transfer had been discovered. Autopsies had shown the Plutonium in the lungs of people who lived near the sea. In the early 1990s, Ray Cartwright, Freda Alexander and others [Alexander *et al* 1990] published a study that asked a reasonable question: Do the radioactive pollutants which collect in estuaries cause increased levels of leukaemia in those who live nearby? They looked at estuary wards around England and Wales, but for some reason, not explained, cut out the estuaries in North Wales. North Wales has the highest concentration of people living near contaminated sediment on the shores of the Irish Sea after Seascale and the coastal villages. They found that there was indeed a modest, but significant excess of leukaemia in the combined estuary wards even excluding north Wales. John Steward knew about this paper because it was he who brought it to my attention. By 1994, WCR was publishing data that showed a significant excess of childhood cancer in North Wales. This was, their Director told me, validated by Gerald Draper of CCRG. After publication of *Wings of Death*, the political pressure forced a meeting with WCR at which the Medical Officer of Health, Dr Deidre Hine, told WCR to give us the data. We were leaked the small area data in 1996. Immediately, WCR was closed and its personnel scattered, and the data removed from the mainframe computer. Dr Hine was removed and her place taken by Dr Ruth Hall, hostile and dismissive to the Green Audit position. The new cancer unit, the WCISU, was headed by a man who admitted to being the author of a 1994 report exonerating the nuclear power stations in north Wales from any effect on health. Shortly after taking over, WCISU published a report showing that they had removed 3000 adult cancers from the WCR data and 15% of the children. No explanation was given, and the time period involved was too short for a major

revalidation exercise. Funded by the Irish State, the analysis by Green Audit of the WCR data in 1999 showed the presence of high levels of child leukaemia in North Wales, also brain tumours in children and also a coastal cancer risk effect in children and adults. This effect became worse over the 16-year period of the data, 1974-89 and was driven by coastal areas and towns near contaminated sediment, particularly near the Menai Strait. BBC-TV did a documentary, *Sea of Troubles*, but the results were rubbished by the WCISU and by COMARE. At that time, two of the members of COMARE, who were part of the meeting making the decision not to follow up the research and to deny the existence of the effect, were Gerald Draper and Ray Cartwright.