# The illness of Stuart Raymond Dyson, Deceased and his previous exposure to Uranium weapons in Gulf War I.

Supplementary report on probability of causation
for HM Coroner
Black Country Coroners District
Smethwick, W. Midlands
&
Response to DSTL report:
*Assessment of the possible Risks to Mr Stuart Raymond Dyson from the use of Depleted Uranium Munitions in the 1990/91 Gulf War*
*by*
*Ron Brown*

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Sept 5th 2009

This report is supplementary to my March 2009 report on the issue of causality in the case of the exposure of Mr Stuart Raymond Dyson to depleted uranium in Gulf War 1 (1991) and his subsequent illness and death from colon cancer at the age of 39. It addresses the arguments advanced by the Ministry of Defence's expert Mr Ron Brown (DSTL 2009) and also includes some relevant material which has appeared since March 2009.

1. DSTL (2009) advances arguments that Mr Dyson's colon cancer could not have been the consequence of exposure to DU because the radiation 'dose' was too low.

2. DSTL (2009) develops its arguments on the basis of a number of platforms. First, there are criticisms of my own expertise and that of the group of radiation experts I represent and base my argument on, the European Committee on Radiation Risk (ECRR). Then DSTL advances its own position relating to the radiological effects of DU exposure on the basis of what it calls a 'scientific consensus'.
It should be noted first, however, that DSTL(2009) is the work of one man, Ron Brown, a person with a Chemistry degree from St Andrews and a diploma in Radiological Protection, an individual with little or no research experience and little scientific publication record in the peer review literature as far as I can determine. Mr Brown's job, has been to work for the Ministry of Defence as a civil servant and to apply there the principles and formulae of the International Commission on Radiological Protection (ICRP), whose risk model is universally employed by national governments and agencies.

It is not my purpose here to belittle Mr Brown, who genuinely believes what he says, and whom I served with on the DUOB, but just to make it clear that he is not a hands-on researcher, but merely an analyst, interpreter and presenter of other people's work. As someone who has been trained in the system of the ICRP he is (and was, on the DUOB) hostile to any suggestion or any evidence that the model he has applied all his life, is flawed. ICRP, as Mr Brown admits, represent the cornerstone of the 'scientific consensus' on which his arguments depend. If it is seen to fail, then all his arguments and those of the bodies he cites, also fail.

3. Apart from a great deal of evidence showing ICRP models to be faulty , this cornerstone has recently been removed by the resignation in April 2009 from the ICRP of Dr Jack Valentin the Editor of the 2007 ICRP report that DSTL(2009) refers to and depends upon (DSTL para.20). Following his resignation, Valentin stated to me in a public meeting in Stockholm that the ICRP risk model 'could not be employed' to predict the health outcomes of exposures to ionizing radiation because for certain internal exposures the uncertainties were as high as two orders of magnitude i.e.100 to 900 times (Valentin 2009). This means that there could be between 100 and 900 times the cancer yield per unit dose than is predicted by the ICRP model. Thus the nuclear site child leukemia clusters, the Chernobyl cancer effects and the effects of uranium are explained. He also stated that since he was no longer the Scientific Secretary of the ICRP he could now say that he believed that ICRP and the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) had been wrong in not addressing the many examples of evidence from Chernobyl and from nuclear site leukemias and also other evidence that the ICRP model was unsafe (Valentin 2009).

The meeting in Stockholm where Dr Valentin and I were discussing the validity of the ICRP model was audio and videotape recorded and I have the tapes which can be shown in Court if required.

4. It is worth emphasizing at this point that ICRP is a desk organization with one permanent paid member its Scientific Secretary Jack Valentin. It carries out no research. It depends for its information on the reviews of scientific papers provided by UNSCEAR and so they are not independent of each other as DSTL (2009) states. UNSCEARs reports are selective. In addition, the two committees often have members in common, and also members who have been or are members of the International Atomic Energy Agency (IAEA). One example is Dr Roger Cox, Chair of the UK National Radiological Protection Board (now the HPA) who is ***also*** Vice Chair of ICRP and ***also*** contributing author to the 2000 UNSCEAR report. Another is Mr Abel Gonzalez of the IAEA, who is ***also*** a full member of the ICRP committee and drafted the ICRP 2008 report. Dr Lars Eric Holm of Sweden is the current Chair of ICRP and ***also*** was Chair of the Swedish Radiological Protection organization SSI and ***also*** Chair of UNSCEAR in 2001. Holm has famously gone on record as stating that the total death toll of Chernobyl is limited to 30 seriously irradiated clean up workers, something that is ***also*** stated regularly in public and at conferences by Abel Gonzalez. The point here is that all the organizations that DSTL (2009) depend upon for its scientific consensus argument ultimately interconnect and come back to one risk model: that of the ICRP. The ICRP is not independent of the organizations that it depends upon for its evidence, and they are not independent of it. The system is an internally consistent and epicyclically-maintained fortress of bad science, bias and false conclusions. All the points made by Mr Brown to support his arguments (see e.g. DSTL para.13) are ultimately dependent upon the methodology and modeling of the ICRP. Mr Brown states that the new independent radiation risk committee, the ECRR,has been criticized for being a 'self-styled organization with no links to official bodies' (DSTL para 16). This should, in this context, be a valuable asset.

5. The dispute over the arguments relating to Mr Dyson has become translated by Mr Brown into a dispute about the credibility of two institutions and two models of radiological risk. Thus scientific arguments seem to have been turned into an *ad hominem* argument about credibility.

The ICRP model is based on the universal applicability of the idea of absorbed dose and the application of this concept to the cancer yield of the Japanese A-Bomb survivors, as I have explained in my earlier report. The ECRR 2003 model and its updated publications dispute the applicability of large acute external gamma radiation exposures to Japanese A-Bomb survivors to those internally contaminated and chronically exposed. ECRR employs weighting factors to allow for the effects of certain specific types of such internal exposures.

To address the credibility argument raised by Mr Brown, it might be valuable to ask just which scientists support the ECRR model and what their credibility is. The ECRR held its 3rd International conference at the University of the Aegean in Lesvos, Greece in May 5-7th 2009. At this conference, 20 eminent radiation experts from all over the world made presentations of their original research which showed that the predictions of the ICRP model were totally unsafe. The proceedings of this conference are being prepared. However, at the end of this conference, the current serious state of affairs in radiation protection led to the preparation of a statement which was signed by all the plenary delegates and which demanded the abandonment of the ICRP risk

model (ECRR Lesvos Declaration 2009). I attach this statement together with a list of the scientists and their positions/ affiliations. It will be clear that these scientists are extremely eminent individuals with long histories of original research and publications in the area of radiation risk. Theirs are not 'desktop studies'.

6. I will now turn to some specific arguments contained in DSTL 2009. DSTL(2009) runs to 52 paragraphs. I will not attempt here to respond to all of them and the result would be too time consuming and costly. I will address the most important points by paragraph number (P).

6.1 (4, 5) *multitude of reports. . varying quality. . .simply restate the work and findings of others.* I capture this argument. All of the main reports on DU effects quoted by DSTL are of this nature i.e. desktop studies. Their conclusions are based upon the ICRP model predictions and they quote each others reports for support.

6.2 (6) All of these reports depend for their conclusions regarding health upon ICRP modeling. None carry out any independent epidemiology of exposed populations. There are a very few of these but DSTL has not cited any.

6.3 (7) Belgium has banned DU; the European Parliament has called for such a ban. Canada is a major source of uranium and influenced by the French AREVA company who control the mining.

6.4 (10) As explained in the DUOB final report, there are technical reasons why the results could not be interpreted. The discovery of the existence of enriched uranium in the environment makes it impossible to employ the isotopic ratio to determine DU. More recently I have carried out experiments which suggest that there is significant adsorption of uranium from solution on to the walls of plastic containers. I suggested that this be examined in the DUOB but it was voted in committee not to pursue such an experimental test.

6.5 (12) My point about IRSN is that the 15 French scientists writing the report agreed that the ICRP model was unsafe: in this they agreed with ECRR. They did not agree with the ECRR prescription for a new model. Therefore I think we can both agree, ECRR and IRSN, that ICRP is unsafe, and therefore cannot be used by DSTL or any of the sources they cite in support of their position.

6.6 (13,14) These organisations are not independent in personnel or logical connection from each other and are funded mainly by governments of nuclear States or those employing nuclear weapons. The World Health Organisation WHO is unable to carry out independent research since its 1959 agreement with the International Atomic Energy Agency whose remit is the development of nuclear energy. This disgraceful agreement is the main reason for the absence of any proper research into the Chernobyl accident effects and is part of an on-going international campaign based in Geneva. The WHO has not carried out any research into the effects of DU in Iraq or the Balkans despite many studies showing increases in cancer and congenital illnesses in areas where DU was employed (Busby 2003). Criticism of this state of affairs by the Senior Radiation Advisor to the WHO, Dr Keith Baverstock resulted in his dismissal by WHO in 2005. The European Parliament has recently asked Baverstock to re-open the issue of the Chernobyl effects and Baverstock submitted a presentation

to the ECRR Lesvos conference in 2009 on this matter. The only independent epidemiological study of DU effects has been the Italian government study of Italian Balkan peacekeepers (Italian Report 2001). The first study showed a 3 to 7 fold excess of lymphoma. The more recent update showed such alarming increases in cancer in the veterans that it has been suppressed by the Italian government pending a reappraisal of the data. It is truly astonishing that no other proper independent epidemiological study of DU effects has been carried out.

6.7 (16) *formal links to official bodies* i.e. independent. (16) *self styled* what can this mean? How can it differ from the *self styled* ICRP or the *self styled* DSTL?

6.8 (17) *hot particle theory* What Monty Charles and others who have attempted to discount the hot particle anisotropy do is discount any epidemiological evidence that hot particles can be harmful and then say there is no evidence that they are harmful. For example, the childhood leukemia increases near nuclear sites listed in ECRR2003 and now joined by the huge KiKK German study (Spix 2008) are clearly examples of inhalation of particulates from nuclear site releases. But the supporters of the ICRP model deny that they have any causal relation to radiation exposure *one the basis that the model argues that they cannot*. This epicyclical defence of a model by science has been compared by the twice Nobel prizewinning scientist Michael Polanyi to the way in which Azande witchdoctors support their magical models of the world (see ECRR 2003 for a discussion). But note that the 2005 draft of the 2007 ICRP report *did* include a paragraph about the hot particle anisotropy problem saying that under such conditions *the model broke down.* The paragraph was removed in the 2007 publication.

6.9 (18) *photoelectron effect* Contrary to Mr Brown's assertion, this research has been published in a peer reviewed proceedings of an international conference of the German Agriculatural Research Laboratories, Braunschweig in 2008 (Busby and Schnug 2008). Further work by me and my colleagues at the University of Ulster has shown the idea to be correct and indeed it is part of a USA Patent to employ gold nanoparticles to enhance the irradiation of breast tumours. I attach a poster presentation of the initial results of a CERN FLUKA analysis of the photoelectron effect in uranium particles. It will be clear how local tissue receives excess radiation dose from the photoelectrons (Elsaesser et al 2008).

6.10 (18) *The Second Event effect*. This was attacked in the literature by Roger Cox (see introduction for Roger Cox). No research has been carried out into this idea; it is supported by a number of observations in the peer review literature. Richard Wakeford is the Senior Scientist for British Nuclear Fuels based at Sellafield. He described himself in CERRIE as BNFL's *Rottweiler*. He has taken early retirement.

6.11 (19) I list at the end of this supplementary report a number of research reports in the literature that show that uranium is anomalously genotoxic. Miller's work is among these. Large particles are not the problem, it is the sub micron particles that are the cause of the effects for reasons which are clear from the graphs in Elsaesser 2008 and my earlier publications on this issue (surface area/ volume considerations and self absorption).

6.12 (20) *ICRP 2007I*
See my introduction. . . Jack Valentin.

6.13 (29-33) But the USA employed large quantities of DU munitions and it is now accepted that about 350 tonnes were left on the battlefields. This is the radiological equivalent of dropping about 2kg of plutonium. The area contamination has been calculated to exceed the UN levels for radioactively contaminated land (Busby 2004). Much of this will be resuspended and inhalable. I measured it in southern Iraq myself in 2000 when I visited the country with radiation measuring alpha discriminating scintillation counters. It also travels significant distances as I have shown from my work in Kosovo in 2001 and my work on the Aldermaston filters with Saoirse Morgan in 2007. This is original research carried out personally, and not some desktop citation or wishful thinking. To put this contamination is perspective, the table below is taken from Busby 2004.

| **Event** | **Activity released or estimated deposited** | **Mean activity density Bq per square metre (area)** |
|---|---|---|
| 10 tons of DU in Kosovo | 0.37TBq | 3700 |
| 350 tons of DU in Iraq 1 | 13 TBq | 130,000 ( into 100 $km^2$ ) |
| 1700 tons of DU in Iraq 2 | 63TBq | 630,000 ( into 100 $km^2$ ) |
| Global weapons fallout Strontium-90 (Sr-90) Northern Hemisphere lat. 50-60deg (UNSCEAR, 2000) | 73.9PBq | 460 |
| Chernobyl 30km Exclusion Zone *measured* Sr-90 (IAEA) | | 37,000 to more than 111,000 |
| UK North Wales Radioactive Sheep restrictions *measured* Caesium-137 (Cs-137) | | 15,000 to 30,000 |
| UNSCEAR definition of contaminated area. (Cs-137) | | > 37,000 |
| Irish Sea cumulative Plutonium from Sellafield 1952-1996 [Busby, 1995] | 1350TBq | 20,000 |

6.14 (36) Neither Sodium Iodide nor Germanium gamma detectors can give any safe information about DU which is an alpha emitter and has to be analysed by mass spectrometry or alpha spectrometry. (Busby 2009 UNIDIR report). UNEP used mostly the wrong equipment and unsafe isotope ratio techniques for looking for DU in Kosovo. The UNEP soil sample analysis showed widespread contamination and published urine analysis work by Nic Priest of Middlesex University for the BBC in 2001 in Kosovo showed widespread contamination into humans.

6.15 (37) The pictures shown in Fig 1 and 2 are of no value in arguing that contamination was local. All the readings significantly exceed the natural concentration of uranium in the area with is less than 20Bq/kg and probably nearer 10Bq/kg. Thus in Fig 2 at 50m downwind from the target, the soil concentration of

uranium particles is at least 32 times background. Given the area of the soil in a 50m radius (7800sq metres) a value of 17000Bq/kg soil to a depth of 5cm (surface contamination is the rule as I have discovered) gives an area contamination of 0.5MBqm$^{-2}$. This is 500GBq km$^{-2}$ and can be compared with the UN definition of radioactively contaminated land of 37GBq km$^{-2}$. The level of activity is roughly that of the inner Chernobyl exclusion zone where people are banned from living.

6.16 (38) HPA's GDL is based on the ICRP model and is unsafe. Their view that and activity concentration of 20000Bq/kg would be a safe level would allow people to live on top of mine-able uranium deposits with an activity greater that the outer Chernobyl exclusion zone. The ICRP model predicts that the doses in the outer Chernobyl exclusion zone are safe and that no-one should develop ill health there. The astounding levels of ill health and cancer regularly reported (see Busby and Yablokov 2006) are ignored by ICRP and not cited or reported by UNSCEAR. IAEA ascribes these to 'radiophobia'.

6.17 (40-45) *Dose* is irrelevant as it is an unsafe concept here: uranium should be seen as a particular type of inhalation hazard.

6.18 (46-47) A cumulative whole body ICRP dose of 3.8mSv translates into a ECRR dose of 3.8Sv following the application of the recent weighting factor for U-238 particles. For the inhalation ICRP dose of 0.034mSv the ECRR dose is 34mSv. However, for these particulate anisotropic exposures involving photoelectron amplification, the concept of dose breaks down. Causation must be established by comparison with epidemiologically similar exposures tempered by biological plausibility informed by animal and cell experiments.

6.19 (52) *Haley and US Research Committee* I cite Haley's work because it is one of the few experimental research studies to have been carried out: significantly it was independently funded by a billionaire. The results are quite clear: uranium destroys deep brain tissue. The French ENVIRHOM report also shows results in mice supporting this. The US Binns Research Committee referred to is perhaps another desk operation like all the others. I have not read the report Mr Brown refers to. I did give evidence to the US Congressional Committee in 2003 but clearly this is not referred to in the Binns Committee report.

**Conclusion**

I stand by my arguments which I laid out in my earlier report on Mr Dyson. I attach some references in addition to those I cited in that

C.Busby September 5$^{th}$ 2009

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ECRR - CERI
European Committee on Radiation Risk
Comité Européenne sur le Risque de l'Irradiation

# The Lesvos Declaration

**6th May 2009**

A. Whereas, the International Commission on Radiological Protection (ICRP) has promulgated certain risk coefficients for ionizing radiation exposure,

B. Whereas, the ICRP radiation risk coefficients are used worldwide by federal and state governmental bodies to promulgate radiation protection laws and standards for exposure to workers and the general public from waste disposal, nuclear weapons, management of contaminated land and materials, naturally occurring and technologically enhanced radioactive materials (NORM and TENORM), nuclear power plant and all stages of the nuclear fuel cycle, compensation and rehabilitation schemes, etc,

C. Whereas, the Chernobyl accident has provided the most important and indispensable opportunity to discover the yields of serious ill health following exposure to fission products and has demonstrated the inadequacy of the current ICRP risk model, especially as applied to foetal and early childhood exposures to radiation,

D. Whereas, by common consent the ICRP risk model cannot validly be applied to post-accident exposures, nor to incorporated radioactive material resulting in internal exposure,

E. Whereas, the ICRP risk model was developed before the discovery of the DNA structure and the discovery that certain radionuclides have chemical affinities for DNA, so that the concept of absorbed dose as used by ICRP cannot account for the effects of exposure to these radionuclides,

F. Whereas, the ICRP has not taken into consideration new discoveries of non-targeted effects such as genomic instability and bystander or secondary effects with regard to understanding radiation risk and particularly the spectrum of consequent illnesses,

G. Whereas, the non-cancer effects of radiation exposure may make it impossible to accurately determine the levels of cancer consequent upon exposure, because of confounding causes of death,

H. Whereas, the ICRP considers the status of its reports to be purely advisory,

I. Whereas, there is an immediate, urgent and continuing requirement for appropriate regulation of existing situations involving radioactivity, to protect the human population and the biosphere,

We the undersigned, in our individual capacities

1. assert that the ICRP risk coefficients are out of date and that use of these coefficients leads to radiation risks being significantly underestimated,

2. assert that employing the ICRP risk model to predict the health effects of radiation leads to errors which are at minimum 10 fold while we are aware of studies relating to certain types of exposure that suggest that the error is even greater,

3. assert that the yield of non-cancer illnesses from radiation exposure, in particular damage to the cardio-vascular, immune, central nervous and reproductive systems, is significant but as yet unquantified,

4. urge the responsible authorities, as well as all of those responsible for causing radiation exposures, to rely no longer upon the existing ICRP model in determining radiation protection standards and managing risks,

5. urge the responsible authorities and all those responsible for causing exposures, to adopt a generally precautionary approach, and in the absence of another workable and sufficiently precautionary risk model, to apply without undue delay the provisional ECRR 2003 risk model, which more accurately bounds the risks reflected by current observations,

6. demand immediate research into the health effects of incorporated radionuclides, particularly by revisiting the many historical epidemiological studies of exposed populations, including re-examination of the data from Japanese A-bomb survivors, Chernobyl and other affected territories and independent monitoring of incorporated radioactive substances in exposed populations,

7. consider it to be a human right for individuals to know the level of radiation to which they are exposed, and also to be correctly informed as to the potential consequences of that exposure,

8. are concerned by the escalating use of radiation for medical investigation and other general applications,

9. urge significant publicly funded research into medical techniques which do not involve radiation exposures to patients.

Statements contained herein reflect the opinions of the undersigned and are not meant to reflect the positions of any institution to which we are affiliated.

Professor Yuri Bandazhevski (Belarus) Mykolas Romeris University, Vilnius, Lithuania; Physicians of Chernobyl, Ukraine.

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