Report on Stuart Raymond Dyson deceased.

I am the Emeritus Professor of Medicinal Chemistry at the University of Sunderland and since 1997 I have acted as the Chief Scientific Advisor to the UK veterans of the first Gulf War, GFW-1. During this time I have represented the veterans on, two Government committees, the Independent Vaccine Panel (full title; the independent panel for the assessment of possible interactions between pyridostigmine bromide and vaccines) and the Depleted Uranium Oversight Board, DUOB. I was at the same time invited to serve as a member of the Gulf War Group of the Royal British Legion. More recently I was elected as the President of the National Gulf War Veterans and Families Association, NGVFA in 2002.
I received a bundle of papers of medical records and pensions entitlements and appeals which were muddled and not clearly labelled containing many duplicates.
Clearly missing are medical records were the period around the GW-1, December 1990-Mar 1991, giving details of his vaccinations and use of NAPS tablets although various reports from examining doctors allowed some of these to be constructed. It is a matter of record that most medical records for those deployed in GW-1 have been lost ~72%, Unwin et al 1999.

Preamble
Stuart Dyson served for almost 7 years in the British Army with a wide variety of postings, Northern Ireland, Falklands, Belize and finally in the first Gulf War, GW-1, with times spent in various UK barracks and in Germany. He served with the Royal Pioneer Corp and was a Physical Training Instructor throughout his service. He also boxed during his army service. Despite some medical problems he remained a very fit young man during his service but his health rapidly deteriorated following service in GW-1 leading to his discharge following a medical in August 27th 1992. After a prolonged illness a diagnosis of bowel cancer was followed by chemotherapy and his final demise in June 2008, almost 17 years after the end of GW-1.

Key Aspects of the Medical Records.
The records show two major and important **chronic** medical problems.
i. Gulf War Syndrome, GWS,
ii. Chronic Fatigue Syndrome, CFS,
Both these give rise to extensive and variable morbidity before death. Hence, monitoring the health of sick veterans cannot be informed by merely collecting mortality or hospitalisation figures.
The major issues raised concern
iii. Exposures to toxins in GW-1, particularly organophosphate pesticides and depleted uranium, DU.
iv. Cancer.
v. Any possible links with the high morbidity and terminal cancer which followed his Army discharge.
In this report I will consider these important factors and then draw some conclusions that I trust will help the Coroner in the Inquest.

Gulf War Syndrome.
Both GWS and CFS are contentious conditions and have been the subject of extensive debate at the medical, scientific and political levels with strongly polarised views emerging. The UK Government, MoD, VA, MAP and NHS all take the view that they are essentially psychological/psychiatric conditions with no valid organ pathology that provides any reliable basis for diagnosis and treatment. The best that can be done is to provide techniques for the

management of these conditions by psychological techniques, Cognitive Behavioural Therapy and Graded Exercise Therapy, CBT/GET, and the use of adjuvant neuropsychiatric drugs, principally antidepressants.

This view of GWS was also taken in the United States until 2004 when following a series of scientific and clinical studies, lead by Professor Robert Haley and supported by funds from the philanthropist Ross Perow, there was a complete change of understanding about GWS that accepted it arose from toxic exposures in GW-1. The conclusions of the major research report from the Research Advisory Committee for Gulf War Veterans' Illness, RACGWVI, 2004, showed that Gulf War Illness, GWI, (note the use of the singular term) is a multi-system illness with a characteristic and coherent pattern of symptoms. The UK veterans' use of GWS, but not that of the MoD and allied agencies, equates to GWI. I will use the term GWS/I in this report to indicate this equivalence.
The MoD whilst conceding the use of GWS defined it as an umbrella term to encompass the previously used and imprecise term of signs and symptoms of ill-defined conditions, SSIDCs, thereby refusing to recognise the validity of the RACGWVI, 2004, report. No published peer-reviewed assessment of the 2004 report has appeared in the UK despite continued assertions by the MoD that they had evaluated and monitored all American research. Such claims by the MoD have not been validated by any written evidence in the 18 years since GW-1. An Independent inquiry, Lloyd Report, 2004, endorsed the RACGWVI report, 2004, but the MoD refused to come before the Inquiry to answer questions.
Congress welcomed the 2004 report and mandated extensive funding, ~$750 million, for further studies resulting in a second RACGWVI report in November, 2008.
This second, Congressionally mandated, report web address, http://www1.va.gov/rac-gwvi/docs/GWIandHealthofGWVeterans_RAC-GWVIReport_2008.pdf consolidated the conclusions from the 2004 report. It includes 1800 references to original peer-reviewed published work and is a monumental work of scientific and medical inquiry. The principal conclusions are, GWI is :-

- A chronic multi-system physical medical condition with a coherent pattern of symptoms.
- Associated with physical brain injury leading to neuropsychological impairment which cannot be detected by routine tests.
- NOT a stress related condition

The following features have been demonstrated by extensive investigations including advanced brain imaging and animal and human studies.

1. Abnormalities of brain structure and chemistry.
2. Impaired function of the autonomic including nervous system
3. Cardiovascular and respiratory dysfunction and disease.
4. Neuroendocrine abnormalities resulting in serious physical impairment.
5. Altered control of cerebral blood flow.
6. Alterations in the immune system and function.

7. Genetic variation in enzyme responsible for protection against neurotoxins.

8. Damage to the skeletal system at tissue and cellular level.

It is unequivocally stated that the cause(s) of GWI lie in the multiple exposures to biological and chemical toxins experienced during GW-1. The most important of which were:-

A. Multiple vaccines, some experimental, eg anthrax. (In the case of UK veterans this would also include the experimental and legally dubious use pertussis as an adjuvant.)

B. Pyridostigmine bromide, also experimental, in Nerve Agent Pre-treatment Set (NAPS) tablets aimed at protecting against exposure to the nerve agent soman but not sarin and closely related compounds.

C. Pesticides, especially, but not exclusively, organophosphates, used to keep down disease vectors.

D. Low levels of chemical warfare agents, particularly sarin.

Other exposures including depleted uranium, oil and smoke, and fuels were not excluded from further consideration although the evidence from present studies was not as conclusive as that for A-D above

The 2008 report provides a new level of clarity concerning GWI which contradicts the stance of the UK Government, all its agencies, and advisors. Despite such a comprehensive report and firm conclusions the present Government has not accepted the 2008 report but is still considering it. The sick veterans have called for its endorsement by the UK Government and its Agencies and Advisors and for new research programmes to be initiated in line with those recommended in the 2008 report and for UK clinicians to be advised accordingly. Among the main recommendations for future research is identifying new and effective treatments for the sick veterans.

It is important to recognise that the USA deployed 697,000 troops in GW-1 whilst the UK deployed a much smaller number, 53,000 but the epidemiological studies conclude that regardless of how GWS/I are defined not less that 25% (a range of 28-32% is given in a previous report) of all deployed forces are now ill. A large minority of the deployed forces in GW-1 are now chronically ill. It is not only a matter of GWS/I as some major defined illnesses have also increased.

“Diagnosed neurological diseases ALS affects Gulf War veterans at twice the rate of non-deployed veterans; Gulf War veterans downwind from 1991 Khamisiyah demolitions have died from brain cancer at twice the rate of other veterans in theater.” RACGWVI, 2008, p.232 It is important to recognise that the rarity of these illnesses requires a very large population base and thorough health monitoring systems to obtain reliable statistical evidence. The large number of USA troops deployed provides a large population base that allows thorough monitoring. Despite this now well established information there has been no study of these illnesses among UK veterans nor has a data base been established to monitor the prevalence of these illnesses among UK veterans although there is evidence of a similar incidence of ALS among the sick UK veterans where the numbers reported are much smaller.

Conclusion

The RACGWVI, 2008 provides overwhelming evidence that all sick UK GW-1 veterans should be investigated thoroughly for a wide variety of medical conditions/ disorders/dysfunctions and the health of all veterans rigorously monitored.

The UK's stress-psychiatric approach has been utterly discredited by this latest RACGWVI study whilst earlier research pointing to the same conclusions has been deliberately ignored and even opposed.

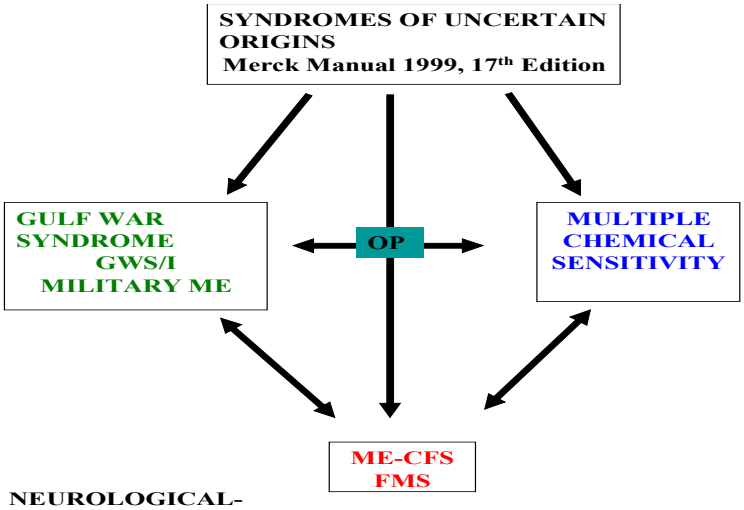
It is clear that although test values from routine clinical tests, eg. blood counts etc, often fall within normal ranges this is misleading and may lead to important investigations being delayed or not even performed. Psychiatric investigations and treatments are inappropriate and may be damaging by delaying prompt medical action rather than offering anodyne therapies for conditions regarded as 'somatisation' conditions, Wessely et al., 1999.

The decision not to support any further research into stress theories in the USA recognises the inadequacy of this approach, although reactive depression and anxiety may well arise from the demands of GWS/I and would be helped by expert treatment for these conditions.

Chronic Fatigue Syndrome/Myalgic Encephalomyelitis, CFS/ME.

CFS is a name adopted relatively recently, 1988, as an alternative to, but not a replacement for, ME which has been listed in the WHO International Classification of Diseases, ICD-G.93.3, since 1969 as a neurological, not a behavioural and mental disorder, ICD-F.48. Despite this persistent and unambiguous identification of the illness and its nominal acceptance by the UK Government Ministers of Health, Lord Warner, 2004 and Lord Darzi, 2008, official information provided to GPs and benefits agencies has presented ME as a behavioural and mental disorder for which the only recommended treatments are psychiatric/psychological. The National Institute for Clinical Excellence, NICE, Guideline adopts this approach and has been hotly contested by ME groups and their supporters leading to a Judicial Review which will take place in 2009.

Myalgic encephalomyelitis means muscle pain with inflammation of the brain and spinal cord (the central nervous system). It is a complex chronic multi-system disorder and is often considered with other such disorders. There is considerable overlap of symptoms, see Figure, Hooper 2007. A significant feature of these illnesses is the failure of routine tests to identify any major underlying pathology. Non-routine, specialised tests are therefore required.



Key: GWS =Gulf War Syndrome/Illness; ME = myalgic encephpalomyelitis: FMS= Fibromyalgia Syndrome; OP= Organophosphate poisoning.

The psychiatric- somatisation- all in the mind paradigm is now discredited, Hooper, 2007, leaving a considerable challenge to modern medicine of a series of complex chronic multi-system conditions with many common symptoms that cannot be identified using routine test procedures.
The most widely used definition of CFS is that proposed by Fukuda and the Centres for Disease Control, CDC, in the States, 1994, for research purposes. Many other definitions have been proposed, the most notorious being the psychiatric Oxford definition.
The Fukuda definition is specifically referred to in Mr Dyson's notes when a diagnosis of CFS was made, June 6th 2000. However, a careful research study, Kennedy et al 2004 , have shown that sick GW-1 veterans, organophosphate poisoned farmers, and ME patients all fit the Fukuda criteria which do not discriminate between these groups. In the light of the collapse of the somatisation-psychiatric-stress theory of these illnesses more sharply focused and clinically useful definitions have appeared, most notably the Canadian clinical criteria. This consensus document compiled by a group of experienced clinicians from Canada, the USA, and Europe provides a comprehensive range of clinical signs that allow physicians to make a precise diagnosis of the illness. Its use is being increasingly demanded by patients and has been adopted in some parts of the UK.
The most common cause of ME is a viral infection, although other organisms and toxins, Vodjani, 1999, can evoke the same condition that involves a persistent and unresolved low level inflammatory condition. Prominent among these viruses is Epstein Barr Virus, EBV, Khausik et al 2005, Kerr et al 2008, which is the causative agent of glandular fever. Mr Dyson was first diagnosed with glandular fever in January 1992, whilst he was still in the Army. The infection reappeared in 1995 in his records as 1st December 1995 when laboratory tests confirmed a chronic infection. Herpes family viruses which include EBV, herpes zoster responsible for chickenpox and shingles usually remain in the body and are suppressed by the immune system. However, when the body is stressed, emotionally, physiologically, or mentally these viruses may reactivate and the disease recur. This pattern is clearly evident in Mr Dyson's medical records. It is also well known that vaccinations may lead to ME in susceptible individuals. In Appendix 12a of the RACGWVI, 2008, report a chronic multi-system illness suffered by sick veterans is identified as a result of multiple vaccines and anthrax vaccine being administered to military personnel deployed to the Gulf. The effects were greatest when vaccines were given in the theatre of war ie, under stressful conditions. Mr Dyson received multiple vaccines including anthrax before and during deployment. This could precipitate his chronic multiple system illness and reactivate his glandular fever and shingles.

Conclusion
It is clear that following Mr Dyson's military service in the Gulf he contracted glandular fever, an infection now known to be a causative agent in some people suffering from ME-CFS, Kerr et al., 2005. This is an organic multi-system illness that resembles GWS. Many of the toxins to which he was exposed are known to reactivate ME-CFS by depressing the immune system leading to a prolonged and persistent low grade inflammatory response that is

characteristic of ME. This is consistent with the glandular fever, diagnosis of CFS, shingles (reactivation of a childhood herpes virus, chickenpox), and the repeated persistent colds/flu/ and general malaise and weakness he suffered after leaving the army. These are the hallmarks of ME-CFS - a neuroendocrineimmune condition that is described in detail by Richardson, 2001, and Hyde et al., 1992.

Toxic Exposures in GW-1

The commonest toxins present in GW-1 were
Pesticides – particularly organophosphates, pyrethroids and lindane (an organochlorine compound).
DEET, NN-diethyl-m-toluamide an insect repellent
Sarin a nerve agent stockpiled for artillery and Scud usage.
Pyridostigmine bromide in NAPS tablets
Vaccines particularly anthrax with pertussis and plague
Oil and smoke from burning oil wells
Depleted uranium munitions
Hooper, 2000.

The Institute of Medicine USA (Gulf War and Health: Volume 1. Depleted Uranium, Pyridostigmine Bromide, Sarin, and Vaccines (2000) Institute of Medicine (IOM) reports some 33 different exposures which include

The following organophosphorus pesticides:

- Chlorpyrifos*
- Diazinon*
- Dichlorvos*
- Malathion*

The following carbamate pesticides:

- Proxpur*
- Carbaryl*
- Methomyl

Pyridostigmine bromide (used for nerve-agent prophylaxis – soman only)

The following chlorinated hydrocarbons and other pesticides and repellents:

- Lindane* –an organochlorine
- Pyrethroids -
- Permethrins* -
- Rodenticides – phosphorus containing compounds(bait)
- DEET – an insect repellent

The following nerve agents and precursor compounds at exposures below those which produce immediately apparent incapacitating symptoms:

- Sarin
- Tabun

○

The following synthetic chemical compounds:

- Mustard agents* at exposures below those which cause immediate blistering
- Volatile organic compounds

- Hydrazine* – a rocket propellant used in Scuds
- Red fuming nitric acid –used as a rocket
- Solvents
- Paints- specialized ones (CARC) for applying camouflage on vehicles.

○ The following sources of radiation:

- Depleted uranium*
- Microwave radiation
- Radiofrequency radiation

○ The following environmental particles and pollutants:

Hydrogen sulfide
Oil-fire byproducts
Diesel-heater fumes
Sand microparticles

Diseases endemic to the region, including the following:

- Leishmaniasis
- Sand fly fever
- Infections due to pathogenic *Escherichia coli*
- Shigellosis dysentery

○ Time-compressed administration of multiple live "attenuated" and toxoid vaccines.

*known carcinogens –my assignments from Lee et al., 2007; Solomon et al., 2000.

Lead is not specifically mentioned but all petrol used was leaded. Some personnel would be exposed to specialized fuels and oils used in aircraft that themselves contain "suspect" chemicals eg. JP-8
Still other sources of potentially dangerous chemicals were widely used including diet coke which contains aspartame that is known to degrade at the high temperatures of the desert into toxic compounds. Malathion is also rendered more toxic due to a photochemical conversion that occurs in strong sunlight.
The testing of the compounds listed is usually carried out on individual compounds and not on mixtures. Where mixtures of chemical diverse compounds have been tested powerful and adverse synergistic effects have been reported. For example mixtures of pyridostigmine bromide with chlorpyrifos and permethrin with DEET are much more neurotoxic than the sum of the individual activity of these compounds, Abou-Donia et al, 1996 and to date.
Many of the toxins listed above are formulated with a variety of other compounds, usually described as "inerts," in complex mixtures. In some cases the so-called "inerts" are themselves toxic or exert synergistic effects with the active component.
Taken together the description of GW-1 as the "most toxic war in Western military history" is fully justified.

It is difficult to know exactly which and what dose of these many toxins Mr Dyson was exposed to but many of them are known to be toxic to the central nervous system, immune system and other major systems of the body. A number are known carcinogens and some organophosphates have been associated with significantly increased risk of colon cancer, Lee et al., 2007.

Depleted Uranium, DU

Depleted uraniuim is the waste material remaining after most of the important commercial and military isotope Uranium-235 has been removed from the ore. It has 60% of the alpha radioactivity of natural uranium but also emits beta radiation which means that the total radioactivity of DU is ~88% of the natural uranium found in very small concentrations in many soils. Alpha radiation is the most damaging when the material is internalized but beta radiation is more penetrating when the material is outside the body. Its development and use as a military weapon in tank and aircraft munitions is well known and very contentious.

In GW-1 the troops in the theatre of war were not informed of its use and were without any advice about protective measures, described in Army Military manuals since 1974, that should be taken in areas where it was used.

The following accounts of USA from military and civilian personnel involved with DU munitions have been posted on the web. https://www.cancercompass.com/message-board/message/single,5387,1.htm

Depleted Uranium Causes Cancer

Date: 05/20/2006

I will provide my qualifications before entering into this discussion, MSME, product design engineer for a military ordnance contractor manufacturing cluster bombs and depleted uranium bullets for the military.

The House of Representatives has passed the military appropriations bill with a rider to include further testing and evaluation concerning health and safety issues regarding the military use of depleted uranium, enriched U238 as a military weapon. This was from very lengthy discussions with DOD personnel and our local congressman.

The Department of Defense states the maximum lifetime exposure to DU or depleted uranium is 475 hours over a lifetime of 30 years before it would be of concern. This is predicated upon a maximum of 15 minutes per 8 hour day in low radiation environmental conditions.

I am one of four people that are personally known to me that sustained cancer in direct relationship to the models used to display and serve as a point of conversation with the military customer. The four of us had DU models in our offices for this purpose. Our exposures were in excess of 6,000 hours. I am the only remaining survivor but am dying and that brings forward this discussion.

It is known to me that if the models were placed high as on the top of a credenza or bookcase, two engineers contracted brain cancer and are now deceased, two years post surgery. My display was located in the center shelf of the bookcase and contracted renal cell carcinoma corrected with a radical nephrectomy in 2005. If the models were on the bottom shelf of the bookcase then there is a reported case of pelvic cancer and three surgeries were not able to save the life of the facilities manager.

The United Nations says it is ok to use depleted uranium enriched 235 or 238 as it is not considered a health risk. Bull!

If this is the criteria then why did pilots returning from Desert Storm have a very high incidence rate of colon-rectal cancer and child birth defects?

Why did a number of troops (company level) all contract an upper respiratory cancer after the A-10 aircraft destroyed enemy armor. DU penetrator bullets upon impact with armor plate or RHA become an aerosol that was inhaled by our troops. A-10 pilots sit above the gatling gun and ammunition feed belts containing depleted uranium.

The point being made is depleted uranium occurs naturally in our environment in such things as fertilizer etc. However, depleted enriched uranium by DOD admission does cause cancer in the dose level above 475 hours per the DOD health and safety inspector general's offices.

For these reasons wish to see that the US government ceases the use of depleted uranium and safely disposes of such materials preventing further injury and cancer in our ordnance industry and also more importantly to our troops. After exposure it takes 15 years for the cancer to develop as my medical records defined to the government. The same situation applied to the other three engineers to which I stated have deceased two years post surgery. My current health status is the RCC was contained however other organs now are in decline and if I follow the path of other engineers also diagnosed with cancer, have less than a year remaining. Liver and remaining kidney are under suspicion due to recent enhanced CT scans, blood panels elevated.
Please share this with those you know that are in the military to seek treatment and observation over their remaining lives.
If this message saves a life, then this disclosure was worth the effort. Please write your senators to pass the House Bill concerning Military Appropriations.

Response to above message by Patient Hokieg33
I served as a Fire Controlman (FC) onboard the USS Pensacola LSD 38 from 1992 to 1996. In 1995 our ship while returning from the Mediterranean was given orders to shoot all our Depleted Uranium rounds into the Sea. Given the cost of the DU this always shocked and concerned me. We shot/destroyed all 6,000 rounds of munitions onboard. The Navy was already in the process of proactively changing to Tungsten rounds and the reason I was given informally for the wholesale destruction was because of the controversy caused by "Gulf War Disease". The post from the munitions designer struck me as being especially poignant for many reason. The exposure level discussed above is troublesome because not only was our workshop directly under our weapon system (CIWS MK 15), but adjacent to the magazine and separated by a non-armored wall. In August 29th 2008, I had a seizure that presented in my sleep. I was transported to the hospital where I went into respiratory failure. I was put into a medically induced coma. I woke up three days later and was given a diagnoses of a brain tumor (Oligodenrogiloma). I had surgery at the Mayo clinic in Jacksonville, FLA on September 4th . My tumor was biopsied and confirmed as Oligodendrogiloma, because of its location the majority of it was not able to be removed. Cancer does not run in my family. Until that August night I was in perfect health, actively playing Softball and Golf and had just turned 41. I know when someone is diagnosed with Cancer the first question is always why and the how, but I am now asking myself could the DU be the reason behind my condition.
Numerous similar testimonies are available in books, see Weapon of Dishonour, and testimonies by GW-1 veterans, especially Major Doug Rokke who is the only survivor of his medical physics team that operated in the GW-1, http://www.johnpilger.com/page.asp?partid=116 This is just 1 of 30,090 articles about Rokke on the web. See also http://www.beyondtreason.com/ Counter responses also appear couched in strong even vitriolic terms. Testimony from many others are disputed by military and government officials and others see http://www.ntanet.net/traprock.html The military testing of DU munitions in New Mexico lead to the protests of a resident of Sirocco close to the family home of Damacio Lopez where unusual birth defects began to appear and an international organization devoted to the eliminations of DU weapons created, See http://myweb.tiscali.co.uk/jgrimbleby/iraq/du.pdf with 798 references. The International Depleted Uranium Study Team, IDUST, see http://www.idust.net/Docs/IQSRWrks/IQSRWTOC.htm for a compilation of documents from international sources.
Many others international and scientific organisations have been created, following the reports of its first use of DU by western forces in GW-1. See Metal of Dishonour, International Action Center NY, 1999 See http://www.iacenter.org/ Major conferences have

been organized involving politicians, clinicians, scientists, and activists, and the public, see http://www.uraniumweaponsconference.de/speakers.htm and resolutions to ban these weapons presented at both the United nations and the European Parliament, http://www.bandepleteduranium.org/en/a/144.html/http://www.bandepleteduranium.org/en/a/215.html and http://www.europarl.europa.eu/sides/getDoc.do?type=MOTION&reference=B6-2008-0230&language=EN. The UK Government has always voted against UN and European resolutions that seek to ban DU munitions.

DU shells when impacting on a hard target are both heavy and pyrophoric giving rise to aerosols of very fine particles of insoluble uranium oxide, many of 2.5 microns or less. Particles of this size are readily transported over large distances, 30 miles has been recorded but much larger distances are probable since the particles are easily re-suspended by moderate breezes. These particles are particularly dangerous when inhaled when they enter the lungs and are slowly removed by scavenging cells that carry them round the body. The lungs, bone and brain are known repositories in the body. When ingested they travel through the alimentary tract. Very tiny particles can be trapped in gut and in the cells lining the gut.

The science of DU exposures has developed slowly following the concerns of troops returning from areas of conflict where these weapons have been used. A good account of the issues is in the DUOB final report which includes a minority report of which I was one of the signatories. Another signatory was Dr Chris Busby who has written two very important books on the effects of low level radiation, Wolves of Water, 2006, and Wings of Death, 1995, and is the principle scientist with the low level radiation campaign, www.llrc.org . Both books provide an excellent and accurate history of the effects of low level radiation and the scientific, medical and political issues. Dr Busby has recently identified a new physical phenomenon, the generation of ionizing photoelectrons from all types of incident radiation by heavy metals, including (depleted) uranium. Three mechanisms for the action of DU need to be considered- its radioactivity, is toxic chemical properties and its capacity to generate ionising photoelectrons. These provide an explanation for the very extensive and puzzling properties of DU which, although described as a weak emitter of alpha and beta particles and a toxic metal, causes many devastating and chronic effects? Uranium ions bind strongly to DNA molecules and ensure that these effects cause the maximum damage to the body's genetic mechanisms. The distinction between internalized DU, inhaled or ingested and radiation from purely external sources requires new models to replace those currently used, based on external radiation dose calculations, to determine the internal dose, Busby, 2006.

Cancer of the rectum has been specifically associated with DU in GW-1 soldiers.

"Soldiers who served in Bradley fighting vehicles, where it was common to sit on ammunition boxes where depleted uranium ammunition was stored, are now reporting that many have rectal cancer."

Increased levels of strange cancers and birth defects have been reported in civilian populations in regions where DU has been used.

"For the first time, medical doctors in Yugoslavia and Iraq have reported multiple *in situ* unrelated cancers developing in patients, and even in families who are living in highly contaminated areas. Even stranger, they report that cancer was unknown in previous generations. Very rare and unusual cancers and birth defects have also been reported to be increasing above normal levels prior to 1991, not only in war torn countries, but in neighbouring countries from transboundary contamination." Moret, 2004.

A recent review concluded,

"The use of depleted uranium in armor-penetrating munitions remains a source of controversy because of the numerous unanswered questions about its long-term health effects. Although

no conclusive epidemiologic data have correlated DU exposure to specific health effects, studies using cultured cells and laboratory rodents continue to suggest the possibility of leukemogenic, genetic, reproductive, and neurological effects from chronic exposure. Until issues of concern are resolved with further research, the use of depleted uranium by the military will continue to be controversial." Millar and McClain, 2007.

This accurately reflects the present confused situation but in an environment where the levels of DU are ever changing the clearest answers about the health consequences of DU will come from areas where civilian populations have continued to live. Very disturbing reports large increases in the numbers of birth defects and childhood cancers have been reported in Iraq, the Balkans and Afghanistan other areas of conflict where these weapons were used.
Although cancer is the major health concern many other health problems are associated with exposure to radiation, ECRR, 2003.

A disturbing presentation to the European Parliament makes clear that the science and medicine of DU has been subverted by the major organizations created to protect the public, "politics has poisoned the well from which democracy must drink," Baverstock, 2001, 2005.

Cancer.
"Unequivocal proof now exists that environmental factors are the predominant cause of cancer". The recent pre-occupation with genetics and cancer does not alter the truth of this statement, Busby 2006. A large number of specific associations between environmental factors and cancer have been reported, Busby, 2006, some of these relevant to Mr Dyson's military and medical history are:-
Heavy metals- including lead and uranium
Ionising radiation – including radioactivity from DU.
Pesticides - organophosphates, permethrin, lindane and the insect repellent DEET.
Solvents, fuels, and oils – mixtures with a wide variety of chemical components

Cancer involves a multi-stage process in which a number of sequential steps lead to progressive genetic mutations and the development of cancer; for cancer of the colon six steps may be involved, Busby, 1995. The process is usually prolonged and takes up to 15-20 years although some cancers can appear much earlier eg. leukaemias peak at ~5 years after a critical exposure.
Mutations are caused by a variety of chemical and physical agents and some viruses and also by random errors in the transcription process, Busby 2006. Free radicals are potent mutagens and are responsible for the oxidative stress associated with ME-CFS, Kennedy al., 2005, and pesticides, Abu Qare ete al., 2001
The present research into the incidence of cancer among GW-1 veterans is unsatisfactory and in their latest RACGWVI, 2008, report a call for continuing studies is made.

"*Research Areas of Importance, p.314 includes.*
Continue current research evaluating cancer rates in Gulf War era veterans, and assess cancer rates among subsets of veterans identified as being exposed to chemical nerve agents, depleted uranium, and smoke from the Kuwaiti oil well fires."

Cancer of the Colon

The main risk factors listed at the Canadian web site, http://www.colorectal-cancer.ca/en/just-the-facts/risk-factors/Risk Factors , can be found at many other sites.

- Being 50 years of age or older*.
- Having a previous history of colorectal polyps*.
- Having an inflammatory bowel disease such as Ulcerative Colitis or Crohn's disease*.
- Having a poor diet, notably one high in red meat consumption and low in fibre, fruits and vegetables.
- Having a family history of colorectal cancer*. (see more on hereditary syndromes associated to colorectal and other cancers)
- Having a personal history of ovarian, endometrial or breast cancer*.
- Little or no exercise*

*factors not applying to Mr Dyson.

Mr Dyson's cancer developed rapidly at the age of 38 and although blood in the stools was observed during earlier rectal examinations with treatment suggesting a diagnosis of irritable bowel disease, IBS. IBS is another illness that some physicians suggest is a result of somatisation, Wessely et al., 1999. Once again Mr Dyson has fallen victim to the stress-psychological theory of GWS espoused by the MoD.
His medical history contained no reference to colorectal polyps or any family history of cancer. Comments on his diet were oblique with prescriptions of high fibre gel indicating a possible concern about diet and IBS.
The incidence of cancer in UK veterans shows small variations with the increase in the 35-39 age group almost reaching statistical significance, McFarlane et al,. 2003 The need to monitor the health of veterans is obvious since only now would any increase in cancers with a long latency begin to be apparent.
Whilst there is at present no recorded increase in excess deaths among UK GW-1 veterans compared with era personnel two factors that almost reached statistical significance emerged. Claimed exposure to depleted uranium and handling of pesticides, McFarlane et al., 2005. Both are potent carcinogens.

Possible Links with the Terminal Cancer and the preceding poor health that resulted in Stuart Dyson's death.

Poor Health –it is clear from the medical records that during his military service Mr Dyson was subject to a bout of glandular fever which is was diagnosed as chronic, in 1992, leading to a persistent multi-system illness. From time to time he had infections affecting his eyes and there were frequent audiometry tests for hearing defects.
His health rapidly deteriorated following military discharge with a growing number of troublesome symptoms culminating in a diagnosis CFS-ME using the Fukuda criteria. This is consistent with his major symptoms that included frequent infections, reactivated herpes infections, and persistent colds and flu-like symptoms with profound malaise. This is consistent with suppression of his immune system, as a result of exposure to organophosphates and other and pesticides, vaccines and depleted uranium, and the diagnosis of CFS.

Cancer and Colon Cancer.
Both OPs and DU are associated with increases of cancers in populations in areas where OPs (agriculture) and DU (area of conflict) have been used. DU is known to induce genetic

instability and an excess of chromosomal aberrations have been found in sick UK veterans, Schroder et al., 2003. The DUOB refused to authorise further testing for other GW-1 veterans.

Excess of colon and colorectal cancers have been found in people exposed to OPs and whilst the epidemiological evidence is as yet inconclusive there are reports of concerns about exposure to DU that almost reach significance and there is widespread recognition that the need for continuing surveillance of GW-1 veterans for cancer and other chronic conditions.

Colorectal cancers have been reported in GW-1 veterans working with DU munitions and in agricultural workers exposed to some OPs.

Mr Dyson's cancer emerged at a much earlier age, 38 years, than the 50 years regarded as a main risk factor for colon cancer. There is no family history of cancer and he was a very fit young man.

True Testimony?

It is extremely distressing to uncover so much deception, avoidance of the facts and downright perversity in Government and scientific and international organisations that are being used to support the use and development of DU munitions coupled with tactics that will protect the arms and nuclear industries holding power for large nations over smaller ones, Baverstock, 2005; Busby 2006, 1995. The UK Government received a report from Atomic Energy Technology, the commercial arm of the Atomic Energy Authority, AET 1991, calculated there would be some 500,000 extra cancers in Southern Iraq as a result of the release of the estimated release of 50 tonnes DU aerosols from the use of 350 tonnes of DU munitions. The report only came to light in 1996, Cohen, 1996, following questions in the House of Lords. The Americans at the same time claimed that DU posed no radiological risk in a RAND report, see Hooper 1999.

A similar attitude was adopted in regard to the use of organophosphate pesticides in which the same confusion/duplicity is evident. The Minister Nicholas Soames initially denied any use of these compounds only to have to apologise to the House for misleading it followed by a report that does less than credit to Parliament, OPIT, 1996. It is the disregard for truth that is both unacceptable and shameful. The same attitude is seen in other areas of science and medicine, eg. ME-CFS, the Gibson Enquiry, 2006.

In contrast the account of Mrs Dyson truthfully reflects the confusion and bewilderment experienced by sick veterans and their families faced with a complex multi-system organic illness in which the sufferer's health progressively deteriorates before their eyes; an observation amply borne out in the medical records. The parsimony of the pension entitlements is described with an initial award of 1.4% rising eventually to 40%. The obdurate ideological commitment of the MoD, VA, and DWP to the psychological theory of GWS and CFS delayed any thorough clinical investigations until after ever increasing declines in health the final diagnosis of bowel cancer was made. The RACGWVI, 2008, lists organophosphates and NAPS tablets as major factors in GWI. The contact with the NGVFA provided help and practical support in claiming a pension for Mr Dyson's increasing debility. A similar story was told at the inquest into the death of Major Ian Hill, Warrington, November 24th 2003, where medical evidence, Dr Holt, described his condition as global illness syndrome – all systems progressively failed to function. In a striking comparison an earlier inquest on the death of a pig farmer was ascribed to multiple system atrophy, Mrs Kathleen Sullivan, Honiton, 7th November 2003, recorded an open verdict after evidence of her prolonged exposure to organophosphate pesticides.

Conclusion

Considering all the evidence I am persuaded that it is beyond reasonable doubt that Mr Dyson's military service in GW-1 was the prime factor in his subsequent ill health, high morbidity, and terminal cancer of the colon. This is consistent with exposure to the complex mixture of biological and chemical toxins used in preparation for deployment and during the time he was in the theatre of battle.

References

Abou-Donia, M.B., Wilmarth, K.R., Jensen, K.F., Oehme, F.W., Kurt, T.L. Neurotoxicity Resulting from coexposure to pyridostigmine Bromide, DEET, and Permethrin: Implications of Gulf War Chemical Exposures. *J. Toxicol. environ.Health* 1996, **48**, 35-56.

Abu-Qare AW, Abou-Donia MB. Combined exposure to sarin and pyridostigmine bromide increased levels of rat urinary 3-nitrotyrosine and 8-hydroxy-2'-deoxyguanosine, biomarkers of oxidative stress. *Toxicol Lett.* 2001;123(1):51-8.

AET 1991, Kuwait – Depleted Uranium Contamination- AEA Technology report released from the House of Commons library, Dep/3 6038 in an answer by Lord Gilbert to the Countess of Mar dated February 1998. The letter seeks reduce the information in the report by claiming that unjustified assumptions were made in the estimated cancer increases.

Baverstock K. Mothersgill C, Thorne M. Radiological Toxicity DU.WHO Report November 5th 2001. This report was originally suppressed.

Baverstock K. Presentation to the European Parliament 23rd June 2005. Download http://www.traprockpeace.org

Busby C, Wolves of Water: A study constructed from Atomic Radiation, Morality, Epidemiology, Science, Bias, Philosophy and Death. Green Audit Books, 2006.

Busby C. Wings of Death: Nuclear Pollution and Human Health. Green Audit Books, 1995

Busby C. Depleted uranium weapons, metal particles and radiation dose. Considerations of radiation exposure in tissue containing small dense particles of chemical elements of high atomic number as a consequence of secondary radiation fields resulting from scattering and photoelectron excitation. *Eur. J. Biol. Bioelectromagn*. 2005;1:82-93.

Busby C. Does uranium contamination amplify natural background radiation dose to the DNA? *Eur. J. Biol. Bioelectromagn.* 2005;1: 120-131.

Busby C, Hooper, M.. Final Report of the UK Ministry of Defence Depleted Uranium Oversight Board (www.duob.org), 2007. 51-74.

Cohen N, *"Radioactive waste left in Gulf by Allies"*, Independent on Sunday, London, 10 November 1991. See also Le Monde diplomatique, April 1995.

ECRR, Recommendations of the European Committee on Radiation Risk:Health Effects of Ionising Radiation Exposure at Low Doses for Radiation Protection Purposes. Regulators' Edition. Brussels, 2003. Green Audit Books.

Gibson I. UK Parliamentary Group on Scientific Research into Myalgic Encephalomyelitis (ME). Download www.erythos.com/gibsonenquiry/

Hooper M. The most Toxic War in Western Military History. Select Defence Committee, 7th Report, Gulf Veterans' Illness, Report and Proceedings of the Committee with Minutes of Evidence and Appendices, 19th April 2000, HMSO.

Hooper M. Myalgic encephalomyelitis: a review with emphasis on key findings in biomedical research *J Clin Pathol* 2007;60:466–471.

Hooper M. UN Peace Celebrations Lecture October 23rd, 1999 Helsinki. DEPLETED URANIUM MUNITIONS: New Weapons of indiscriminate and Mutually Assured Destruction

Hotopf M, David A, Hull L, et al. Role of vaccinations as risk factors for ill health in veterans of the Gulf war: cross sectional study *BMJ* 2000;320:1363-1367. See also Rapid Response to this article, especially McNally K, Wongso AH, Further Study needed and the Addendum that retracts the main thesis of the paper. Download http://www.bmj.com/cgi/eletters/320/7246/1363#8832

Hyde B, Goldstein J, Levine P. The Clinical and Scientific Basis of Myalgic Encephalomyelitis/Chronic Fatigue Syndrome, Nightingale Research Foundation, Ottawa, 1992. See also http://www.nightingale.ca/

Institute of Medicine. 2000. Gulf War and Health Vol 1 Depleted Uranium, Pyridostigmine Bromide, Sarin, Vaccines. The National Academies Press, 2000 http://www.nap.edu/catalog.php?record_id=12183

N Kaushik, D Fear, S C M Richards, et al. Gene expression in peripheral blood mononuclear cells from patients with chronic fatigue syndrome. *J. Clin. Pathol.* 2005;58;826-832

Kennedy G, Abbot NC, Spence V, et al. The specificity of the CDC-1994 criteria for chronic fatigue syndrome: comparison of health status in three groups of patients who fulfill the criteria. *Ann Epidemiol* 2004;14:95–100.

Kennedy G, Spence VA, McLaren M, et al. Oxidative stress levels are raised in chronic fatigue syndrome and are associated with clinical symptoms. Free Radic Biol Med 2005;39:584–9.

Kerr JR, Petty R, Burke B, et al. Gene Expression Subtypes in Patients with Chronic Fatigue Syndrome/Myalgic Encephalomyelitis. *J Infectious Dis* 2008; 197:1171– 84.

Lee W, Sandler DP, Blair A et al. Pesticide use and colorectal cancer risk in the Agricultural Health Study. *Int J Cancer*2007;1221:339-346.

Lloyd Report, 2004. Download Lloyd Report on Gulf War Illnesses. www.lloyd-gwii.com/report.asp

Macfarlane GJ, Biggs A-M, Maconochie N et al. Incidence of cancer among UK Gulf war veterans: cohort study *BMJ* 2003;327:1373.

McFarlane GJ, Hotopf M, Maconacnhie N et al Long-term mortality amongst Gulf War Veteraans: in there a relationship with experiences during deployment and subsequent morbidity. *Int J Epidemiol* 2005;14:1403-1408.

Metal of Dishonour, revised edition1999: How the Pentagon radiates Soldiers and civilians with DU Weapons. International Action Center NY.

Miller AC, McClain D. A review of depleted uranium biological effects: In vitro and in vivo studies. *Reviews Environmental Health* 2007; 22:75-89.

Moret L. The Trojan Horse of Nuclear War: Depleted Uranium. *J International Issues* 1st July 2004. Download http://www.mindfully.org/Nucs/2004/DU-Trojan-Horse1jul04.htm

OPPIT. Organophosphate Pesticide Investigation Team Substantive Report 6th December 1996, Ministry of Defence, a report in six parts

RACGWVI, 2004 and 2008. Research Advisory Committee Gulf War Veterans' Illness. Download http://www1.va.gov/rac-gwvi/page.cfm?pg=13

Richardson J. Enteroviral and Toxin Mediated Myalgic Encephalomyelitis/Chronic Fatigue Syndrome and other Organ Pathologies. Haworth Medical Press, Binghampton NY, 2001.

Schroder H, Heimers A Frentzel – Beyme R, Schott A and Hoffmann W. Chromosome Aberration Analysis in Peripheral Lymphocytes of Gulf War and Balkans War Veterans. *Radiation Protection Dosimetry* 2003;103:211–19.

Solomon G, et al Pesticides and Human Health: a Resource for Health Care Professionals. Physicians for Social Responsibility and Californians for Pesticide Reform, 2000, p.21-30.
Unwin, C., Blatchley, N., Coker, W., Ferry, S., Hotopf M, Hull L, Ismail K, Palmer I, David A, Wessley S. Health of UK servicemen who served in the Persian Gulf War. *Lancet,* 1999, **353**, 169-178.
Vojdani A, Lapp CW. Interferon-induced proteins are elevated in blood samples of patients with chemically/virally induced chronic fatigue syndrome. *Immunopharmacol Immunotoxicol* 1999;21:175–202.
Wessely S, Nimnuan C, Sharpe M. Functional somatic syndromes: one or many? *Lancet* 1999;354:936–9.

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19th January 2009