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Depleted Uranium and the Medical Mismanagement of Gulf War Veterans

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The United States insists that weapons containing depleted uranium (DU) pose no health hazards to exposed populations. This charade persists because an artful propaganda matrix has infiltrated and corrupted certain aspects of the radiation and biological sciences. The facts which follow will introduce how our debilitated veterans are being misinformed of the possible role played by uranium in their illnesses.

1. Within the medical system of the Veterans Administration (VA), veterans are misled into believing that no medical test exists that can determine DU contamination. This stance was echoed in a 2006 study by the Institute of Medicine, lauded as "... the authoritative word on Gulf War Illness."¹ In the preface of the IOM's definitive study, this quote appears: "Although there is a blood test that can provide an indication of exposure to Agent Orange and dioxin that occurred many years ago, there is not (sic) biological measure that can be employed today to assess exposures during the Gulf War."²

This statement is a lie. A protocol does exist which can determine DU contamination years after the exposure event. The methodology was published in 2002 by Durakovic, Horan and Dietz.³ Essentially, it involves collecting a 24-hour urine sample and analyzing the uranium content by means of multicollector inductively coupled plasma ionization mass spectrometry. By this means, the relative concentration of the different uranium isotopes can be measured. This information can then be used to determine whether or not the test subject was contaminated with DU. This test has been reproduced by a number of research groups around the world and has been confirmed as the state-of-the-art means of accurately determining DU exposure. The VA ignores this scientific breakthrough and does not offer it to veterans attempting to come to terms with the cause of their illnesses.

2. The US government ardently wishes to convince the public that the only battlefield hazard posed by DU munitions is shrapnel injuries. Again, the Institute of Medicine study succinctly states this position: "... it is now understood that retention of DU-containing embedded shrapnel is the major source of increased DU exposure in military personnel."

This, too, is a lie. Its purpose is to draw attention away from the inhalation pathway. In the study by Durakovic et al., mentioned above, 27 veterans were studied. All presented complex, nonspecific symptoms of Gulf War Illness. None of them had suffered shrapnel injury. Among this cohort, 14 were found to have been contaminated with DU. It is important to note that this test was conducted nine years after the Gulf War, demonstrating the long residency time of inhaled uranium and the ability to identify such contamination years after the exposure event.

3. According to conventional wisdom, there are two vectors to uranium's toxicity: It is radioactive and it is a heavy metal capable of producing adverse chemical effects. These two phenomenon are usually treated separately despite the fact



1 Sartin J.S. "Gulf War Syndrome: The Final Chapter?" *Mayo Clinic Proceedings*, 2006, 81(11):1425-1426.

2 Institute of Medicine. Committee on Gulf War and Health. "A Review of the Medical Literature Relative to the Gulf War Veterans' Health." "Gulf War and Health. Volume 4: Health Effects of Serving in the Gulf War." Washington, DC, National Academies Press, 2006.

3 Durakovic A., Horan P., Dietz L. "The Quantitative Analysis of Depleted Uranium Isotopes in British, Canadian, and U.S. Gulf War Veterans," *Military Medicine*, 2002, 167(8):620-627.

that abundant research has proven that the two work synergistically, each enhancing the deleterious effects of the other. Uranium's radioactivity is rejected out of hand as hazardous because the "dose" of radiation likely to be absorbed on the contaminated battlefield is too low to produce cancer.

Cancer? Why does cancer enter the discussion of the unexplained illness of Gulf War veterans? Unbeknownst to most people, the current science of radiation safety confines itself to cancer causation. This is a sophisticated ruse that has held sway over radiation protection for half a century. There exists a large body of research on noncancerous effects of radiation that is ignored by the international radiation protection community and the VA. (A complete explanation can be found in ⁴ in the bibliography.)

As for uranium's chemical toxicity, typical acute exposure events prior to the first Gulf War, such as with uranium miners, led to the determination that the kidney was the organ most susceptible to damage. However, battlefield exposure has no corollary to any other type of uranium exposure and, as a consequence, may produce unique physiological effects. In no other circumstances do humans inhale aerosolized micro- and nano-sized particles of highly insoluble, ceramic, uranium-bearing material. Innovative research is urgently needed to confirm if other types of injury may be initiated in the contaminated individual that bypasses observable damage to the kidney. (See discussion below).

4. The first Gulf War ignited a renewed interest in the toxicology of uranium. Numerous laboratory studies have documented that uranium is genotoxic (capable of damaging DNA), cytotoxic (poisonous to cells), mutagenic (capable of inducing mutations), teratogenic (capable of interfering with normal embryonic development) and neurotoxic (capable of harming nerve tissue). This research has yet to dislodge the stale mantra that uranium is only capable of causing cancer or kidney damage. (For an extensive review of recent research on the toxicology of uranium, see ⁴.)

5. Here's an example of blatant medical fraud. A veteran suffering from the undiagnosed illness commonly referred to as Gulf War Syndrome goes to his doctor concerned that uranium exposure may have been a factor in his deteriorating condition. In response, the physician orders a test to measure the total concentration of uranium in a 24-hour urine sample. (This is an entirely different test from the one described earlier.) When the test results return from the lab, the GI is informed that the amount of uranium in his urine is within the normal range. Uranium contamination is not a problem. What he is not told is that this was a foregone conclusion. Why? Because he was given the wrong diagnostic test!

In accidents where people absorb into their bodies an abnormal amount of uranium, the soluble portion relatively rapidly enters the blood, is transported to the kidneys and is then excreted. During this period, measured in days to weeks, the uranium concentration in the urine will be elevated while the body efficiently goes about ridding itself of excess uranium. Measurement of total uranium in urine during this time will demonstrate abnormally high levels, which can be used to determine if kidney damage is a possible concern. Similarly, a veteran injured by shrapnel will show an elevated concentration of uranium in his urine for years as uranium slowly dissolves from the metal fragments in his body. In the case of inhalation exposure, measurement of total uranium would be elevated only if measured on the battlefield soon after exposure while the soluble fraction of uranium is being eliminated from the body. But conducted years after exposure, the test would provide no useful information because uranium levels would have returned to within the normal range. What's not being addressed is the fate of the insoluble portion of the absorbed uranium. This uranium dissolves very slowly, over a period of years. While this is taking place, the total concentration of uranium in the urine may never rise above the normal range. If a veteran wants to know whether he is carrying DU in his body years after exposure, he requires the proper diagnostic test, the one mentioned in number 1 above.

6. The war in Bosnia was fought between March 1992 and November 1995. In its aftermath, soldiers serving in the former Yugoslavian army, staffers of humanitarian missions and Yugoslavian residents began manifesting symptoms of some unidentified illness similar to that suffered by US soldiers who served in the Gulf. Belatedly, NATO announced in 2000 that munitions containing DU had been fired on the Bosnian battlefields. This revelation was groundbreaking. The Bosnian theater contained none of the risk factors for Gulf War Illness that veterans were exposed to who served in Iraq and Kuwait, such as oil well fires, vaccines for anthrax or botulinum toxins, Iraqi chemical and biological warfare agents etc. The only factor that linked the two theaters together were DU munitions.

Using an innovative technique of electronic microscopy, Antonietta Gatti and Stephano Montanari analyzed tissue samples taken from those suffering so-called Balkan War Syndrome.⁵ Every tissue sample and lymph node that was examined contained spherical, combustion-derived, metal-alloyed microparticles and nanoparticles. To confirm an environmental origin of this debris, the researchers noted that particles found in the tissues of diseased soldiers and civilians were "mutually compatible" with those found on the ground in the territories where battles had been fought and where the pathologies were contracted.

This avenue of investigation reveals a third vector of DU's toxicity which acts synergistically with DU's radiation and chemical effects. Nanoparticles have recently received a great deal of attention due the numerous proposed applications of nanotechnology, the use of materials smaller than 100 nanometers (0.1 microns). Nanoparticles have been shown to exhibit many unusual properties. They possess the ability to pass directly through certain tissue types, travel along

⁴ Zimmerman P. "A Primer in the Art of Deception: The Cult of Nuclearists, Uranium Weapons and Fraudulent Science," August, 2009.

⁵ Gatti A.M., Montanari S. "So-called Balkan Syndrome: A Bioengineering Approach," Emilia, Italy, Laboratory of Biomaterials of the University of Modena and Reggio, February 2004.

neurons, escape filtration from the blood by the spleen and the liver and avoid immune system detection by macrophages. These unusual characteristics give nanoparticles ready access to all tissues of the body. While circulating through the body, their surface chemistry provides a platform for ongoing heavy metal interactions with the body's molecular makeup. Thus, insoluble uranium nanoparticles represent point sources for chronic chemical and radiological poisoning to the body's interior. In addition, nanoparticles of many different compositions have been implicated in initiating inflammation, oxidative stress and gene activation.

With over 100,000 Gulf War veterans ill with an undiagnosed illness, one would think that the work of Gatti and Montanari would have stimulated medical follow-up among researchers sincerely interested in exploring the origins of Gulf War Illness. However, their work has so far remained ignored by the VA.

7. On August 20, 2007, the Discovery Channel aired an episode in its series "Conspiracy Test" entitled "Gulf War Illness." During the program, the results of research undertaken at the Molecular Medicine and Genetics Lab at Wayne State University were presented. In a preliminary study supervised by Dr. Henry Heng, blood samples were collected from five veterans of the 1991 Gulf War who were suffering symptoms of the undiagnosed illness they had contracted while in military service. All had previously tested positive for the presence of DU in their urine and none had served in any area of Iraq where possible exposure to chemical warfare agents might have occurred as a result of the destruction of weapon caches at Khamisiyah. Using spectral karyotyping (SKY), Heng and his graduate students imaged and analyzed the chromosome structure of blood cells in each of the veterans. What Heng and his colleagues found using this technique was startling. The karyotype of each of the veterans clearly displayed significant levels of chromosome damage. According to Heng, the damage widely exceeded that observed in cancer patients. Translocations, broken chromosomes, centromere displacements and aneuploidy (a gain or loss in the number of chromosomes) were observed. According to Heng, the chromosome aberrations observed were typical of the type of damage produced by radiation. This is another avenue of investigation ignored by the VA.

8. In 2003, Heike Schröder and her research associates published a study of 16 British Gulf War and Balkan War veterans who suspected that they had been exposed to DU. When compared to suitable controls, the study group demonstrated a statistically significant increase in the frequency of dicentric chromosomes and centric-ring chromosomes in peripheral lymphocytes.⁶ (These aberrantly shaped chromosomes are created when two double-strand breaks in DNA are improperly repaired, either between the DNA from two separate chromosomes or within the DNA of a single chromosome. The elevated occurrence of these in individuals serves as a biological indicator of exposure to ionizing radiation.)

The findings of Schröder and her colleagues are extremely significant. The observed chromosome aberration frequency they observed should not have been occurring at the "dose" delivered by battlefield DU. According to the authors, "However, as dicentric chromosomes are reliable indicators of ionizing radiation, our findings contradict official releases from the IAEA, the WHO, the MOD and the DOE, stating that the radiotoxicity of DU would be negligible."⁷ A further bewildering discovery was that the observed chromosome aberrations should not have been so prevalent ten years after exposure, which was when the veterans in this study were tested. Schröder offered the observation that soluble DU would have been flushed from the bodies of test subjects relatively soon after exposure. Further, the biological half-life of dicentric chromosomes is 3.5 years. As a consequence, the observed chromosome aberrations could not have been produced at the time of the exposure event. So, how were they produced? Schröder proposed that the chromosome aberrations were a manifestation of ongoing damage to the body's interior produced by the radiation emitted from insoluble particles that were lodged in the body since the moment they were absorbed on the contaminated battlefield.

The scientific research mentioned above clearly suggests that DU is a factor in the undiagnosed illness suffered by veterans. Yet, numerous publications from the world's guardian institutions continue to proclaim that this is impossible. The VA has aligned itself with this political propaganda and, in the process, makes a mockery of science.

To conclude, the VA is being lackadaisical at best, criminally negligent at worst, in its treatment of veterans suffering from symptoms of so-called Gulf War Illness. Valuable avenues of research are being intentionally ignored because they raise disturbing questions of the impact to health from radioactive material released into the environment. Rather than throw a disparaging light on cherished weapon systems, our cherished veterans are being abused by an uncaring medical system.

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⁶ Schröder H., presentation at the World Uranium Weapons Conference, October 16-19, 2003. University of Hamburg, Germany.

⁷ Schröder H., Heimers A., Frentzel-Beyme R., Schott A., Hoffmann W. "Chromosome Aberration Analysis in Peripheral Lymphocytes of Gulf War and Balkans War Veterans. Radiation Protection Dosimetry," 2003, 103(3):211-219.