

Gulf War Syndrome: A Deadly Legacy

by Gary Null and Mitzi Flade

The situation is unfair from start to finish. It begins with soldiers who are asked to participate in research or take experimental drugs, but are not told what the risks are before, during, or after ... this situation is unacceptable.

John D. Rockefeller IV, senator from West Virginia;
chair of the Senate's Committee on Veterans' Affairs

For almost two decades, the official word from the Veterans Administration, the Department of Defense (DOD), and the White House was that Gulf War syndrome did not exist. Our country's vets, affected by multiple and diverse debilitating symptoms from Gulf War syndrome, struggled for many years to have their health problems recognized as something other than psychological. This struggle has led to bitter debate and fierce wrangling over funding for the care of sick veterans. In the meantime, tens of thousands died from these conditions. Many lost their homes because of the high costs to pay for medical care themselves. Independent investigations, including those conducted by many of the Gulf War veterans themselves, showed multiple causes behind Gulf War syndrome, including experimental vaccines; exposure to depleted uranium (DU); and toxicity from biological and chemical weapons, oil fires, and other environmental contaminants.

Official opinion, however, has slowly begun to come around to the fact that veterans are suffering from physical illness as evidence from medical studies has grown.

In March 2008, a US Congress-appointed committee released its

findings after analyzing more than 100 studies relating to Gulf War illnesses. The committee concluded that there was a clear link to exposures to specific kinds of chemicals. The chemicals identified included pesticides, the anti-nerve-gas drug pyridostigmine bromide, and the nerve gas sarin that troops may have been exposed to during the demolition of a weapons depot. The committee's chief scientist, Dr. Beatrice Golomb, singled out the acetylcholinesterase (AChE) inhibitor drugs such as pyridostigmine bromide as having a particularly strong connection to the development of ill health in veterans. She also revealed that some people appear to be particularly at risk from such chemicals due to genetic variations which impair enzyme function. When exposed, these people run a much higher risk for developing symptoms and disease.¹

Importantly, the committee concluded that Gulf War illnesses are almost certainly physical in nature and that the psychological stressors evidence by Gulf War vets, while substantial, were inadequate to account for the extent of their illnesses. The committee findings report that more than a quarter of the 700,000 US veterans of the 1991 conflict suffer from the illness.²

Gulf War syndrome is manifested in many ways. Chronic fatigue immune dysfunction syndrome affects over half of the syndrome's victims, according to Dr. Garth Nicolson, who, with his wife, molecular biophysicist and University of Texas professor Dr. Nancy Nicolson, evaluates and studies veterans' health. Other symptoms include lymphoma, cardiac ailments,

memory loss, leukoencephalopathy, and neurological diseases such as multiple sclerosis.³ Public health records estimate that 80% to 90% of syndrome patients are plagued with severe aches and pains in their joints. Others commonly experience dizziness, nausea, stomach pains, light sensitivity, intense anxiety, breathing difficulty, muscle spasms, diarrhea, blurred vision, inexplicable skin rashes, hives, bleeding gums, eye redness, night sweats, and acute migraine-like headaches.

Paul Sullivan, a cavalry scout with the First Armored Division in the Persian Gulf War, spoke about what he went through: "I first became ill right there in the gulf, with rashes and what we just considered runny noses. It never went away. I ended up with chronic sinusitis, chronic bronchitis, and later learned I had a tuberculosis infection. The rashes still haven't gone away."⁴

Sullivan is not alone. There are thousands of others with similar stories. And, unfortunately, the suffering is not limited to vets. Reed West, daughter of Gulf veteran Dennis West from Waynesboro, Mississippi, was born prematurely with collapsed lungs and a faulty immune system. Joshua Miller, the son of veteran Aimee Miller, constantly suffers from strange colds, pneumonia, and high fevers. There are many more cases, including children who are dying of heart defects, liver diseases, and other rare disorders. It's been estimated that 30% of Gulf War veterans' babies are born with deformities; this is 10 times higher than the number of birth defects one would expect to find in the general population. In

Waynesboro, Mississippi, the site of the National Guard Quartermaster Corps, 13 out of 15 children born to Gulf veterans suffer from serious disorders. Infant mortality rates have dramatically escalated in four counties in Kentucky and Tennessee, where the Army's 101st Airborne Division is based; in three counties in Georgia, where the Army's 197th Infantry Division is located; and at Ft. Hood, in Texas.⁵ According to Dr. Ellen Silbergeld, a molecular toxicologist at the University of Maryland, men pass toxic chemicals on to their unborn children through their semen. A whole new generation is being affected by Gulf War syndrome.⁶

According to Birth Defect Research for Children, a Florida-based association that studies birth defects in Gulf veterans' families, there is an increase in birth defects in children born to Gulf War vets. Its registry keeps track of babies born with missing limbs, chronic infections, failure to thrive, cancer, heart problems, and immunity defects. It has specifically identified a disproportionate occurrence of Goldenhar syndrome in Gulf veterans' offspring.⁷ Goldenhar syndrome (medically called oculo-auriculo-vertebral [OVA] spectrum) is defined by the National Institutes of Health as a "rare disease," yet it is popping up in the babies of Gulf War vets far too frequently. The syndrome has a wide range of symptoms, and frequently looks very different from one child to the next. Despite dissimilarities, Goldenhar syndrome tends to produce in children facial deformities, including faces smaller on one side than the other; abnormally small eyes; missing upper eyelids; malformation of the ears; incomplete or fused vertebral development; and numerous internal problems with the heart, lungs, kidneys, and intestines.

Persian Gulf vet Steve Miller knows this condition all too well: his son, conceived soon after his return from the Gulf, was born with it. According to Miller, "He had hydrocephalus, spinal scoliosis, spina bifida, was missing his left eye and left ear, [and] his heart was on the right side of his

body." Miller continued to explain that "according to the National Institute of Health, [Goldenhar syndrome] is either hereditary or caused by teratogenic exposure. In our case we both tested negative in genetic testing."⁸

So how did Miller's child end up with such a rare disease when the genetic factors that supposedly cause Goldenhar syndrome were absent from both parents' DNA? The answer: a multiplicity of poisons.

The term *Gulf War syndrome* is not one easily defined problem, but rather encompasses a wide variety of ailments. Congressman Steven Buyer (R-IN), whose Army reserve unit was stationed at a prisoner of war camp in the region, thinks that *Gulf War syndrome* is really a misnomer, explaining that he and other afflicted servicemen have been plagued with a broad spectrum of chronic disorders. Having experienced some of the symptoms firsthand, Buyer attributes the heightened frequency of illnesses among veterans to the wide variety of hazardous substances that they encountered in the Gulf, including poison gases, diesel fumes, petroleum-related pollution, parasites, experimental medications, and biological warfare agents.⁹ According to the Association of Birth Defect Children, Gulf War exposures include, but are not limited to: DEET, permethrin, pyridostigmine, pentachlorophenol, benzocaine sulfur, aluminum phosphide, baygon, boric acid, Sevin, amidinohydrazone, diazinon, Dursban, dichlorvos, Ficam, carbaryl, lindane, malathion, oil well fires, leaded fuels, depleted uranium, solvents, DeContam agent, malaria pills, campfires, leishmaniasis, chemical warfare agents, CARC, experimental vaccinations (including those with squalene), D-phenothrin, allethrin, paint toxins, and many others.¹⁰

Dr. Boaz Milner of the VA hospital in Allen Park, Michigan, has treated hundreds of patients claiming to have become ill as a result of their Gulf War experience. Milner agrees with Buyer that the collection of symptoms

that have manifested can be attributed to a variety of factors, which he has categorized into five syndromes. Milner's first category of Gulf War syndrome sufferers consists of soldiers who were exposed to excessive quantities of radiation, likely a result of the uranium used in munitions. The second form of the syndrome was induced by the widespread use of experimental vaccines that were designed to protect the troops from the harmful elements that they would encounter, while another category encompasses veterans exposed to various environmental pollutants, including the more than 700 burning oil wells that contaminated the region's air and water. Milner believes that other soldiers may have contracted illnesses due to the presence of toxic chemical compounds, such as pesticides; and the fifth form of the syndrome was brought on by the release of biological warfare agents.¹¹ With so many exposures, it is seemingly logical to anticipate a broad spectrum of symptoms for sufferers of Gulf War syndrome.

The effects from the mélange of chemicals that Gulf War vets were exposed to become nearly impossible to unravel when examining the brutal fact that the experimental vaccines mixed with unmonitored medicine that they were given had never been proved safe. In fact, the widespread use of experimental vaccines during Desert Storm has been cited by many as a possible cause of Gulf War syndrome. Dr. Garth Nicolson elaborates, "I'm not a big fan of experimental vaccines. There have been too many mistakes. Usually you find these things out years later. Often agents that we think innocuous turn out to be harmful."¹² Even worse, during the Gulf War, the established procedures of vaccination were neglected and ignored. Normally, only one inoculation should be given at a time, but the military insisted on giving multiple shots at once, which, according to Nicolson, is the worst thing you can do because it suppresses the immune system.¹³

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► The troops immunized for the Gulf became government guinea pigs. They received experimental vaccines, such as those for anthrax and botulinum, which were not approved for use by the Food and Drug Administration (FDA) and have since been proved to cause potentially dangerous side effects. Soldiers who were given these experimental vaccines, without informed consent, have reported suffering from a variety of neurological problems and aberrant bleeding from all parts of the body.

Neil Tetzlaff, a lieutenant colonel in the US Air Force during the Gulf War, testified at a senate hearing of his symptoms:

On the plane ride to Saudi and during my first day in-country, I was nauseated and vomited. I attributed the sickness to the plane ride and tenseness of the situation. On my second day there, I vomited again and felt different. I attributed the sickness to something I'd eaten. On the third day, I was extremely nauseated and vomited multiple times. I sought out the doctor and discussed my illness with him. We dismissed it as something I had eaten at the Saudi canteen. On my fourth day there, I vomited violently, the worst ever of my life, and was acting a bit off center and muddled. ... On the morning of the seventh day, I vomited about a quart of blood. Since deployed for Desert Shield, I have been suffering moderate to severe and intolerable pain, and fatigue, and lately have developed one heck of a palsy. I've lost [much of] my ability to speak because I can't recall words, have extreme problems with my short-term memory, and I had a dramatic change in my olfactory system. The last three and a half years have been extremely difficult on me and my family.¹⁴

Not only did the experimental vaccines pose a threat to the troops' immune systems, the anthrax vaccination that they received contained squalene, an unapproved adjuvant that has since been linked

to devastating autoimmune diseases. The DOD made every attempt to deny that squalene was indeed an added contaminant in the anthrax vaccine administered to Persian Gulf War military personnel.¹⁵ Despite these efforts, unusually high antibody levels for squalene have been showing up in the blood of Gulf War vets, and a clear link was established between the contaminated product and all the syndrome sufferers who had been injected with the vaccine containing squalene.

This was confirmed in an investigation conducted by *Insight* magazine, which also reports that VA spokespeople have no explanation for these findings.¹⁶ The mystery is compounded by the disappearance of up to 70,000 service-related immunization records.

One of the scientists hired by *Insight* to investigate the presence of squalene in veterans' blood elaborates on the study's findings: "We found soldiers who are not sick that do not have the antibodies. ... We found soldiers who never left the U.S. but who got shots who are sick, and they have squalene in their systems. We found people who served overseas in various parts of the desert that are sick who have squalene. And we found people who served in the desert but were civilians who never got these shots ... who are not sick and do not have squalene."¹⁷

According to one government official familiar with the blood test results, increased levels of sickness in veterans were indeed correlated with increased levels of antibodies for squalene. Another official explained, "I'm not telling you that squalene is making these people sick, but I am telling you that the sick ones have it in them."¹⁸

Research immunologist Pam Asa has worked with about 150 individuals who have Gulf War syndrome. Asa is one of the investigators looking into squalene, and she stresses that this is not a substance approved for use in humans, as it hasn't been through rigorous safety testing. She reports that the autoimmune manifestations

of squalene vary from person to person, depending on the patient's genetic makeup. "In other words, patient A will have a certain spectrum of symptoms, and patient B will have another. But it's still the same disease."¹⁹

Mark Zeller is one of the service people affected by this issue:

I sent my blood and got a notice back that I'm positive for this stuff called squalene, which is an adjuvant, which goes into a vaccine. This adjuvant is still not for human use. I'm here to tell you, I've got squalene in my body. And I said, it's not supposed to be in humans. To this date, it's still not used in humans except for research. I never sought to be a guinea pig out in the desert. I signed on to protect my country. At least that's what I thought.²⁰

Zeller isn't alone. A study conducted at Tulane Medical School and published in the February 2000 issue of *Experimental Molecular Pathology* included these stunning statistics:

... The substantial majority (95%) of overtly ill deployed GWS patients had antibodies to squalene. All (100%) GWS patients immunized for service in Desert Shield/Desert Storm who did not deploy, but had the same signs and symptoms as those who did deploy, had antibodies to squalene.

In contrast, none (0%) of the deployed Persian Gulf veterans not showing signs and symptoms of GWS have antibodies to squalene. Neither patients with idiopathic autoimmune disease nor healthy controls had detectable serum antibodies to squalene. The majority of symptomatic GWS patients had serum antibodies to squalene.²¹

According to Viera Scheibner, PhD, a former principle research scientist for the government of Australia:

... This adjuvant [squalene] contributed to the cascade of reactions called "Gulf War Syndrome," documented in the soldiers involved in the Gulf War. The symptoms they developed included arthritis, fibromyalgia, lymphadenopathy, rashes,

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photosensitive rashes, malar rashes, chronic fatigue, chronic headaches, abnormal body hair loss, non-healing skin lesions, aphthous ulcers, dizziness, weakness, memory loss, seizures, mood changes, neuropsychiatric problems, anti-thyroid effects, anemia, elevated ESR (erythrocyte sedimentation rate), systemic lupus erythematosus, multiple sclerosis, ALS (amyotrophic lateral sclerosis), Raynaud's phenomenon, Sjogren's syndrome, chronic diarrhea, night sweats and low-grade fevers.²²

Because these vaccines were experimental, many questions have arisen as to why our government dispensed them – and why our military men and women had to suffer from them. What are the ethical ramifications of giving experimental drugs to soldiers in time of war? Arthur L. Caplan, PhD, and director of the Center for Bioethics at the University of Pennsylvania, stated the following at the hearing titled "Is Military Research Hazardous to Veterans' Health?" led by the Senate's Committee on Veterans' Affairs. Caplan asserted:

Some would argue that the entire category of ethically suspect research makes no sense in the context of war. Hot or cold, when the threat to the nation's security is immediate, real, and serious, then the prevailing rules of human experimentation requiring the informed consent of subjects and prior review by research review committees must, of necessity, go out the window. The niceties of ethics regarding how to conduct human experimentation are for times of peace, not for the exigencies imposed by the threat or reality of war. But this argument is wrong.

The prevailing standards for human experimentation were set down as a direct response to experiments conducted under conditions of war. The Nuremberg trials at the end of the Second World War promulgated a code of research ethics that has been absorbed into both professional ethics and law by many bodies and governments in the years since that war. The

Nuremberg Code makes no exception for research conducted in the context of war. The enormously important goal of protecting the nation's security is not held to be a value that is so overriding as to obliterate the individual subjects' rights. The code states clearly and unambiguously that everyone involved in research is to be so informed and that they are to have the right to give or withhold their consent to that research.²³

For our soldiers, however, none of those conditions were met. The DOD had the FDA grant it waivers from informed-consent regulations for the use of pyridostigmine and botulinum-toxoid vaccine. As a result, many Gulf veterans were not told what vaccine they were being given or what the risks were. PhDs Diana Zuckerman and Patricia Olson conducted an investigation for Senator Rockefeller, where they reported:

many [veterans] report that they were told not to tell medical personnel that they had received a vaccination, even if the vaccination caused pain or swelling. No record of the vaccine was available in medical records. As a result, physicians who were concerned about any local or, systemic reactions often had no information about the possible causes of those symptoms. Veterans who claim they were harmed by the vaccines or pyridostigmine frequently have no proof that they were vaccinated or took the pills, or that they had an adverse reaction.²⁴

One of the veterans who knows about this situation firsthand is the Reverend Dr. Barry Walker, who served as a chaplain in Saudi Arabia and ultimately in Iraq and Kuwait. In his testimony to the Senate committee hearing, he confirmed the veil of mystery that the DOD drew over the medication and vaccines to which they were subjected:

On January 16, 1991 I received the first of two shots of a vaccine, but we were not told exactly what it was. We were later told that the purpose of the vaccine was to protect us; rumor was that it was for protection against anthrax. Also

in January, after the first Scud was launched, we were ordered to start taking some pills, although we were not told exactly what they were, either. All we were told was that the pills would protect us against chemical and biological weapons. We were told to take the pills and not given a choice, though some soldiers did not take them. I was expected to be an example to others, so I took them at first. I later learned that these pills were pyridostigmine.

To my knowledge, none of the 4,700 troops [in my ministry], except maybe the command headquarters, was given any real information about the risks of these drugs or vaccines. We were not shown anything in writing or told anything other than that these would protect us. My chemical officer was asked to find out more about the pills, and she shared some of that information with the group commander and a few staff officers. She said there were no problems with the pills.

The fact that we were given the vaccine or drugs was not recorded in our medical records, although I insisted that the vaccine be recorded in my personal record. Many soldiers did not carry a vaccine record, and most wouldn't have thought to ask that it be recorded. I don't recall any list being made of who was given the vaccine.²⁵

As Walker pointed out, the problem wasn't only the experimental vaccinations. It was also the use of pyridostigmine bromide, a medication that had only been approved by the FDA to treat patients with the neurological disorder myasthenia gravis. The government wanted to use pyridostigmine to protect US troops against certain chemical weapons, but it had not been proved safe or effective for repeated use (and it was distributed repeatedly to the troops) by healthy persons. Despite claims which the DOD made that pyridostigmine was safe, the FDA could not establish safety or efficacy

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of its use for the troops based on the research that the DOD provided. To the contrary, Zuckerman and Olson stated:

Pyridostigmine bromide is a chemical which is believed to enhance the effectiveness of established drugs for the treatment of nerve-agent poisoning. Pyridostigmine is also a nerve agent itself. ... In recent studies, animals given pyridostigmine followed by two antidotes (atropine and 2-PAM) were more likely to survive exposure to a nerve agent called soman. However, pyridostigmine pretreatment may make individuals more vulnerable to other nerve agents, such as sarin. The DOD scientists concluded that pyridostigmine should only be used when the chemical-warfare threat is soman. Iraq was believed to have both soman and sarin, and the only verified report of chemical weapons in the Gulf War concluded that sarin was present.²⁶

They further asserted that the DOD's use of pyridostigmine was ineffective:

In addition, DOD documents indicate that the treatment regimen for U.S. troops during the Persian Gulf War may have included an inadequate dose of atropine. Therefore, even if Persian Gulf soldiers had been exposed to soman, it is questionable if the pyridostigmine pretreatment would have provided any protection, since the dose of atropine was apparently inadequate. ...

Because of the DOD researchers' concerns about serious adverse reactions, virtually all of the studies screened the male subjects to determine whether they were hypersensitive to pyridostigmine before allowing them to participate in the experiment. In addition, individuals with many medical conditions, those on medications, and those who smoked were excluded from the studies. Study participants were told not to drink any alcoholic beverages. Despite these precautions, serious adverse

reactions were reported for several of the studies, including respiratory arrest, abnormal liver tests, unusual electrocardiograms, gastrointestinal disturbances, memory loss, and anemia. ...

None of the Persian Gulf War troops were adequately warned about the risks associated with the drug, and few if any were given a choice of whether or not to take it.²⁷

Nurse Carol Picou, who served in the Gulf, experienced this firsthand:

This has been used since 1955 on patients with Myasthenia Gravis. This drug has never been tested on healthy human beings. Yet I have a report where they show they did do testing on 10 soldiers – men. Two couldn't even finish the program. Two got severely sick. Even when you give it to Myasthenia Gravis patients you monitor for levels of toxicity. You give it to them according to their height, weight, bone structures. Yet they gave us pyridostigmine – everybody the same pack – 30 mg pills. Take them three times a day. And when people had problems with them they didn't take us off. Right away, I looked it up. In 1955, if you have problems with this drug, they should take you off of it, and the antidote is atropine. Well, we received atropine during the war. We didn't know why we had to carry atropine and Valium. Well, it's because of the fact of the chemical warfare threat, and the fact that if something would happen to us from the pyridostigmine, that would be our antidote.²⁸

Picou has been experiencing serious health problems, not the least of which is head-to-toe neurological damage, since her Gulf service.

Although there were enough concerns about the effects of pyridostigmine in and of itself, Dr. James Fox, a scientist with the US Department of Agriculture, conducted pyridostigmine research on cockroaches and made startling discoveries, ones that held particularly significant implications for Gulf War veterans. Fox discovered that pyridostigmine, when used in combination with the common pesticide DEET, rendered a powerful

pesticide punch: DEET became 10 times more toxic. DEET and many other pesticides were used extensively throughout the Gulf War. Consequently, vets who took pyridostigmine pills became more vulnerable to the pesticides surrounding them, giving a very plausible explanation for the serious neurological symptoms experienced by so many Gulf War vets.²⁹

While the medical hazards associated with experimental vaccinations with dangerous adjuvants, unapproved medications like pyridostigmine, and exposure to numerous pesticides were certainly enough to cause physical complications, our Gulf War vets were exposed to even more physical hazards: biological and chemical weaponry additives.

On May 1, 1996, Major General Ronald Blanck, senior physician at Walter Reed Army Hospital, admitted to the President's Panel on Gulf War Illnesses that chemical and biological weapons had been used during Operation Desert Storm, and that low-level exposures to these agents probably occurred. Studies had confirmed that hundreds of Iraqi missiles had been loaded with biological warfare agents, but until Blanck's report – five years after the war – the evidence had been completely disavowed by official sources.³⁰

Disclosures by high-ranking Iraqi officials have in fact confirmed that Iraq possessed an extensive chemical and biological arsenal during the Gulf War. After the August 1995 defection of Saddam Hussein's top biological weapons adviser, Lieutenant General Hussein Kamel Majid, the Iraqi government, in an attempt to lessen the impact of Majid's revelations, unveiled an abundance of classified information to United Nations investigators documenting the development of biological and chemical warfare arsenals. The Iraqis revealed that prior to the Gulf War, their nation engaged in a top-secret program to develop biological, chemical, and nuclear weapons that

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could be used against any of their foes, including the US, Israel, and Saudi Arabia. Prior to the disclosures, Iraq had claimed that it had only 10 people employed by its biological programs, but it has since admitted that 150 scientists and an extensive support staff were involved in the mass development of biological warfare agents in the 1980s. According to UN officials, Iraq possessed at least 50 bombs loaded with anthrax, 100 bombs containing botulinum, and 25 missile warheads carrying other germ agents.

The Iraqi government's goal was to create a diversified arsenal that went far beyond conventional weapons. For instance, one viral agent manufactured by the Iraqis was capable of generating hemorrhagic conjunctivitis, which commonly results in temporary blindness or bleeding eyes, while another agent could be used to induce chronic diarrhea, a condition quite effective in immobilizing troops. Secret Iraqi biological warfare programs were also responsible for the production of at least 78 gallons of gangrene-inducing chemicals that were capable of penetrating the body and infecting wounds. Other agents included "yellow rain," a lethal fungus responsible for bleeding lungs, and ricin, a deadly toxin derived from castor oil plants.

Was Iraq ready to use its poisons on the battlefield? Jonathan Tucker, in an article in the *Nonproliferation Review*, documents that it was, and in fact did use them, in 76 incidents.³¹ And Tucker mentions that, during the conflict, London's *Sunday Times* reported that intercepted Iraqi military communications indicated that Saddam Hussein had authorized front-line commanders to use chemical weapons as soon as coalition forces began their ground offensive.³² The American *Newsweek*, as well, reported this fact.³³

We have military documentation to support assertions of biological and chemical weapons presence. For instance, battlefield reports of the 513th Military Intelligence Brigade confirmed the release of anthrax on

Feb. 24, 1991, at King Khalid Military City, while documentation from the following day reveals the presence of lewisite, a nerve gas that could have been released either by an Iraqi assault or as a result of secondary explosions.

In addition to the chemical and biological warfare that our troops were exposed to, there is another very disturbing legacy that has been and is continuing to be a part of Iraq, and will be forever: depleted uranium. DU is a byproduct of the uranium enrichment process. Its name implies that this is a harmless material, but in actuality it is still a highly poisonous, radioactive, heavy metal. The term *depleted* comes from the fact that natural uranium is made from a fissionable isotope, U-235, while DU is made from a relatively stable isotope, U-238. After U-235 is extracted from U-238 for use in nuclear weapons and breeder reactors, only U-238 remains. While it is now depleted because it no longer contains U-235, due to its density the uranium still emits one-third of its original level of radioactivity.

The military uses DU to tip bullets and tank shells, praising the material's ability to make metals super-hard so that they can penetrate steel as easily as butter. But what the military neglects to consider is that the downside to this technology far outweighs its benefits. Once bullets reach their destinations, they explode upon impact, releasing a fine, radioactive, aerosol mist. These toxic particles travel in the wind, mix with water and soil, and are inhaled and ingested by anyone in their path.

US and British forces used Operation Desert Storm as a testing ground for the widespread employment of DU in Gulf War I. It is estimated that over 940,000 30 mm uranium-tipped bullets and 14,000 large-caliber depleted rounds were used. Even before the second Gulf War, between 350 and 800 tons of DU residue, with a half-life of 4.4 billion years, permeated the ground and water of Iraq, Kuwait, and Saudi Arabia.

In light of such immense pollution, it is easy to see that many people have come into contact with depleted

uranium. Inhalation and ingestion of the substance were unavoidable for troops in proximity to exploding shells. In addition, soldiers spent long hours sitting in tanks, handling uranium-laced shells and casings. Weapons were also taken home as souvenirs. Families of veterans came in contact with the substance after handling clothing laced with it.

The insidious action of DU in the body was illustrated by scientists at the DOD's Armed Forces Radiobiology Research Institute in Maryland, in research presented to the American Association for Cancer Research and the Society of Toxicology. They tested the effects of embedded DU by inserting shrapnel-like pellets into the legs of rats, and they were surprised at how quickly they discovered oncogenes – genes believed to be precursors to cancer. Another finding was that DU kills suppressor, or health-maintaining, genes. The experiments also demonstrated that DU spreads throughout the body, depositing itself in the brain and spleen, among other organs, and that it can be passed by a pregnant rat to a developing fetus.³⁴

Many of the symptoms experienced by Gulf War veterans and their families are indicative of radiation poisoning. Some of these are nausea, vomiting, wasting, memory loss, and raised rates of cancer. As has been mentioned, vets' children are manifesting an alarming rate of birth defects, lowered immunity, and

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► childhood cancers, some of which may be due to radiation-affected sperm.

Dr. Jay Gould, author of *The Enemy Within: The High Cost of Living Near Nuclear Reactors*, has long been an outspoken critic of low-level radiation. Gould says that exposure to DU released into the atmosphere poses the same grave dangers as does any other exposure to uranium. "There is nothing new about it," Gould says, stressing that a biochemical impact of low-level radiation is that it immediately attacks the immune response.³⁵ Since the immune response is a key factor in maintaining good health, this means that people are then vulnerable to any kind of infection or allergic response. So, everything from cancer to allergies to multiple chemical sensitivities can be activated by the uranium dust.

Gould adds that one of the reasons that people generally ignore the problem is that low-level radiation is often confused with background radiation:

background radiation is something that humans have lived with for hundreds of thousands of years. Over that long period, our immune response has developed a capacity to resist natural forms of radiation from cosmic rays and radiation in the soil. But ever since the nuclear age began, we have introduced new fission products, like radioactive iodine and radioactive strontium that are released in the operation of a nuclear reactor or an explosion of a bomb. These have the ability to impact the immune response. This is what we mean by low-level radiation. It's an internal radiation. In other words, if you ingest a fission product or a piece of uranium dust, it is like having a tiny x-ray go off for a tiny fraction of a second for the rest of your life. The effects of low-level radiation are quite awful, depending on which organ is affected.³⁶

There have been several army reports on the dangers of depleted

uranium, which have been released by the Depleted Uranium Citizens' Network. In November 1996, Sara Flounders, coordinator of the International Action Center, a network of organizations and activists initiated by former US Attorney General Ramsey Clark, pointed out that one of these reports, which was put out by the Army Environmental Policy Institute, discusses the negative health and environmental consequences of DU use in the army. According to the report, the financial implications of long-term disability payments and other health-care costs would be excessive if DU were indicted as a causative agent for Desert Storm illnesses. This may be why DU had not been discussed as a cause of Gulf War syndrome, Flounders believes.³⁷

Since the first Gulf War, DU has been used in the Balkans and Kosovo, and, most recently, the current Gulf mission. It has been suspected as the culprit in lung and kidney illnesses, as it can be transmitted either by drinking, as it is soluble in water, or by inhalation, as it creates a fine dust when it hits armored vehicles. Soldiers in Kosovo have complained of an illness that causes extreme lethargy. Since government officials have not recognized an official illness caused by the use of DU, the official word is that uranium radiation in the areas where it was used does not exceed background radiation. Despite suspicions as to the relationships between the use of DU and disease, up to the year 2001, no extensive health research had been completed to determine the long-term effects of repeated DU exposure.³⁸

A recently published peer-reviewed study of Gulf War vets in 2005 equivocated on the reality of Gulf War illness for soldiers in the first Gulf War, but did admit that there was some higher but not statistically significant increase in death rates for soldiers who came into contact with DU and pesticides. This paper was produced by the University of Aberdeen Public Health Department in the UK. A recent examination of the effects of DU in lung cell lines

indicates that uranium changes biochemical processes of certain regulatory pathways within the lung tissues.³⁹ In rat tissue cells, dramatic decrease in certain liver enzymes occurred, and other results indicate an increase in mRNA response (precursors to the cellular enzymes) to make up for the previous decrease in enzyme production.

Another paper by the Laboratoire de Radiotoxicologie Experimentale in Marseilles, France, seemed to suggest that at least in animal studies, DU inhalation could damage certain lung cells by changing base pairs on one side of the double-stranded DNA helix, and that radiation subsequently within the cell could damage the other side of the helix as well.⁴⁰ Introduction of DU into rat tracheae caused increased enzyme activity in rat testes three months later. In mouse cell lines, DU caused DNA mutations, and the authors point out that these were not only caused by radiation, but the actual presence of the chemical was toxic as well.⁴¹ White blood cells of people exposed to the effects of DU in Bosnia and Herzegovina had measured changes in their genetic material.⁴² In addition, a study in Israel showed that concentrations in hair, nails, and urine were directly correlated to the amounts of DU ingested in the water.⁴³ A rat study shows that neurological exposure to DU may influence motor behavior as well as memory loss.⁴⁴ Despite the lack of extensive human cohort studies, these data seem to suggest that DU present in the bodily systems affects the various tissues throughout the body.

The University of Maryland School of Medicine studied vets who were exposed to friendly fire in the first Gulf War; and over a period of longer than a decade, vets were continuing to show elevated levels of DU in their urine. The presence of increased DU research in the literature indicates a growing consensus that exposure to DU is a cause for concern.⁴⁵

One soldier who was struggling with terminal colon cancer described the environment where he was

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stationed as a toxic dump of "oil refineries, a cement factory, a chlorine factory and a sulfuric acid factory" all polluting the air.⁴⁶

Dr. Doug Rokke, a retired major who served as the director of the US Army Depleted Uranium Project in the mid-90s, and a specialist in uranium clean-up efforts, has been an advisor for DU science and health to the Centers for Disease Control, US Institute of Medicine, Congress, and the DOD. Rokke has been at the forefront in efforts to alert health and military officials about DU's enormous health risks. After Operation Desert Storm, he was the officer in charge of cleaning up the mess and assessing environmental risks due to the invasion. During the course of his mission, Rokke said, he received an order, the Los Alamos Memorandum, "which was a direct order to lie in all the reports about the health and environmental effects from uranium munitions in order to sustain their use and avoid all liability." Throughout his months in Saudi Arabia in cleanup efforts, Rokke and his team received "numerous orders to provide medical care and numerous orders to ignore them and numerous orders to lie, cheat, steal and do whatever you have to do."⁴⁷

These lies, the insidious cover-up, however, can change the legacy left by the Gulf War conflicts. Our servicemen and -women were exposed to DU and dangerous biological and chemical weapons. Our own government experimented on them with unstudied vaccines and unapproved medications, both of which had unforeseen consequences. Gulf War vets' children are being born with birth defects. And it didn't stop in the Bush-Cheney freedom wars.

Rokke is now convinced that the DOD's own reports stating that almost 20% of active-duty personnel in the current military campaigns in Afghanistan and Iraq are nondeployable because of severe illness, are the direct result from prolonged exposure to the toxic swamp that has become the Middle East. He has also observed

in his research that with respect to the causes of death among OEF (Operation Enduring Freedom) and OIF (Operation Iraqi Freedom) personnel for medical reasons, there is a surprising proportionality with the medical causes of death among veterans from the first Gulf War. What GIs from both campaigns share is their high exposure to chemical toxicity, multiple toxic vaccines, and in particular DU.⁴⁸

With only 148 Americans officially killed in action and only 467 wounded, ours seemed to be a shining victory in the Gulf. But this victory has lost its glow somewhat; now that we know that nearly 200,000 thousand of our Gulf service people have become sick from a debilitating and sometimes deadly syndrome. According to the last VA report in February 2008 – the *Gulf War Veterans Information System* – the government lists the actual veteran death toll from Gulf War illness at over 75,000.⁴⁹ For 19.5 years, the VA has denied that Gulf War syndrome exists. As a result, those who have been inflicted with Gulf War syndrome are still suffering; being refused the treatment that they are entitled to.

For Gulf War vets like Paul Sullivan, the search for help is seemingly futile:

The VA completely blew me off for two years until I went public and talked on your radio station. ... Before then, the VA was in the process of purging people's records, denying them service. ... This denial of the problem – that it ever exists – by the Department of Defense and the Department of Veterans' Affairs is absolutely shocking, immoral, and unconscionable – absolutely outrageous. ...

When you finally get into the VA system, what happens is, they'll lose your records. I went to appointments, ended up waiting four, five additional hours for the doctor simply to find my medical records or the X-rays that they took two or three days earlier. When you do get an exam, the doctor will say, 'I've got five minutes. Tell me your problem.' Then they won't record your symptoms. You

hear stories about doctors where their stethoscopes were not even in their ears. You hear stories about soldiers going in there like me, with rashes and respiratory problems and the doctors not even writing it down. Then, even though we're sick, they don't do any tests. Lung function tests, sinus X-rays, chest X-rays – they weren't doing any of that. Then for the few tests they did run, such as blood tests, in my case, they knew I had an immune deficiency – nobody ever looked at the results. ...

Unfortunately for many veterans who get out of the service and don't have any health insurance, the VA is our only option. And our only option has crashed and burned under the stress of so many hundreds of thousands of vets coming in and looking for help.⁵⁰

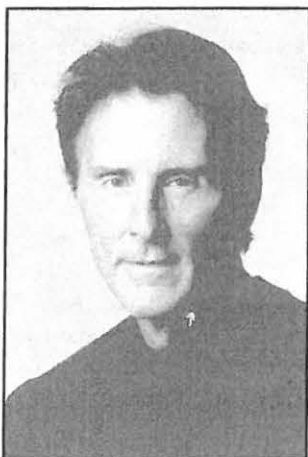
Clearly there is a sadistic irony that we are implementing on our troops. We asked our brave men and women in the US, whether in the reserve, National Guard, or enlisted troops, to serve in dangerous environments including Afghanistan and Iraq. While there, we allowed them to be exposed to biological and chemical agents, experimental vaccines, environmental toxins – ranging from the byproducts of air pollutants released from burning oil wells to DU – and then we bring them home, and not only refuse to properly thank or treat them, but even go so far as to deny that their illnesses even exist. As a result, many of our veterans have gone bankrupt because their conditions are not covered under any government programs for assistance. We are not referring to the rare case; we are referring to hundreds of thousands of human beings. In fact, the Department of Veterans Affairs estimates that 131,000 veterans are homeless on any given night; however, more independent analysis shows the figure can be as high as 300,000, and up to 840,000 veterans will experience homelessness during the course of a year.^{51,52} But the actual number is certainly higher. ➤

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Our afflicted veterans are suffering. Because we neglected their cries, too many are now destitute, homeless, hungry, having spent tens of thousands of dollars, depleting their life savings, in an unsuccessful attempt to relieve their ailments. After nearly two decades of abandonment, their hope is gone. As Senators Don Riegle Jr. (D-MI) and Alfonse D'Amato (R-NY) so adeptly observed, "The veterans of the Gulf War have asked us for nothing more than the assistance they have earned. Our refusal to come to their immediate assistance can only lead others to question the integrity of the nation they serve."⁵³ It has been too long. It is time for the negligence to end. It is time for us to act with integrity. It is time to fight for our vets.

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