

THE GULF WAR'S TROUBLING LEGACY

By Gary Null Ph.D.

Introduction

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 tens of thousands of our Gulf service people have become sick from a debilitating and sometimes deadly syndrome. The Department of Veterans Affairs has reported that approximately 6000 soldiers have died since the war's conclusion, including 1300 18- to 24-year-olds who were in perfect health prior to the war, but who mysteriously contracted various forms of cancer after their involvement with the military. According to H. Lindsey Arison, III, aide to the undersecretary of the U.S. Air Force, there are now over 50,000 veterans suffering from Gulf War syndrome, including about 11,000 still on active duty.

Arison outlines the causes of Gulf vets' health problems. First, they were exposed to nonlethal levels of chemical and biological agents released primarily by direct Iraqi attack via missiles, rockets, artillery, or aircraft munitions and by fallout from allied bombings of Iraqi chemical warfare munitions facilities during the 38-day 1991 air war.

Exposure to chemical and biological agents alone is one thing. But the effects of these were exacerbated by a whole gamut of other factors to which vets were exposed. Arison enumerates them: nerve agent pretreatment pills, called pyridostigmine bromide, that our service people were ordered to take; investigational botulinum toxoid vaccines; anthrax vaccines; and depleted uranium, used in armor-piercing munitions. Other factors entering into the synergistic mix included oil fire contamination and pesticides, and some people believe that an artificially engineered bacterium/virus cross called a mycoplasma, and, separately, that a vaccine ingredient, the adjuvant squalene, were significant factors too.

Arison emphasizes the point that since different people were exposed to different hazards at different levels, a whole variety of symptomatology have arisen in Gulf War vets. This variability of symptoms is sometimes taken to mean that Gulf War syndrome is a "mystery

illness" or that people are imagining things, when in fact it just shows that the syndrome is a multifactorial problem.

Dr. Garth Nicolson is a specialist in cell biology and biochemistry and a professor of internal medicine and pathology at the University of Texas Medical School in Houston. After extensive study of Gulf veterans' ailments, he estimates that 100,000 Americans have become sick from Gulf War syndrome (this number includes both soldiers and members of their immediate families), and says that over 7000 soldiers may have died. He points out that although Gulf War syndrome is not a universal disease that everyone who served in the Persian Gulf region has acquired, there are entire units that have become sick, which suggests some variance dependent on exact locations within the region.

Nicolson stresses that in addition to affecting Americans, Gulf War syndrome has taken its toll on others who participated in the coalition forces. Currently 27 of the 28 coalition nations have claimed that they have numerous sick veterans--and sick members of veterans' families--and this is especially true in England, where, depending on whose estimates you use, between 1200 and over 3500 Gulf War vets are afflicted with the syndrome, referred to as desert fever in that country. Many Gulf vet families in Britain are suing their government after having had deformed children, and it was reported that at least one ex-soldier has requested a vasectomy because he is terrified of having any more children with problems.

It should be noted that there is a coalition nation not reporting Gulf War illnesses--France. That country has not observed any sick soldiers or affected children, possibly because they did not immunize their troops with experimental vaccines, or because they treated them with the antibiotic doxycycline prior to active service.

An important dimension of the Gulf's health legacy is that families of Gulf War veterans have not been spared from the suffering. Unfortunately, many of them haven't been properly diagnosed, due to the lack of objective clinical findings associated with the syndrome. A survey of 1000 servicemen and women conducted by the Senate Committee on Banking, Housing, and Urban Affairs revealed that an assortment of illnesses associated with Gulf War syndrome are, in fact, contagious. According to Senator Donald Riegle (D.--Michigan), who headed the committee's two-year investigation of Gulf War veterans' health problems, the survey was designed for maximum reliability by inserting a few "ringer" questions to identify false responses, and the replies were indeed consistent with the pool

of common symptoms. In most cases, responses to the poll indicated that spouses and children of Gulf War veterans are experiencing only a few of the indications, whereas the veterans themselves are suffering from up to 20 symptoms.

But both the families and the veterans have suffered because of the government's lack of curiosity about their service people's post-war ailments. Since, until recently, the Department of Defense did not acknowledge the existence of any war-caused illnesses, soldiers who claim that they have the syndrome have been denied proper medical attention and have in some cases been instructed to leave the military. In pain, neglected by their country, and mistakenly diagnosed with psychiatric ailments, many veterans have tragically turned to suicide to cope with a problem that no one seemed to understand or care about.

Symptoms

Gulf War syndrome is manifested in many ways. Chronic fatigue immune dysfunction syndrome affects over half of syndrome victims, according to Dr. Garth Nicolson, who, with his wife, molecular biophysicist and University of Texas professor Dr. Nancy Nicolson, has examined and evaluated many syndrome patients. Other symptoms include lymphoma, cardiac ailments, memory loss, leukoencephalopathy, and neurological diseases such as multiple sclerosis. Public health expert Dr. Leonard Horowitz estimates that 80 to 90 percent 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. Sexual and urination disorders plague numerous victims, while up to 25 percent of syndrome patients have experienced hair loss, and 25 percent have acquired multiple chemical sensitivities, which means they have become allergic to a wide variety of chemical substances and can consequently have severe reactions to even the most common household items.

According to Drs. Garth and Nancy Nicolson, the chronic fatigue immune dysfunction syndrome (CFIDS) characteristic of sick Gulf vets is induced by an unusual microorganism that seems to be the product of weaponization, that is, human manipulation of germs for the purposes of warfare. The Nicolsons report that the organism present in each of the CFIDS patients is an odd variant of a typical mycoplasma. Ordinarily, mycoplasma is across

between a bacterium and a virus, and can be effectively combated with antibiotics. But in this case, the organism contains human immunodeficiency virus (HIV-1) and anthrax genes. Since it is not possible for the typical mycoplasma to naturally mutate into a modified form of anthrax and the alleged AIDS virus, this seems to be an engineered organism. The Nicolsons contend that the U.S. military created this mycoplasma and sold it to Iraq, which subsequently used it against U.S. troops.

The Drs. Nicolson go on to explain that since the mycoplasma sequence associated with the various Gulf syndrome symptoms is quite infectious, prolonged contact, or even casual contact, with an infected person can facilitate its dissemination. In one instance, the wife and children of a soldier serving in Operation Desert Storm became seriously ill after being exposed to clothing sent back from the Gulf region. Within weeks, the soldier's wife and two sons were diagnosed with asthma, while the 22-month-old daughter nearly died from gangrenous lesions. In another case recounted before the Riegle Committee, a nurse whose brother had returned from the Gulf with the disease had had to rush him to the hospital with an abnormally high fever. His sweat, she reported, had actually left reddish burn marks on her skin. Shortly after this incident, the nurse mysteriously contracted several health conditions that could not be explained by doctors.

A New Generation Affected

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. These are just a couple of the Gulf War's second-generation casualties; there are many others, including children who are dying of heart defects, liver diseases, and other rare disorders. It's been estimated that 30 percent of Gulf War veterans' babies are born with deformities; this is ten 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 quartermasters 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.

At a Congressional hearing, Dr. Ellen Silbergeld, a molecular toxicologist at the University of Maryland, reported that men can pass toxic chemicals on to their unborn children through their semen. Indeed, many wives of ill veterans report urinary tract and vaginal infections after sex, and say that their husband's semen burns their skin. And Akron, Ohio, environmental pediatrician Dr. Francis J. Waickman reports a 30-percent rate of abnormalities among Gulf vets' children, which is about 10 times the expected incidence. Waickman reminds us that toxic chemicals can lower immunity and increase susceptibility to infections in newborns, and he speculates that severe chemical exposure can alter genes as well. He offers this advice about our Gulf experience: "To my knowledge, this is the first time we've ever had such a large group exposed to a possible large degree of chemicals, so we better learn from this whole series of events."

One organization attempting to learn more about birth defects in Gulf vets' families is the Orlando, Florida-based Association of Birth Defect Children. They maintain a registry for Persian Gulf War families, and are keeping track of babies with Goldenhar syndrome, missing limbs, chronic infections, failure to thrive, cancer, heart problems, and immune problems.

Steve Miller is a Persian Gulf vet who can explain what the rare condition called Goldenhar syndrome involves because his son, conceived soon after Miller's return from the Gulf, was born with it: "He had hydrocephalus, spinal scoliosis, spina bifida, was missing his left eye and left ear, the heart was on the right side of the body...For a child to be born completely missing an eye, according to the National Institute of Health, is either hereditary or caused by teratogenic exposure [fetal exposure to a substance blocking normal growth]. In our case we both tested negative in genetic testing. The normal occurrence for this type of birth defect is one in 26,500. And I believe as of right now [August '97] we have located 17 children of Gulf War vets with the same birth defect. And there were only 75,000 born after the Persian Gulf War."

Betty Mekdeci, founder of the Association of Birth Defect Children, confirms that Goldenhar syndrome is now occurring disproportionately in Gulf veterans' offspring. And she cites chronic, serious immune problems as the type of problem most frequently reported to the organization in connection with veterans' offspring.

A Multiplicity of Poisons

As we've mentioned, the term Gulf War syndrome is not one, easily defined problem, but rather encompasses a wide variety of ailments. Congressman Steven Buyer from Indiana, whose Army reserve unit was stationed at a prisoner of war camp in the region, feels 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, Representative 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.

Dr. Boaz Milner, of the VA hospital in Allen Park, Michigan, has treated over 300 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, possibly from 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 they might 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, while the fifth form of the syndrome was brought on by the release of biological warfare agents.

Germs from the Gulf are good travelers, according to members of the medical community who have expressed concern regarding the possibility of infectious microorganisms becoming fastened to equipment and other materials. They cite incidences of Navy personnel on aircraft carriers who never set foot on land, but who mysteriously acquired the syndrome subsequent to active duty in the Gulf region. When aircraft returning from overseas service were unloaded in domestic Air Force bases at the conclusion of the war, the contaminated equipment aboard the returning planes may have facilitated the disease's dissemination into the general population. This hypothesis is strengthened by reports of illness in stevedores assigned to unload repatriated transport planes. It is estimated that

clothing brought back by soldiers may contain infectious microorganisms that can survive for up to seven years.

Unproven Vaccines, Unmonitored Medicine

The widespread use of experimental vaccines during Desert Storm has often been cited 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." He explains that during the Gulf War, the established procedures of vaccination were 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.

The troops immunized for the Gulf have been called guinea pigs, and for good reason. They received experimental vaccines, e.g., those for anthrax and botulinum that were not approved for use by the FDA and have since proven 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 their body. Because of these vaccines' experimental nature, many questions have arisen as to why our government dispensed them. Not the least of these questions is, what about the Nuremberg Code? Developed by the Allies after World War II in response to inhumane Nazi experimentation, the Nuremberg code says that voluntary and informed consent is absolutely essential from all human subjects who participate in research, whether during peace or war.

Nerve-gas-counteracting pills were a big problem for many Desert Storm participants. Documents released by the Pentagon in 1995 revealed that high-ranking military officials had pressured the Food and Drug Administration into authorizing experimentation with pyridostigmine bromide (PB) tablets for protection against Iraqi chemical or biological attacks. PB tablets are usually only used for the treatment of the chronic muscle weakness disorder myasthenia gravis, but the military and the FDA waived the traditional informed consent procedures during the early stages of the conflict. Many soldiers did inquire about the classified nature of the pills, but, nevertheless, they were forced to consume them in excessive quantities by their commanding officers. Others, fearing for their safety, ignored

the orders of their superiors after witnessing the pills' highly unpleasant gastric effects upon their fellow servicemen.

Where Was the FDA?

Isn't the FDA responsible for making sure that Americans aren't given unsafe drugs? Shouldn't they at least warn people of possible dangers? They claim they tried. They blame the Pentagon for PB. In May '97, it was reported that a top FDA official told Congress the Pentagon did not keep a promise to fully inform soldiers before giving them the experimental nerve-gas antidotes during the war. The promise to warn soldiers about the drugs had been a condition of the FDA's agreeing, in 1991, to waive standard consent requirements. A Pentagon spokesperson said that information sheets had been sent to the gulf, but sent late. Some members of Congress were outraged upon hearing this. For instance, Christopher Shays (R.--Connecticut), chairman of the Congressional investigating committee, said that the FDA's failure to compel the military to keep its word "blows my mind."

Evidence has indicated that the procedure for administering the pills placed the recipients at risk. Records of who received the pills were not kept, and a standard dosage was distributed, regardless of sex, age, weight, or medical history. What's more, the toxicity of this experimental drug was actually heightened by issuing it along with common household insecticides, a potentially lethal combination.

Nurse Carol Picou, who served in the Gulf, elaborates on the problems with pyridostigmine bromide: "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."

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

James Moss, a former researcher for the Department of Agriculture, has criticized the military's experimentation with PB tablets and has correlated their use with the manifestation of birth defects. At a Congressional Veterans Affairs Committee hearing, committee chairman Senator John D. Rockefeller IV (D.--West Virginia) censured the pentagon for its disregard for human rights and its utter lack of responsibility. Rockefeller believes that the Pentagon had no proof that the drugs or vaccines were safe or effective, yet proceeded to dispense them without first evaluating female recipients or apprising troops of possible side effects.

At that same hearing, Gulf veteran Air Force Lieutenant Colonel Neil Tetzlaff explained to the committee how he and fellow servicemen experienced severe vomiting and other acute conditions after taking PB tablets during the journey to Saudi Arabia. According to Tetzlaff, officials from the Department of Veterans Affairs were reluctant to cooperate with the afflicted soldiers upon their arrival in the Gulf region because they were unable to corroborate that the medication was the cause of their problems. In defense of the pentagon, Assistant Secretary of Defense Dr. Edward Martin asserted that the military was only trying to fulfill its obligations to its troops by offering protection from an enemy who had previously engaged in chemical and biological warfare. Regardless of these good intentions, babies with serious abnormalities continue to be born to demoralized veterans. As Senator Tom Daschle (D.--South Dakota) said at the hearing, "How many more lessons do we have to learn?" He was referring to the military's past experience with Agent Orange during the 1970s.

Adjuvant Antibodies Found

Recently, new information has been brought to light about squalene, an adjuvant (or compound that boosts the effectiveness of a vaccine) that is not supposed to be used in humans except in research on illnesses such as HIV and herpes. However, unusually high antibody levels for squalene have been showing up in the blood of Gulf War vets. This was the gist of an investigation by Insight magazine, which reports that VA spokespeople have no explanation for these findings. 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."

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. It's probably whatever was used with the squalene that's doing it, or in combination with the squalene. You find that, and you may be on to something."

Research immunologist Pam Asa has worked with about 150 individuals with 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 make-up. "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 process, basically. It does also involve neurological disease."

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.'"

Iraq's Deadly Arsenal

Another possible cause of Gulf War syndrome was the presence of biological and chemical additives present in the Scud B and Frog missiles. On May 1, 1996, senior physician at Walter Reed Army Hospital Major General Ronald Blanck 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 Major General Blanck's report--five years after the war--the evidence had been completely disavowed by official sources.

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 Lieutenant General Hussein Kamel Majid, Saddam Hussein's top biological weapons adviser, 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 could be used against any of their foes, including the U.S., Israel, and Saudi Arabia. Prior to the disclosures, Iraq had claimed that it had only ten 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 U.N. 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 way 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 developed by the Iraqis 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 fungi 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 they were, and that they in fact did use them, in 76 incidents. 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. The American Newsweek, as well, reported this fact.

We do 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 Lewicite, a nerve gas that could have been released either by an Iraqi assault or as a result of secondary explosions.

The U.S. as Supplier

A sad irony of the Gulf War involves the origin of Iraq's biological and chemical weapons. At least some of them came from the United States. By sharing weapons and intelligence throughout Iraq's long war with Iran in the 1980s, the U.S. helped create the largest stockpile of chemical weapons in history. That these were later used to our detriment is an example of the phenomenon known as "blow-back," i.e., what happens when we don't look at the long-term consequences of our foreign policy actions.

According to the Riegle report, during the 1980s the U.S. government supplied the Iraqi Atomic Energy Commission with at least 28 biological weapons to use in its bitter war with neighboring Iran. In 1987, then Vice President Bush met with Iraqi officials to ensure that technological equipment used to produce chemical and biological warfare agents would continue to be exported to the Iraqis. When he assumed the presidency, Bush maintained this policy, despite Congressional dissension. Corporations involved in transactions with the Iraqi government, including Hewlett-Packard, Honeywell, Rockwell, and Tektronix, were licensed to export more than \$1.5 million of highly sophisticated equipment in the five years preceding the Gulf War, and these companies frequently delivered their products directly to Iraqi chemical and nuclear plants.

On June 6, 1994, 26 Gulf veterans filed a \$1 billion class action lawsuit in Angleton, Texas, naming 11 firms involved in biological and chemical warfare production as defendants. The attorney for the plaintiffs cited the defendants' cognizant participation in the manufacture of unreasonably dangerous biological compounds as the basis for the suit. In addition, the defendants have also been accused of allowing their business practices to enable an outlaw country like Iraq to obtain and use biological and chemical weapons.

In his report to Congress, Senator Riegle was quite explicit, being able to name the biologicals involved, the batch numbers sent to Iraq, and their dates. For instance, among the agents delivered to various agencies of the Iraqi government were *Clostridium perfringens*, a gaseous gangrene causing agent, *Brucella melitensis*, *Clostridium botulinum*, salmonella, *Klebsiella pneumoniae*, *Escherichia coli*, *Bacillus subtilis*, and *Staphylococcus epidermis*.

The U.S. was a participant in the Geneva Biological Weapons Convention of 1972, and we (as well as Iraq!) signed the resultant agreement that prohibited both experimentation with and the sale of biologicals or weapons of mass destruction. Now, obviously, our government has a considerable interest in keeping the U.S. breach of this agreement covered up. Plus there's the inconvenient fact of our history of cooperation with Saddam Hussein, a tyrant who was denounced by the global community and likened to Adolf Hitler. Embarrassment about revealing our past dealings with our current enemy has hampered our government's readiness to deal fairly with veterans.

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A New Generation Affected

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In Waynesboro, Mississippi, the site of the National Guard quartermasters 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.

At a Congressional hearing, Dr. Ellen Silbergeld, a molecular toxicologist at the University of Maryland, reported that men can pass toxic chemicals on to their unborn children through their semen. Indeed, many wives of ill veterans report urinary tract and vaginal infections after sex, and say that their husband's semen burns their skin. And Akron, Ohio, environmental pediatrician Dr. Francis J. Waickman reports a 30-percent rate of abnormalities among Gulf vets' children, which is about 10 times the expected incidence. Waickman reminds us that toxic chemicals can lower immunity and increase susceptibility to infections in newborns, and he speculates that severe chemical exposure can alter genes as well. He offers this advice about our Gulf experience: "To my knowledge, this is the first time we've ever had such a large group exposed to a possible large degree of chemicals, so we better learn from this whole series of events."

One organization attempting to learn more about birth defects in Gulf vets' families is the Orlando, Florida-based Association of Birth Defect Children. They maintain a registry for Persian Gulf War families, and are keeping track of babies with Goldenhar syndrome, missing limbs, chronic infections, failure to thrive, cancer, heart problems, and immune problems.

Steve Miller is a Persian Gulf vet who can explain what the rare condition called Goldenhar syndrome involves because his son, conceived soon after Miller's return from the Gulf, was born with it: "He had hydrocephalus, spinal scoliosis, spina bifida, was missing his left eye and left ear, the heart was on the right side of the body...For a child to be born completely missing an eye, according to the National Institute of Health, is either hereditary or caused by teratogenic exposure [fetal exposure to a substance blocking normal growth]. In our case we both tested negative in genetic testing. The normal occurrence for this type of birth defect is one in 26,500. And I believe as of right now [August '97] we have located 17 children of Gulf War vets with the same birth defect. And there were only 75,000 born after the Persian Gulf War."

Betty Mekdeci, founder of the Association of Birth Defect Children, confirms that Goldenhar syndrome is now occurring disproportionately in Gulf veterans' offspring. And she cites chronic, serious immune problems as the type of problem most frequently reported to the organization in connection with veterans' offspring.

A Multiplicity of Poisons

As we've mentioned, the term Gulf War syndrome is not one, easily defined problem, but rather encompasses a wide variety of ailments. Congressman Steven Buyer from

Indiana, whose Army reserve unit was stationed at a prisoner of war camp in the region, feels 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, Representative 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.

Dr. Boaz Milner, of the VA hospital in Allen Park, Michigan, has treated over 300 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, possibly from 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 they might 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, while the fifth form of the syndrome was brought on by the release of biological warfare agents.

Germs from the Gulf are good travelers, according to members of the medical community who have expressed concern regarding the possibility of infectious microorganisms becoming fastened to equipment and other materials. They cite incidences of Navy personnel on aircraft carriers who never set foot on land, but who mysteriously acquired the syndrome subsequent to active duty in the Gulf region. When aircraft returning from overseas service were unloaded in domestic Air Force bases at the conclusion of the war, the contaminated equipment aboard the returning planes may have facilitated the disease's dissemination into the general population. This hypothesis is strengthened by reports of illness in stevedores assigned to unload repatriated transport planes. It is estimated that clothing brought back by soldiers may contain infectious microorganisms that can survive for up to seven years.

Unproven Vaccines, Unmonitored Medicine

The widespread use of experimental vaccines during Desert Storm has often been cited 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." He explains that during the Gulf War, the established procedures of vaccination were 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.

The troops immunized for the Gulf have been called guinea pigs, and for good reason. They received experimental vaccines, e.g., those for anthrax and botulinum that were not approved for use by the FDA and have since proven 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 their body. Because of these vaccines' experimental nature, many questions have arisen as to why our government dispensed them. Not the least of these questions is, what about the Nuremberg Code? Developed by the Allies after World War II in response to inhumane Nazi experimentation, the Nuremberg code says that voluntary and informed consent is absolutely essential from all human subjects who participate in research, whether during peace or war.

Nerve-gas-counteracting pills were a big problem for many Desert Storm participants. Documents released by the Pentagon in 1995 revealed that high-ranking military officials had pressured the Food and Drug Administration into authorizing experimentation with pyridostigmine bromide (PB) tablets for protection against Iraqi chemical or biological attacks. PB tablets are usually only used for the treatment of the chronic muscle weakness disorder myasthenia gravis, but the military and the FDA waived the traditional informed consent procedures during the early stages of the conflict. Many soldiers did inquire about the classified nature of the pills, but, nevertheless, they were forced to consume them in excessive quantities by their commanding officers. Others, fearing for their safety, ignored the orders of their superiors after witnessing the pills' highly unpleasant gastric effects upon their fellow servicemen.

Where Was the FDA?

Isn't the FDA responsible for making sure that Americans aren't given unsafe drugs? Shouldn't they at least warn people of possible dangers? They claim they tried. They blame the Pentagon for PB. In May '97, it was reported that a top FDA official told Congress the Pentagon did not keep a promise to fully inform soldiers before giving them the

experimental nerve-gas antidotes during the war. The promise to warn soldiers about the drugs had been a condition of the FDA's agreeing, in 1991, to waive standard consent requirements. A Pentagon spokesperson said that information sheets had been sent to the gulf, but sent late. Some members of Congress were outraged upon hearing this. For instance, Christopher Shays (R.--Connecticut), chairman of the Congressional investigating committee, said that the FDA's failure to compel the military to keep its word "blows my mind."

Evidence has indicated that the procedure for administering the pills placed the recipients at risk. Records of who received the pills were not kept, and a standard dosage was distributed, regardless of sex, age, weight, or medical history. What's more, the toxicity of this experimental drug was actually heightened by issuing it along with common household insecticides, a potentially lethal combination.

Nurse Carol Picou, who served in the Gulf, elaborates on the problems with pyridostigmine bromide: "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."

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

James Moss, a former researcher for the Department of Agriculture, has criticized the military's experimentation with PB tablets and has correlated their use with the manifestation of birth defects. At a Congressional Veterans Affairs Committee hearing, committee chairman Senator John D. Rockefeller IV (D.--West Virginia) censured the pentagon for its disregard for human rights and its utter lack of responsibility.

Rockefeller believes that the Pentagon had no proof that the drugs or vaccines were safe or effective, yet proceeded to dispense them without first evaluating female recipients or

apprising troops of possible side effects.

At that same hearing, Gulf veteran Air Force Lieutenant Colonel Neil Tetzlaff explained to the committee how he and fellow servicemen experienced severe vomiting and other acute conditions after taking PB tablets during the journey to Saudi Arabia. According to Tetzlaff, officials from the Department of Veterans Affairs were reluctant to cooperate with the afflicted soldiers upon their arrival in the Gulf region because they were unable to corroborate that the medication was the cause of their problems. In defense of the pentagon, Assistant Secretary of Defense Dr. Edward Martin asserted that the military was only trying to fulfill its obligations to its troops by offering protection from an enemy who had previously engaged in chemical and biological warfare. Regardless of these good intentions, babies with serious abnormalities continue to be born to demoralized veterans. As Senator Tom Daschle (D.--South Dakota) said at the hearing, "How many more lessons do we have to learn?" He was referring to the military's past experience with Agent Orange during the 1970s.

Adjuvant Antibodies Found

Recently, new information has been brought to light about squalene, an adjuvant (or compound that boosts the effectiveness of a vaccine) that is not supposed to be used in humans except in research on illnesses such as HIV and herpes. However, unusually high antibody levels for squalene have been showing up in the blood of Gulf War vets. This was the gist of an investigation by Insight magazine, which reports that VA spokespeople have no explanation for these findings. 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."

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. It's probably whatever was used with the squalene that's doing it, or in combination with the squalene. You find

that, and you may be on to something."

Research immunologist Pam Asa has worked with about 150 individuals with 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 make-up. "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 process, basically. It does also involve neurological disease."

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.'"

Iraq's Deadly Arsenal

Another possible cause of Gulf War syndrome was the presence of biological and chemical additives present in the Scud B and Frog missiles. On May 1, 1996, senior physician at Walter Reed Army Hospital Major General Ronald Blanck 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 Major General Blanck's report--five years after the war--the evidence had been completely disavowed by official sources.

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 Lieutenant General Hussein Kamel Majid, Saddam Hussein's top biological weapons adviser, 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 could be used against any of their foes, including the U.S., Israel, and Saudi Arabia. Prior to the disclosures, Iraq had claimed that it had only ten 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 U.N. 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 way 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 developed by the Iraqis 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 fungi 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 they were, and that they in fact did use them, in 76 incidents. 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. *The American Newsweek*, as well, reported this fact. We do 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.

The U.S. as Supplier

A sad irony of the Gulf War involves the origin of Iraq's biological and chemical weapons. At least some of them came from the United States. By sharing weapons and intelligence throughout Iraq's long war with Iran in the 1980s, the U.S. helped create the largest stockpile of chemical weapons in history. That these were later used to our detriment is an example of the phenomenon known as "blow-back," i.e., what happens when we don't look at the long-term consequences of our foreign policy actions.

According to the Riegle report, during the 1980s the U.S. government supplied the Iraqi Atomic Energy Commission with at least 28 biological weapons to use in its bitter war with neighboring Iran. In 1987, then Vice President Bush met with Iraqi officials to ensure that

technological equipment used to produce chemical and biological warfare agents would continue to be exported to the Iraqis. When he assumed the presidency, Bush maintained this policy, despite Congressional dissension. Corporations involved in transactions with the Iraqi government, including Hewlett-Packard, Honeywell, Rockwell, and Tektronix, were licensed to export more than \$1.5 million of highly sophisticated equipment in the five years preceding the Gulf War, and these companies frequently delivered their products directly to Iraqi chemical and nuclear plants.

On June 6, 1994, 26 Gulf veterans filed a \$1 billion class action lawsuit in Angleton, Texas, naming 11 firms involved in biological and chemical warfare production as defendants. The attorney for the plaintiffs cited the defendants' cognizant participation in the manufacture of unreasonably dangerous biological compounds as the basis for the suit. In addition, the defendants have also been accused of allowing their business practices to enable an outlaw country like Iraq to obtain and use biological and chemical weapons.

In his report to Congress, Senator Riegle was quite explicit, being able to name the biologicals involved, the batch numbers sent to Iraq, and their dates. For instance, among the agents delivered to various agencies of the Iraqi government were *Clostridium perfringens*, a gaseous gangrene causing agent, *Brucella melitensis*, *Clostridium botulinum*, salmonella, *Klebsiella pneumoniae*, *Escherichia coli*, *Bacillus subtilis*, and *Staphylococcus epidermis*.

The U.S. was a participant in the Geneva Biological Weapons Convention of 1972, and we (as well as Iraq!) signed the resultant agreement that prohibited both experimentation with and the sale of biologicals or weapons of mass destruction. Now, obviously, our government has a considerable interest in keeping the U.S. breach of this agreement covered up. Plus there's the inconvenient fact of our history of cooperation with Saddam Hussein, a tyrant who was denounced by the global community and likened to Adolf Hitler. Embarrassment about revealing our past dealings with our current enemy has hampered our government's readiness to deal fairly with veterans.

Update on April 22, 2010 by Gary Null

What made our Gulf War veterans sick? There were several factors--including unprecedented environmental hazards, chemical and biological warfare agents, pesticides, experimental vaccines, and weapons made from depleted uranium--and it's getting harder for the government to pretend they didn't exist.

CONTENTS

Introduction

Symptoms

A New Generation Affected

A Multiplicity of Poisons

Unproven Vaccines, Unmonitored Medicine

Where Was the FDA?

Adjuvant Antibodies Found

Iraq's Deadly Arsenal

The U.S. as Supplier

The Corporate Connection

Unheeded Alarms

Depleted Uranium

The Downsized Doctors

A Half-Decade of Cover-Up

Other Countries' Experience

A Cover-Up Condemned

The Pentagon Begins to Come Clean

Are Gulf Vets Really Sicker?

Missing Log Pages...And Credibility

Preliminary Panel Report

The Power of Synergy

Strong Insecticides Used

Uncompassionate Care

What Clinton Says

We Need to Learn More

Endnotes

Introduction

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 tens of thousands of our Gulf service people have become sick from a debilitating and sometimes deadly syndrome. The Department of Veterans Affairs has reported that approximately 6000 soldiers have died since the war's conclusion, including 1300 18- to 24-year-olds who were in perfect health prior to the war, but who mysteriously contracted various forms of cancer after their involvement with the military. According to H. Lindsey Arison, III, aide to the undersecretary of the U.S. Air Force, there are now over 50,000 veterans suffering from Gulf War syndrome, including about 11,000 still on active duty. [1]

Arison outlines the causes of Gulf vets' health problems. First, they were exposed to nonlethal levels of chemical and biological agents released primarily by direct Iraqi attack via missiles, rockets, artillery, or aircraft munitions and by fallout from allied bombings of Iraqi chemical warfare munitions facilities during the 38-day 1991 air war.

Exposure to chemical and biological agents alone is one thing. But the effects of these were exacerbated by a whole gamut of other factors to which vets were exposed. Arison enumerates them: nerve agent pretreatment pills, called pyridostigmine bromide, that our service people were ordered to take; investigational botulinum toxoid vaccines; anthrax vaccines; and depleted uranium, used in armor-piercing munitions. Other factors entering into the synergistic mix included oil fire contamination and pesticides, and some people believe that an artificially engineered bacterium/virus cross called a mycoplasma, and, separately, that a vaccine ingredient, the adjuvant squalene, were significant factors too.

Arison emphasizes the point that since different people were exposed to different hazards at different levels, a whole variety of symptomatology have arisen in Gulf War vets. This variability of symptoms is sometimes taken to mean that Gulf War syndrome is a "mystery illness" or that people are imagining things, when in fact it just shows that the syndrome is a multifactorial problem.

Dr. Garth Nicolson is a specialist in cell biology and biochemistry and a professor of internal medicine and pathology at the University of Texas Medical School in Houston. After extensive study of Gulf veterans' ailments, he estimates that 100,000 Americans have become sick from Gulf War syndrome (this number includes both soldiers and members of their immediate families), and says that over 7000 soldiers may have died. He points out that although Gulf War syndrome is not a universal disease that everyone who served in the Persian Gulf region has acquired, there are entire units that have become sick, which suggests some variance dependent on exact locations within the region.

Nicolson stresses that in addition to affecting Americans, Gulf War syndrome has taken its toll on others who participated in the coalition forces. Currently 27 of the 28 coalition nations have claimed that they have numerous sick veterans--and sick members of veterans' families--and this is especially true in England, where, depending on whose estimates you use, between 1200 and over 3500 Gulf War vets are afflicted with the syndrome, referred to as desert fever in that country. Many Gulf vet families in Britain are suing their government after having had deformed children, and it was reported that at least one ex-soldier has requested a vasectomy because he is terrified of having any more children with problems. [2].

It should be noted that there is a coalition nation not reporting Gulf War illnesses--France. That country has not observed any sick soldiers or affected children, possibly because they did not immunize their troops with experimental vaccines, or because they treated them with the antibiotic doxycycline prior to active service.

An important dimension of the Gulf's health legacy is that families of Gulf War veterans have not been spared from the suffering. Unfortunately, many of them haven't been properly diagnosed, due to the lack of objective clinical findings associated with the syndrome. A survey of 1000 servicemen and women conducted by the Senate Committee on Banking, Housing, and Urban Affairs revealed that an assortment of illnesses associated with Gulf War syndrome are, in fact, contagious. According to Senator Donald Riegle (D.--

Michigan), who headed the committee's two-year investigation of Gulf War veterans' health problems, the survey was designed for maximum reliability by inserting a few "ringer" questions to identify false responses, and the replies were indeed consistent with the pool of common symptoms. In most cases, responses to the poll indicated that spouses and children of Gulf War veterans are experiencing only a few of the indications, whereas the veterans themselves are suffering from up to 20 symptoms. [3]

But both the families and the veterans have suffered because of the government's lack of curiosity about their service people's post-war ailments. Since, until recently, the Department of Defense did not acknowledge the existence of any war-caused illnesses, soldiers who claim that they have the syndrome have been denied proper medical attention and have in some cases been instructed to leave the military. In pain, neglected by their country, and mistakenly diagnosed with psychiatric ailments, many veterans have tragically turned to suicide to cope with a problem that no one seemed to understand or care about.

Symptoms

Gulf War syndrome is manifested in many ways. Chronic fatigue immune dysfunction syndrome affects over half of syndrome victims, according to Dr. Garth Nicolson, who, with his wife, molecular biophysicist and University of Texas professor Dr. Nancy Nicolson, has examined and evaluated many syndrome patients. Other symptoms include lymphoma, cardiac ailments, memory loss, leukoencephalopathy, and neurological diseases such as multiple sclerosis. Public health expert Dr. Leonard Horowitz estimates that 80 to 90 percent 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. Sexual and urination disorders plague numerous victims, while up to 25 percent of syndrome patients have experienced hair loss, and 25 percent have acquired multiple chemical sensitivities, which means they have become allergic to a wide variety of chemical substances and can consequently have severe reactions to even the most common household items. [4]

According to Drs. Garth and Nancy Nicolson, the chronic fatigue immune dysfunction syndrome (CFIDS) characteristic of sick Gulf vets is induced by an unusual microorganism that seems to be the product of weaponization, that is, human manipulation of germs for

the purposes of warfare. The Nicolsons report that the organism present in each of the CFIDS patients is an odd variant of a typical mycoplasma. Ordinarily, mycoplasma is a cross between a bacterium and a virus, and can be effectively combated with antibiotics. But in this case, the organism contains human immunodeficiency virus (HIV-1) and anthrax genes. Since it is not possible for the typical mycoplasma to naturally mutate into a modified form of anthrax and the alleged AIDS virus, this seems to be an engineered organism. [5] The Nicolsons contend that the U.S. military created this mycoplasma and sold it to Iraq, which subsequently used it against U.S. troops.

The Drs. Nicolson go on to explain that since the mycoplasma sequence associated with the various Gulf syndrome symptoms is quite infectious, prolonged contact, or even casual contact, with an infected person can facilitate its dissemination. In one instance, the wife and children of a soldier serving in Operation Desert Storm became seriously ill after being exposed to clothing sent back from the Gulf region. Within weeks, the soldier's wife and two sons were diagnosed with asthma, while the 22-month-old daughter nearly died from gangrenous lesions. In another case recounted before the Riegle Committee, a nurse whose brother had returned from the Gulf with the disease had had to rush him to the hospital with an abnormally high fever. His sweat, she reported, had actually left reddish burn marks on her skin. Shortly after this incident, the nurse mysteriously contracted several health conditions that could not be explained by doctors. [6]

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Airborne Division is based, in three counties in Georgia, where the Army's 197th Infantry Division is located, and at Ft. Hood, in Texas.

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One organization attempting to learn more about birth defects in Gulf vets' families is the Orlando, Florida-based Association of Birth Defect Children. They maintain a registry for Persian Gulf War families, and are keeping track of babies with Goldenhar syndrome, missing limbs, chronic infections, failure to thrive, cancer, heart problems, and immune problems.

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The widespread use of experimental vaccines during Desert Storm has often been cited 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." He explains that during the Gulf War, the established procedures of vaccination were 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. [5]

The troops immunized for the Gulf have been called guinea pigs, and for good reason. They received experimental vaccines, e.g., those for anthrax and botulinum that were not approved for use by the FDA and have since proven 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 their body. Because of these vaccines' experimental nature, many questions have arisen as to why our government dispensed them. Not the least of these questions is, what about the Nuremberg Code? Developed by the Allies after World War II in response to inhumane Nazi experimentation, the Nuremberg code says that voluntary and informed consent is absolutely essential from all human subjects who participate in research, whether during peace or war. [11]

Nerve-gas-counteracting pills were a big problem for many Desert Storm participants. Documents released by the Pentagon in 1995 revealed that high-ranking military officials had pressured the Food and Drug Administration into authorizing experimentation with pyridostigmine bromide (PB) tablets for protection against Iraqi chemical or biological attacks. PB tablets are usually only used for the treatment of the chronic muscle weakness disorder myasthenia gravis, but the military and the FDA waived the traditional informed consent procedures during the early stages of the conflict. Many soldiers did inquire about the classified nature of the pills, but, nevertheless, they were forced to consume them in excessive quantities by their commanding officers. Others, fearing for their safety, ignored

the orders of their superiors after witnessing the pills' highly unpleasant gastric effects upon their fellow servicemen.

Where Was the FDA?

Isn't the FDA responsible for making sure that Americans aren't given unsafe drugs? Shouldn't they at least warn people of possible dangers? They claim they tried. They blame the Pentagon for PB. In May '97, it was reported that a top FDA official told Congress the Pentagon did not keep a promise to fully inform soldiers before giving them the experimental nerve-gas antidotes during the war. [12] The promise to warn soldiers about the drugs had been a condition of the FDA's agreeing, in 1991, to waive standard consent requirements. A Pentagon spokesperson said that information sheets had been sent to the Gulf, but sent late. Some members of Congress were outraged upon hearing this. For instance, Christopher Shays (R.--Connecticut), chairman of the Congressional investigating committee, said that the FDA's failure to compel the military to keep its word "blows my mind."

Evidence has indicated that the procedure for administering the pills placed the recipients at risk. Records of who received the pills were not kept, and a standard dosage was distributed, regardless of sex, age, weight, or medical history. What's more, the toxicity of this experimental drug was actually heightened by issuing it along with common household insecticides, a potentially lethal combination.

Nurse Carol Picou, who served in the Gulf, elaborates on the problems with pyridostigmine bromide: [13] "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."

Carol Picou has been experiencing a variety of serious health problems, not the least of which is head-to-toe neurological damage, since her Gulf service. [13]

James Moss, a former researcher for the Department of Agriculture, has criticized the military's experimentation with PB tablets and has correlated their use with the manifestation of birth defects. At a Congressional Veterans Affairs Committee hearing, committee chairman Senator John D. Rockefeller IV (D.--West Virginia) censured the Pentagon for its disregard for human rights and its utter lack of responsibility. Rockefeller believes that the Pentagon had no proof that the drugs or vaccines were safe or effective, yet proceeded to dispense them without first evaluating female recipients or apprising troops of possible side effects. [14]

At that same hearing, Gulf veteran Air Force Lieutenant Colonel Neil Tetzlaff explained to the committee how he and fellow servicemen experienced severe vomiting and other acute conditions after taking PB tablets during the journey to Saudi Arabia. According to Tetzlaff, officials from the Department of Veterans Affairs were reluctant to cooperate with the afflicted soldiers upon their arrival in the Gulf region because they were unable to corroborate that the medication was the cause of their problems. In defense of the Pentagon, Assistant Secretary of Defense Dr. Edward Martin asserted that the military was only trying to fulfill its obligations to its troops by offering protection from an enemy who had previously engaged in chemical and biological warfare. Regardless of these good intentions, babies with serious abnormalities continue to be born to demoralized veterans. As Senator Tom Daschle (D.--South Dakota) said at the hearing, "How many more lessons do we have to learn?" He was referring to the military's past experience with Agent Orange during the 1970s.

Adjuvant Antibodies Found

Recently, new information has been brought to light about squalene, an adjuvant (or compound that boosts the effectiveness of a vaccine) that is not supposed to be used in humans except in research on illnesses such as HIV and herpes. However, unusually high antibody levels for squalene have been showing up in the blood of Gulf War vets. This was the gist of an investigation by Insight magazine, [15] which reports that VA spokespeople have no explanation for these findings. 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."

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. It's probably whatever was used [mixed] with the squalene that's doing it, or in combination with the squalene. You find that, and you may be on to something."

Research immunologist Pam Asa has worked with about 150 individuals with 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 make-up. "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 process, basically. It does also involve neurological disease." [16]

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.'" [17]

Iraq's Deadly Arsenal

Another possible cause of Gulf War syndrome was the presence of biological and chemical additives present in the Scud B and Frog missiles. On May 1, 1996, senior physician at Walter Reed Army Hospital Major General Ronald Blanck 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 Major General Blanck's report--five years after the war--the evidence had been completely disavowed by official sources.

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 Lieutenant General Hussein Kamel Majid, Saddam Hussein's top biological weapons adviser, 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 could be used against any of their foes, including the U.S., Israel, and Saudi Arabia. Prior to the disclosures, Iraq had claimed that it had only ten 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 U.N. 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 way 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 developed by the Iraqis 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 fungi 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*[18] documents that they were, and that they in fact did use them, in 76 incidents. 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. [19] The American Newsweek, as well, reported this fact. [20]

We do 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 Lewicite, a nerve gas that could have been released either by an Iraqi assault or as a result of secondary explosions.

The U.S. as Supplier

A sad irony of the Gulf War involves the origin of Iraq's biological and chemical weapons. At least some of them came from the United States. By sharing weapons and intelligence throughout Iraq's long war with Iran in the 1980s, the U.S. helped create the largest stockpile of chemical weapons in history. That these were later used to our detriment is an example of the phenomenon known as "blow-back," i.e., what happens when we don't look at the long-term consequences of our foreign policy actions.

According to the Riegle report, during the 1980s the U.S. government supplied the Iraqi Atomic Energy Commission with at least 28 biological weapons to use in its bitter war with neighboring Iran. In 1987, then Vice President Bush met with Iraqi officials to ensure that technological equipment used to produce chemical and biological warfare agents would continue to be exported to the Iraqis. When he assumed the presidency, Bush maintained this policy, despite Congressional dissension. Corporations involved in transactions with the Iraqi government, including Hewlett-Packard, Honeywell, Rockwell, and Tektronix, were licensed to export more than \$1.5 million of highly sophisticated equipment in the five years preceding the Gulf War, and these companies frequently delivered their products directly to Iraqi chemical and nuclear plants. [21]

On June 6, 1994, 26 Gulf veterans filed a \$1 billion class action lawsuit in Angleton, Texas, naming 11 firms involved in biological and chemical warfare production as defendants. The attorney for the plaintiffs cited the defendants' cognizant participation in the manufacture of unreasonably dangerous biological compounds as the basis for the suit. In addition, the defendants have also been accused of allowing their business practices to enable an outlaw country like Iraq to obtain and use biological and chemical weapons. [22]

In his report to Congress, Senator Riegle was quite explicit, being able to name the biologicals involved, the batch numbers sent to Iraq, and their dates. For instance, among the agents delivered to various agencies of the Iraqi government were *Clostridium perfringens*, a gaseous gangrene causing agent, *Brucella melitenis*, *Clostridium botulinum*, salmonella, *Klebsiella pneumoniae*, *Escherichia coli*, *Bacillus subtilis*, and *Staphylococcus epidermis*.

The U.S. was a participant in the Geneva Biological Weapons Convention of 1972, and we (as well as Iraq!) signed the resultant agreement that prohibited both experimentation with and the sale of biologicals or weapons of mass destruction. Now, obviously, our government has a considerable interest in keeping the U.S. breach of this agreement covered up. Plus there's the inconvenient fact of our history of cooperation with Saddam Hussein, a tyrant who was denounced by the global community and likened to Adolf Hitler. Embarrassment about revealing our past dealings with our current enemy has hampered our government's readiness to deal fairly with veterans.

The Corporate Connection

The January 1996 issue of *Media Bypass* magazine [23] carries a hard-hitting article by Sarah McClendon that exposes U.S. corporations' production and sale of chemical and biological weapons to Iraq. McClendon writes that "Proof is building upwards, stronger than ever, that big U.S. corporations made the weapons that Iraq's Saddam Hussein used to kill American soldiers in the Persian Gulf war. These corporations also provided the chemical and biological weapons that the Iraqis used to make thousands of surviving soldiers chronically ill."

The article goes on to condemn both the Bush and Clinton administrations' Justice Departments for agreeing not to prosecute the big-name American corporations for trading with the enemy: "The building up of Iraq's weapons, paid for by U.S. taxpayers, was conducted for years before the Persian Gulf war and after it started...But at this very moment, the Clinton Justice Department turned this question over to the Treasury Department's Office of Foreign Assets Control where, at first, officials were pondering whether this should be treated as a criminal or civil offense."

Even after being warned, the Clinton administration assigned the same FBI men, the same prosecutors who had ruled that the corporations during the Bush administration should not

be prosecuted, to investigate the case to see if charges should be filed against the corporations and their officers. In 1995 the Justice Department said it did not prosecute the corporations because they did not have the proof to win the case.

Not to be overlooked is the matter of the \$5 billion loan to Iraq from the BNL Italian bank of Rome which was guaranteed by U.S. taxpayers through the Department of Agriculture's Commodity Credit Corporation. Iraq turned this loan into letters of credit with which it bought \$5 billion in weapons (including biologicals and Scuds from the U.S.), and when Iraq later defaulted on the loan, the U.S. taxpayer essentially paid the bill for weapons that were later shot back at U.S. soldiers.

Why was there no investigation? When Sarah McClendon asked George Bush to give the public a list of the corporations in the Pittsburgh area that were making weapons for Saddam Hussein, he refused. Perhaps it was no coincidence that these corporations were tied to the Brown Brothers Harriman Bank, which had been managed by President Bush's father, the late Senator Prescott Bush.

Says McClendon: "How was this cover-up of the manufacture of weapons for Iraq arranged in the U.S.? Bush arranged for 70 percent of the policy-makers in the Justice Department to remain in their jobs when the transition from Bush to Clinton took place. They took a lower pay scale, but stayed in control. These holdovers are running the Justice Department today. Clinton has been told about this, but somehow he does not seem to act on the information."

Unheeded Alarms

Many Gulf War veterans have testified that chemical warfare detector alarms at bases across the region were frequently triggered, yet troops were ordered to ignore the alarms. According to General Colin Powell, who had been chairman of the Joint Chiefs of Staff during the war, American commanders had believed the frequent alarms to be false, because nobody seemed to be getting sick immediately. It was believed by those involved that you had to become obviously ill at the time of exposure to chemical or biological agents for exposure to mean anything. [24]

One veteran who did get immediately ill, Petty Officer Sterling Symms of the Naval Reserve Construction Battalion, was stationed in Saudi Arabia when one morning he was awakened by an extremely loud explosion overhead. Right after the detonation, chemical alarms were

sounded, and a strong ammonia-like aroma permeated the air. Before he could rush to get his protective gear on, Symms's face and eyes began to burn; several months later, he began to suffer from typical Gulf vet symptoms, including chronic fatigue, open sores, and rashes. Symms and several of his comrades, who had contracted similar symptoms, described to Congress how they were issued orders by their commanding officers to avoid any further discussion of the incident.

Another veteran who testified before the Riegle Committee, Army Sergeant Randall L. Vallee, explained how orders to ignore chemical-detector alarms were rationalized by a variety of absurd scenarios, such as the idea that supersonic aircraft or sand-infested equipment had triggered the alarms. Vallee, like Symms, testified that the alarms frequently sounded throughout the conflict, especially after Iraqi Scud attacks. In Senator Riegle's report, it was confirmed that 14,000 chemical alarm monitoring units were installed by the military throughout the region to provide an early warning of imminent gas attacks, but many of them were disarmed after they began to sound too frequently. Members of the Riegle Committee chastised the Department of Defense for its apathetic disregard for the safety of our service people, concluding that the Department's insistence that all of the alarms had been false was a little hard to believe.

Interestingly, after his testimony before Congress, Sergeant Vallee received a phone call from Lieutenant Colonel Vicki Merriman, an aide to the deputy assistant secretary of defense for chemical and biological matters, who, after initially seeming sympathetic, interrogated the veteran and attempted to alter his recollections. [25]

Depleted Uranium

There's an aspect of our participation in the Gulf that hasn't gotten wide publicity, but should: our use of depleted uranium. Depleted uranium is a byproduct of the uranium enrichment process. [26, 27] 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 depleted uranium 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 depleted uranium 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 in its enthusiasm for depleted uranium is that the downside to this technology far outweighs its benefits. Once bullets reach their destination, 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.

U.S. and British forces used Operation Desert Storm as a testing ground for the widespread employment of depleted uranium. It is estimated that over 940,000 30-mm uranium-tipped bullets and 14,000 large-caliber depleted rounds were used. Between 350 and 800 tons of depleted uranium residue, with a half-life of 4.4 billion years, permeate 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 close 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 depleted uranium in the body was illustrated by scientists at the Defense Department 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 depleted uranium 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. [28]

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 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 depleted uranium released into the atmosphere poses the same grave dangers as does any other exposure to uranium. [29] "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. 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 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."

There have been several army reports on the dangers of depleted uranium, which have been released by the Depleted Uranium Citizens' Network. [27] Sara Flounders, coordinator of the International Action Center, a network of organizations and activists initiated by former U.S. Attorney General Ramsey Clark, points out that one of these reports, which was put out by the Army Environmental Policy Institute, discusses the negative health and environmental consequences of depleted uranium use in the army. [30] According to the report, the financial implications of long-term disability payments and other health care costs would be excessive if depleted uranium was indicted as a causative agent for Desert Storm illnesses. This may be why depleted uranium is not being discussed as a cause of Gulf War syndrome, Flounders feels.

The Downsized Doctors

Dr. Asaf Durakovic was a chief of nuclear medicine at the VA Medical Center in Wilmington, Delaware. After the war, Dr. Durakovic tried to test members of the 144th Service and Supply Company for depleted-uranium contamination. This was a unit that had been salvaging equipment that had been hit by depleted-uranium rounds. Durakovic first tested the vets and concluded that 14 out of 24 were contaminated. But since his testing equipment was outdated, Durakovic proceeded to send urine samples from the vets to be tested at the U.S. Army Radiochemistry Laboratory in Aberdeen, Maryland.

This proved impossible. A number of the samples apparently never made it to the lab, and the ones that did were lost. What's more, the VA decided against further testing. Dr. Durakovic was told by both the VA and the Department of Defense to stop his depleted uranium investigation. Then, after eight years of outstanding performance at his VA position, he ended up losing his job "because of cutbacks." Meanwhile two of the vets exposed to uranium died. The Pentagon released a paper stating that uranium had not been proven to cause health problems, but Durakovic points out that they were looking for short-term, not long-term hazards. [31] He also has stated that he feels certain that he was terminated from his job as a direct result of his involvement in the management of Gulf War veterans and his raising of nuclear safety issues.

Dr. Durakovic testified before a House of Representatives subcommittee in June 1997, estimating that 123,000 troops had been exposed to depleted uranium through contact with captured Iraqi tanks. "Those that were required to receive the vehicles actually lived very near them, ate lunch on top of them, and cooled themselves inside of them," he reported. "On Mar. 10, 1991, a Battle Damage Assessment Team dressed in full radioprotective clothing arrived, stating that they were from Washington to assess the radioactivity of specific tanks. They reviewed the tanks for four days, fully dressed in 90 degree temperatures. At the conclusion of the assessment the soldier in charge of the crew, required to move the equipment, was told that the tanks were 'hot,' to mark them with the atomic symbol, and not to let people go near them. The assessment team had detected 0.26 to 1.0 rad inside the tanks....The team stated that the tanks were not dangerous to those required to work in their environment. One soldier was given an outdated dosimeter which began to detect radiation right away despite the fact that it was long past its expiration date....All work that was conducted on behalf of DU contamination was coordinated through the Persian Gulf Registry of the Wilmington VA hospital. All records were subsequently lost." [32]

The Radiochemistry Lab in Aberdeen, Maryland, does admit to losing Dr. Durakovic's medical tests. What's more, Durakovic had also sought help from the Boston VA Medical Clinic. Two physicians from the Boston VA, Dr. Burroughs and Dr. Slingerland, asked for more sensitive equipment to better diagnose the 24 soldiers of the 144th Service and Supply Company who had been referred to them by Dr. Durakovic. The two lost their jobs.

Concerning testing for exposure to depleted uranium, Dan Fahey, legal assistant and outreach worker at Swords to Plowshares, a San Francisco veterans service organization, brings up the point the urinalysis tests will give accurate results only if they're used within a year of exposure. That's because, for a year, the body naturally purges most of the uranium that's been inhaled or ingested, and after a year, although the substance remains in the bones, kidneys, and lungs, it's not being excreted in the urine. Thus, today, this type of test is useless. [33]

Fahey also describes a 1991 incident in Kuwait during which troops were unknowingly exposed to depleted uranium:

"There was a fire in July 1991 in Doha, Kuwait, in which there were several thousand DU rounds that burned up in this very large fire. There were severe explosions for six hours. The fire raged until the following day. And through the Freedom of Information Act we learned that while this fire was going on there was an explosive ordnance disposal team that was rushed to the scene of the fire, but before they arrived they warned the commanders at the Doha base...that DU rounds were burning, that they should keep the people out of the downwind area, and that they should issue respiratory protection. And we also know that that message was never passed down to the troops. And as a result some people were exposed during the fire." [33]

Fahey goes on to explain that troops were exposed after the fire as well. Given no information about the presence of depleted uranium contamination, they were assigned to clean up the compound with brooms, shovels, and their hands, and were given no protection.

According to the Depleted Uranium Education Project, [34] "the fire at the U.S. Army Black Base in Doha, Kuwait, destroyed more than 660 large-caliber DU tank rounds, 9720 small-caliber DU rounds, and four M1A1 tanks with DU armor. Over 9000 pounds of DU penetrators were lost in the fire, exposing thousands of vets to airborne uranium oxides.

Despite the known health problems of vets, the U.S. Army's report on exposures to depleted uranium at Doha has not even been released to the Presidential Advisory Committee on Gulf War Illnesses, and U.S. troops continue to be stationed at Doha."

A Half-Decade of Cover-Up

From 1991 to 1996, the Pentagon basically took a see-no-evil approach regarding the causes of Gulf War syndrome. In a document entitled "Memorandum for Persian Gulf Veterans," released on May 25, 1994, Defense Secretary William Perry and Joint Chiefs of Staff chairman General John Shalikashvili assured veterans that there was no evidence, classified or unclassified, suggesting that chemical or biological weapons were used in the Gulf, while a June 23, 1994, report by the Pentagon's science board attempted to reinforce that argument, asserting that servicemen were not exposed to chemical or biological elements at any level. During the initial stages of the Reigle investigation, Senator Riegle inquired as to the possibility that allied exposure to chemical and biological agents was responsible for the manifestation of post-war illnesses. Walter Reed's Major General Blanck responded that the issue had not been addressed because military intelligence maintained that such exposures never occurred.

But consider this: Official documents at Defense Department headquarters reveal that several American soldiers participating in Desert Storm were commended for their role in ascertaining the presence of hazardous chemical agents. For example, Army Private Allen Fisher was awarded the bronze star for the first confirmed detection of chemical-agent contamination in the theater of operations, while Captain Michael Johnson of the Nuclear, Chemical, and Biological Branch of the Army was given the Meritorious Service Medal for a similar action. A question naturally arises as to why these men were commended for pointing out chemical-agent threats, if the powers that be really thought there weren't any!

On Oct. 8, 1994, after reviewing the Pentagon's service records and considering the accounts of soldiers who had witnessed the events in the Gulf firsthand and had received official commendations for their heroic actions, Senator Riegle berated the Defense Department for its inconsistency.

Other Countries' Experience

Lieutenant Louise Richard of the Canadian Navy served as an operating room nurse in the Gulf, where she treated numerous American and British servicemen, as well as Iraqi

prisoners of war. In September 1995 Richard was discharged after eight years of lauded service because her health had deteriorated significantly subsequent to her overseas service. Richard's symptoms mimicked those of many other combat veterans, but when she complained to her superiors regarding the lack of acknowledgment of her combat-related illness and threatened to seek redress in the media, she was warned that she would be jeopardizing her career and her pension. "We were valued individuals when we were sent there," she says, but "now we're back, and we're not valued individuals at all."

It's important to remember that United States troops have not been the only victims of governmental callousness. Other allied governments, including those of Canada, Great Britain, and Kuwait, also disavowed evidence of chemical and biological warfare for a long period. According to an Oct. 10, 1995, article in the British newspaper Today, the British Ministry of Defense instituted a policy of denying the existence of what is known in that country as desert fever, for fear of big compensation claims. In an interview with the paper, a British Defense spokesperson alleged, "We have no evidence that this illness exists." This was an odd declaration when you considered that over 1000 of the 43,000 British veterans deployed to the Gulf reported that they were suffering from the syndrome.

Corporal Richard Turnball, an 18-year member of the Royal Air Force who participated in the Gulf conflict, asserts that a multitude of British veterans returned home suffering from various acute symptoms. Turnball, who was stationed in Dhahran, Saudi Arabia, during the war, aided in the construction of nuclear, biological, and chemical shelters, and educated British troops as to the correct use of chemical monitors and protective gear. According to Corporal Turnball, the use of chemical and biological weapons by the Iraqis was deemed inevitable by British intelligence reports prior to the war. During the conflict, Turnball claims that the inevitable came to pass many times; he personally witnessed casualties suffering from chest and eye ailments, infections, and skin irritations. But despite a multitude of warnings and reliable documentation by highly advanced equipment, the British Ministry of Defense denied the incidences, asserting that the alarms were activated by aircraft fuel.

Another British veteran, Corporal Terry Walker, recalled the sounding of chemical monitoring devices at approximately 2:30 a.m. on Jan. 20, 1991, after several Scud missiles exploded overhead. Military officials attempted to attribute the alarms and the explosions to supersonic aircraft, but Walker explains that their justification seemed

ridiculous for two reasons: First, alarms within a 15-mile radius had been activated almost simultaneously, and second, the alarms had never been triggered by aircraft in the past. Corporal Walker, who had difficulty donning his gas mask during the attack, recalls experiencing an ammonia-like smell and a burning sensation on his body. Since his return from active service he has been plagued by a multitude of ailments, including chest infections, rashes, and headaches, and his wife and daughter have been afflicted as well.

The British medical establishment has begun, recently, to look into the Gulf War's repercussions for their veterans. According to the British Medical Association, a pilot study was conducted on 14 veterans, 12 men and two women, with an average age of 34. These veterans, who were randomly selected from a long list of many with unexplained illnesses, underwent a variety of tests, and the results were compared with those of a group of 13 healthy civilians. The tests included established techniques assessing the function of nerve function in the limbs, transmission of impulses between nerves and muscles, and movement of nerve signals through pathways in the brain and spinal chord. The researchers concluded that the tests revealed evidence of problems in the nervous systems of the veterans, particularly in the nerves of the arms and legs. [35]

Kuwaiti sources have also reported new health problems since the war. At the Kuwaiti Ministry of Public Health, Dr. Saleh Al-Harbi has verified that a significant number of Kuwaiti citizens are suffering from a variety of chronic illnesses evidently induced by exposure to either chemical or biological agents. Since the war's conclusion a variety of inexplicable diseases, such as rare blood disorders, have surfaced, and the rate of birth defects has increased dramatically. Dr. Al-Harbi, like many of his American peers, believes that the syndrome is a form of multiple chemical sensitivity. The Kuwaiti government, however, continues to emulate the official policies of their Western saviors by downplaying the problem. [25]

A Cover-Up Condemned

The Riegle report essentially accuses the Department of Defense of lying to the American public, and condemns it for abandoning the servicemen who were willing to die for their country. Senator Riegle referred to the heartlessness and irresponsibility of the military bureaucracy, concluding that there is no more serious crime than a cover-up of facts that could facilitate the diagnosis and treatment of sick U.S. veterans. [25] The military establishment was fully aware that Sadaam possessed biological weapons, was willing to

use them, and, in fact, did use them; but despite concrete evidence, John Deutch, director of the CIA, and General John Shalikashvili, chairman of the Joint Chiefs of Staff, continued to deny the use of biological or chemical weapons by either side.

Proof contradicting the official government position exists in the Nuclear, Biological, and Chemical (NBC) logs maintained by General Schwartzkopf at Central Command. These records indicate that U.S. forces were able to confiscate chemical and biological weapons, and cite the specific days on which the acquisition of weapons took place. In addition, the NBC logs detail plans for the destruction of the confiscated materials, and reveal that the military did not want to destroy the weapons in bulk, as such an action may have precipitated an international incident. Many of the NBC logs for the Gulf War have been smuggled out of the Department of Defense by veterans, who were able to circulate them and prove to the public that the U.S. government had full knowledge of the presence of biological warfare agents in Iraq.

Unfortunately, assessment of the magnitude of Gulf War syndrome has been made more difficult by the military's unbelievable ability to misplace essential information. While some of the documents may have been legitimately lost or misplaced, others seem to have been intentionally destroyed in an attempt to conceal information from the public. For instance, a request to view documents by the Gulf War Veterans of Georgia was rejected by Lieutenant Richard I. Neal, deputy commander of the U.S. Central Command, who justified his response by referring to national security interests. Two months after the initial request was filed, additional inquiries to view the documents were also declined, but this time, veterans groups were informed that the documentation no longer existed.

All branches of the armed forces have been implicated in the destruction of vital records. Corporal Patrick Weissenfluh and Sergeant Todd See, two Marines who were stationed at Camp Pendleton, San Diego, witnessed the burning of hundreds of medical records, while Navy Captain Julia Dyckman experienced a similar situation, in which records sent overseas were mysteriously lost. Despite the excuses of faulty record keeping that were given, Senator Riegle's investigative committee found the pattern of misplaced files and service records within the Department of Defense to be highly irregular. [21]

In addition to exposing governmental negligence and illegal business activities, Senator Riegle's two-year study disclosed information pertaining to the 12 biological, 18 chemical, and four nuclear facilities within Iraq that were destroyed by coalition forces. After the

attacks, atmospheric currents transported malignant airborne debris to the vicinity of Allied troops; this is documented in U.S. satellite photos. Prior to the destruction of Iraqi facilities, former Soviet chemical-biological warfare expert Ivan Yevstafyev, as well as scientists from several prominent laboratories, including Sandia, Los Alamos, and Livermore National Laboratories, warned of the danger of chemical fallout, but their advice was ignored. General Raymond Germanos of the French Ministry of Defense prepared a report that in February 1991 confirmed the presence of chemical fallout in the region, while in July 1993 a report by the Czech Ministry of Defense revealed traces of dangerous nerve gases, including sarin and Yperite. [21] In a classified briefing on Oct. 28, 1993, the Pentagon acknowledged the Czech report, but refused to comment. After a few weeks of silence, Defense Secretary Les Aspin did finally accept the possibility of low-level exposure to mustard gas and sarin, but nevertheless maintained that a correlation still could not be established between chemical agent exposure and any of the ailments that had arisen in the approximately 9000 vets that had already registered with the VA for examination of their symptoms.

At a Senate Veterans Affairs Committee hearing shortly thereafter, Aspin's see-no-evil attitude was challenged by Chief Warrant Officer Joseph P. Cottrell of the Marine Corps. According to Cottrell, his unit, while in Kuwait, had employed a highly sophisticated German chemical detection vehicle known as the Fox, which had detected the release of a chemical agent capable of inducing severe blistering. The Department of Defense attempted to counter Cottrell by attributing the detection to the presence of airborne oil debris, but further investigation by Congressman Joseph Kennedy discredited the Pentagon's rebuttal by disproving the possibility of system malfunction.

A similar scenario was documented by Gulf veterans William Hicks and Sterling Sims of the Alabama National Guard in testimony before the Senate Armed Services subcommittee on military health care. Hicks attested to the release of chemical weapons by the Iraqis on the first day of the war, January 17, 1991. He recalled experiencing a burning sensation as he and other members of his unit rushed to don protective suits after emergency alarms went off. Sims showed those at the hearing the red welts with which he'd been afflicted since returning from active service. He then explained to the committee how the VA medical center in Birmingham, Alabama, had attempted to recommend a psychiatrist to help him cope with his problem. [36]

The Pentagon Begins to Come Clean

It was at a Washington press conference on June 21, 1996, that the Pentagon finally began to drop its know-nothing stance. They admitted that the demolition of an Iraqi ammunition depot, just after the war's end, may have released chemical agents, including mustard gas and sarin. [37] According to Defense Department officials, United Nations inspectors who had visited the site at the Kamisiyah ammunition depot in southern Iraq in May 1996 had verified traces of these deadly gases at the ruins of a bunker destroyed in March 1991. At the press conference, Pentagon spokesperson Kenneth Bacon also admitted that documentation of this incident had existed as early as 1991, but that it had been temporarily misplaced in the abundance of Pentagon paperwork. The lost-paperwork excuse, though, was too familiar. Commented Senator John D. Rockefeller of West Virginia, "The guy [Bacon] was incoherent because he was faced with having to tell the truth. He was distinctly uncomfortable...They've known all along. How could they possibly not have known all along?" [4]

In that June '96 press conference, the Pentagon did admit that some illnesses may have resulted from the Kamisiyah incident. At that time they spoke of, at most, a couple of hundred soldiers being exposed to chemical weapons gases. From there, though, the numbers of exposed troops changed and the story seemed to worsen practically every day. During the second half of '96, and beyond, there was a cascade of revelations about our Gulf experience and today, you didn't have to be a conspiracy theorist--simply a reader of the mainstream media--to understand that our government has been trying to hide important facts from us for most of this decade.

You can't get more mainstream than The New York Times. From page 1 of the Aug. 28, 1996 issue [38] we learned that top echelons of government, i.e., the Pentagon, the White House, the CIA, and the State Department, had been informed in 1991 that chemical weapons were in fact stored at the Kamisiyah site. Yet an official line of no use, exposure, or presence of chemical weapons in the Gulf War had been upheld until '95. [39] During the next few months, the number of exposed troops kept rising. On Sept. 7, '96, the Associated Press reported that a presidential panel was upping the number of troops exposed to toxic gas at the Kamisiyah demolition from a few hundred to 1100. [40] September 19 saw that number rise dramatically, to 5000, raising with it, as even The Times admitted, new questions about the Pentagon's credibility. [41]

In October, the military's medical records were assailed as being of poor quality by a National Academy of Sciences panel. This obviously hampers our understanding of Gulf veterans' health problems, as the group's chairman noted. The number of troops that might have been exposed to chemical weapons gases at Kamisiyah had been raised to 15,000 by this time. [42] Also in October '96 came news that the White House panel studying Gulf veterans' illnesses found the Defense Department's attitude toward veterans "patronizing or dismissive." [43] Plus it was widely reported that the Czechs, participants with us in Operation Desert Storm and world-recognized chemical detection experts, had warned American commanders about low levels of nerve and mustard gas during the war, but had been ignored. Many Czech veterans have also become sick, it was reported. [44] And in a lengthy Oct. 30, 1996 Times story, [25] two ex-CIA employees asserted that that agency had evidence of up to 60 Gulf War incidents of American troop exposure to chemical weapons. Tens of thousands of our people in the Gulf may have been exposed, said Patrick Eddington, who had specialized, before resigning from the CIA, in analyzing aerial photographs from that region. His wife, Robin Eddington, who has also resigned, reported having seen, during her CIA tenure, classified information to the effect that trace exposure to chemical weapons, over an extended period, can cause illness. The Defense Department has officially denied this possibility. [45]

In November '96, the Pentagon figure for soldiers who might have been at risk in the Kamisiyah demolition was reported at 20,000. [46] And the White House panel was calling for the independent investigation of more than 15 additional Gulf War incidents of chemical weapons detection, and accusing the Pentagon of poor medical record-keeping. [47]

Are Gulf Vets Really Sicker?

For years now, there has long been the idea that while Gulf War syndrome illnesses may exist, they're really an old problem--a response to stress--with a new name, and that Gulf veterans are in reality no sicker than other vets. But in November '96, the chairwoman of a federal panel investigating the issue contended that Gulf conflict participants are in fact sicker than other soldiers. [48] Prominent toxicologist Eula Bingham concluded that, clearly, Gulf vets were suffering from a disproportionate level of ailments. One of the reasons this had been unclear probably had to do with what investigators were looking at. While government reports had shown that our Gulf troops were not dying or falling

seriously ill at disproportionate rates, many of the vets' ailments--such as gastrointestinal symptoms, chronic fatigue, and aching joints--do not usually result in what researchers had been looking for--hospitalization or early death. Thus, the vets' symptoms were not taken into proper account.

Dr. Bingham and other members of the Persian Gulf Expert Scientific Committee of the Department of Veterans Affairs, feel that chemical exposure has to be looked into, both from weapons and from other sources, such as the Kuwaiti oil-well fires. A point that panel members emphasized was that battlefield stress has been overrated as a causative agent of the symptomatology.

Two government reports substantiated Dr. Bingham's conclusion that Gulf vets are sicker than others. Both the Centers for Disease Control and the Navy, it was reported in November '96, [49] had the same finding, citing significantly raised rates of chronic diarrhea, joint pain, skin rashes, fatigue, depression, headaches, and memory loss for Gulf vets, compared to troops who had served elsewhere. And memory loss was the subject of research made public in spring '97. Rats injected with the family of chemicals that includes the nerve gas sarin and pesticides exhibited brain damage similar to that in people with memory loss. The Pentagon described these finding as important but, typically, said it was too early to draw firm conclusions. [50]

Underscoring the complexity of the problems that vets are experiencing was the January 1997 issue of the Journal of the American Medical Association. It featured four studies on Gulf War syndrome, one of which concluded that the syndrome is actually six syndromes, the most serious of which is characterized by problems in thinking and reasoning, confusion, and dizziness. Another syndrome is marked by joint pain, muscle fatigue, tingling, and numbness. Another study of sick Gulf War vets found evidence of subtle neurological damage compatible with exposure to combinations of cholinesterase-inhibiting chemicals. [51].

Missing Log Pages...and Credibility

Echoes of Watergate seemed to resound in December '96, when it was revealed that military records from a 7-day period right after the Gulf War (Mar. 4-10, 1991) were reported lost by the Pentagon. It was within this time frame that the Kamisiyah arms depot was blown up. [52] Former Senate investigator James Tuite voiced the skepticism of many

when he said, "This was the historical record of what was supposedly the brightest moment in the last 50 years of American military history, and now they say they've misplaced part of the historical record?" [52] Subsequent information (from March '97) provided by the Pentagon estimates that 80 percent of the logs are missing. According to the Department of Defense, they had managed to track down only 36 pages of the known 200 pages of log material. The 36 pages show repeated warnings that Iraqi chemical weapons were detected, but these were all called false at the time by commanders. The logs for the destruction of Kamisiyah were still unfound. [53]

Tuite did get some information recently, through the Freedom of Information Act, that shed light on Kamisiyah. He obtained a report given to the Air Force by the Livermore National Laboratory three months before the war, the essence of which was that bombing Iraq's arsenals would release deadly nerve agents that could endanger our troops, given the direction of prevailing winds. [54] The Livermore predictions had been kept under wraps for seven years.

"This latest bombshell is no surprise," commented Representative Christopher Shays (R.--Connecticut), chairman of the House Subcommittee on Human Resources. In other words, cover-up is par for the governmental course.

So are outspoken doctors who end up losing their jobs. This is an issue that keeps surfacing. Indeed, in December '96, the leader of a Congressional investigation into Gulf vets' illnesses accused the Department of Veterans Affairs of trying to rid that agency of doctors who questioned official government positions. [55] According to Representative Shays, the veterans' agency threatened to fire doctors who gave voice to the ideas that exposure to chemical agents in the Gulf made Americans sick, or that there was an infectious agent endemic to the region responsible for our soldiers' illnesses. For instance, one of the first doctors to notice a pattern of health problems among Gulf vets, Dr. Katherine Murray Leisure, was informed that she was to lose her job. It took protests from veterans' groups and members of Congress to rescind her firing--temporarily. A half year later she did lose her job.

"This is a very dark era for federal medicine," Dr. Leisure feels. "It's a new disease with new problems combined with chemical warfare, biological warfare, and unknown agents in the desert. But federal officials think the enemy is the veterans and the people who are trying to help them."

Dr. William Baumzweiger, who has testified in Congress that low doses of Iraqi nerve gas probably led to veterans' ailments, was another physician slated for dismissal and then saved, through protests by Congress people who had heard his testimony. Said Representative Shays: "If you have a contrary view that maybe the Congress or the public needs to hear, you are silenced." [55]

The truth will out, though. Recent evidence of American troops' exposure to nerve gas has led Nobel-prize-winning scientist Dr. Joshua Lederberg to call for a new study to determine if low-level nerve gas exposure can lead to long-term disease. [56] This was the same Dr. Lederberg who headed a 1994 Pentagon study that said there was no chemical weapons link with Gulf War syndrome, but the new information coming out on Kamisiyah has made him an advocate of a second look. Lederberg is also paying attention to recent reports by Israeli scientists that anti-nerve-gas agents given to allied troops during the Gulf conflict may be having physical repercussions today.

Issues of credibility came to the fore in illuminating December '96 Congressional testimony from two American soldiers who had served in the Gulf War. [57] Major Michael F. Johnson and Gunnery Sergeant George J. Grass, of the Army and the Marines, respectively, had worked in a Fox--the kind of vehicle that functions as a chemical-detector lab--during the war. They reported that chemical weapons were found in Kuwait, both during and after the war. This contradicted the Pentagon's previous line about false alarms and no chemical weapons presence in Kuwait. The soldiers' chemical detections were ignored at the time, and Sergeant Grass noted that many of the chemical-agent shells spotted appeared to be American-made.

Also providing riveting testimony at that hearing was Major Randy Hebert, a Marine suffering from amyotrophic lateral sclerosis (Lou Gehrig's disease), a condition he suspects is linked to low-level chemical exposure during his Gulf service. Hebert's words, which, because of his condition, had to be translated by family members, were to the effect that the Pentagon did not want to accept its responsibility for sick veterans. [57]

Other news from the end of '96: Britain joined the U.S., the Czech Republic, and Slovakia in expanding its inquiry into the conditions plaguing coalition forces. [58] Our Department of Veterans Affairs said it was slow in investigating vets' health complaints because of previous false assurances by the Pentagon that no chemical weapons exposure had occurred. [59] And an ex-investigator--he was fired--working with the Presidential

Advisory Committee on Gulf War Veterans' Illnesses said he'd been told to limit his investigation to government agencies. Dr. Jonathan B. Tucker had been instructed that actual Gulf War veterans were off-limits as information sources in the committee's investigation of veterans' illnesses! [60] Also off-limits were government whistle-blowers.

Regarding the number of Americans exposed to gas at the Kamisiyah demolition, the Pentagon estimate seems to have topped off at 100,000, up from the few hundred of mid-'96! In December '96, when the number had reached 20,000 [61] a panel reported that we will probably never know how many Americans were exposed, due to uncertainty about weather conditions at the time, as well as other factors. Noted The New York Times about this bit of news: "The news release was made available at the Pentagon late on Friday afternoon, too late for television networks to include it in their evening broadcast, and without any notification to news organization that routinely cover the department. It is the latest in a series of incidents in which the Pentagon has released bad news about this and other issues late on a Friday afternoon or in the evening." [61]

Preliminary Panel Report

By January '97, about 80,000 of our 700,000 Gulf veterans had requested special medical examinations keyed to Gulf-related illness. [62] At that point, governmental response to this large segment of our Gulf service population was a White House panel report saying that the group could find no evidence that exposure to chemical weapons hurt soldiers' health. But that's like saying--as was said for years--that there's no evidence cigarette smoke causes cancer. You have to know how to find such evidence, because it's going to involve statistical correlation over long periods of time, rather than easy, short-term experimentation.

The panel mentioned stress as a contributing factor to veterans' ailments. But as John D. Rockefeller IV put it, "it's not just a stress syndrome." Rockefeller underscored the fact that there are 50,000 or more people who went over to the Gulf completely healthy and came back "very, very sick," and he complained of the "massive indifference of the whole military establishment." [62]

On the plus side--for veterans--of the panel's report was that it did also say that the Pentagon's long-standing reluctance to research the health effects of low-level chemical agent exposure had done the country a disservice. And it called for more investigation of

other possible Gulf syndrome factors, such as oil-well fires and pesticides. [62] Other early 1997 news came from Senator Tom Harkin (D.--Iowa) and the Centers for Disease Control and Prevention. They reported that Iowa's Gulf veterans were indeed sicker than that state's other veterans. [62]

The Power of Synergy

More and more truths are being acknowledged about the Gulf War syndrome picture, and one of the most important is that our troops were exposed not just to a single toxin, but to a whole variety. So we can't lose sight of the power of synergy. That is, when two or more relatively weak illness-causing factors are combined, they can be quite harmful. This was underscored by a January '97 paper by researchers who had studied both experimental animals and Gulf War vets at the University of Texas Southwestern Medical Center in Dallas. Their findings: Harmless levels of two or more chemicals can combine to cause precisely the symptoms reported by Gulf War syndrome sufferers. These symptoms appear to be a type of organophosphate poisoning, report the researchers. What's more, they note that the subtle nerve damage caused by organophosphate poisoning can be missed by physicians unfamiliar with the phenomenon. [63]

Dr. Robert W. Haley, head of epidemiology at Southwestern Medical Center and leader of the research team, spoke of the severe symptoms being experienced by a group of vets who had been at Khafji, near the Saudi-Kuwait border, on Jan. 20, 1991, during the air war. This was a day when Czech chemical experts had detected sarin and mustard gas. The hard-hit vets seem to have taken pyridostigmine nerve gas antidote tablets after, rather than before, chemical exposure, which can be particularly damaging.

Additional work done at the Southwestern Medical Center shows stronger evidence that chemical synergy--not stress--is what's making vets sick. Professor of clinical neurology Jim Hom was a principal investigator on this study. He explained that the researchers compared a broad range of brain-related psychological functions of ill and well veterans from the 24th Naval Mobile Construction Battalion. The scientists were blinded as to which group was which until the end of the work. [64]

"The ill veterans performed worse on 59 of the 71 brain-related measures," Hom reported, adding that the affected vets' psychological profile was similar to that of individuals with general medical problems and did not include psychopathology. "Clearly, the ill veterans

demonstrated a neuropsychological pattern of impairment that is indicative of generalized brain damage, not psychological reactions." [65]

What was particularly noteworthy about Hom's study was that it refuted the results of an earlier study done at the Birmingham VA Medical Center by researchers who used many, but not all, of the same neuropsychological tests. In that study, 55 Gulf vets with cognitive difficulties were tested, and the VA researchers concluded that exposure to neurotoxins did not come into play, attributing the vets' symptoms to "intentional exaggeration of problems" or "emotional distress," and going as far as to say that some of the vets were faking.

But there was a problem with the Birmingham study, Hom explained: It had no control group. The Dallas study, by contrast, had a control group of veterans from the same unit who were not reporting any problems. "When you stack all the results of our tests together it is clear that something is wrong. The brain is an organ that integrates all types of functions. You can't isolate and test just one thing. The tests have to be complementary. Our tests were designed to be a package--they complemented each other. This is what makes our study different than others."

Thus, Hom discounts psychological disorders, including post-traumatic stress disorder, as being responsible for the veterans' symptoms. He says, rather, that affected vets suffer from one of three syndromes: The first is characterized by thought, memory, and sleep difficulties; the second by more significant thought problems, as well as by confusion and imbalance; and the third by joint and muscle soreness and by tingling and numbness in the hands and feet. And these three syndromes are variations of organophosphate-induced delayed polyneuropathy, which results from exposure to certain chemicals that inhibit cholinesterase, an enzyme necessary for proper nervous system functioning.

Commented Hom's co-researcher Dr. Robert Haley, "This study supports our overall theory that the syndrome we identified represents neurological damage from combinations of chemicals."

And Hom said, when asked about the psychological aspects of Gulf War syndrome, "Psychological issues are important--but they don't cause brain damage."

Strong Insecticides Used

Hom and Haley's studies, as well as others done recently with Duke University scientists, are finally demonstrating that chemical synergy, rather than combat stress, is the underlying factor in Gulf War syndrome. Because of all the toxins to which troops were exposed--including pesticides; insect repellent, sometimes used in the form of flea collars worn by soldiers, and including DEET; nerve gas; anti-nerve-gas medication; experimental vaccines; burning-oil-well fumes; and depleted uranium--the potential for synergistic damage is extensive, and hard to fully comprehend.

Use of insect repellent is a mundane factor that nevertheless ought not to be overlooked when considering synergistic damage. Stars and Stripes reports [64] that while the insecticide DEET was deemed safe in concentrations of less than 31 percent, Desert Storm participants received DEET in strengths between 33 and 75 percent. The combination of DEET and PB--those pyridostigmine bromide anti-nerve gas pills that servicemen and women were ordered to take--is being studied at the University of Florida at Gainesville for their combined effects. Also, the insecticide permethrin, sprayed on soldiers' uniforms, was used in strengths exceeding safe levels, and may have exacerbated the effects of other substances.

In Dr. Garth Nicolson's view, some Gulf War illness patients are sick due to chemical exposure, others are sick due to biologic exposure, and some are sick due to both types of exposure. [66] "This last group are often the sickest," he says. "In fact, many of these people have probably died, although it's very difficult to get the true numbers. The estimates are somewhere between 12,000 and 15,000, but we don't have accurate figures on this because they're not being released."

Nicolson points out that new information reveals that soldiers may have been subjected to far more of these toxins than is publicly admitted. One of the most interesting revelations comes from a group of former CIA employees who stumbled on aerosol generators that were probably used as sprayer units to spread biologic agents. These were designed to fit onto any vehicle--from jeeps to trucks to helicopters to small aircraft--and used to contaminate large areas. In fact, some generators were found with their contents still intact. A further source of pollution may come from Scud weapons that were equipped with chemical and biological warheads. Iraqis were operating under a Soviet war doctrine that suggests mixing together chemical and biological agents. One CIA report indicates that 40 or more of these Scuds were loaded with both chemical and biological weapons. Reports

circulating on the Internet site known as Gulflink said these weapons were ready to use, although whether or not they were actually used remains in question. Nicholson believes these weapons probably were used and that they were low-explosive warheads that blew up at 2000 to 5000 feet in the air. Reserve units observed warheads that exploded, dispersing a purplish blue vapor. During this time, chemical alarms sounded. People exposed to these vapors subsequently become very sick, and many have died.

Nicolson summarizes the various modes of toxin transmission: "In our testimony to Congress, we indicated that there were several possible ways in which soldiers could have been exposed to chemical and biologic agents in the Gulf War. Number one among those was contaminated vaccines. The second was the sky-burst warheads used on some of the Scuds that could have delivered biological and chemical weapons. The third was the presence of exclusionary zones in southern Iraq in which...the sprayers were found. These are the principle ways, we feel, that soldiers could have been exposed during their service in the Persian Gulf theater of operations."

As mentioned previously, Nicolson has spoken of a genetically altered version of a mycoplasma as a disease-causing factor for Gulf War veterans. He says that antibiotics have been effective in treating this problem, which is, he says, highly contagious. Being airborne, Nicolson explains, this microorganism can be picked up without intimate contact. [67] It should be noted that some Desert Storm veterans' groups dispute Nicolson's claims, terming them alarmist. They point out that if the public perceives Gulf vets as carriers of a contagious disease, they could be discriminated against. [68]

Uncompassionate Care

Our servicemen and women work hard for their country and take tremendous risks. This is all part of being in the military. But what happens when they suffer physically in the process and subsequently need medical care? Shouldn't they receive the very best care possible?

In June 1997, the Department of Veterans Affairs admitted that its doctors had given less than adequate attention and care to many of the men and women who have become ill after serving in the Gulf. The department's undersecretary for health, Dr. Kenneth W. Kizer, told a Congressional committee that "While we believe that our programs have been well designed, we also know that they are neither uniformly delivered nor perfect. [69]

"We also recognize that some veterans have not received the kind of reception or care at VA medical facilities that we can be proud of," Kizer added. He was referring to the many reports that veterans complaining of fatigue, muscle and joint pain, memory loss, shortness of breath, and other common Gulf War syndrome symptoms are treated with little sympathy, cursory examinations, and little or no follow-up, the idea being that their problems exist "only in their head." Said Stephen P. Backhus, of the General Accounting Office, Congress's investigative branch, "Veterans who expect treatment designed for those suffering from Gulf War illnesses appeared more likely to express frustration and disappointment with the care they receive."

Kizer expressed the intention of improving VA service to Gulf vets.

Will vets in fact receive the kind of care and compensation that they need? In September 1997, the Presidential Advisory Committee on Gulf War Veterans' Illnesses, which had studied vets' health problems for two years, made its final recommendations, which held out some hope for affected veterans. The most important recommendation was a call for a permanent statutory program of benefits and health care for service people experiencing post-Gulf problems. The organization of such a plan, and financial arrangements, would be matters for the Department of Veterans Affairs and Congress to work out.

Congressional representatives involved in implementing such benefits, and in pushing for further research, include Senator John D. Rockefeller IV (D.--W. Virginia), Representative Bernard Sanders (I.--Vermont), and Representative Cliff Sterns (R.--Florida), among others. [70]

In a previous report (the preliminary one of January '97), the presidential committee had said it could not find a causal link between the symptoms referred to as Gulf War syndrome and the suspected causes. That report had mentioned stress as a probable factor, a finding that was left intact in the panel's final report, to the dismay of many veterans' groups. On the positive side, the advisory committee expressed the opinion that free care for veterans should not be linked to whether or not we understand the cause of their illnesses. Also, the panel called for more research into chemical causation and felt that the Pentagon had lost credibility with the public by denying that there were chemicals on the battlefield. While the Pentagon had been doing research into the effects of low-level exposure to chemical and biological warfare agents, the committee called for independent review of the research in light of the Pentagon's seeming lack of objectivity.

Arthur Caplan, noted bioethics professor at the University of Pennsylvania and a member of the advisory committee, described his distrust of Pentagon research this way, "The Pentagon is not credible to continue inquiries that veterans and the public do not find persuasive....Pentagon officials are inclined to see things from the point of view at which they started: Deny that there were chemicals on the battlefield. The Pentagon sees the burden of evidence as falling on those who argue otherwise. I find that not a credible stance. I find it distasteful. I find it unpersuasive. I find it, in fact, unbelievable." [71]

What Clinton Says

In November 1997, President Clinton issued a statement on Gulf War Veterans' illnesses. [72] Reiterating his panel's call for compensation and care for all affected veterans, whether or not the cause of illness is fully understood, he said he is asking the National Academy of Sciences to review the ongoing research on the connections between all the reported illnesses and Gulf War service. He also plans to help Congress pass laws guaranteeing that veterans' benefits will continue during future administrations.

Additionally, Clinton spoke of dedicating \$13.2 million for research on how low-level exposure to chemical agents can cause illness, and on other possible causes. He said that former Senator Warren Rudman will be leading an oversight board to ensure that the Defense Department's research meets high standards.

Also, "to apply the lessons we have learned for the future," Clinton said, "I am directing the Departments of Defense and Veterans Affairs to create a new Force Health Protection Program. Every soldier, sailor, airman, and Marine will have a comprehensive, life-long medical record of all illnesses and injuries they suffer, the care and inoculations they receive, and their exposure to different hazards. These records will help us prevent illness and identify and cure those that occur."

What Clinton says sounds good. But we should keep in mind that the panel he appointed was the one that dragged its feet on getting rid of the stress explanation for Gulf War syndrome. In fact, it still hasn't, although it's call for research into physical causes was a step in the right direction.

We Need to Learn More

There is still a lot to understand about our Gulf experience and its aftermath. One field of inquiry involves Garth Nicolson's contention that a genetically altered mycoplasma is responsible for some Gulf War illness. Another centers on the role of depleted uranium. And an emerging question involves the Kamisiyah arms depot demolition. Was this action carried out recklessly? Pentagon officials have asserted that the obliteration of the Iraqi bunker was supervised by experts trained in chemical warfare, but according to several U.S. servicemen who were present at the scene, this was not the case. According to Corporals Brian Martin and Chris Tullius, whose recollections of the Kamisiyah incident have been corroborated by their executive officer, Major Randy Riggins, chemical specialists were never present and testing that was supposedly conducted prior to and after the demolition of the bunker did not occur. Martin, who had videotaped the entire proceedings at the bunker, revealed that chemical detection devices were not even taken out at the site, while Riggins indicated that his troops did not examine the inside of the bunkers because the entrances had been mined by the recently departed Iraqis.

According to Riggins, the enormous explosion of the demolition caused a downpour of debris to fall upon himself and his troops. Riggins recalled that the immensity of the blast had triggered chemical detector alarms at the engineers' camp ten miles away. Unfortunately, the servicemen present at the Kamisiyah depot were not provided with ample warning, and consequently, their exposure to noxious fallout has since resulted in numerous reports of chronic disorders within the unit. [10]

One of the most important questions that will be researched is the extent to which low-level chemical exposure affects people over the long term. That there is an effect has in fact been documented years ago, i.e., in a 1974 study entitled *Delayed Toxic Effects of Chemical Warfare Agents*. This study, conducted by the director of the Institute of Chemical Toxicology of the East German Academy of Sciences, Dr. Karlbeinz Lohs, describes how workers at chemical-weapons plants were diagnosed with chronic disorders that were the same as symptoms currently being exhibited by Gulf War veterans. The whole gamut of problems--from neurological to gastrointestinal and cardiac problems, to memory loss, increased cancer incidence, and a higher birth defect rate--is the same. And further research has shown that exposure to organophosphate insecticides, which in essence are diluted forms of chemical warfare agents, can promote the onset of chronic health disorders. [10]

In short, the evidence is there. Gulf veterans are suffering from more than stress. And as the body of current research expands upon that of the past, no one will be able to deny that truth.

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What made our Gulf War veterans sick? There were several factors--including unprecedented environmental hazards, chemical and biological warfare agents, pesticides, experimental vaccines, and weapons made from depleted uranium--and it's getting harder for the government to pretend they didn't exist.

CONTENTS
Introduction
Symptoms
A New Generation Affected
A Multiplicity of Poisons
Unproven Vaccines, Unmonitored Medicine
Where Was the FDA?
Adjuvant Antibodies Found
Iraq's Deadly Arsenal
The U.S. as Supplier
The Corporate Connection
Unheeded Alarms
Depleted Uranium
The Downsized Doctors
A Half-Decade of Cover-Up
Other Countries' Experience
A Cover-Up Condemned
The Pentagon Begins to Come Clean
Are Gulf Vets Really Sicker?
Missing Log Pages...And Credibility
Preliminary Panel Report
The Power of Synergy
Strong Insecticides Used
Uncompassionate Care
What Clinton Says
We Need to Learn More
Endnotes
Introduction

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 tens of thousands of our Gulf service people have become sick from a debilitating and sometimes deadly syndrome. The Department of Veterans Affairs has reported that approximately 6000 soldiers have died since the war's conclusion, including 1300 18- to 24-year-olds who were in perfect health prior to the war, but who mysteriously contracted various forms of cancer after their involvement with the military. According to H. Lindsey Arison, III, aide to the undersecretary of the U.S. Air Force, there are now over 50,000 veterans suffering from Gulf War syndrome, including about 11,000 still on active duty. [1]

Arison outlines the causes of Gulf vets' health problems. First, they were exposed to nonlethal levels of chemical and biological agents released primarily by direct Iraqi attack via missiles, rockets, artillery, or aircraft munitions and by fallout from allied bombings of Iraqi chemical warfare munitions facilities during the 38-day 1991 air war.

Exposure to chemical and biological agents alone is one thing. But the effects of these were exacerbated by a whole gamut of other factors to which vets were exposed. Arison enumerates them: nerve agent pretreatment pills, called pyridostigmine bromide, that our service people were ordered to take; investigational botulinum toxoid vaccines; anthrax vaccines; and depleted uranium, used in armor-piercing munitions. Other factors entering into the synergistic mix included oil fire contamination and pesticides, and some people

believe that an artificially engineered bacterium/virus cross called a mycoplasma, and, separately, that a vaccine ingredient, the adjuvant squalene, were significant factors too. Arison emphasizes the point that since different people were exposed to different hazards at different levels, a whole variety of symptomatology have arisen in Gulf War vets. This variability of symptoms is sometimes taken to mean that Gulf War syndrome is a "mystery illness" or that people are imagining things, when in fact it just shows that the syndrome is a multifactorial problem.

Dr. Garth Nicolson is a specialist in cell biology and biochemistry and a professor of internal medicine and pathology at the University of Texas Medical School in Houston. After extensive study of Gulf veterans' ailments, he estimates that 100,000 Americans have become sick from Gulf War syndrome (this number includes both soldiers and members of their immediate families), and says that over 7000 soldiers may have died. He points out that although Gulf War syndrome is not a universal disease that everyone who served in the Persian Gulf region has acquired, there are entire units that have become sick, which suggests some variance dependent on exact locations within the region.

Nicolson stresses that in addition to affecting Americans, Gulf War syndrome has taken its toll on others who participated in the coalition forces. Currently 27 of the 28 coalition nations have claimed that they have numerous sick veterans--and sick members of veterans' families--and this is especially true in England, where, depending on whose estimates you use, between 1200 and over 3500 Gulf War vets are afflicted with the syndrome, referred to as desert fever in that country. Many Gulf vet families in Britain are suing their government after having had deformed children, and it was reported that at least one ex-soldier has requested a vasectomy because he is terrified of having any more children with problems. [2].

It should be noted that there is a coalition nation not reporting Gulf War illnesses--France. That country has not observed any sick soldiers or affected children, possibly because they did not immunize their troops with experimental vaccines, or because they treated them with the antibiotic doxycycline prior to active service.

An important dimension of the Gulf's health legacy is that families of Gulf War veterans have not been spared from the suffering. Unfortunately, many of them haven't been properly diagnosed, due to the lack of objective clinical findings associated with the syndrome. A survey of 1000 servicemen and women conducted by the Senate Committee on Banking, Housing, and Urban Affairs revealed that an assortment of illnesses associated with Gulf War syndrome are, in fact, contagious. According to Senator Donald Riegle (D.--

Michigan), who headed the committee's two-year investigation of Gulf War veterans' health problems, the survey was designed for maximum reliability by inserting a few "ringer" questions to identify false responses, and the replies were indeed consistent with the pool of common symptoms. In most cases, responses to the poll indicated that spouses and children of Gulf War veterans are experiencing only a few of the indications, whereas the veterans themselves are suffering from up to 20 symptoms. [3]

But both the families and the veterans have suffered because of the government's lack of curiosity about their service people's post-war ailments. Since, until recently, the Department of Defense did not acknowledge the existence of any war-caused illnesses, soldiers who claim that they have the syndrome have been denied proper medical attention and have in some cases been instructed to leave the military. In pain, neglected by their country, and mistakenly diagnosed with psychiatric ailments, many veterans have tragically turned to suicide to cope with a problem that no one seemed to understand or care about.

Symptoms

Gulf War syndrome is manifested in many ways. Chronic fatigue immune dysfunction syndrome affects over half of syndrome victims, according to Dr. Garth Nicolson, who, with his wife, molecular biophysicist and University of Texas professor Dr. Nancy Nicolson, has examined and evaluated many syndrome patients. Other symptoms include lymphoma, cardiac ailments, memory loss, leukoencephalopathy, and neurological diseases such as multiple sclerosis. Public health expert Dr. Leonard Horowitz estimates that 80 to 90 percent 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. Sexual and urination disorders plague numerous victims, while up to 25 percent of syndrome patients have experienced hair loss, and 25 percent have acquired multiple chemical sensitivities, which means they have become allergic to a wide variety of chemical substances and can consequently have severe reactions to even the most common household items. [4]

According to Drs. Garth and Nancy Nicolson, the chronic fatigue immune dysfunction syndrome (CFIDS) characteristic of sick Gulf vets is induced by an unusual microorganism that seems to be the product of weaponization, that is, human manipulation of germs for the purposes of warfare. The Nicolsons report that the organism present in each of the CFIDS patients is an odd variant of a typical mycoplasma. Ordinarily, mycoplasma is a cross

between a bacterium and a virus, and can be effectively combated with antibiotics. But in this case, the organism contains human immunodeficiency virus (HIV-1) and anthrax genes. Since it is not possible for the typical mycoplasma to naturally mutate into a modified form of anthrax and the alleged AIDS virus, this seems to be an engineered organism. [5] The Nicolsons contend that the U.S. military created this mycoplasma and sold it to Iraq, which subsequently used it against U.S. troops.

The Drs. Nicolson go on to explain that since the mycoplasma sequence associated with the various Gulf syndrome symptoms is quite infectious, prolonged contact, or even casual contact, with an infected person can facilitate its dissemination. In one instance, the wife and children of a soldier serving in Operation Desert Storm became seriously ill after being exposed to clothing sent back from the Gulf region. Within weeks, the soldier's wife and two sons were diagnosed with asthma, while the 22-month-old daughter nearly died from gangrenous lesions. In another case recounted before the Riegle Committee, a nurse whose brother had returned from the Gulf with the disease had had to rush him to the hospital with an abnormally high fever. His sweat, she reported, had actually left reddish burn marks on her skin. Shortly after this incident, the nurse mysteriously contracted several health conditions that could not be explained by doctors. [6]

A New Generation Affected

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. These are just a couple of the Gulf War's second-generation casualties; there are many others, including children who are dying of heart defects, liver diseases, and other rare disorders. [7] It's been estimated that 30 percent of Gulf War veterans' babies are born with deformities; this is ten 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 quartermasters 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.

At a Congressional hearing, Dr. Ellen Silbergeld, a molecular toxicologist at the University of Maryland, reported that men can pass toxic chemicals on to their unborn children through their semen. Indeed, many wives of ill veterans report urinary tract and vaginal

infections after sex, and say that their husband's semen burns their skin. And Akron, Ohio, environmental pediatrician Dr. Francis J. Waickman reports a 30-percent rate of abnormalities among Gulf vets' children, which is about 10 times the expected incidence. Waickman reminds us that toxic chemicals can lower immunity and increase susceptibility to infections in newborns, and he speculates that severe chemical exposure can alter genes as well. He offers this advice about our Gulf experience: "To my knowledge, this is the first time we've ever had such a large group exposed to a possible large degree of chemicals, so we better learn from this whole series of events." [7]

One organization attempting to learn more about birth defects in Gulf vets' families is the Orlando, Florida-based Association of Birth Defect Children. They maintain a registry for Persian Gulf War families, and are keeping track of babies with Goldenhar syndrome, missing limbs, chronic infections, failure to thrive, cancer, heart problems, and immune problems.

Steve Miller is a Persian Gulf vet who can explain what the rare condition called Goldenhar syndrome involves because his son, conceived soon after Miller's return from the Gulf, was born with it: "He had hydrocephalus, spinal scoliosis, spina bifida, was missing his left eye and left ear, the heart was on the right side of the body...For a child to be born completely missing an eye, according to the National Institute of Health, is either hereditary or caused by teratogenic exposure [fetal exposure to a substance blocking normal growth]. In our case we both tested negative in genetic testing. The normal occurrence for this type of birth defect is one in 26,500. And I believe as of right now [August '97] we have located 17 children of Gulf War vets with the same birth defect. And there were only 75,000 born after the Persian Gulf War." [8].

Betty Mekdeci, founder of the Association of Birth Defect Children, confirms that Goldenhar syndrome is now occurring disproportionately in Gulf veterans' offspring. And she cites chronic, serious immune problems as the type of problem most frequently reported to the organization in connection with veterans' offspring. [9]

A Multiplicity of Poisons

As we've mentioned, the term Gulf War syndrome is not one, easily defined problem, but rather encompasses a wide variety of ailments. Congressman Steven Buyer from Indiana, whose Army reserve unit was stationed at a prisoner of war camp in the region, feels 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, Representative 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. [10] Dr. Boaz Milner, of the VA hospital in Allen Park, Michigan, has treated over 300 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, possibly from 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 they might 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, while the fifth form of the syndrome was brought on by the release of biological warfare agents. [6]

Germes from the Gulf are good travelers, according to members of the medical community who have expressed concern regarding the possibility of infectious microorganisms becoming fastened to equipment and other materials. They cite incidences of Navy personnel on aircraft carriers who never set foot on land, but who mysteriously acquired the syndrome subsequent to active duty in the Gulf region. When aircraft returning from overseas service were unloaded in domestic Air Force bases at the conclusion of the war, the contaminated equipment aboard the returning planes may have facilitated the disease's dissemination into the general population. This hypothesis is strengthened by reports of illness in stevedores assigned to unload repatriated transport planes. It is estimated that clothing brought back by soldiers may contain infectious microorganisms that can survive for up to seven years.

Unproven Vaccines, Unmonitored Medicine

The widespread use of experimental vaccines during Desert Storm has often been cited 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." He explains that during the Gulf War, the established procedures of vaccination were 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. [5]

The troops immunized for the Gulf have been called guinea pigs, and for good reason. They received experimental vaccines, e.g., those for anthrax and botulinum that were not approved for use by the FDA and have since proven 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 their body. Because of these vaccines' experimental nature, many questions have arisen as to why our government dispensed them. Not the least of these questions is, what about the Nuremberg Code? Developed by the Allies after World War II in response to inhumane Nazi experimentation, the Nuremberg code says that voluntary and informed consent is absolutely essential from all human subjects who participate in research, whether during peace or war. [11]

Nerve-gas-counteracting pills were a big problem for many Desert Storm participants. Documents released by the Pentagon in 1995 revealed that high-ranking military officials had pressured the Food and Drug Administration into authorizing experimentation with pyridostigmine bromide (PB) tablets for protection against Iraqi chemical or biological attacks. PB tablets are usually only used for the treatment of the chronic muscle weakness disorder myasthenia gravis, but the military and the FDA waived the traditional informed consent procedures during the early stages of the conflict. Many soldiers did inquire about the classified nature of the pills, but, nevertheless, they were forced to consume them in excessive quantities by their commanding officers. Others, fearing for their safety, ignored the orders of their superiors after witnessing the pills' highly unpleasant gastric effects upon their fellow servicemen.

Where Was the FDA?

Isn't the FDA responsible for making sure that Americans aren't given unsafe drugs? Shouldn't they at least warn people of possible dangers? They claim they tried. They blame the Pentagon for PB. In May '97, it was reported that a top FDA official told Congress the Pentagon did not keep a promise to fully inform soldiers before giving them the experimental nerve-gas antidotes during the war. [12] The promise to warn soldiers about the drugs had been a condition of the FDA's agreeing, in 1991, to waive standard consent requirements. A Pentagon spokesperson said that information sheets had been sent to the Gulf, but sent late. Some members of Congress were outraged upon hearing this. For instance, Christopher Shays (R.--Connecticut), chairman of the Congressional investigating

committee, said that the FDA's failure to compel the military to keep its word "blows my mind."

Evidence has indicated that the procedure for administering the pills placed the recipients at risk. Records of who received the pills were not kept, and a standard dosage was distributed, regardless of sex, age, weight, or medical history. What's more, the toxicity of this experimental drug was actually heightened by issuing it along with common household insecticides, a potentially lethal combination.

Nurse Carol Picou, who served in the Gulf, elaborates on the problems with pyridostigmine bromide: [13] "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."

Carol Picou has been experiencing a variety of serious health problems, not the least of which is head-to-toe neurological damage, since her Gulf service. [13]

James Moss, a former researcher for the Department of Agriculture, has criticized the military's experimentation with PB tablets and has correlated their use with the manifestation of birth defects. At a Congressional Veterans Affairs Committee hearing, committee chairman Senator John D. Rockefeller IV (D.--West Virginia) censured the Pentagon for its disregard for human rights and its utter lack of responsibility. Rockefeller believes that the Pentagon had no proof that the drugs or vaccines were safe or effective, yet proceeded to dispense them without first evaluating female recipients or apprising troops of possible side effects. [14]

At that same hearing, Gulf veteran Air Force Lieutenant Colonel Neil Tetzlaff explained to the committee how he and fellow servicemen experienced severe vomiting and other acute conditions after taking PB tablets during the journey to Saudi Arabia. According to Tetzlaff, officials from the Department of Veterans Affairs were reluctant to cooperate with the

afflicted soldiers upon their arrival in the Gulf region because they were unable to corroborate that the medication was the cause of their problems. In defense of the Pentagon, Assistant Secretary of Defense Dr. Edward Martin asserted that the military was only trying to fulfill its obligations to its troops by offering protection from an enemy who had previously engaged in chemical and biological warfare. Regardless of these good intentions, babies with serious abnormalities continue to be born to demoralized veterans. As Senator Tom Daschle (D.--South Dakota) said at the hearing, "How many more lessons do we have to learn?" He was referring to the military's past experience with Agent Orange during the 1970s.

Adjuvant Antibodies Found

Recently, new information has been brought to light about squalene, an adjuvant (or compound that boosts the effectiveness of a vaccine) that is not supposed to be used in humans except in research on illnesses such as HIV and herpes. However, unusually high antibody levels for squalene have been showing up in the blood of Gulf War vets. This was the gist of an investigation by Insight magazine, [15] which reports that VA spokespeople have no explanation for these findings. 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."

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. It's probably whatever was used [mixed] with the squalene that's doing it, or in combination with the squalene. You find that, and you may be on to something."

Research immunologist Pam Asa has worked with about 150 individuals with 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 make-up. "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 process, basically. It does also involve neurological disease." [16]

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.'" [17]

Iraq's Deadly Arsenal

Another possible cause of Gulf War syndrome was the presence of biological and chemical additives present in the Scud B and Frog missiles. On May 1, 1996, senior physician at Walter Reed Army Hospital Major General Ronald Blanck 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 Major General Blanck's report--five years after the war--the evidence had been completely disavowed by official sources.

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 Lieutenant General Hussein Kamel Majid, Saddam Hussein's top biological weapons adviser, 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 could be used against any of their foes, including the U.S., Israel, and Saudi Arabia. Prior to the disclosures, Iraq had claimed that it had only ten 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 U.N. 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 way 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 developed by the Iraqis 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 fungi 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*[18] documents that they were, and that they in fact did use them, in 76 incidents. 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. [19] *The American Newsweek*, as well, reported this fact. [20] We do 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 Lewicite, a nerve gas that could have been released either by an Iraqi assault or as a result of secondary explosions.

The U.S. as Supplier

A sad irony of the Gulf War involves the origin of Iraq's biological and chemical weapons. At least some of them came from the United States. By sharing weapons and intelligence throughout Iraq's long war with Iran in the 1980s, the U.S. helped create the largest stockpile of chemical weapons in history. That these were later used to our detriment is an example of the phenomenon known as "blow-back," i.e., what happens when we don't look at the long-term consequences of our foreign policy actions.

According to the Riegle report, during the 1980s the U.S. government supplied the Iraqi Atomic Energy Commission with at least 28 biological weapons to use in its bitter war with neighboring Iran. In 1987, then Vice President Bush met with Iraqi officials to ensure that technological equipment used to produce chemical and biological warfare agents would continue to be exported to the Iraqis. When he assumed the presidency, Bush maintained this policy, despite Congressional dissension. Corporations involved in transactions with the Iraqi government, including Hewlett-Packard, Honeywell, Rockwell, and Tektronix, were licensed to export more than \$1.5 million of highly sophisticated equipment in the five

years preceding the Gulf War, and these companies frequently delivered their products directly to Iraqi chemical and nuclear plants. [21]

On June 6, 1994, 26 Gulf veterans filed a \$1 billion class action lawsuit in Angleton, Texas, naming 11 firms involved in biological and chemical warfare production as defendants. The attorney for the plaintiffs cited the defendants' cognizant participation in the manufacture of unreasonably dangerous biological compounds as the basis for the suit. In addition, the defendants have also been accused of allowing their business practices to enable an outlaw country like Iraq to obtain and use biological and chemical weapons. [22]

In his report to Congress, Senator Riegle was quite explicit, being able to name the biologicals involved, the batch numbers sent to Iraq, and their dates. For instance, among the agents delivered to various agencies of the Iraqi government were *Clostridium perfringens*, a gaseous gangrene causing agent, *Brucella melitenis*, *Clostridium botulinum*, salmonella, *Klebsiella pneumoniae*, *Escherichia coli*, *Bacillus subtilis*, and *Staphylococcus epidermis*.

The U.S. was a participant in the Geneva Biological Weapons Convention of 1972, and we (as well as Iraq!) signed the resultant agreement that prohibited both experimentation with and the sale of biologicals or weapons of mass destruction. Now, obviously, our government has a considerable interest in keeping the U.S. breach of this agreement covered up. Plus there's the inconvenient fact of our history of cooperation with Saddam Hussein, a tyrant who was denounced by the global community and likened to Adolf Hitler. Embarrassment about revealing our past dealings with our current enemy has hampered our government's readiness to deal fairly with veterans.

The Corporate Connection

The January 1996 issue of *Media Bypass* magazine [23] carries a hard-hitting article by Sarah McClendon that exposes U.S. corporations' production and sale of chemical and biological weapons to Iraq. McClendon writes that "Proof is building upwards, stronger than ever, that big U.S. corporations made the weapons that Iraq's Saddam Hussein used to kill American soldiers in the Persian Gulf war. These corporations also provided the chemical and biological weapons that the Iraqis used to make thousands of surviving soldiers chronically ill."

The article goes on to condemn both the Bush and Clinton administrations' Justice Departments for agreeing not to prosecute the big-name American corporations for trading with the enemy: "The building up of Iraq's weapons, paid for by U.S. taxpayers, was conducted for years before the Persian Gulf war and after it started...But at this very

moment, the Clinton Justice Department turned this question over to the Treasury Department's Office of Foreign Assets Control where, at first, officials were pondering whether this should be treated as a criminal or civil offense."

Even after being warned, the Clinton administration assigned the same FBI men, the same prosecutors who had ruled that the corporations during the Bush administration should not be prosecuted, to investigate the case to see if charges should be filed against the corporations and their officers. In 1995 the Justice Department said it did not prosecute the corporations because they did not have the proof to win the case.

Not to be overlooked is the matter of the \$5 billion loan to Iraq from the BNL Italian bank of Rome which was guaranteed by U.S. taxpayers through the Department of Agriculture's Commodity Credit Corporation. Iraq turned this loan into letters of credit with which it bought \$5 billion in weapons (including biologicals and Scuds from the U.S.), and when Iraq later defaulted on the loan, the U.S. taxpayer essentially paid the bill for weapons that were later shot back at U.S. soldiers.

Why was there no investigation? When Sarah McClendon asked George Bush to give the public a list of the corporations in the Pittsburgh area that were making weapons for Saddam Hussein, he refused. Perhaps it was no coincidence that these corporations were tied to the Brown Brothers Harriman Bank, which had been managed by President Bush's father, the late Senator Prescott Bush.

Says McClendon: "How was this cover-up of the manufacture of weapons for Iraq arranged in the U.S.? Bush arranged for 70 percent of the policy-makers in the Justice Department to remain in their jobs when the transition from Bush to Clinton took place. They took a lower pay scale, but stayed in control. These holdovers are running the Justice Department today. Clinton has been told about this, but somehow he does not seem to act on the information."

Unheeded Alarms

Many Gulf War veterans have testified that chemical warfare detector alarms at bases across the region were frequently triggered, yet troops were ordered to ignore the alarms. According to General Colin Powell, who had been chairman of the Joint Chiefs of Staff during the war, American commanders had believed the frequent alarms to be false, because nobody seemed to be getting sick immediately. It was believed by those involved that you had to become obviously ill at the time of exposure to chemical or biological agents for exposure to mean anything. [24]

One veteran who did get immediately ill, Petty Officer Sterling Symms of the Naval Reserve

Construction Battalion, was stationed in Saudi Arabia when one morning he was awakened by an extremely loud explosion overhead. Right after the detonation, chemical alarms were sounded, and a strong ammonia-like aroma permeated the air. Before he could rush to get his protective gear on, Symms's face and eyes began to burn; several months later, he began to suffer from typical Gulf vet symptoms, including chronic fatigue, open sores, and rashes. Symms and several of his comrades, who had contracted similar symptoms, described to Congress how they were issued orders by their commanding officers to avoid any further discussion of the incident.

Another veteran who testified before the Riegle Committee, Army Sergeant Randall L. Vallee, explained how orders to ignore chemical-detector alarms were rationalized by a variety of absurd scenarios, such as the idea that supersonic aircraft or sand-infested equipment had triggered the alarms. Vallee, like Symms, testified that the alarms frequently sounded throughout the conflict, especially after Iraqi Scud attacks. In Senator Riegle's report, it was confirmed that 14,000 chemical alarm monitoring units were installed by the military throughout the region to provide an early warning of imminent gas attacks, but many of them were disarmed after they began to sound too frequently. Members of the Riegle Committee chastised the Department of Defense for its apathetic disregard for the safety of our service people, concluding that the Department's insistence that all of the alarms had been false was a little hard to believe.

Interestingly, after his testimony before Congress, Sergeant Vallee received a phone call from Lieutenant Colonel Vicki Merriman, an aide to the deputy assistant secretary of defense for chemical and biological matters, who, after initially seeming sympathetic, interrogated the veteran and attempted to alter his recollections. [25]

Depleted Uranium

There's an aspect of our participation in the Gulf that hasn't gotten wide publicity, but should: our use of depleted uranium. Depleted uranium is a byproduct of the uranium enrichment process. [26, 27] 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 depleted uranium 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 depleted uranium 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 in its enthusiasm for depleted uranium is that the downside to this technology far outweighs its benefits. Once bullets reach their destination, 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.

U.S. and British forces used Operation Desert Storm as a testing ground for the widespread employment of depleted uranium. It is estimated that over 940,000 30-mm uranium-tipped bullets and 14,000 large-caliber depleted rounds were used. Between 350 and 800 tons of depleted uranium residue, with a half-life of 4.4 billion years, permeate 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 close 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 depleted uranium in the body was illustrated by scientists at the Defense Department 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 depleted uranium 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. [28]

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 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 depleted uranium released into the atmosphere poses the same grave dangers as does any

other exposure to uranium. [29] "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. 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 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."

There have been several army reports on the dangers of depleted uranium, which have been released by the Depleted Uranium Citizens' Network. [27] Sara Flounders, coordinator of the International Action Center, a network of organizations and activists initiated by former U.S. Attorney General Ramsey Clark, points out that one of these reports, which was put out by the Army Environmental Policy Institute, discusses the negative health and environmental consequences of depleted uranium use in the army. [30] According to the report, the financial implications of long-term disability payments and other health care costs would be excessive if depleted uranium was indicted as a causative agent for Desert Storm illnesses. This may be why depleted uranium is not being discussed as a cause of Gulf War syndrome, Flounders feels.

The Downsized Doctors

Dr. Asaf Durakovic was a chief of nuclear medicine at the VA Medical Center in Wilmington, Delaware. After the war, Dr. Durakovic tried to test members of the 144th Service and Supply Company for depleted-uranium contamination. This was a unit that had been salvaging equipment that had been hit by depleted-uranium rounds. Durakovic first tested the vets and concluded that 14 out of 24 were contaminated. But since his testing equipment was outdated, Durakovic proceeded to send urine samples from the vets to be

tested at the U.S. Army Radiochemistry Laboratory in Aberdeen, Maryland.

This proved impossible. A number of the samples apparently never made it to the lab, and the ones that did were lost. What's more, the VA decided against further testing. Dr. Durakovic was told by both the VA and the Department of Defense to stop his depleted uranium investigation. Then, after eight years of outstanding performance at his VA position, he ended up losing his job "because of cutbacks." Meanwhile two of the vets exposed to uranium died. The Pentagon released a paper stating that uranium had not been proven to cause health problems, but Durakovic points out that they were looking for short-term, not long-term hazards. [31] He also has stated that he feels certain that he was terminated from his job as a direct result of his involvement in the management of Gulf War veterans and his raising of nuclear safety issues.

Dr. Durakovic testified before a House of Representatives subcommittee in June 1997, estimating that 123,000 troops had been exposed to depleted uranium through contact with captured Iraqi tanks. "Those that were required to receive the vehicles actually lived very near them, ate lunch on top of them, and cooled themselves inside of them," he reported. "On Mar. 10, 1991, a Battle Damage Assessment Team dressed in full radioprotective clothing arrived, stating that they were from Washington to assess the radioactivity of specific tanks. They reviewed the tanks for four days, fully dressed in 90 degree temperatures. At the conclusion of the assessment the soldier in charge of the crew, required to move the equipment, was told that the tanks were 'hot,' to mark them with the atomic symbol, and not to let people go near them. The assessment team had detected 0.26 to 1.0 rad inside the tanks....The team stated that the tanks were not dangerous to those required to work in their environment. One soldier was given an outdated dosimeter which began to detect radiation right away despite the fact that it was long past its expiration date....All work that was conducted on behalf of DU contamination was coordinated through the Persian Gulf Registry of the Wilmington VA hospital. All records were subsequently lost." [32]

The Radiochemistry Lab in Aberdeen, Maryland, does admit to losing Dr. Durakovic's medical tests. What's more, Durakovic had also sought help from the Boston VA Medical Clinic. Two physicians from the Boston VA, Dr. Burroughs and Dr. Slingerland, asked for more sensitive equipment to better diagnose the 24 soldiers of the 144th Service and Supply Company who had been referred to them by Dr. Durakovic. The two lost their jobs. Concerning testing for exposure to depleted uranium, Dan Fahey, legal assistant and outreach worker at Swords to Plowshares, a San Francisco veterans service organization,

brings up the point the urinalysis tests will give accurate results only if they're used within a year of exposure. That's because, for a year, the body naturally purges most of the uranium that's been inhaled or ingested, and after a year, although the substance remains in the bones, kidneys, and lungs, it's not being excreted in the urine. Thus, today, this type of test is useless. [33]

Fahey also describes a 1991 incident in Kuwait during which troops were unknowingly exposed to depleted uranium:

"There was a fire in July 1991 in Doha, Kuwait, in which there were several thousand DU rounds that burned up in this very large fire. There were severe explosions for six hours. The fire raged until the following day. And through the Freedom of Information Act we learned that while this fire was going on there was an explosive ordnance disposal team that was rushed to the scene of the fire, but before they arrived they warned the commanders at the Doha base...that DU rounds were burning, that they should keep the people out of the downwind area, and that they should issue respiratory protection. And we also know that that message was never passed down to the troops. And as a result some people were exposed during the fire." [33]

Fahey goes on to explain that troops were exposed after the fire as well. Given no information about the presence of depleted uranium contamination, they were assigned to clean up the compound with brooms, shovels, and their hands, and were given no protection.

According to the Depleted Uranium Education Project, [34] "the fire at the U.S. Army Black Base in Doha, Kuwait, destroyed more than 660 large-caliber DU tank rounds, 9720 small-caliber DU rounds, and four M1A1 tanks with DU armor. Over 9000 pounds of DU penetrators were lost in the fire, exposing thousands of vets to airborne uranium oxides. Despite the known health problems of vets, the U.S. Army's report on exposures to depleted uranium at Doha has not even been released to the Presidential Advisory Committee on Gulf War Illnesses, and U.S. troops continue to be stationed at Doha."

A Half-Decade of Cover-Up

From 1991 to 1996, the Pentagon basically took a see-no-evil approach regarding the causes of Gulf War syndrome. In a document entitled "Memorandum for Persian Gulf Veterans," released on May 25, 1994, Defense Secretary William Perry and Joint Chiefs of Staff chairman General John Shalikashvili assured veterans that there was no evidence, classified or unclassified, suggesting that chemical or biological weapons were used in the Gulf, while a June 23, 1994, report by the Pentagon's science board attempted to reinforce

that argument, asserting that servicemen were not exposed to chemical or biological elements at any level. During the initial stages of the Reigle investigation, Senator Riegle inquired as to the possibility that allied exposure to chemical and biological agents was responsible for the manifestation of post-war illnesses. Walter Reed's Major General Blanck responded that the issue had not been addressed because military intelligence maintained that such exposures never occurred.

But consider this: Official documents at Defense Department headquarters reveal that several American soldiers participating in Desert Storm were commended for their role in ascertaining the presence of hazardous chemical agents. For example, Army Private Allen Fisher was awarded the bronze star for the first confirmed detection of chemical-agent contamination in the theater of operations, while Captain Michael Johnson of the Nuclear, Chemical, and Biological Branch of the Army was given the Meritorious Service Medal for a similar action. A question naturally arises as to why these men were commended for pointing out chemical-agent threats, if the powers that be really thought there weren't any! On Oct. 8, 1994, after reviewing the Pentagon's service records and considering the accounts of soldiers who had witnessed the events in the Gulf firsthand and had received official commendations for their heroic actions, Senator Riegle berated the Defense Department for its inconsistency.

Other Countries' Experience

Lieutenant Louise Richard of the Canadian Navy served as an operating room nurse in the Gulf, where she treated numerous American and British servicemen, as well as Iraqi prisoners of war. In September 1995 Richard was discharged after eight years of lauded service because her health had deteriorated significantly subsequent to her overseas service. Richard's symptoms mimicked those of many other combat veterans, but when she complained to her superiors regarding the lack of acknowledgment of her combat-related illness and threatened to seek redress in the media, she was warned that she would be jeopardizing her career and her pension. "We were valued individuals when we were sent there," she says, but "now we're back, and we're not valued individuals at all."

It's important to remember that United States troops have not been the only victims of governmental callousness. Other allied governments, including those of Canada, Great Britain, and Kuwait, also disavowed evidence of chemical and biological warfare for a long period. According to an Oct. 10, 1995, article in the British newspaper Today, the British Ministry of Defense instituted a policy of denying the existence of what is known in that country as desert fever, for fear of big compensation claims. In an interview with the paper,

a British Defense spokesperson alleged, "We have no evidence that this illness exists." This was an odd declaration when you considered that over 1000 of the 43,000 British veterans deployed to the Gulf reported that they were suffering from the syndrome.

Corporal Richard Turnball, an 18-year member of the Royal Air Force who participated in the Gulf conflict, asserts that a multitude of British veterans returned home suffering from various acute symptoms. Turnball, who was stationed in Dhahran, Saudi Arabia, during the war, aided in the construction of nuclear, biological, and chemical shelters, and educated British troops as to the correct use of chemical monitors and protective gear. According to Corporal Turnball, the use of chemical and biological weapons by the Iraqis was deemed inevitable by British intelligence reports prior to the war. During the conflict, Turnball claims that the inevitable came to pass many times; he personally witnessed casualties suffering from chest and eye ailments, infections, and skin irritations. But despite a multitude of warnings and reliable documentation by highly advanced equipment, the British Ministry of Defense denied the incidences, asserting that the alarms were activated by aircraft fuel.

Another British veteran, Corporal Terry Walker, recalled the sounding of chemical monitoring devices at approximately 2:30 a.m. on Jan. 20, 1991, after several Scud missiles exploded overhead. Military officials attempted to attribute the alarms and the explosions to supersonic aircraft, but Walker explains that their justification seemed ridiculous for two reasons: First, alarms within a 15-mile radius had been activated almost simultaneously, and second, the alarms had never been triggered by aircraft in the past. Corporal Walker, who had difficulty donning his gas mask during the attack, recalls experiencing an ammonia-like smell and a burning sensation on his body. Since his return from active service he has been plagued by a multitude of ailments, including chest infections, rashes, and headaches, and his wife and daughter have been afflicted as well. The British medical establishment has begun, recently, to look into the Gulf War's repercussions for their veterans. According to the British Medical Association, a pilot study was conducted on 14 veterans, 12 men and two women, with an average age of 34. These veterans, who were randomly selected from a long list of many with unexplained illnesses, underwent a variety of tests, and the results were compared with those of a group of 13 healthy civilians. The tests included established techniques assessing the function of nerve function in the limbs, transmission of impulses between nerves and muscles, and movement of nerve signals through pathways in the brain and spinal chord. The researchers concluded that the tests revealed evidence of problems in the nervous systems

of the veterans, particularly in the nerves of the arms and legs. [35]

Kuwaiti sources have also reported new health problems since the war. At the Kuwaiti Ministry of Public Health, Dr. Saleh Al-Harbi has verified that a significant number of Kuwaiti citizens are suffering from a variety of chronic illnesses evidently induced by exposure to either chemical or biological agents. Since the war's conclusion a variety of inexplicable diseases, such as rare blood disorders, have surfaced, and the rate of birth defects has increased dramatically. Dr. Al-Harbi, like many of his American peers, believes that the syndrome is a form of multiple chemical sensitivity. The Kuwaiti government, however, continues to emulate the official policies of their Western saviors by downplaying the problem. [25]

A Cover-Up Condemned

The Riegle report essentially accuses the Department of Defense of lying to the American public, and condemns it for abandoning the servicemen who were willing to die for their country. Senator Riegle referred to the heartlessness and irresponsibility of the military bureaucracy, concluding that there is no more serious crime than a cover-up of facts that could facilitate the diagnosis and treatment of sick U.S. veterans. [25] The military establishment was fully aware that Sadaam possessed biological weapons, was willing to use them, and, in fact, did use them; but despite concrete evidence, John Deutch, director of the CIA, and General John Shalikashvili, chairman of the Joint Chiefs of Staff, continued to deny the use of biological or chemical weapons by either side.

Proof contradicting the official government position exists in the Nuclear, Biological, and Chemical (NBC) logs maintained by General Schwarzkopf at Central Command. These records indicate that U.S. forces were able to confiscate chemical and biological weapons, and cite the specific days on which the acquisition of weapons took place. In addition, the NBC logs detail plans for the destruction of the confiscated materials, and reveal that the military did not want to destroy the weapons in bulk, as such an action may have precipitated an international incident. Many of the NBC logs for the Gulf War have been smuggled out of the Department of Defense by veterans, who were able to circulate them and prove to the public that the U.S. government had full knowledge of the presence of biological warfare agents in Iraq.

Unfortunately, assessment of the magnitude of Gulf War syndrome has been made more difficult by the military's unbelievable ability to misplace essential information. While some of the documents may have been legitimately lost or misplaced, others seem to have been intentionally destroyed in an attempt to conceal information from the public. For instance,

a request to view documents by the Gulf War Veterans of Georgia was rejected by Lieutenant Richard I. Neal, deputy commander of the U.S. Central Command, who justified his response by referring to national security interests. Two months after the initial request was filed, additional inquiries to view the documents were also declined, but this time, veterans groups were informed that the documentation no longer existed.

All branches of the armed forces have been implicated in the destruction of vital records. Corporal Patrick Weissenfluh and Sergeant Todd See, two Marines who were stationed at Camp Pendleton, San Diego, witnessed the burning of hundreds of medical records, while Navy Captain Julia Dyckman experienced a similar situation, in which records sent overseas were mysteriously lost. Despite the excuses of faulty record keeping that were given, Senator Riegle's investigative committee found the pattern of misplaced files and service records within the Department of Defense to be highly irregular. [21]

In addition to exposing governmental negligence and illegal business activities, Senator Riegle's two-year study disclosed information pertaining to the 12 biological, 18 chemical, and four nuclear facilities within Iraq that were destroyed by coalition forces. After the attacks, atmospheric currents transported malignant airborne debris to the vicinity of Allied troops; this is documented in U.S. satellite photos. Prior to the destruction of Iraqi facilities, former Soviet chemical-biological warfare expert Ivan Yevstafyev, as well as scientists from several prominent laboratories, including Sandia, Los Alamos, and Livermore National Laboratories, warned of the danger of chemical fallout, but their advice was ignored. General Raymond Germanos of the French Ministry of Defense prepared a report that in February 1991 confirmed the presence of chemical fallout in the region, while in July 1993 a report by the Czech Ministry of Defense revealed traces of dangerous nerve gases, including sarin and Yperite. [21] In a classified briefing on Oct. 28, 1993, the Pentagon acknowledged the Czech report, but refused to comment. After a few weeks of silence, Defense Secretary Les Aspin did finally accept the possibility of low-level exposure to mustard gas and sarin, but nevertheless maintained that a correlation still could not be established between chemical agent exposure and any of the ailments that had arisen in the approximately 9000 vets that had already registered with the VA for examination of their symptoms.

At a Senate Veterans Affairs Committee hearing shortly thereafter, Aspin's see-no-evil attitude was challenged by Chief Warrant Officer Joseph P. Cottrell of the Marine Corps. According to Cottrell, his unit, while in Kuwait, had employed a highly sophisticated German chemical detection vehicle known as the Fox, which had detected the release of a

chemical agent capable of inducing severe blistering. The Department of Defense attempted to counter Cottrell by attributing the detection to the presence of airborne oil debris, but further investigation by Congressman Joseph Kennedy discredited the Pentagon's rebuttal by disproving the possibility of system malfunction.

A similar scenario was documented by Gulf veterans William Hicks and Sterling Sims of the Alabama National Guard in testimony before the Senate Armed Services subcommittee on military health care. Hicks attested to the release of chemical weapons by the Iraqis on the first day of the war, January 17, 1991. He recalled experiencing a burning sensation as he and other members of his unit rushed to don protective suits after emergency alarms went off. Sims showed those at the hearing the red welts with which he'd been afflicted since returning from active service. He then explained to the committee how the VA medical center in Birmingham, Alabama, had attempted to recommend a psychiatrist to help him cope with his problem. [36]

The Pentagon Begins to Come Clean

It was at a Washington press conference on June 21, 1996, that the Pentagon finally began to drop its know-nothing stance. They admitted that the demolition of an Iraqi ammunition depot, just after the war's end, may have released chemical agents, including mustard gas and sarin. [37] According to Defense Department officials, United Nations inspectors who had visited the site at the Kamisiyah ammunition depot in southern Iraq in May 1996 had verified traces of these deadly gases at the ruins of a bunker destroyed in March 1991. At the press conference, Pentagon spokesperson Kenneth Bacon also admitted that documentation of this incident had existed as early as 1991, but that it had been temporarily misplaced in the abundance of Pentagon paperwork. The lost-paperwork excuse, though, was too familiar. Commented Senator John D. Rockefeller of West Virginia, "The guy [Bacon] was incoherent because he was faced with having to tell the truth. He was distinctly uncomfortable...They've known all along. How could they possibly not have known all along?" [4]

In that June '96 press conference, the Pentagon did admit that some illnesses may have resulted from the Kamisiyah incident. At that time they spoke of, at most, a couple of hundred soldiers being exposed to chemical weapons gases. From there, though, the numbers of exposed troops changed and the story seemed to worsen practically every day. During the second half of '96, and beyond, there was a cascade of revelations about our Gulf experience and today, you didn't have to be a conspiracy theorist--simply a reader of the mainstream media--to understand that our government has been trying to hide

important facts from us for most of this decade.

You can't get more mainstream than The New York Times. From page 1 of the Aug. 28, 1996 issue [38] we learned that top echelons of government, i.e., the Pentagon, the White House, the CIA, and the State Department, had been informed in 1991 that chemical weapons were in fact stored at the Kamisiyah site. Yet an official line of no use, exposure, or presence of chemical weapons in the Gulf War had been upheld until '95. [39] During the next few months, the number of exposed troops kept rising. On Sept. 7, '96, the Associated Press reported that a presidential panel was upping the number of troops exposed to toxic gas at the Kamisiyah demolition from a few hundred to 1100. [40] September 19 saw that number rise dramatically, to 5000, raising with it, as even The Times admitted, new questions about the Pentagon's credibility. [41]

In October, the military's medical records were assailed as being of poor quality by a National Academy of Sciences panel. This obviously hampers our understanding of Gulf veterans' health problems, as the group's chairman noted. The number of troops that might have been exposed to chemical weapons gases at Kamisiyah had been raised to 15,000 by this time. [42] Also in October '96 came news that the White House panel studying Gulf veterans' illnesses found the Defense Department's attitude toward veterans "patronizing or dismissive." [43] Plus it was widely reported that the Czechs, participants with us in Operation Desert Storm and world-recognized chemical detection experts, had warned American commanders about low levels of nerve and mustard gas during the war, but had been ignored. Many Czech veterans have also become sick, it was reported. [44] And in a lengthy Oct. 30, 1996 Times story, [25] two ex-CIA employees asserted that that agency had evidence of up to 60 Gulf War incidents of American troop exposure to chemical weapons. Tens of thousands of our people in the Gulf may have been exposed, said Patrick Eddington, who had specialized, before resigning from the CIA, in analyzing aerial photographs from that region. His wife, Robin Eddington, who has also resigned, reported having seen, during her CIA tenure, classified information to the effect that trace exposure to chemical weapons, over an extended period, can cause illness. The Defense Department has officially denied this possibility. [45]

In November '96, the Pentagon figure for soldiers who might have been at risk in the Kamisiyah demolition was reported at 20,000. [46] And the White House panel was calling for the independent investigation of more than 15 additional Gulf War incidents of chemical weapons detection, and accusing the Pentagon of poor medical record-keeping. [47]

Are Gulf Vets Really Sicker?

For years now, there has long been the idea that while Gulf War syndrome illnesses may exist, they're really an old problem--a response to stress--with a new name, and that Gulf veterans are in reality no sicker than other vets. But in November '96, the chairwoman of a federal panel investigating the issue contended that Gulf conflict participants are in fact sicker than other soldiers. [48] Prominent toxicologist Eula Bingham concluded that, clearly, Gulf vets were suffering from a disproportionate level of ailments. One of the reasons this had been unclear probably had to do with what investigators were looking at. While government reports had shown that our Gulf troops were not dying or falling seriously ill at disproportionate rates, many of the vets' ailments--such as gastrointestinal symptoms, chronic fatigue, and aching joints--do not usually result in what researchers had been looking for--hospitalization or early death. Thus, the vets' symptoms were not taken into proper account.

Dr. Bingham and other members of the Persian Gulf Expert Scientific Committee of the Department of Veterans Affairs, feel that chemical exposure has to be looked into, both from weapons and from other sources, such as the Kuwaiti oil-well fires. A point that panel members emphasized was that battlefield stress has been overrated as a causative agent of the symptomatology.

Two government reports substantiated Dr. Bingham's conclusion that Gulf vets are sicker than others. Both the Centers for Disease Control and the Navy, it was reported in November '96, [49] had the same finding, citing significantly raised rates of chronic diarrhea, joint pain, skin rashes, fatigue, depression, headaches, and memory loss for Gulf vets, compared to troops who had served elsewhere. And memory loss was the subject of research made public in spring '97. Rats injected with the family of chemicals that includes the nerve gas sarin and pesticides exhibited brain damage similar to that in people with memory loss. The Pentagon described these findings as important but, typically, said it was too early to draw firm conclusions. [50]

Underscoring the complexity of the problems that vets are experiencing was the January 1997 issue of the Journal of the American Medical Association. It featured four studies on Gulf War syndrome, one of which concluded that the syndrome is actually six syndromes, the most serious of which is characterized by problems in thinking and reasoning, confusion, and dizziness. Another syndrome is marked by joint pain, muscle fatigue, tingling, and numbness. Another study of sick Gulf War vets found evidence of subtle neurological damage compatible with exposure to combinations of cholinesterase-

inhibiting chemicals. [51].

Missing Log Pages...and Credibility

Echoes of Watergate seemed to resound in December '96, when it was revealed that military records from a 7-day period right after the Gulf War (Mar. 4–10, 1991) were reported lost by the Pentagon. It was within this time frame that the Kamisiyah arms depot was blown up. [52] Former Senate investigator James Tuite voiced the skepticism of many when he said, "This was the historical record of what was supposedly the brightest moment in the last 50 years of American military history, and now they say they've misplaced part of the historical record?" [52] Subsequent information (from March '97) provided by the Pentagon estimates that 80 percent of the logs are missing. According to the Department of Defense, they had managed to track down only 36 pages of the known 200 pages of log material. The 36 pages show repeated warnings that Iraqi chemical weapons were detected, but these were all called false at the time by commanders. The logs for the destruction of Kamisiyah were still unfound. [53]

Tuite did get some information recently, through the Freedom of Information Act, that shed light on Kamisiyah. He obtained a report given to the Air Force by the Livermore National Laboratory three months before the war, the essence of which was that bombing Iraq's arsenals would release deadly nerve agents that could endanger our troops, given the direction of prevailing winds. [54] The Livermore predictions had been kept under wraps for seven years.

"This latest bombshell is no surprise," commented Representative Christopher Shays (R.--Connecticut), chairman of the House Subcommittee on Human Resources. In other words, cover-up is par for the governmental course.

So are outspoken doctors who end up losing their jobs. This is an issue that keeps surfacing. Indeed, in December '96, the leader of a Congressional investigation into Gulf vets' illnesses accused the Department of Veterans Affairs of trying to rid that agency of doctors who questioned official government positions. [55] According to Representative Shays, the veterans' agency threatened to fire doctors who gave voice to the ideas that exposure to chemical agents in the Gulf made Americans sick, or that there was an infectious agent endemic to the region responsible for our soldiers' illnesses. For instance, one of the first doctors to notice a pattern of health problems among Gulf vets, Dr. Katherine Murray Leisure, was informed that she was to lose her job. It took protests from veterans' groups and members of Congress to rescind her firing--temporarily. A half year later she did lose her job.

"This is a very dark era for federal medicine," Dr. Leisure feels. "It's a new disease with new problems combined with chemical warfare, biological warfare, and unknown agents in the desert. But federal officials think the enemy is the veterans and the people who are trying to help them."

Dr. William Baumzweiger, who has testified in Congress that low doses of Iraqi nerve gas probably led to veterans' ailments, was another physician slated for dismissal and then saved, through protests by Congress people who had heard his testimony. Said Representative Shays: "If you have a contrary view that maybe the Congress or the public needs to hear, you are silenced." [55]

The truth will out, though. Recent evidence of American troops' exposure to nerve gas has led Nobel-prize-winning scientist Dr. Joshua Lederberg to call for a new study to determine if low-level nerve gas exposure can lead to long-term disease. [56] This was the same Dr. Lederberg who headed a 1994 Pentagon study that said there was no chemical weapons link with Gulf War syndrome, but the new information coming out on Kamisiyah has made him an advocate of a second look. Lederberg is also paying attention to recent reports by Israeli scientists that anti-nerve-gas agents given to allied troops during the Gulf conflict may be having physical repercussions today.

Issues of credibility came to the fore in illuminating December '96 Congressional testimony from two American soldiers who had served in the Gulf War. [57] Major Michael F. Johnson and Gunnery Sergeant George J. Grass, of the Army and the Marines, respectively, had worked in a Fox--the kind of vehicle that functions as a chemical-detector lab--during the war. They reported that chemical weapons were found in Kuwait, both during and after the war. This contradicted the Pentagon's previous line about false alarms and no chemical weapons presence in Kuwait. The soldiers' chemical detections were ignored at the time, and Sergeant Grass noted that many of the chemical-agent shells spotted appeared to be American-made.

Also providing riveting testimony at that hearing was Major Randy Hebert, a Marine suffering from amyotrophic lateral sclerosis (Lou Gehrig's disease), a condition he suspects is linked to low-level chemical exposure during his Gulf service. Hebert's words, which, because of his condition, had to be translated by family members, were to the effect that the Pentagon did not want to accept its responsibility for sick veterans. [57]

Other news from the end of '96: Britain joined the U.S., the Czech Republic, and Slovakia in expanding its inquiry into the conditions plaguing coalition forces. [58] Our Department of Veterans Affairs said it was slow in investigating vets' health complaints because of

previous false assurances by the Pentagon that no chemical weapons exposure had occurred. [59] And an ex-investigator--he was fired--working with the Presidential Advisory Committee on Gulf War Veterans' Illnesses said he'd been told to limit his investigation to government agencies. Dr. Jonathan B. Tucker had been instructed that actual Gulf War veterans were off-limits as information sources in the committee's investigation of veterans' illnesses! [60] Also off-limits were government whistle-blowers. Regarding the number of Americans exposed to gas at the Kamisiyah demolition, the Pentagon estimate seems to have topped off at 100,000, up from the few hundred of mid-'96! In December '96, when the number had reached 20,000 [61] a panel reported that we will probably never know how many Americans were exposed, due to uncertainty about weather conditions at the time, as well as other factors. Noted The New York Times about this bit of news: "The news release was made available at the Pentagon late on Friday afternoon, too late for television networks to include it in their evening broadcast, and without any notification to news organization that routinely cover the department. It is the latest in a series of incidents in which the Pentagon has released bad news about this and other issues late on a Friday afternoon or in the evening." [61]

Preliminary Panel Report

By January '97, about 80,000 of our 700,000 Gulf veterans had requested special medical examinations keyed to Gulf-related illness. [62] At that point, governmental response to this large segment of our Gulf service population was a White House panel report saying that the group could find no evidence that exposure to chemical weapons hurt soldiers' health. But that's like saying--as was said for years--that there's no evidence cigarette smoke causes cancer. You have to know how to find such evidence, because it's going to involve statistical correlation over long periods of time, rather than easy, short-term experimentation.

The panel mentioned stress as a contributing factor to veterans' ailments. But as John D. Rockefeller IV put it, "it's not just a stress syndrome." Rockefeller underscored the fact that there are 50,000 or more people who went over to the Gulf completely healthy and came back "very, very sick," and he complained of the "massive indifference of the whole military establishment." [62]

On the plus side--for veterans--of the panel's report was that it did also say that the Pentagon's long-standing reluctance to research the health effects of low-level chemical agent exposure had done the country a disservice. And it called for more investigation of other possible Gulf syndrome factors, such as oil-well fires and pesticides. [62] Other early

1997 news came from Senator Tom Harkin (D.--Iowa) and the Centers for Disease Control and Prevention. They reported that Iowa's Gulf veterans were indeed sicker than that state's other veterans. [62]

The Power of Synergy

More and more truths are being acknowledged about the Gulf War syndrome picture, and one of the most important is that our troops were exposed not just to a single toxin, but to a whole variety. So we can't lose sight of the power of synergy. That is, when two or more relatively weak illness--causing factors are combined, they can be quite harmful. This was underscored by a January '97 paper by researchers who had studied both experimental animals and Gulf War vets at the University of Texas Southwestern Medical Center in Dallas. Their findings: Harmless levels of two or more chemicals can combine to cause precisely the symptoms reported by Gulf War syndrome sufferers. These symptoms appear to be a type of organophosphate poisoning, report the researchers. What's more, they note that the subtle nerve damage caused by organophosphate poisoning can be missed by physicians unfamiliar with the phenomenon. [63]

Dr. Robert W. Haley, head of epidemiology at Southwestern Medical Center and leader of the research team, spoke of the severe symptoms being experienced by a group of vets who had been at Khafji, near the Saudi--Kuwait border, on Jan. 20, 1991, during the air war. This was a day when Czech chemical experts had detected sarin and mustard gas. The hard--hit vets seem to have taken pyridostigmine nerve gas antidote tablets after, rather than before, chemical exposure, which can be particularly damaging.

Additional work done at the Southwestern Medical Center shows stronger evidence that chemical synergy--not stress--is what's making vets sick. Professor of clinical neurology Jim Hom was a principal investigator on this study. He explained that the researchers compared a broad range of brain--related psychological functions of ill and well veterans from the 24th Naval Mobile Construction Battalion. The scientists were blinded as to which group was which until the end of the work. [64]

"The ill veterans performed worse on 59 of the 71 brain--related measures," Hom reported, adding that the affected vets' psychological profile was similar to that of individuals with general medical problems and did not include psychopathology. "Clearly, the ill veterans demonstrated a neuropsychological pattern of impairment that is indicative of generalized brain damage, not psychological reactions." [65]

What was particularly noteworthy about Hom's study was that it refuted the results of an earlier study done at the Birmingham VA Medical Center by researchers who used many,

but not all, of the same neuropsychological tests. In that study, 55 Gulf vets with cognitive difficulties were tested, and the VA researchers concluded that exposure to neurotoxins did not come into play, attributing the vets' symptoms to "intentional exaggeration of problems" or "emotional distress," and going as far as to say that some of the vets were faking.

But there was a problem with the Birmingham study, Hom explained: It had no control group. The Dallas study, by contrast, had a control group of veterans from the same unit who were not reporting any problems. "When you stack all the results of our tests together it is clear that something is wrong. The brain is an organ that integrates all types of functions. You can't isolate and test just one thing. The tests have to be complementary. Our tests were designed to be a package--they complemented each other. This is what makes our study different than others."

Thus, Hom discounts psychological disorders, including post-traumatic stress disorder, as being responsible for the veterans' symptoms. He says, rather, that affected vets suffer from one of three syndromes: The first is characterized by thought, memory, and sleep difficulties; the second by more significant thought problems, as well as by confusion and imbalance; and the third by joint and muscle soreness and by tingling and numbness in the hands and feet. And these three syndromes are variations of organophosphate-induced delayed polyneuropathy, which results from exposure to certain chemicals that inhibit cholinesterase, an enzyme necessary for proper nervous system functioning.

Commented Hom's co-researcher Dr. Robert Haley, "This study supports our overall theory that the syndrome we identified represents neurological damage from combinations of chemicals."

And Hom said, when asked about the psychological aspects of Gulf War syndrome, "Psychological issues are important--but they don't cause brain damage."

Strong Insecticides Used

Hom and Haley's studies, as well as others done recently with Duke University scientists, are finally demonstrating that chemical synergy, rather than combat stress, is the underlying factor in Gulf War syndrome. Because of all the toxins to which troops were exposed--including pesticides; insect repellent, sometimes used in the form of flea collars worn by soldiers, and including DEET; nerve gas; anti-nerve-gas medication; experimental vaccines; burning-oil-well fumes; and depleted uranium--the potential for synergistic damage is extensive, and hard to fully comprehend.

Use of insect repellent is a mundane factor that nevertheless ought not to be overlooked

when considering synergistic damage. Stars and Stripes reports [64] that while the insecticide DEET was deemed safe in concentrations of less than 31 percent, Desert Storm participants received DEET in strengths between 33 and 75 percent. The combination of DEET and PB--those pyridostigmine bromide anti-nerve gas pills that servicemen and women were ordered to take--is being studied at the University of Florida at Gainesville for their combined effects. Also, the insecticide permethrin, sprayed on soldiers' uniforms, was used in strengths exceeding safe levels, and may have exacerbated the effects of other substances.

In Dr. Garth Nicolson's view, some Gulf War illness patients are sick due to chemical exposure, others are sick due to biologic exposure, and some are sick due to both types of exposure. [66] "This last group are often the sickest," he says. "In fact, many of these people have probably died, although it's very difficult to get the true numbers. The estimates are somewhere between 12,000 and 15,000, but we don't have accurate figures on this because they're not being released."

Nicolson points out that new information reveals that soldiers may have been subjected to far more of these toxins than is publicly admitted. One of the most interesting revelations comes from a group of former CIA employees who stumbled on aerosol generators that were probably used as sprayer units to spread biologic agents. These were designed to fit onto any vehicle--from jeeps to trucks to helicopters to small aircraft--and used to contaminate large areas. In fact, some generators were found with their contents still intact. A further source of pollution may come from Scud weapons that were equipped with chemical and biological warheads. Iraqis were operating under a Soviet war doctrine that suggests mixing together chemical and biological agents. One CIA report indicates that 40 or more of these Scuds were loaded with both chemical and biological weapons. Reports circulating on the Internet site known as Gulflink said these weapons were ready to use, although whether or not they were actually used remains in question. Nicholson believes these weapons probably were used and that they were low-explosive warheads that blew up at 2000 to 5000 feet in the air. Reserve units observed warheads that exploded, dispersing a purplish blue vapor. During this time, chemical alarms sounded. People exposed to these vapors subsequently become very sick, and many have died.

Nicolson summarizes the various modes of toxin transmission: "In our testimony to Congress, we indicated that there were several possible ways in which soldiers could have been exposed to chemical and biologic agents in the Gulf War. Number one among those was contaminated vaccines. The second was the sky-burst warheads used on some of the

Scuds that could have delivered biological and chemical weapons. The third was the presence of exclusionary zones in southern Iraq in which...the sprayers were found. These are the principle ways, we feel, that soldiers could have been exposed during their service in the Persian Gulf theater of operations."

As mentioned previously, Nicolson has spoken of a genetically altered version of a mycoplasma as a disease-causing factor for Gulf War veterans. He says that antibiotics have been effective in treating this problem, which is, he says, highly contagious. Being airborne, Nicolson explains, this microorganism can be picked up without intimate contact. [67] It should be noted that some Desert Storm veterans' groups dispute Nicolson's claims, terming them alarmist. They point out that if the public perceives Gulf vets as carriers of a contagious disease, they could be discriminated against. [68]

Uncompassionate Care

Our servicemen and women work hard for their country and take tremendous risks. This is all part of being in the military. But what happens when they suffer physically in the process and subsequently need medical care? Shouldn't they receive the very best care possible?

In June 1997, the Department of Veterans Affairs admitted that its doctors had given less than adequate attention and care to many of the men and women who have become ill after serving in the Gulf. The department's undersecretary for health, Dr. Kenneth W. Kizer, told a Congressional committee that "While we believe that our programs have been well designed, we also know that they are neither uniformly delivered nor perfect. [69]

"We also recognize that some veterans have not received the kind of reception or care at VA medical facilities that we can be proud of," Kizer added. He was referring to the many reports that veterans complaining of fatigue, muscle and joint pain, memory loss, shortness of breath, and other common Gulf War syndrome symptoms are treated with little sympathy, cursory examinations, and little or no follow-up, the idea being that their problems exist "only in their head." Said Stephen P. Backhus, of the General Accounting Office, Congress's investigative branch, "Veterans who expect treatment designed for those suffering from Gulf War illnesses appeared more likely to express frustration and disappointment with the care they receive."

Kizer expressed the intention of improving VA service to Gulf vets.

Will vets in fact receive the kind of care and compensation that they need? In September 1997, the Presidential Advisory Committee on Gulf War Veterans' Illnesses, which had studied vets' health problems for two years, made its final recommendations, which held

out some hope for affected veterans. The most important recommendation was a call for a permanent statutory program of benefits and health care for service people experiencing post-Gulf problems. The organization of such a plan, and financial arrangements, would be matters for the Department of Veterans Affairs and Congress to work out.

Congressional representatives involved in implementing such benefits, and in pushing for further research, include Senator John D. Rockefeller IV (D.--W. Virginia), Representative Bernard Sanders (I.--Vermont), and Representative Cliff Sterns (R.--Florida), among others. [70]

In a previous report (the preliminary one of January '97), the presidential committee had said it could not find a causal link between the symptoms referred to as Gulf War syndrome and the suspected causes. That report had mentioned stress as a probable factor, a finding that was left intact in the panel's final report, to the dismay of many veterans' groups. On the positive side, the advisory committee expressed the opinion that free care for veterans should not be linked to whether or not we understand the cause of their illnesses. Also, the panel called for more research into chemical causation and felt that the Pentagon had lost credibility with the public by denying that there were chemicals on the battlefield. While the Pentagon had been doing research into the effects of low-level exposure to chemical and biological warfare agents, the committee called for independent review of the research in light of the Pentagon's seeming lack of objectivity.

Arthur Caplan, noted bioethics professor at the University of Pennsylvania and a member of the advisory committee, described his distrust of Pentagon research this way, "The Pentagon is not credible to continue inquiries that veterans and the public do not find persuasive....Pentagon officials are inclined to see things from the point of view at which they started: Deny that there were chemicals on the battlefield. The Pentagon sees the burden of evidence as falling on those who argue otherwise. I find that not a credible stance. I find it distasteful. I find it unpersuasive. I find it, in fact, unbelievable." [71]

What Clinton Says

In November 1997, President Clinton issued a statement on Gulf War Veterans' illnesses. [72] Reiterating his panel's call for compensation and care for all affected veterans, whether or not the cause of illness is fully understood, he said he is asking the National Academy of Sciences to review the ongoing research on the connections between all the reported illnesses and Gulf War service. He also plans to help Congress pass laws guaranteeing that veterans' benefits will continue during future administrations.

Additionally, Clinton spoke of dedicating \$13.2 million for research on how low-level

exposure to chemical agents can cause illness, and on other possible causes. He said that former Senator Warren Rudman will be leading an oversight board to ensure that the Defense Department's research meets high standards.

Also, "to apply the lessons we have learned for the future," Clinton said, "I am directing the Departments of Defense and Veterans Affairs to create a new Force Health Protection Program. Every soldier, sailor, airman, and Marine will have a comprehensive, life-long medical record of all illnesses and injuries they suffer, the care and inoculations they receive, and their exposure to different hazards. These records will help us prevent illness and identify and cure those that occur."

What Clinton says sounds good. But we should keep in mind that the panel he appointed was the one that dragged its feet on getting rid of the stress explanation for Gulf War syndrome. In fact, it still hasn't, although its call for research into physical causes was a step in the right direction.

We Need to Learn More

There is still a lot to understand about our Gulf experience and its aftermath. One field of inquiry involves Garth Nicolson's contention that a genetically altered mycoplasma is responsible for some Gulf War illness. Another centers on the role of depleted uranium. And an emerging question involves the Kamisiyah arms depot demolition. Was this action carried out recklessly? Pentagon officials have asserted that the obliteration of the Iraqi bunker was supervised by experts trained in chemical warfare, but according to several U.S. servicemen who were present at the scene, this was not the case. According to Corporals Brian Martin and Chris Tullius, whose recollections of the Kamisiyah incident have been corroborated by their executive officer, Major Randy Riggins, chemical specialists were never present and testing that was supposedly conducted prior to and after the demolition of the bunker did not occur. Martin, who had videotaped the entire proceedings at the bunker, revealed that chemical detection devices were not even taken out at the site, while Riggins indicated that his troops did not examine the inside of the bunkers because the entrances had been mined by the recently departed Iraqis.

According to Riggins, the enormous explosion of the demolition caused a downpour of debris to fall upon himself and his troops. Riggins recalled that the immensity of the blast had triggered chemical detector alarms at the engineers' camp ten miles away.

Unfortunately, the servicemen present at the Kamisiyah depot were not provided with ample warning, and consequently, their exposure to noxious fallout has since resulted in numerous reports of chronic disorders within the unit. [10]

One of the most important questions that will be researched is the extent to which low-level chemical exposure affects people over the long term. That there is an effect has in fact been documented years ago, i.e., in a 1974 study entitled *Delayed Toxic Effects of Chemical Warfare Agents*. This study, conducted by the director of the Institute of Chemical Toxicology of the East German Academy of Sciences, Dr. Karlbeinz Lohs, describes how workers at chemical-weapons plants were diagnosed with chronic disorders that were the same as symptoms currently being exhibited by Gulf War veterans. The whole gamut of problems--from neurological to gastrointestinal and cardiac problems, to memory loss, increased cancer incidence, and a higher birth defect rate--is the same. And further research has shown that exposure to organophosphate insecticides, which in essence are diluted forms of chemical warfare agents, can promote the onset of chronic health disorders. [10]

In short, the evidence is there. Gulf veterans are suffering from more than stress. And as the body of current research expands upon that of the past, no one will be able to deny that truth.

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