

U.S. Chemical and Biological Exports to Iraq and Their Possible Impact on the Health Consequences of the Persian Gulf War

Committee Staff Report No. 3: Chemical Warfare Agent Identification, Chemical Injuries, and Other Findings.

U.S. Senate Committee on Banking, Housing, and Urban Affairs

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A. BACKGROUND

The Senate Committee on Banking, Housing, and Urban Affairs is responsible for U.S. government legislation and oversight as it effects "dual use" exports -- those materials and technologies that can be converted to military uses.

During the Cold War, United States export policy focused primarily on restricting the export of sensitive "dual use" materials and technologies to the Soviet Union and its allies. This myopic approach to the non-proliferation of these materials ultimately resulted in the acquisition of unconventional weapons and missile-system technologies by several "pariah nations" with aggressive military agendas. For the United States, the reality of the dangers associated with these types of policies were realized during the Persian Gulf War. Recognizing the shortcomings of existing policies, and with the dissolution of the Soviet empire, an inquiry was initiated by the Committee into the contributions that exports from the United States played in the weapons of mass destruction programs that have flourished under the direction of Iraqi President Saddam Hussein.

On October 27, 1992, the Committee on Banking, Housing and Urban Affairs held hearings that revealed that the United States had exported chemical, biological, nuclear, and missile-system equipment to Iraq that was converted to military use in Iraq's chemical, biological, and nuclear weapons program. Many of these weapons -- weapons that the U.S. and other countries provided critical materials for -- were used against us during the war.

On June 30, 1993, several veterans testified at a hearing of the Senate Committee on Armed Services. There, they related details of unexplained events that took place during the Persian Gulf War which they believed to be chemical warfare agent attacks. After these unexplained events, many of the veterans present reported symptoms consistent with exposure to a mixed agent attack. Then, on July 29, 1993, the Czech Minister of Defense announced that a Czechoslovak chemical decontamination unit had detected the chemical warfare agent Sarin in areas of northern Saudi Arabia during the early phases of the Gulf War. They had attributed the detections to fallout from coalition bombing of Iraqi chemical warfare

agent production facilities.

In August 1993, Senate Banking Committee Chairman Donald W. Riegle Jr. began to research the possibility that there may be a connection between the Iraqi chemical, biological, and radiological warfare research and development programs and a mysterious illness which was then being reported by thousands of returning Gulf War veterans. In September 1993, Senator Riegle released a staff report on this issue and introduced an amendment to the Fiscal Year 1994 National Defense Authorization Act that provided preliminary funding for research of the illnesses and investigation of reported exposures.

When this first staff report was released by Senator Riegle, the estimates of the number of veterans suffering from these unexplained illnesses varied from hundreds, according to the Department of Defense, to thousands, according to the Department of Veterans Affairs. It is now believed that tens of thousands of U.S. Gulf War veterans are suffering from a myriad of symptoms collectively labelled either Gulf War Syndrome, Persian Gulf Syndrome, or Desert War Syndrome. Hundreds and possibly thousands of servicemen and women still on active duty are reluctant to come forward for fear of losing their jobs and medical care. These Gulf War veterans are reporting muscle and joint pain, memory loss, intestinal and heart problems, fatigue, nasal congestion, urinary urgency, diarrhea, twitching, rashes, sores, and a number of other symptoms.

They began experiencing these multiple symptoms during and after -- often many months after -- their tour of duty in the Gulf. A number of the veterans who initially exhibited these symptoms have died since returning from the Gulf. Perhaps most disturbingly, members of veteran's families are now suffering these symptoms to a debilitating degree. The scope and urgency of this crisis demands an appropriate response.

This investigation into Gulf War Syndrome, which was initiated by the Banking Committee under the direction of Chairman Riegle, has uncovered a large body of evidence linking the symptoms of the syndrome to the exposure of Gulf War participants to chemical and biological warfare agents, chemical and biological warfare pre-treatment drugs, and other hazardous materials and substances. Since the release of the first staff report on September 9, 1993, this inquiry has continued. Thousands of government officials, scientists, and veterans have been interviewed or consulted, and additional evidence has been compiled. This report will detail the findings of this ongoing investigation.

On February 9, 1994, Chairman Donald W. Riegle, Jr. disclosed on the U.S. Senate floor that the U.S. government actually licensed the export of deadly microorganisms to Iraq. It was later learned that these microorganisms exported by the United States were identical to those the United Nations inspectors found and recovered from the Iraqi biological warfare program.

Throughout this investigation, the Department of Defense has assured the Committee that our troops were never exposed to chemical or biological agents during the Persian Gulf War. They have repeatedly testified in hearings and have made public statements that, at no time, were chemical and biological agents ever found in the Kuwaiti theater of operations.

In February of this year, the Chairman wrote a letter asking them to declassify all information on the exposure of U.S. forces to chemical and biological agents.

Then on May 4, 1994, the Chairman received assurances in a joint letter from Secretary Perry, Secretary Brown, and Secretary Shalala, that

--"there is no classified information that would indicate any exposures to or detections of chemical or

biological weapons agents." (1)

--Also in May, Undersecretary of Defense Edwin Dorn in sworn testimony in a hearing before the Committee on Banking, Housing, and Urban Affairs, claimed that all chemical agents were discovered

--**"a great distance from the Kuwait theater of operations."** (2)

During the same hearing, another senior Defense Department official was forced to recant part of the statement when confronted with the highly publicized discovery of chemical agents by U.N. inspectors near An Nassiriyah, which was very close to areas in which U.S. forces were deployed.(3)

In fact, we have received reports from Persian Gulf War veterans that U.S. forces actually secured this chemical weapons storage area.

Also during the hearing, a joint memorandum for Persian Gulf War veterans from Secretary of Defense Perry and the Chairman of the Joint Chiefs of Staff was presented. The memorandum stated, in part

"there is no information, classified or unclassified, that indicated that chemical or biological weapons were used in the Gulf." (4)

Then, the Department of Defense announced on June 23, 1994, that the Defense Science Board found that

"there is no evidence that either chemical or biological warfare was deployed at any level, or that there was any exposure of U.S. service members to chemical or biological warfare agents."(5)

This report raises serious questions about the integrity of the Department of Defense position. It describes events for which the Department of Defense explanations are inconsistent with the facts as related by the soldiers who were present, and with official government documents prepared by those who were present and with experts who have examined the facts.

B. RECOVERY OF CHEMICAL AGENTS IN KUWAIT

August 1991 - Sabahiyah High School for Girls

The Committee staff has obtained British and U.S. Army reports which document in detail the discovery of more than 250 gallons of dangerous chemical agents. According to the units that were present, mustard gas and another blister agent were found in a storage tank in southeastern Kuwait.

These chemical agents were recovered in Kuwait, well inside the Kuwaiti theater of operations, well inside areas occupied by U.S. and British forces. According to the reports, they had been placed there by Iraqi forces during the occupation of Kuwait. The liquid was tested and over 20 times the presence of chemical agents was confirmed.

The Committee staff has obtained a copy of a recommendation for an Army Commendation Medal that was presented to Sergeant James Warren Tucker for among other things "participating in the mission that located stores of chemical agents" while deployed in Southwest Asia.(6)

Committee staff has also identified the commander of that unit, Captain Michael F. Johnson, currently with the U.S. Army at The Infantry School at Fort Benning, Georgia -- who was awarded a Meritorious

Service Medal for his actions.(7)

These two soldiers and as many as six others from the 54th Chemical Troop of the United States Army's 11th Armored Cavalry Regiment were given Army medals for "the positive identification of suspected chemical agent," according to the citation presented to Captain Johnson.(8)

We have obtained the actual reports from two NATO countries who were Coalition members during the Persian Gulf War.(9)

This is a step-by-step analysis of the event as recorded in documents and the testimony of Nuclear Biological and Chemical, or NBC, officers who were there.

A container suspected of containing chemical agents was located in southeastern Kuwait in an area about 50 kilometers north of Saudi Arabia and 4 kilometers west of the Persian Gulf. The precise coordinates are TN18832039 (Magellan)(10) Maps showing the precise location in which this container was found is attached.(11)

According to the British report, on August 5, 1991, several months after the end of the Persian Gulf War, Major J.P Watkinson of the British Army received orders to investigate a container that was believed to be leaking mustard gas.(12)

According to the official report prepared by Major Watkinson on 7 August 1991, the request to investigate the leaking container was made by Lt. Colonel Saleh Al Ostath of the Kuwaiti Army and agreed to by Mr. Lucas of the Royal Ordinance Corps.(13)

Major Watkinson and his unit, the 21st Explosive Ordinance Disposal Squadron, were taken to the site of the Sabahiyah High School for Girls and directed to a metal storage tank with a capacity of approximately 2,000 liters. According to the report, there appeared to be entry and exit bullet holes of approximately 7.62 caliber in the container.(14)

A photograph of the schoolyard with some of the chemical specialists approaching the tank that contained the chemical agents is attached.(15)

According to Major Watkinson's report, the container was leaking a brown vapor from both holes. The school was not in use and there were U.S. civilian contractors clearing explosives and rubbish from the area.(16)

The school security guard told the British that the tank was not there before the war. He first noticed the tank when he returned to the school after the war on March 20, 1991 -- four and a half month prior to these tests. The British report notes that the school was used as an Iraqi defensive position during the war.(17)

Major Watkinson ordered all personnel to move up wind, and after putting on his chemical protective clothing, approached the container and tested the brown colored vapor with a Chemical Agent Monitor (CAM).(18)

The Chemical Agent Monitor gave a reading of eight (8) bars on H, for mustard agent -- a maximum reading indicating a highly concentrated agent -- and no bars on G, indicating no nerve agent present. (19)

This was the first positive test for chemical mustard agent at this location.

Distilled mustard is described in the Merck Index, a handbook for chemists, as **an oily substance**. It is also described as being amber brown in color -- remember Watkinson's report describes it as a brown substance.(20)

A photo and diagram of a Chemical Agent Monitor or CAM in use showing the types of displays that a chemical detection specialist would observe is attached.(21)

An 8-bar reading indicates a highly concentrated agent. These monitors are still in use by both U.S. and British forces.

Watkinson then tested the vapor with one color detector paper and nothing happened. He used three color detector paper and it turned pink indicating the presence of mustard agent.(22) **This was the second positive test for mustard agent.**

On a second visit to the container, according to the report, he inserted a wire into one of the bullet holes, and according to his report,

"wiped the oily substance on both types of detector paper."(23)

Again the oily nature of the substance indicates a property that is consistent with the properties of mustard agent.

The one color paper turned brown and the three colored paper turned pink, the latter again indicating the presence of mustard agent. **This was the third positive test for mustard agent.** Major Watkinson then sealed both holes in the container with masking tape.(24)

On yet a third visit to the container, the holes were uncovered and the vapor was tested using an M18A2 chemical detector kit. This test was repeated six times. On four of the tests the color indicator immediately turned blue indicating mustard (or "H") agent.(25)

For the remaining two tests, the color indicator went yellow but later turned blue.(26) **These were the fourth through the ninth positive tests for mustard agent.**

Another wire dip test was conducted using the three color detector paper from the M18A2 kit and the paper turned pinkish/orange **indicating mustard agent for the tenth time.** The bullet holes were resealed using industrial silicone filler and plaster of paris bandages. The container was checked with the Chemical Agent Monitor for leaks and the area was secured.(27)

On August 7, 1991, the Commander of the 11th Armored Cavalry Regiment was asked to send two FOX chemical reconnaissance vehicles, in support of the Kuwaiti Ministry of Defense and the Royal Ordinance Corps, to assist Major Watkinson in confirming the presence of a chemical agent.(28)

Since this was a joint and combined live agent chemical detection mission, involving both U.S. and British forces, detailed rehearsals occurred to ensure that no mistakes were made. The unit then travelled to the Sabahiyah High School for Girls in southeastern Kuwait.(29)

On August 8, 1991, one FOX team moved to the area near the container and began to conduct point surveys inserting the detection probe of the FOX vehicle into the ground to a depth of about four

centimeters. The mass spectrometer showed microdoses of chemical mustard agent in the ground.(30)
This was the eleventh confirmation.

At the same time another collection team in full chemical protective clothing walked to the container, estimated to contain between 800-1000 liters, or about 250 gallons of liquid, with Chemical Agent Monitors and other assorted chemical detection equipment. This team removed the storage container's seals and there was a discharge of pressurized vapor into the air.(31)

Captain Johnson's report confirms that he saw a light copper to amber colored vapor exit from the hole. (32) Again, mustard agent is described as an amber brown liquid.(33)

Tests were conducted with both the Chemical Agent Monitor and chemical detection paper. **The detection paper confirmed the presence of chemical mustard agent; the twelfth confirmation.** The Chemical Agent Monitor registered eight bars, again confirming highly concentrated mustard agent. **This was the thirteenth confirmation of mustard agent** by the specialists present.(34)

Captain Johnson's unit then inserted a medical syringe with a catheter tube into the container to extract liquid agent for detection paper, Chemical Agent Monitor, and FOX testing.(35)

The sample was placed into a metal dish. By the time a ground team member moved to the rear of the FOX to the probe, there was not enough liquid available to get a reliable reading.(36)

Another attempt was made and the ground team extracted a larger sample of liquid and placed it into the metal dish. The dish was moved to the FOX probe and the liquid was drawn for analysis -- not random vapors -- not oil fumes -- but the actual liquid chemical agent. Within six seconds, the mass spectrometer detected and identified the liquid as highly concentrated mustard agent.(37) Both four point and full spectrum readings were obtained, according to Captain Johnson, in each of the mass spectrometer analyses.(38) **This therefore was the fourteenth (4 point) and fifteenth (full spectrum) confirmation of mustard agent.**

Further analysis by the system also indicated the presence of traces phosgene, a non-persistent choking agent, and phosgene oxime, a blister agent. Another test was conducted to validate the findings. **Again the FOX vehicle confirmed the presence of mustard agent for the sixteenth and seventeenth time, and again phosgene, and phosgene oxime were confirmed.**(39)

Captain Johnson ordered yet another mass spectrometer test, utilizing the second FOX vehicle. The team in the second vehicle was not informed of the findings of the first vehicle, to rule out any possibility of biased readings from the team in the second vehicle. The team in the second FOX vehicle repeated the test and reported the same findings except that this time the reported levels of phosgene oxime were much higher. They also performed a second test to confirm their results. Again both 4-point and full spectrum analysis was conducted during each of these tests.(40) **These were the eighteenth through twenty-first confirmations.**

While the Chemical Agent Monitor and many other chemical detection kits available to military forces only detect H, or mustard agents, and G and V nerve agents, the FOX chemical reconnaissance vehicle accurately detects 60 known chemical agents using a computerized mobile mass spectrometer.(41)

It is capable of identifying the individual component chemical elements, such as sulfur, hydrogen, chlorine, and so forth; their molecular composition; and their molecular weight. This provides a scientific means to precisely identify substances.

In response to a request by the Committee for an explanation from the Department of Defense, Dr. Theodore Prociv, Deputy Assistant for Chemical and Biological Matters (Atomic Energy), replied on July 26 that the Department of Defense analysis of the FOX tapes revealed that the ions matched in three of four categories for a mustard agent, but matched nitric acid in all four categories.(42)

Committee staff solicited an opinion from the National Institute of Standards and Technology regarding the accuracy of this explanation.(43)

On September 6, in response to several specific questions, Dr. Stephen Stein, of the Institute, replied that "HD [mustard] has no major peaks in common with those expected to arise directly from fuming nitric acid," and that it is "highly unlikely that a properly functioning mass spectrometer would produce any of the major peaks of nitric acid or nitrogen oxides from HD." Furthermore, "if fuming red nitric acid did not decompose prior to detection (ionization) there would be no possibility of mistaking it for HD." (44)

The commander of the unit said that the tests were run using both the four principle mass peaks and full spectrum analysis on the substance in question. The tests were run twice each by two FOX vehicles. The mass spectrometers were checked for calibration before and after each test, with no problems noted.

Each of the four tests identified identical substances-namely; mustard agent and phosgene oxime. When asked specifically, "how likely is it that under these circumstances that the computer algorithm identified nitric acid as these substances," Dr. Stein responded that "if fuming red nitric acid did not react prior to detection, there is no likelihood that either the four peak analysis or the full spectrum analysis would lead to false identification of mustard." (45)

And, "if nitric acid did react, the reaction products might generate a large number of peaks. Some of these might fortuitously be those characteristic of HD or other chemical agents and therefore might produce a false positive 4-peak identification of HD. A robust full spectrum matching algorithm, however, would not be expected to falsely identify mustard." (46)

The ground collection team then extracted a larger sample from the container and prepared it for transport from the area for further testing and evaluation.(47)

According to Captain Johnson's report and other eyewitness testimony, a member of the British team was injured while collecting a sample of the chemical agent. Some of the liquid agent made contact with the soldiers left wrist. The soldier immediately reacted to the liquid and was in severe pain and was believed to be going into shock.(48)

The injured soldier was quickly taken to a decontamination site and covered with decontamination powder and cut out of his chemical protective clothing.(49) A photograph of the British soldier on the FOX vehicle and his clothing laying in a pile beside the vehicle is attached.(50)

Dr. Prociv in his July 26, 1994 letter to the Committee reported that the injured soldiers clothing had been found by the British government to have been burned by fuming nitric acid in tests conducted at Porton Down.(51) Previously, in response to direct questioning by Committee staff, Captain Johnson stated that the contaminated suit was burned, that is, incinerated, at the site.(52)

The decontamination team then doused the soldier with a decontamination solution. Within one minute, a small blister was observed forming on his left wrist the size of a pinhead. About five minutes later, the blister had already reached the size of a U.S. fifty cent piece coin. Medics on the scene screened the victim for residual liquid contamination and sent him to the hospital for further treatment. After the

casualty was evacuated, the rest of the unit and equipment was decontaminated.(53)

According to **Military Chemical and Biological Agents: Chemical and Toxicological Properties**, mustard agents acting alone may take hours to form blisters, but phosgene oxime acts within 30 seconds leaving a blanched area and immediately forms a red rash-like ring. With phosgene oxime, instant death from systemic shock or trauma is possible from exposure.

The reported reaction of the British casualty was as might have been predicted when exposed to the identified agents. The fate of this injured British soldier is unknown.

After completing their testing, the U.S. FOX team leaders were ordered to remove the tapes from the mass spectrometer of the FOX vehicles by Lieutenant Colonel Killgore, the chemical officer for Task Force Victory.(55) These tapes are the paper records of the chemical breakdown of the liquid or vapors and are produced by the mobile mass spectrometer in the FOX vehicle.

The tapes and the collected samples were reportedly turned over to personnel wearing desert camouflage uniforms with no rank or distinguishing patches.(56) Captain Johnson does not know what happened to the tapes or samples as he was ordered from the scene after his unit's mission was completed. (57)

Dr. Prociv in his written response to the Committee stated that these were U.N. personnel. According to Lt. Colonel Killgore, while they were United Nations personnel, they were assigned to the U.N. team from the **British Chemical and Biological Defence Establishment at Porton Down -- British Ministry of Defence employees**.(58) In a subsequent inquiry, the U.N. could produce no written records of the findings of the U.N. team at the site.

CONCLUSIONS

Chemical mustard agent was detected by:

- chemical specialists from the British Army using a Chemical Agent Monitor, M18A2 chemical agent detector, and detector paper; and,
- chemical specialists from the United States Army using a Chemical Agent Monitor, detector paper, and two mass spectrometers.

Phosgene oxime was detected by:

- two sophisticated FOX vehicles' mass spectrometers.

These were direct samples -- not random vapors collected by the vehicle -- as in previously reported cases.

As cited above, mass spectrometry is capable of identifying the individual chemical elements, such as sulfur, hydrogen, chlorine, and so forth; their molecular composition; and, their molecular weight. This provides a means to precisely identify substances. This was not an intake of random fumes by a moving vehicle in heavy smoke, it was a direct analysis of liquid agent drawn from the container.

This was not the only confirmation of the identity of the chemical agents present -- the results were confirmed by nearly every detector deployed with U.S. and British forces -- in a controlled setting.

A British soldier who came into contact with the liquid blistered immediately and appeared to be going into shock -- as might be predicted from the nature of the agents present.

The tapes were ordered removed from the vehicle and forward with a sample of the chemical agents. The soldiers were ordered to give the materials to individuals in unmarked uniforms and Captain Johnson, who earlier this year, after hearing that the Department of Defense was denying the presence of chemical agents in Kuwait, forwarded the report on this incident through his chain of command, and had the report returned to him. It was not forwarded to the Department of Defense.

The Kuwaiti, U.S., and British governments all received reports on this recovery of bulk chemical agents.

While these reports are not classified, the Department of Defense has consistently maintained that no chemical agents were located in areas occupied by U.S. forces -- including in testimony before committees of both the House of Representatives and the Senate.

The Department of the Army originally told Committee staff that prior to releasing Captain Johnson's report they must obtain clearance from the Department of Defense, and that an intelligence review must be conducted.(59) That would seem to contradict the claim that there is no classified information on this subject. They claimed that prior to releasing the British report, they must get the permission of the British.(60) However, when British report was received, it was dated July 14, 1994, indicating that it had been prepared in response to the Committee request, in coordination with the Department of Defense. (61)

The Committee was not provided with an official British report dating from the time of the incident by the Department of Defense as requested. A copy of that report was obtained by the Committee outside of Department of Defense channels. This official report, dated August 7, 1991, confirms that mustard agent was detected, and that the substance was oily, like mustard agent.(62) Nitric acid is not oily.

The U.S. report, prepared by Captain Johnson, confirms that not only was mustard agent detected in the container using a mass spectrometer, **but also in microdoses on the ground.**(63) This would eliminate the explanation that the container held fuming nitric acid -- rocket fuel oxidizer -- so concentrated that it reacted with materials in the mass spectrometer causing false readings when the material was examined. The mass spectrometers in both FOX vehicles were also successfully calibrated before and after this detection event.

There is also the issue of how the Department of Defense has handled this and other investigations into reported chemical agent detection events. Committee staff continues to receive reports from individuals, many of whom are no longer in the military -- civilians who have been contacted by high ranking military officers assigned to work with the Defense Science Board Task Force investigating this issue. We have received complaints from veterans that rather than trying to seek other witnesses or corroborate their reports, these officers have called to convince them that they were mistaken. That their findings were not credible -- that their statements made to Congress would be refuted.(64) Most recently, an individual associated with this detection of chemical agents was contacted by one of these officers. This officer specifically told the individual that these findings would be refuted by the Department of Defense -- even before the Department received the report from the British that was eventually forwarded to the Committee.

In this case there were 21 field tests conducted on this substance which were positive for mustard agent; both U.S. and British Chemical Agent Monitor readings confirmed 8 bars for mustard gas, a maximum

reading indicating the presence of highly concentrated agent; 8 of 8 mobile mass spectrometer tests, using two separate FOX vehicles and liquid agent in a controlled setting identified identical substances - mustard agent, and phosgene oxime; it was the same color as mustard agent; it was oily like mustard agent; a mobile mass spectrometer reading indicated that microdoses of mustard agent were present in the soil; a British soldier suffered a chemical injury consistent with what would be expected when exposed to these agents, particularly to phosgene oxime; and the Department of Defense explanation was described by the National Institute for Standards and Technology variously as "highly unlikely," "no likelihood," and "not possible."

C. CHEMICAL INJURY AND CHEMICAL STORAGE BUNKER

Iraqi Bunker Complex - Southeastern Iraq (between Kuwaiti border and Basra) March 1, 1991

This case involves the experiences of former Sergeant David Allen Fisher, who also discovered what appears to have been a cache of chemical weapons where the Department of Defense says none were deployed.

While searching an Iraqi ammunition bunker in Iraq in an area south of Basra, Mr. Fisher brushed up against some wooden crates marked with skulls and crossbones. Within 8 hours his arm had reddened and began to sting. Several hours later, he noticed painful blisters on his upper arm.(65)

In his report of the incident, in a Question and Answer Brief prepared for the U.S. Central Command (CENTCOM) Public Affairs Office, and in a subsequent journal article, Colonel Michael Dunn, who would later become the commander of the U.S. Army Medical Research Institute for Chemical Defense confirmed that Fisher's injuries were the result of exposure to chemical agents.(66)

In this case, as in the other cases like it, it seems impossible to obtain an explanation from the Department of Defense that is consistent with the events as reported by the soldiers present. In August, a Pentagon spokesperson stated that whatever chemicals were encountered in the bunker must have been left over from earlier fighting between Iraq and Iran.(67)

However, in September 1994, that same spokesperson said that he was not aware that any chemical weapons crates were discovered by Mr. Fisher, despite Colonel Dunn's report and despite the fact that Mr. Fisher received a Purple Heart for his injuries.(68) Others who were present that date including the FOX vehicle operators, one of whom received a bronze star, and Colonel Dunn corroborate these events. Further, according to Mr. Fisher, this was an active bunker complex with artillery pieces present and their mission there was to go from bunker to bunker searching for Iraqi soldiers.(69) Old chemical weapons, left over from a previous war, would be stored in a separate storage facility; if they were present at an active artillery position, they were deployed with the intention of using them.

D. CHEMICAL DETECTION AND CHEMICAL INJURIES

Breaching Operations - Second Marine Division - Southwestern Kuwait, February 24, 1991

The following is an excerpt taken directly from "U.S. Marines in the Persian Gulf, 1990-1991: With the 2D Marine Division in Desert Shield and Desert Storm," an official report published in 1993 by the History and Museums Division, Headquarters, United States Marine Corps, Washington, D.C.

"The use of chemical munitions by the Iraqis had been expected, but happily had not yet occurred. At approximately 0656, the "Fox" chemical reconnaissance vehicle at Red 1 detected a "trace" of mustard

gas, originally thought to be from a chemical mine. The alarm was quickly spread throughout the division. Since everyone had been to don his protective outer garments and boots the previous evening, it was only necessary to hurriedly pull on a gas-mask and protective gloves to attain MOPP level 4. A second "Fox" vehicle was sent to the area, and confirmed the presence of an agent that had probably been there a long time. Unknown in its origin, it was still sufficiently strong to cause blistering on the exposed arms of two AAV crewmen. Work continued on the clearance of the lanes, and MOPP level was reduced to 2 after about a half-hour." (70)

Several issues are raised by this report. First, chemical mustard agent was detected by the FOX vehicles with the unit. Second, two marines were reportedly injured as a result of exposure to these agents. Third, it is highly unlikely that the chemical agents could have been there "a long time." These detections were made in southwestern Kuwait, an area not occupied by Iraq until after the invasion of Kuwait on August 2, 1990. Investigation by the Committee into this incident continues.

E. CHEMICAL AND BIOLOGICAL ANALYSIS OF EQUIPMENT

The Committee has submitted samples for analysis to several renowned laboratories, including the Lawrence Livermore National Laboratory's Forensic Science Center.(71)

In biological analyses, based on preliminary testing using advanced DNA analyses and screening techniques, unique DNA sequences were detected. Q-fever and Brucella were indicated on the inside of a gas mask carrying case, the top of a gas mask filter, and under the rubber seal of a mask submitted to the Committee for analysis by U.S. Persian Gulf War veterans who brought them back from the Middle East.(72)

When additional primer pairs were compared, the findings were negative. These tests were repeated with identical findings -- that is, the same identical unique DNA primer pairs were indicated.(73)

While false positive DNA testing can occur with only a single primer pair analysis, these results can also be indicative of the presence of only a single strand -- perhaps due to the presence of another genetically-altered biological warfare-related microorganism.(74)

We do know that the U.S. licensed the export of genetic materials capable of being used to create these types of genetically-altered biological warfare agents to the Iraqi Atomic Energy Commission -- an Iraqi governmental agency that conducted biological warfare-related research -- prior to the war.(75) One method of creating these genetically altered micro-organisms is by exposing them to radiation. The U.S. also licensed the export of several species of brucella to Iraqi governmental agencies.(76) Both Q-fever and Brucellosis are also endemic to the region.(77)

This study is far from conclusive but points to the need for further research in this area. According to the Lawrence Livermore National Laboratory, biological studies need further attention. Cultures need to be investigated more closely. Experiments to amplify the whole genome and to allow for the manipulation of increased concentrations of DNA by advanced testing would likely be more precise in identifying threat organisms -- organisms that may be causing Gulf War Syndrome.

In addition many chemical compounds were present in the samples. The scientists at Lawrence Livermore National Laboratory Forensic Science Center believe that additional analysis of more samples may isolate and identify unusual hazardous chemical compounds, chemicals that in combination may be hazardous, chemical warfare agent compounds, or biological pathogens on the surface of collected items -- and that much more study is warranted.(78)

While these results are preliminary they are also very important. They show that we have the tools to get to the bottom of this problem if we simply choose to use them.

F. COMMITTEE STAFF REMARKS

What seems to be emerging is a troubling pattern of events involving individuals who have received medals -- Bronze Stars, Meritorious Service Medals, Army Commendation Medals, and Purple Hearts -- in the course of coming into contact with unconventional weapons that the Department of Defense continues to insist were not even present in theater. **Chemical and biological weapons were either present, or they were not present.** If weapons such as these were present, they were deployed doctrinally, as a matter of Iraqi Army practice, not in isolated instances. These events raise serious concerns about the veracity of the Department of Defense's claims as well as their motives. These reports call into question each and every Department of Defense refutation of previously reported detections and each and every triggered chemical agent detection alarm.

We know that there were chemicals found near An Nasiriyah, in an area that was secured by elements of the 18th Airborne Corps. The U.N. confirms that they were there, and a Defense Department official testifying before the Senate Banking Committee confirmed that troops were close to this facility -- contradicting previous testimony in the same hearing by another senior Defense Department official.

Careful scrutiny leads us to conclude that they were found in a container in southeastern Kuwait in an area tested by Kuwaiti, British, and American soldiers from the 11th Armored Cavalry Regiment.

We know from the reports on Sergeant Fisher that they were found in an Iraqi bunker complex south of Basra in an area that was secured by elements of the 3rd Armored Division.

Two U.S. Marines were injured by chemical agents in breaching operations during the "ground war."

We now know that many of the soldiers that were present during each of these events are ill -- others were given medals for their actions. Many of the veterans of the Gulf War and their families are now suffering permanently debilitating illnesses -- some have died. Currently it is estimated that there are 29,000 servicemen and women on the Department of Veterans Affairs Persian Gulf Registry and 7,000 on the Department of Defense Registry. The Department of Defense Registry is growing at a rate of about 500 individuals per week.

Just over one year ago, on September 9, 1993, when the first staff report was prepared for the Chairman, we were forced to estimate the numbers of sick veterans. Since that time we have learned that 5,400 Persian Gulf War veterans had registered with the Department of Veterans Affairs up to that point. The Department of Defense Registry numbered only a few hundred. In just over a years time the number of veterans who have registered in these registries has grown by nearly 700% We have also learned that many of the signs and symptoms of illnesses initially experienced by the veterans of the Persian Gulf War are now being experienced by their spouses and families. This data confirms that these illnesses are becoming a major threat to the health and well-being of a significant and rapidly growing number of individuals and warrants a serious and immediate effort by the government to determine the precise causes of the illnesses.

G. References

1. Letter to Chairman Donald W. Riegle, Jr., Committee on Banking, Housing, and Urban Affairs from Secretary of Defense William J. Perry, Secretary of Veterans Affairs Jesse Brown, and Secretary of

Health and Human Services Donna Shalala, dated May 4, 1994. (Appendix A-1)

2. Testimony of Dr. Edwin Dorn, Undersecretary of Defense for Personnel and Readiness before the U.S. Senate Committee on Banking, Housing, and Urban Affairs during a hearing convened on U.S. Export Policies to Iraq and Their Possible Impact on the Health Consequences of the Persian Gulf War, on May 25, 1994. (Appendix A-2)

3. Department of Defense testimony before the U.S. Senate Committee on Banking, Housing, and Urban Affairs during a hearing convened on U.S. Export Policies to Iraq and Their Possible Impact on the Health Consequences of the Persian Gulf War, on May 25, 1994. (Appendix A-3)

4. Memorandum for Persian Gulf War Veterans, Persian Gulf War Health Issues, from John M. Shalikashvili, Chairman of the Joint Chiefs of Staff and William J. Perry, Secretary of Defense, dated 25 May 1994. (Appendix A-4)

5. Report of the Defense Science Board Task Force on Persian Gulf War Health Effects, Office of the Undersecretary of Defense for Acquisition and Technology, (Washington, D.C.: Department of Defense, June 1994); and Department of Defense Press Release, June 23, 1994.

6. Recommendation for Award of Army Commendation Medal, Sergeant James Warren Tucker, Decontamination Platoon Squad Leader, 54th Chemical Troop, 11th Armored Cavalry Regiment, dated July 1993. (Appendix B-1)

7. Recommendation for and Award of Meritorious Service Medal, Captain Michael F. Johnson, Troop Commander, 54th Chemical Troop, 11th Armored Cavalry Regiment, dated January 1993. (Appendix B-2)

8. Ibid.

9. Memorandum for Director, CATD, Iraqi Chemical Agents--Information Paper: To Present First Hand Knowledge of Iraqi Chemical Agents Identified in Kuwait, prepared by Michael F. Johnson, Captain, CM NBC Branch, January 4, 1994. - FOR OFFICIAL USE ONLY - (Appendix B-3). Initial Report: Suspected Chemical Container, prepared by Major J.P. Watkinson, Officer Commanding, 21st EOD Squadron Group, Royal Ordinance (United Kingdom), dated 7 August 1991 - RESTRICTED: MANAGEMENT IN CONFIDENCE - (Appendix B-4).

10. Ibid.

11. From Initial Report: Suspected Chemical Container, prepared by Major J.P. Watkinson, Officer Commanding, 21st EOD Squadron Group, Royal Ordinance (United Kingdom), dated 7 August 1991 - RESTRICTED: MANAGEMENT IN CONFIDENCE - (Appendix B-5, B-6).

12. Initial Report: Suspected Chemical Container, prepared by Major J.P. Watkinson, Officer Commanding, 21st EOD Squadron Group, Royal Ordinance (United Kingdom), dated 7 August 1991 - RESTRICTED: MANAGEMENT IN CONFIDENCE - (Appendix B-4).

13. Ibid.

14. Ibid.

15. Appendix B-7.

16. Initial Report: Suspected Chemical Container, prepared by Major J.P. Watkinson, Officer Commanding, 21st EOD Squadron Group, Royal Ordinance (United Kingdom), dated 7 August 1991 - RESTRICTED: MANAGEMENT IN CONFIDENCE - (Appendix B-4).

17. Ibid.

18. Ibid.

19. Ibid

20. Susan Budavari, ed., The Merck Index: An Encyclopedia of Chemicals, Drugs, and Biologicals, Eleventh Edition (Rahway, N.J.: Merck and Co., Inc., 1989), pp. 995-996. (Appendix B-8) James A.F. Comptom, Military Chemical and Biological Agents: Chemical and Toxicological Properties (Caldwell, N.J.: The Telford Press, (September 1987), 9-17. (Appendix B-9)

21. Jane's NBC Protection Equipment, 1990-91, (London, U.K.: Jane's Information Group, 1991). Appendix B-1

22. Initial Report: Suspected Chemical Container, prepared by Major J.P. Watkinson, Officer Commanding, 21st EOD Squadron Group, Royal Ordinance (United Kingdom), dated 7 August 1991 - RESTRICTED: MANAGEMENT IN CONFIDENCE - (Appendix B-4).

23. Ibid.

24. Ibid.

25. Ibid.

26. Ibid.

27. Ibid.

28. Memorandum for the Commander, 11th ACR, Tasking Number 91-047, dated 7 August 1991 from Joseph W. Miller, Lieutenant Colonel, GS, ACofs, G-3. (Appendix B-11)

29. Memorandum for Director, CATD, Iraqi Chemical Agents--Information Paper: To Present First Hand Knowledge of Iraqi Chemical Agents Identified in Kuwait, prepared by Michael F. Johnson, Captain, CM NBC Branch, January 4, 1994. - FOR OFFICIAL USE ONLY - (Appendix B-3).

30. Ibid.

31. Ibid.

32. Ibid.

33. James A.F. Comptom, Military Chemical and Biological Agents: Chemical and Toxicological Properties (Caldwell, N.J.: The Telford Press, (September 1987), 9-17. (Appendix B-9)

34. Memorandum for Director, CATD, Iraqi Chemical Agents--Information Paper: To Present First Hand Knowledge of Iraqi Chemical Agents Identified in Kuwait, prepared by Michael F. Johnson, Captain, CM NBC Branch, January 4, 1994. - FOR OFFICIAL USE ONLY - (Appendix B-3).
35. Ibid.
36. Ibid.
37. Ibid.
38. Staff interviews with Captain Johnson and Sergeant Tucker.
39. Memorandum for Director, CATD, Iraqi Chemical Agents--Information Paper: To Present First Hand Knowledge of Iraqi Chemical Agents Identified in Kuwait, prepared by Michael F. Johnson, Captain, CM NBC Branch, January 4, 1994. - FOR OFFICIAL USE ONLY - (Appendix B-3).
40. Ibid.
41. Memorandum for Director, CATD, Iraqi Chemical Agents--Information Paper: To Present First Hand Knowledge of Iraqi Chemical Agents Identified in Kuwait, prepared by Michael F. Johnson, Captain, CM NBC Branch, January 4, 1994. - FOR OFFICIAL USE ONLY - (Appendix B-3).
42. Letter to Chairman Donald W. Riegle, Jr., Committee on Banking, Housing, and Urban Affairs, from Dr. Theodore M. Prociw, Deputy for Chemical and Biological Matters, Office of the Assistant Secretary of Defense for Atomic Energy, dated July 26, 1994. (Appendix B-12)
43. Committee inquiry to the National Institute of Standards and Technology, dated August 1, 1994. (Appendix B-13)
44. Letter to Committee staff from Dr. Stephen E. Stein, Ph.D., Director, National Institute for Standards and Technology, Director, Mass Spectrometry Data Center, Chemical Science and Technology Laboratory, dated September 6, 1994. (Appendix B-14)
45. Ibid.
46. Ibid.
47. Memorandum for Director, CATD, Iraqi Chemical Agents--Information Paper: To Present First Hand Knowledge of Iraqi Chemical Agents Identified in Kuwait, prepared by Michael F. Johnson, Captain, CM NBC Branch, January 4, 1994. - FOR OFFICIAL USE ONLY - (Appendix B-3).
48. Ibid.
49. Ibid.
50. Appendix B-15.
51. Letter to Chairman Donald W. Riegle, Jr., Committee on Banking, Housing, and Urban Affairs, from Dr. Theodore M. Prociw, Deputy for Chemical and Biological Matters, Office of the Assistant Secretary of Defense for Atomic Energy, dated July 26, 1994. (Appendix B-10).

52. Committee staff interviews with Captain Michael F. Johnson.
53. Memorandum for Director, CATD, Iraqi Chemical Agents--Information Paper: To Present First Hand Knowledge of Iraqi Chemical Agents Identified in Kuwait, prepared by Michael F. Johnson, Captain, CM NBC Branch, January 4, 1994. - FOR OFFICIAL USE ONLY - (Appendix B-3).
54. James A.F. Comptom, Military Chemical and Biological Agents: Chemical and Toxicological Properties (Caldwell, N.J.: The Telford Press, (September 1987), 9-17 (Appendix B-7), 64-69. (Appendix B-16).
55. Memorandum for Director, CATD, Iraqi Chemical Agents--Information Paper: To Present First Hand Knowledge of Iraqi Chemical Agents Identified in Kuwait, prepared by Michael F. Johnson, Captain, CM NBC Branch, January 4, 1994. - FOR OFFICIAL USE ONLY - (Appendix B-3).
56. Ibid.
57. Staff interviews.
58. Memorandum for the Office of the Assistant Secretary of Defense for Chemical Biological Matters (OASD(CBM)), Suspect Chemical Container Found in Kuwait City, Kuwait, in August 1991, Don W. Killgore, Lieutenant Colonel, Technical Inspections Branch, Office of the Inspector General, Department of the Army, July 29, 1994 -- FOR OFFICIAL USE ONLY -- (Appendix B-17)
59. Staff interviews with Office of Legislative Affairs, U.S. Department of the Army.
60. Ibid.
61. Memorandum to Lieutenant Colonel Vicki Merriman, Office of the Deputy Assistant to the Secretary of Defense for Chemical and Biological Matters from Dr. Graham S. Pearson, Director General, Chemical and Biological Defence Establishment, Ministry of Defence, Porton Down, Salisbury, Wilts, U.K., Suspect Chemical Container: Kuwait City: August 1991. (Appendix B-18)
62. Initial Report: Suspected Chemical Container, prepared by Major J.P. Watkinson, Officer Commanding, 21st EOD Squadron Group, Royal Ordnance (United Kingdom), dated 7 August 1991 - RESTRICTED: MANAGEMENT IN CONFIDENCE - (Appendix B-4).
63. Memorandum for Director, CATD, Iraqi Chemical Agents--Information Paper: To Present First Hand Knowledge of Iraqi Chemical Agents Identified in Kuwait, prepared by Michael F. Johnson, Captain, CM NBC Branch, January 4, 1994. - FOR OFFICIAL USE ONLY - (Appendix B-3).
64. Letter of complaint from Mr. Randall Vallee, September 23, 1994 (Appendix B-19) and staff interviews.
65. Information Paper: Chemical Agent Exposure - Operation Desert Storm, prepared and authenticated by Colonel Michael A. Dunn, March 5, 1991. (Appendix C-1)
66. Information Paper: Chemical Agent Exposure - Operation Desert Storm, prepared and authenticated by Colonel Michael A. Dunn, March 5, 1991. (Appendix C-1), Question and Answer Brief prepared for the U.S. Central Command (CENTCOM) Public Affairs Office, March 1991 (Appendix C-2), Lieutenant Colonel John V. Wade, Major Robert M. Gum, and Colonel Michael A. Dunn, "Medical

Chemical Defense in Operation Desert Shield and Desert Storm," Journal of the U.S. Army Medical Department, (January-February 1992), pp. 34-36. (Appendix C-3)

67. Thomas D. Williams, "Veteran's Story Counters Official One on Gas War," The Hartford Courant (September 21, 1994) A2. (Appendix C-4)

68. Ibid.

69. Staff interviews.

70. Lieutenant Dennis P. Mroczkowski, U.S. Marines in the Persian Gulf, 1991: With the 2d Marine Division in Desert Shield and Desert Storm, (Washington, D.C.: History and Museums Division, Headquarters, U.S. Marine Corps, 1993), p. 41 (Appendix D-1), p. 45 (Appendix D-2)

71. Laboratory analysis request from Chairman Donald W. Riegle, Jr., Committee on Banking, Housing, and Urban Affairs to the Lawrence Livermore National Laboratory Forensic Science Center, dated April 15, 1994. (Appendix E-1)

72. Brian Andresen, Ph.D., Jackie Stilwell, M.S., Patrick Grant, Ph.D., Jeff Haas, M.S., Richard Whipple, B.A., and Armando Arcaraz, M.S., "Preliminary Results of Gas Masks and Exposure-Monitoring Equipment Associated with Desert Storm: Chemical and Biological Analyses of First Samples Sent," Forensic Science Center, J Division/NAI Directorate, Lawrence Livermore National Laboratory, June 1994 (Appendix E-2); Staff interviews with laboratory personnel.

73. Ibid.

74. Ibid.

75. American Type Culture Collection, Rockville, Maryland (January 21, 1994).

76. Ibid.

77. Robert Berkow, M.D., Editor-in-Chief, The Merck Manual of Diagnosis and Therapy, Sixteenth Edition (Rahway, N.J.: Merck and Co., Inc., 1992). Q-fever (Appendix E-3) and Brucellosis (Appendix E-4) summaries attached.

78. Brian Andresen, Ph.D., Jackie Stilwell, M.S., Patrick Grant, Ph.D., Jeff Haas, M.S., Richard Whipple, B.A., and Armando Arcaraz, M.S., "Preliminary Results of Gas Masks and Exposure-Monitoring Equipment Associated with Desert Storm: Chemical and Biological Analyses of First Samples Sent," Forensic Science Center, J Division/NAI Directorate, Lawrence Livermore National Laboratory, June 1994 (Appendix E-2); Staff interviews with laboratory personnel.