

Chapter 1

“DESERT RATS, NOT LAB RATS”¹

During their Annual General Meeting and Respite Week (AGM) in 2002 the members of the Gulf War Veterans’ Association (GWVA)² discussed their experiences of the war. One veteran stood up and said, “We were desert rats, not lab rats”. The room erupted in enthusiastic agreement. I was struck by this interesting analogy because it seemed to embody the veterans’ beliefs, their ongoing attachment to their identity as a soldier in the Gulf War and their unbending assertion that they had been experimented upon by their government.

Introduction

Gulf veterans had a series of experiences which they make sense of in a particular way. They understand their suffering to be caused by various exposures: to vaccinations and other preventative measures, depleted uranium (DU), chemical weapons, organophosphates (OPs) and oil fires. This explanatory system is still in flux: it accommodates new findings, new scientific directions and is open to internal alterations as long as the central tenet remains intact. Information which would contradict the overall explanation – that Gulf War exposures caused a physical illness – is ignored, dismissed or altered. At times parts of theories are used whilst the other aspects are forgotten. Furthermore, theories of causation of GWS remain a watertight system

1. ‘Desert Rats’ was the nickname of the Gulf War 7th Armoured Brigade.
2. This is a pseudonym.

able to deflect criticism and accommodate a vast array of factors which, at times, appear to be contradictory. Veterans and their advocates hold together a jumble of theories, which sometime overlap, sometimes are believed simultaneously, and are often altered. This system may look confused, but it is no different from how most people make sense of the world; people pick and choose those theories available to them which best make sense of the world. It is a coherent system but it is also flexible. As Evans-Pritchard wrote of Azande witchcraft beliefs:

[T]hey are not indivisible ideational structures but are loose associations of notions. When a writer brings them together in a book and presents them as a conceptual system their insufficiencies and contradictions are at once apparent. In real life they do not function as a whole but in bits. A man in one situation utilizes what in the beliefs are convenient to him and pays no attention to other elements which he might use in different situations. Hence a single event may evoke a number of different and contradictory beliefs among different persons. (1976: 221)

The view of GWS held by the scientific community is discussed below. This is then contrasted with the veterans' view, by way of a detailed account given by one veteran and his wife. The various themes which emerge from the narrative are then analysed and supplemented with other data. Although there is a mainstream biomedical understanding of the illness, science is not homogeneous and there are scientists and doctors who dispute this construction. Veterans make use of these scientist's theories and incorporate them into their explanatory models. Whilst veterans generally ignore and dispute findings put forward by researchers who dispute GWS as an organic condition, they do incorporate those aspects which support their construction of their illness; thus, they pick and choose parts of theories. Despite denials by the scientific community of a unique GWS, public understanding of the illness is very much in line with the veterans' view. In this section we see the way people build theories to make sense of their lives. While this may not reflect a biomedical way of making sense of the world, veterans' theories remain very rooted in science and medical language. Veterans ignore, embrace, alter and accommodate various scientific findings and understandings about GWS and the world at large.

Although often presented as bizarre, illogical and incoherent, on closer inspection veterans' accounts make a great deal of sense. Their focus on dangerous exposures resonates with common cultural fears of toxins, chemicals and other invisible dangers. There is a sense that exposure implies contamination, reminiscent of Frazer's (1922) notion of contagion: that two things which have been in contact continue to

act on one another long after the physical connection has been severed. The idea that there is something inside them, that they are experiencing an interactive assault, is more than reasonable in a world where we are constantly concerned with how most things (e.g. certain foods, stress, lack of sleep, toxins) affect our immune system. These narratives sound familiar to us: they remind us of recognisable ailments. Their emphasis on the individuality of the illness – the notion that assaults affect each of us differently – echoes common-sense ideas about health and illness.

Biomedical Position on GWS

The accepted biomedical understanding of GWS is that we do not have a medical explanation for it. Although it is acknowledged that some veterans of the Gulf conflict have become ill and report more ill health than comparable groups, the suggestion is that this pattern of ill health is not unique to Gulf veterans (Ismail et al. 1999; Unwin et al. 1999; Cherry et al. 2001; Gray and Kang 2006; Ismail and Lewis 2006). The same symptoms are seen in UK military personnel who did not deploy to the Gulf. However, veterans of the 1990/91 Gulf conflict report having more of the symptoms and are suffering more severely from them. It is incontrovertible that rates of ill health are greater in veterans of the Gulf War than in members of the Armed Forces who served elsewhere. This same trend has been seen in the US, Canada, the UK and Australia, but not in Saudi Arabia (Gacksetter et al. 2005). The only disease-based outcome which has been somewhat accepted in medical circles is the elevation of motor-neuron disease (MND) and yet this finding is generally seen as not definitive; Wessely and Freedman point out that this does not explain ill health in anything but a very small number of GWS sufferers (2006: 722).

Studies have found that Gulf veterans do not present a distinct and identifiable pattern of symptoms or signs. Thus, the consensus of the international scientific and medical community is that there is insufficient evidence to enable this ill health to be characterised as a unique illness or syndrome. In May 2003 the Medical Research Council (MRC) addressed this in a review of research and came to the same conclusion, arguing against classifying the condition as a unique illness. In short, findings from the scientific and medical community have led the MoD, the government and medical institutions not to recognise

“Gulf War Syndrome” as a medical condition.³ Each toxic exposure and the possible “cocktail effect” have been studied in depth and dismissed as causes of GWS (see Wessely and Freedman 2006). Interestingly, the focus for both the scientific and veteran communities has remained on the exposures themselves. In 2006 and 2007 two reviews were published on GWS research to date: a special issue of *Philosophical Transactions of the Royal Society* and a book edited by Lee and Jones (2007). Both publications support (and influence) the view within biomedicine of GWS: that the illness remains medically unexplained, but that it is likely to be a psychological or social condition: that GWS is likely the result of psychosomatic or somatisation processes.

A Veteran’s View

Debbie and Mark⁴ are well known in the GWS community due to their high media profile. Mark is ill with GWS, but what is unique about his family is that his four children are also ill (see Chapter 6). After being put in touch with the family by the veterans’ association, I went to stay with them for a few days. They told me that they had become involved in the veterans’ association in 1994 after reading a story in the paper. Debbie said that before she saw the article she felt that there was something wrong with her husband but that he would not admit it. It was not until after her first two children were born, she said, that Mark began to think there might be a problem. She would notice things in Mark: he seemed to have stiff joints; and at times when she was talking

3. Recently there has been renewed interest in the classification of GWS as a medical condition as a result of the 2004 Lord Lloyd Inquiry. This inquiry, which reviewed the literature about GWS and heard testimonies from veterans and scientists, concluded that GWS should be accepted as a unique biomedical phenomenon, and called for the MoD to accept it as such. However, this has not taken place and the findings were widely criticised by the biomedical community. The medical community and the MoD argued that the inquiry, and Lord Lloyd in particular, was not in a position to make medical judgments. They also argued that the inquiry was biased and was merely reviewing the established literature rather than doing anything new.
4. All names of veterans have been changed along with other identifying features. The names of scientists and government figures, however, have not been changed. The scientists and researchers who appear in this book are well-known public figures who are linked to their published literature, making it impossible to mask their identities. For a further discussion of anonymity, claims to knowledge and ethical dilemmas posed by this work see the final chapter on “The approach of anthropology”.

to him, it seemed that he was not there. He was also irritable and "snappy". Debbie said she just had the sense that something was not right, so when she saw the story in the paper with the association's contact details, she called them.

Mark had joined the army in 1985 at the age of 16. After his initial training he became a driver who transported large machinery. He was based in Germany for three years and also did two tours of Ireland. In October 1990 he was sent to the Gulf and returned to the UK in June 1991. Soon after returning Mark began experiencing pains in his legs which made it more difficult to complete fitness tests. One month after he returned from the Gulf he met Debbie, who was also in the army. At this time Mark was having some health problems: he was spitting up blood and taking tablets for a "bad stomach". The problem now is that they do not know what was wrong with him because he cannot remember and all of his medical records have been lost. The army was changing and a lot of people were leaving the forces, so Mark decided to leave the army in 1993, as did Debbie. Mark subsequently became a lorry driver until 2000, when he stopped working.

Debbie says that their doctors do not know what is wrong with Mark and are as frustrated about it as he is. Sometimes she wonders if it was something other than the Gulf that made them all ill, but cannot think what. At times the doctors have said that her eldest son's problems are all in the child's head; the same has been said of Mark. They have a nutritionist who is interested in the Gulf War; he put them in touch with Paul Shattock, who works on diet and autism. Shattock conducted a urine test on Mark which revealed vaccine poisoning; he suggested that they get in contact with Malcolm Hooper, a leading scientist in the GWS movement who is also the veterans' scientific advisor. When asked about what caused the illness, both immediately pointed to the vaccines.

Mark has knee pain, joint pain, forgetfulness, mood swings, flashbacks, bleeding gums, ulcers, "bleeding from his backside" and he describes that frequently his "get up and go gets up and goes". He has also been diagnosed as suffering from PTSD and has been told by doctors at the GVMAP that most of his problems are "psychiatric". As Mark understands it, the doctor's diagnosis is: it is your "brain saying you have these problems but [you] don't really. It's all in your head". As Mark argues,

I don't think what you've seen would make your joints sore [...] Like we don't know what causes the Gulf war illness, but there is evidence of, um, personally I've got what's shown as massive vaccine damage in the stomach

umm, or even the back passage or oral bleeding. [1]⁵ Those are all physical things I don't see how a psychiatric problem could cause you to bleed, you know what I mean? ... The bleeding, it's something that's there you can actually see it. The vaccine damage is there; you can see it ... But the illness itself, it was a lot of small things that you didn't really piece together. Like the joints and then being sore. [2] I thought that maybe it was because I had been in the army since I was sixteen and it was a bit too much. Umm and the fact the job did entail a lot of heavy lifting. Um, and my knee, my doctor gave me an explanation for the knee, he said the knee cap was crumbling, due to running in boots and the lifting, the heavy lifting and lifting things incorrectly and things like that. [3] Um, it wasn't really until we were out and we started meeting, I suppose it was Debbie that started to put it together first. Sort of reading about it in the newspaper and people describing their problems and you are thinking, "well I've got some of their problems as well". Not as much as what some of them have got, obviously ... and then just piece it together like that and then by talking to people as well. And Debbie, she's on the phone to people and they're describing their husbands and she's like, "You just described my husband as well." People that you don't know. It's not as though that it's a great conspiracy ... people talking to people they've never met in their lives ... and that's how you put it down. And the only thing we had in common was the fact that we'd been to the Gulf. [...] [4] I don't think anybody knows what caused it and I don't think anybody will know what caused it. And really I don't think it really matters what caused it ... It might do to the medical people and that, but I don't think it really matters. I think the main thing is that you are trying to find a way to help people that suffer from it rather than being obsessed with finding the cause. I suppose the cause [is important] for those that don't think it exists. [5] I think it's a combination of everything. [6] The fact that they gave us all these vaccinations and in such a short space of time. [7] Um and giving us unlicensed drugs as well, and the [8] NAPS: they were unlicensed and untried, untested on humans until we went to the Gulf. So really we were guinea pigs for the NAPS. [9] There's also the issue with the DU as well. We came in contact with vehicles that had been hit with DU shells. Battlefields that were covered in spent DU rounds. [10] Smoke from the oil fires as well. We were driving through those as well. When we were driving from Kuwait into Saudi Arabia. [11] You got the adrenaline pumping through your body, [12] so I think it's a combination of all that that caused it. [13] There was also a paper that came out in America that said that you were more prone to get it if you had a certain gene within your makeup as well. But I don't know if that was ever substantiated. They were trying to explain why some people suffered when other people didn't and that was one of the things they came up with. [14] I think it was a combination of all the things that were there and here at the time that possibly caused it.

5. Throughout the narrative I assign numbers to different topics. In the discussion section that follows, I refer to these topics by reference to the topic number.

During this interview with Mark, Debbie had been in the other room. At this point she came into the room and joined the conversation:

[15] Malcolm Hooper did the urine test. Mark did it and all the kids. [16] [He was the] first one to say that Michael [their son] had an allergy to dairy products. Also linked to autism. Michael is totally off dairy and noticed the difference. Coughing all the time since birth. Thought it was asthma, but it was building up phlegm. [...] [17] I think it [GWS] is something with the central nervous system and causes all these things. [...] [18] I don't know much about them [OPs]. It's something that attacks the central nervous system. Could cause Chronic Fatigue and that. So I don't really know enough about it. Do you? [to Mark, who says no]. Mark lived in his lorry, they weren't in tents or anything like that, you know what I mean ... not around a lot of it. But DU you were there, you were all over it. [...] [19] It doesn't matter what done it. If they know ... recognition [*sic*], even if they can't cure them, recognition from doctors and GPs that know that it exists. A lot of people still don't think it exists and that's the main thing. If they can't cure you if, which I don't think they can, I think the thing half way to treating the ones who get depressed and that is getting doctors to recognize it. He had one doctor that turned around and said, "what do you expect when you go to war". He was very rude. We were so angry with him we just got up and walked out. [...]

[20] I've been thinking about that lately that it might be MMR. But Michael's had it since birth, but MMR they get really young. So maybe it is. [...] Because I've been reading about it. Rebecca [leading GWVA member] told us about Dr Wakefield who looks at these things – a gastro ... is his specialty. But problems with MMR show that vaccines are a problem. But MMR helps most kids. It helps more than it hurts, so it shouldn't stop. Michael has autism, et cetera, but he also has other things. [...] [21] Our doctor told us that the children's problems are possibly due to DU; she said that their problems were the same as those found in the children of Iraq. DU causes birth defects, but other people were made ill by other things. [22] I think the concoction of the injections never helped. [23] I do think that. I don't think its one particular element of why Gulf War veterans are ill. And I think that's why it's hard to pinpoint what caused it ... [24] I think it was unique in the way that that much went on. I mean it was a rush with people getting the injections, the signals were going out and they didn't get the instructions on the DU ... Also like talk to Mark, he was in the part of the desert where the smoke was that thick and black. Because of the oil ... that had to do something ... they were out there ten months, not three weeks or six weeks. He went from October to June ... that's a long time in the desert.

Discussion of GWS Causes

It is clear from this account that GWS systems of thought are not unitary. There are, however, a number of dominant themes which are contained in this narrative and reflect accounts of the majority of sufferers. It is extremely relevant that Mark begins his discussion of his illness and its cause by disputing the argument that it is psychological in nature (1);⁶ the denial of psychological factors is central to GWS narratives and will be discussed fully in Chapter 5. Veterans often suggest that any psychological symptoms are chemically induced. Another typical element of their accounts is that the sufferer initially explained their problems in their own way (2), until then came across other sufferers. Through speaking with them their past experiences suddenly made sense and the link to the Gulf War was made (3). The various exposures are key to this realisation of the relevance of the Gulf War. The Gulf exposures are the starting point, the diagnosis and that which all veterans have in common. In this way, GWS is unique as it is not necessarily symptoms or clinical features which represent the diagnosis, but the cause itself.

Both Mark and his wife mention (4, 19) that discovering a cause is not important, yet focus on the causation of the illness. They discuss the difficulty in deciphering the exact cause due to the sheer number of possibilities. Although they suggest that it is unnecessary to uncover which exposure was the culprit, they do ascertain that cause may be important in terms of proving the existence of the illness. Thus, cause is tied up with truth and proof. They later told me about their anger at being told by different doctors that there was nothing wrong with Mark; that his problems were normal. One doctor took every complaint and pointed out why that was normal for someone of his age, much to Mark and Debbie's anger. They described their complete relief when Mark was told that he was ill. Although Mark and Debbie say they are not concerned about the specific causes, their focus on the various exposures suggests that it is a central issue. Indeed, for most veterans, uncovering the cause is fundamental and they see it as central to their fight for recognition.

Mark suggests that the cause of the illness is unknown, but that there are a large number of possible culprits. Veterans often list each exposure and their contact with them, sometimes going into great detail. Every exposure is a cause of anxiety because of its novelty; it is

6. Throughout this section such a number refers to the area(s) in the narrative that discuss this particular topic.

as though the modernity of the substance itself makes it an object of apprehension. Vaccines play the dominant role in theories of causation (6, 22) and veterans often point to scientific studies which suggest a link between self-reported symptoms and vaccinations (Unwin et al. 1999; Cherry et al. 2001). They disregard findings which suggest that there is little evidence of vaccination causing veterans' illnesses.⁷ It is often pointed out that injections were the "common denominator" – the exposure which all sufferers have in common.⁸ Vaccines are frequently referred to as the dominant, primary and original cause of the illness. Mark, like most other veterans, suggests that the large number of vaccines given over a short period of time is hazardous and likely to be a major factor in their illness. Veterans explain that the body simply could not respond to so much information. When discussing the number of vaccines and the proximity in which they were given, many veterans refer to the recent and ongoing controversy surrounding the Measles, Mumps and Rubella (MMR) vaccination. In 1998 a paper was published in the *Lancet* which suggested a link between the MMR vaccine and autism and bowel problems. This caused, and continues to cause, a huge amount of anxiety in the UK, with a large number of parents either refusing to vaccinate their children or opting for single vaccines. Many veterans believe that the alleged problems with the MMR vaccination were similar to their experience of numerous vaccinations in a short time. Veterans' theories thus absorb aspects of other topical issues. So, as the public debate about the relationship between the MMR vaccine and autism appeared, veterans drew on aspects of the theory to make sense of their own illness.

Veterans refer to the large number of vaccines as "overload" (Chapter 4) and often recount which vaccines they were administered. John, an ill veteran and one of the leading campaigners, focuses on experiences during the war to emphasise the danger of the vaccinations, noting that a number of troops became ill as a result of the vaccines and had to be sent home. The fact that a small number of

7. A number of studies have suggested that there is not a link between the vaccinations given and GWS. In 2003 a major review of all the relevant literature on GWS was undertaken by the Medical Research Council (MRC). This review concluded that there was no known link between the Gulf vaccinations and GWS. Peakman et al. (2006) have more recently suggested that there is no link between vaccines and GWS.
8. I did meet people who reported that there were those who were suffering from GWS who did not have the vaccines and did not go to the Gulf, but claimed other exposures. For example, I met one man who had GWS because he had worked on the vehicles that had come back from the Gulf that were "covered in DU dust".

veterans had adverse reactions was often used to highlight the dangers of the vaccines they were given. There was clearly anxiety at the time of immunisation. Irwin et al. (1996) remind us that when investigating public understandings of science we must remember that the public has its own knowledge already. Not only do they build on common understandings about the immune system and vaccinations, but soldiers are amongst the most vaccinated people in the world and are taught about them regularly by the military itself.

Vaccines are seen as the start of a process of deteriorating health: the injections given to soldiers made them vulnerable, and the other exposures simply added to this initial degradation of health. This theory applies well-known medical understandings of vaccinations and the immune system, which veterans then build on using their own personal experience. For example, they point out that some experienced flu-like symptoms after being vaccinated, emphasising that their immune system was diminished. As John and his friend Jack, another ill veteran, explain:

John: I personally believe that the vaccines and the medication we were given were the first insult to the immune system and anything else after that was secondary. And whether those people that were insulted at the time their immune system didn't recover in time to react against the organophosphate compounds that were in the air. Or indeed, DU. Maybe the younger people their immune system did recover to give them protection ... Mostly a case of exposure as well. Some people were more greatly exposed than others. And some suffered more extreme stress at the time.

Jack: The initial assault being the injections. We have people that were, for example, who were in Cyprus, or indeed in the UK that were given injections and were subjected to that regime because they were due to fly out. Eventually they didn't fly out and they have come down with the majority of the illnesses ... Didn't have DU or oil well fires that have come down with a lot of the problems. So, like John said earlier, a lot of people were made worse by the injections, some were made worse by the DU, some were made a bit worse by the oil well fires. If your name were lucky you got triple whammy. But certainly I think the major area to look at, again, I'm not a medic, I'm just a simple gunner, is the injections because that is the common denominator with people in UK, Germany or Cyprus that never set foot out there. [...] I think the injections were like pushing a start switch. That's started a series of events in motion, which was then further exacerbated by things in the air, by depleted uranium, by oil fires, by whatever. But I think that initial start switch, I think initially was caused by injections.

The centrality of vaccinations is key to the inclusive GWS explanatory system as it enables people who did not go to the Gulf who are ill to be included: it makes the incoherent coherent.

Central to this argument of accumulating dangers is the immune system. The role of the immune system in GWS explanatory systems will be explained in depth in Chapter 4. However, it is important to explain at this point that vaccines were seen as the initial assault on the immune system, leaving many open and vulnerable to further assaults in the form of exposures such as DU, oil fires and NAPS (Nerve Agent Pre-treatment Sets) tablets. However, although veterans believe some people could become ill because of the injections alone, most stated that they believed that those who had been to the war were more ill due to additional exposures.

Mark includes NAPS tablets as a likely causal feature of his illness and points out that they, too, were untested and unlicensed (8). Veterans are well aware of the scientific qualities of NAPS tablets, as they were described to them prior to the war: they are aware that they affect the nervous system and so develop this scientific theory to understand the cause of their illness. Debbie, for example, suggests that she thinks GWS involves the nervous system (17). When NAPS tablets are implicated in the health problems of veterans, the suggestion is that the compound has penetrated the central nervous system. If a nerve agent does not kill, it can injure and cause psychological and behavioural alterations: fatigue, mood swings, and forgetfulness, amongst others (Wheelwright 2001). Thus, the suggestion is that Pyridostigmine Bromide (PB), the active component of NAPS, particularly in combination with other chemicals, may have done something similar to troops over a longer period. This line of reasoning implies that psychological aspects of GWS might have a neurotoxic explanation. This relates to the belief that their psychological symptoms and diagnoses of post-traumatic stress disorder (PTSD) are likely to be chemically induced (1). Veterans also use NAPS tablets to make sense of what they see as neurological symptoms, like pins and needles and clumsiness. This is further combined with theories involving OPs, which will be discussed below. We can see here how veterans' theories are complex, overlapping with other aspects of their system of thought in order to make sense of a whole range of issues.

Veterans develop theories using their past experiences. Central to this is the fact that NAPS tablets had given them a number of unwelcome side-effects during the war, such as: diarrhoea, stomach upset, constant need to urinate, constant erections/inability to get an erection. Rumours about NAPS tablets circulated during the war and many veterans reported feeling anxious about them. Indeed, a number

of my informants stated that they stopped taking them because of the adverse side-effects. Another contentious issue surrounding the vaccines and NAPS concerned their unequal distribution. Veterans and their advocates suggest that officers and aircrew did not accept all the preventative measures that the lower ranks were forced to take. Many aircrews indeed did not take NAPS tablets because one of their side-effects was frequent urination, which would have made long air trips untenable. This unequal distribution helps to explain, at times, why some were ill and others were not. Furthermore, it explains why so few officers were ill with GWS. Studies have shown that those from lower ranks are more likely to suffer from GWS (Ismail et al. 2000). This aspect of the system of thought is therefore able to respond to this finding. NAPS tablets and the vaccinations were not needed in the end since nerve agents were not used by Saddam Hussein, a fact which may have added to the subsequent anxiety surrounding them. There is a sense that they were an unnecessary, unused substance remaining in the body.

Discussions about NAPS tablets often overlap with concerns about organophosphates (chemical weapons, pesticides and insect repellents) because these compounds work in similar ways on the nervous system. A number of insecticides were used during the Gulf War and were focused on early in investigations into GWS. Mark and Debbie suggest that OPs are not a real concern for them and do not play a role in their theory of causation (18). This reveals the very individual nature and flexibility of GWS systems of belief, which are based on personal ideas of risk exposure. Having a different theory of causation from others is acceptable within the system, as long as your theory points to one or more of the exposures. It is a complex system, with people able to pick and choose aspects which are particularly relevant to them. Although Mark disregards the relevance of this exposure himself, OPs remain an important factor to others. No single thing affects all sufferers; in this way it is a closed system, as it cannot be contradicted. Ann, an ill veteran, emphasises the role of OPs amongst other factors in her narrative:

The other thing, I looked after a lot of evacuees and a lot of our lads as well who, the evacuees literally were covered in, they had been de-loused so they were covered in organophosphates powder and God knows what else. The lads came in from the front, their clothes were covered with what could have been sand, but we don't know what else so we bagged their clothing ... I think, again that the vaccines have caused this, or even the organophosphates ... And I think umm, that there may be something, maybe and again it hasn't been proven, but this squalene thing sounds like there was something that may have been added to boost our immune

system ... Because I think when I look at civilians, there is a lot of CFS, there is a lot of fibromyalgia. It's not just us that's got this. And for some of them, just for example, the organo-poison phosphate [*sic*], the organophosphate poison farmers, the sheep dip. That's a big thing at the moment.

At a later stage of the same interview Ann mentions two scientists to support the theory that organophosphates were involved in GWS. She points to the fact that one of these papers was published in the *Lancet* as further proof of its claims to expertise; veterans often refer to specific papers and particular scientists. Ann's narrative reveals the chaotic nature of theories of causation: there are just so many factors, so much information and so much at stake. She also shows the way in which these systems of thought constantly accommodate outside information and link it to a grand narrative. Thus, she connects the high incidence of CFS and the sheep dip-farmers movement, amongst other things, with her illness and GWS.

The concern surrounding exposure to OPs was introduced prior to the Gulf War; veterans subsequently encapsulated relevant themes into their understanding of the cause of their illness. In the UK "sheep dip farmers" had received a great deal of media coverage and the peril of OPs was well known to the public. Indeed, a number of advocates for GWS became involved through their dealings with OPs. The problems reported in farmers were the result of OP poisoning occurring after accidentally high levels of exposure to OP pesticides, either inhaling the vapour or spilling liquid on their skins. However, in the Gulf War there have been no reported cases of acute organophosphate poisoning. Instead, some researchers believe that a milder form of OP neuropathy affected the veterans, an exposure not characterised by any acute symptoms at the time. Alternatively, if there were symptoms, they were interpreted as flu, effects of vaccines or stress of war. The belief is that organophosphates are not only toxic in themselves (Jamal et al. 1996; Haley et al. 1997a; Jamal 1998), but interact synergistically with other pesticides, multiplying the overall toxicity of these compounds (Abou-Donia et al. 1996, 2000; Abu-Qare et al. 2001).

Veterans often speak about Robert Haley, the leading proponent of neurotoxic injury and one of the most heralded and respected scientists within GWS circles, who advocated this theory and focused on the issue of delay in OP poisoning. His theory is that low levels of these chemicals injured the soldiers' brains. Chemical weapons are a causal feature in Haley's theory of GWS, which he links to the nerve gas that was released when the US bombed Iraqi weapons plants on the fourth

day of the Gulf War.⁹ Haley put 23 sick veterans and 20 healthy ones through detailed scans and said he had detected damage to their deep brain structure. Haley stated that GWS was due to brain damage from sarin. Furthermore, he introduced a genetic element to his theory, suggesting that some did not become ill while others did because they lacked a common enzyme that protects the body from toxic chemicals such as nerve gas and PB.

In January 1997 the *Journal of the American Medical Association (JAMA)* published three of his papers in the same issue, immediately placing Haley at the centre of the Gulf War debate. Although welcomed enthusiastically by veterans and their advocates, Haley is highly criticised by the mainstream scientific community involved in GWS research. He was charged with recall bias and selection bias as he had confined his sample to a suggestible, high-profile reserve battalion called 24th Navy Seabees. Haley used a small number and had not used a control group, a fact which greatly diminished his findings, according to his critics. It was also suggested that the neurological differences between the sick and the healthy study participants was due to other factors such as chemicals at their civilian jobs, or personal habits such as drinking, anxiety or depression (Wheelwright 2001).

Another GWS scientist who focused on OPs as the cause of GWS was Mohammed Abou-Donia. He suggested that DEET, PB and permethrin were more toxic to animals when administered together than when given singly. Critics point out that both Abou-Donia and Haley were funded by Ross Perot, the suggestion being that this may have meant they were biased. Perot, the Texan millionaire politician, had become interested in the veterans' cause when he was running for President of the United States.¹⁰ It has been suggested that it was in his interest to be seen to support veterans in their battle for recognition of the illness and, thus, those researchers he supported financially would do so too. However, this argument echoes the veterans' and their supporters' belief that any work paid for by the US Department of Defence or MoD

9. The US Pentagon reports deny Haley's assertion. They say that no Iraqi chemical weapons were bombed on the fourth day of the war and that any bombing on that day was more than 200 miles away from the group Haley studied.
10. Throughout the book I use material from both UK and non-UK sources. Although it is wrong to assume direct comparisons, I believe these sources can shed light on the issues raised. Importantly, GWS appears to be quite similar in the countries where it has appeared (Canada, US, UK, Australia) and it is from these countries that I use additional material. Furthermore, militaries can be seen as sharing cultural characteristics and these particular militaries are often in contact and share experiences. Veterans themselves move fluidly between UK and other sources, while GWS itself is a product of a dialogue between these various arenas.

is biased in the opposite direction: disputing the existence of GWS as a unique disease category.

One exposure which is missing from Mark's account is chemical weapons. Although he and his wife do not mention it, exposure to chemical weapons is often included in veterans' theories of causation. At the AGM Malcolm Hooper, the veteran's scientific advisor, went into detail about the various exposures and causal theories. He spoke at great length about Haley and his work, saying that Haley had found a genetic link in that some people were more susceptible to things like sarin:

Oops, we weren't exposed to sarin gas, says the MoD. The Americans have now admitted that they were. We are still playing silly buggers at this, sorry about the language, but I just get so cross. I'm preaching tomorrow as well so I'd better be careful [everyone laughs]. But these are the sort of things that we are seeing. "Oh, there's no evidence that we were exposed to sarin gas". What about all the alarms that went off? "Oh, they didn't work". Why did you buy them then? Why did you claim there was no exposure if the alarms went off anyway?

Concerns about chemical weapons are more often expressed through reporting of the frequency of the NAIADs (the alarms used to detect chemical weapons) sounding. Chemical weapons alarms went off frequently during combat and were regularly ignored, something that many veterans use to support their theory. However, it was later suggested that the alarms were too sensitive and reacted to things like jet fuel. It was reported that nerve gas was noticed by Czech military teams on 19 January 1991: two days after the beginning of the war on the ground. Five days later, the same teams detected mustard gas (*The Economist* 1997).

Many veterans referred to the 'Khamisayah incident'¹¹ and in some cases showed me a map which detailed the "plume" along with where they had been located in relation to it. Importantly, John's 205/32 Field Hospital was said to have been located in an area which was near the plume; thus, the link between the illness, that particular field hospital and the veterans' association was strengthened. However, the plume diagram kept changing and veterans complained if the updated plume

11. The Khamisayah incident refers to 4 March and 10 March 1991 when the Khamisayah ammunition depot was detonated, probably releasing sarin into the air. Deadly levels were not attained and no gagging or gasping by the US troops on the scene was reported. When details about the incident were first reported 400 veterans were said to be at risk. Later, the number was raised to 1,100, 5,000 and then 21,000. The fact that it took so long for the American government to disclose the event added to accusations of cover-up.

left them out of the area. The Khamisayah incident added much fuel to the GWS fire, particularly to accusations of cover-up. The incident was first reported on the front page of the *New York Times* and other newspapers on 22 June 1996, five years after the war (Wheelwright 2001). The reports referred to the fact that the Pentagon had disclosed that troops may have been exposed to nerve gas shortly after the war when an army unit blew up an Iraqi ammunition depot that contained rockets armed with chemical agents. The revelation was immediately linked with a possible explanation for GWS. However, this theory is not absolute, as it did not explain why those who were not near the incident are reporting similar symptoms.

Despite focusing on his location in the Khamisayah plume, his exposure to chemical weapons and endorsing Haley's theory, at one stage John completely dismissed the role of chemical weapons. He told me that initially he had suspected chemical weapons, but now dismisses that theory in favour of issues like DU. The shift in theory, he suggests, was due, in part, to the increased focus on DU in the media due to Bosnia and Kosovo, but also because he had come to accept that had chemical weapons been released people would have died at the time. This dismissal of chemical weapons contradicts Haley's theory, outlined above. We can see the way in which veterans use different, often contradictory theories at different times. They use part of Haley's theory to develop their own, ignoring other parts which do not fit into their model. It must also be noted that when veterans were advocating Haley's work they did so seemingly without awareness that by doing so they were contradicting other theories, since Haley's theory suggests that DU, vaccines and oil fires are not factors in GWS. Although veterans and Hooper often refer to Haley, they mainly focus on his "proof" of brain damage and links with psychological symptoms.

Depleted uranium is mentioned by both Mark and Debbie as a likely cause of Mark's illness as well as the children's problems (9, 21). Indeed, Debbie reports that one of her doctors made the connection between the health problems of their children, the problems found in Iraqi children and DU. DU is most commonly cited as the cause of birth defects and reproductive problems of veterans and their partners (see Chapter 7). It was used as "tank busting" ammunition by US and UK troops. Thus, it would seem that only victims of the friendly fire incidents between the US and UK¹² were at risk from direct DU

12. During Gulf War An American A-10 attacked British armoured personnel carriers, the incident resulted in the deaths of nine British soldiers and the serious injury of another twelve British soldiers. In addition, 35 of the 148 American servicemen and women who died in the Gulf War were killed inadvertently by their comrades.

exposure. However, many veterans believe that they were exposed to depleted uranium in a more indirect manner. Veterans suggest that they had "breathed in or ingested" DU dust as a result of coming into contact with or handling either Iraqi or friendly fire victims. The other suggestion is that there had been a large, unknown amount of DU in the general atmosphere as a result of the ammunition. Often, contact with DU involves discussions of the enemy and the Basra Road incident.¹³ As Jack describes:

I mean, I was on an armoured reconnaissance regiment and we had some DU shells which we weren't warned about. Once the war had finished we were on the Basra high road and some of our lot was responsible for burying bodies, etc; and again, without being ghoulish, once any conflict like that has happened, one thing you do is you look over war trophies. Now, we were ... because it was the first chance to look up close at various military tanks, armoured cars, armoured personnel carriers, etc; we were clambering all over these vehicles: one to look at the vehicles and two to bring back ... whether it be a helmet or whatever. And we were clambering all over these vehicles that had been hit by DU but we didn't have a clue.

Souvenir hunting and being on the Basra Road implies contamination by DU. Mark's opinion was that those who were ill as a result of coming into contact with DU while souvenir hunting "deserved it". Some veterans combine discussion of psychiatric problems (PTSD) with a discussion of depleted uranium. The trauma of handling dead bodies is entwined with the DU on the same bodies.

The various causal theories are outlined on the GWVA's website. On one webpage Hooper goes into great detail in explaining the role of DU in the illness:

Undoubtedly DU exposure has contributed very significantly to the illnesses now suffered by some GWVs,¹⁴ their families, and the civilian population of Iraq including the unborn ... There is a 250,000-fold excess of babies born without eyes in a study from Baghdad, De Sutter, 2001. Research commissioned by the GWVs themselves has shown that some of them are still excreting DU some 8–10 years after the Gulf War, Durakovic¹⁵ et al.,

13. At the end of the war American planes had attacked a mass exodus of Iraqis trying to escape in any vehicle they could, including tanks, ambulances and ordinary cars. The result was a mass of dead and burnt bodies and burnt-out vehicles (de la Billière 1992).
14. Gulf War Veterans.
15. Durakovic is a scientist involved in GWS who studied UK Gulf veterans; he reports finding that some of the sick were excreting DU in their urine. He further suggests that this could be causing GWS (see Durakovic 1999, 2001).

2002. This clearly indicates slow elimination of DU from internal body stores that were laid down in 1990–1. The cumulative internal radiological dose from that date is thousands of times the allowed dose advised by the national and international agencies, Busby, 2000 ... Environmental damage is also extensive with grossly deformed plants and animals being reported ... Cancers expected as a major consequence of internal exposure to DU are lymphomas, leukaemia, lung and kidney cancers.

The above discussion by Hooper is extremely important because veterans look to him as the supreme expert in GWS issues, as will be discussed below. DU is linked by Hooper to cancers and birth defects and he explains that DU remains in veterans' bodies and is slowly being excreted out, something which is testable. Ann reports:

It's a scientific fact that I've been exposed to depleted uranium. I was tested in 1998 by Durakovic and this was showing levels that were over 100 times the safe limit of what I should have been exposed to over the period of a year. And this was several years after I had been exposed. I've had chromosome aberration test done in Germany. And low-level radiation expert saw a result that showed three times the biological damage as the residents of Chernobyl showed at the time of the disaster. That's a scientific fact.

Ann mentions the name of a scientist who was very much involved in the GWS movement and who focused on DU as the cause of the illness. Chernobyl is often referred to in discussions about DU, as veterans absorb other theories. The link between radiation, Chernobyl and DU is further developed into belief systems about GWS and problems with offspring. Above, Hooper suggests that DU is radioactive and will remain in Iraqi land, continuing to harm civilians and the environment. As John notes,

What I know about DU, the considerable lack of knowledge with regards to chemicals exposure we had and that and what side-effects could be cause ... it's a carcinogen ... depleted uranium is a heavy metal toxin and its chemical compound, and it's very worrying ... DU has a chemical half life, a biological half life of, 500 million years, so it has nowhere to go. And I think that's an issue.

In his long list of causal features of his illness, Mark presents smoke from oil well fires as something he was exposed to and a contributory hazard (10). Oil well fires were regarded as the first culprit of GWS, but soon lost favour as anything but a subsidiary danger. Most of the veterans I interviewed listed a number of exposures – oil fires among them – yet exposure to oil fires remains a minor feature. Many

veterans would, however, describe their experience of the fires by saying, "the sky was black", "day turned to night" – thereby emphasising their experience of exposure.

One theme that emerges repeatedly in the above narrative is the assertion that the *combination* of the exposures is a likely culprit in the illness (5, 12, 14, 23, 24). Although each substance is seen as new and therefore dangerous, the uniqueness of the unknown combinations of these substances is also a cause for concern. As mentioned above, many of the theories involve the notion of synergism. Most veterans stress the role of the "cocktail effect" of the various exposures. Hooper constantly refers to the Gulf War environment as totally novel – "the most toxic war" – and describes the atmosphere of the Gulf as "a witch's brew of toxins". The image is of a toxic soup, with a number of dangerous and unknown substances mixing together, creating new and even more dangerous materials. Importantly, it is suggested that all the possible combinations could never be fully researched, leaving the cause of GWS out of reach. Since there were so many possible combinations, with the added possibility that different combinations affected different people, the cause remained elusive. The sheer number of possible combinations of exposures and their different and unique effects on individuals means GWS theories of causation are fairly impenetrable.

When listing all the possible factors which may have caused his illness, Mark mentions the adrenaline in his body (11). Many veterans add other non-exposure factors which may have contributed to their illness, possibly in combination with the other exposures. Veterans mention the heat, the NBC suits,¹⁶ dehydration, lack of water, lack of alcohol, and unknown entities like viruses and diseases as potential contributory factors, adding to the already abundant and complicated theories.

When discussing the long list of possible explanations for his illness, Mark mentions the fact that he was given unlicensed drugs (7). This is a theme which dominates most veterans' accounts of the cause of their illness. Veterans emphasise the newness of the substances and that some of the exposures were untested, unlicensed, secret and experimental. They link this to the way in which medical and other

16. Nuclear, Biological and Chemical Suit. The full-body suits which were to protect against possible nuclear, biological or chemical attacks. The suits were donned often due to the perceived threat. Also called a "Noddy suit". Veterans often had to don them quickly, when the NAIAD alarms sounded. They were described as hot, cumbersome and claustrophobic.

relevant records were not kept or lost, and to grander conspiracy theories, as the following discussion with John and Jack reveals:

John: The deliberate loss of medical documentation, the destroying of medical documentation ...

Jack: Other wars have [lots of paperwork], so obviously the MoD and the government know that things happened in the Gulf that shouldn't have happened. Either there were exposures that we shouldn't have been exposed to or we were given stuff that we shouldn't have been given. And so they went out systematically, methodically destroying documentation ... The doctors can't treat you because they aren't aware of what you've been given. And, in fact, because they are withholding information from doctors, doctors could, technically, prescribe us with something that makes us even worse.

John: Vaccines were not licensed to be used in the UK because of the contradictory effects ... according to all the rules and regulations at the time, it was an erroneous prophylactic programme that they gave us. And they shouldn't have done it. They were advised by the Department of Health not to give us those vaccines in that manner ... should not have given perutussis [*sic*] in conjunction with the anthrax vaccine ... The recommendation on that clearly states, 'not for adult use'. The vaccines and medication were experimental. Never been used before ... It was the first time that the vaccines were given, vaccines that were classified secret were given, anthrax and perutussis [*sic*], the first time they were given, in conjunction. The first time that NAPS tablets were given ... Depleted uranium: the first time that had been used in a war. The first time the British army and the United States had used it in a battle environment.

Jack: Again, it was experimental in the Gulf. Like a lot of things, like the injections, like the NAPS, like so many other things [...] The first time people had come into contact with oil well fires. Possible other contamination with Iraqi chemical works being destroyed. First time that people have come into contact with those sorts of materials [...] DU was experimental in the Gulf ... um but again it's an experiment. What better way then try out all your experiments, your new injections, your new toys, your new weaponry, what better way to have a real live war? Great, it's not on our doorstep we're not going to be affected anyway. If we go in and if we affect the country so what?

The notion of the war as a large-scale experiment relates to the title of this chapter; veterans see themselves as guinea pigs, lab rats upon which the government could do as they pleased. Concerns about the untested/unlicensed nature of the preventative measures developed from information veterans received. NAPS, for example, was not licensed for specific use in warfare at the time the Gulf War, although they are now.

However, PB has been successfully used since 1955 to treat men and women suffering from the neuromuscular disease *myasthenia gravis*. The belief in a conspiratorial experiment is further strengthened by many veterans' assertion that officers, pilots and the Special Forces did not take the same medication as other soldiers. Thus, issues of class and rank are tied up in discussions of the illness and help veterans to make sense of the statistics which report that officers are unlikely to suffer from GWS.

John claimed that some units were clearly being monitored as part of an experiment:

At the end of the war there was a RAF medical unit going around from unit to unit and asking about NAPS tablets and effects, side-effects. Also, some of the units were bled ... Blood was taking off them after the war, while they were still there. And some of the units were bled before they went out. So, particularly 205, for instance, the general hospital: that was bled before it went out. Bled after the ground war, before they all came back. To see what the uptake was on the vaccines and at the end of it, which is an experiment. There is no two ways about that. That is an experiment.

The issues of novelty and secrecy often involve specific examples in veterans' accounts. The interviews from which I have taken these narratives were conducted early in my fieldwork. Theories are constantly changing and adapting, though. Whereas John briefly mentioned a substance called "squalene" as a possible factor, Mark and Debbie did not mention it at all. Squalene was to take a major role in theories of causation a few months later. Concerns about the role of vaccinations in the illness took a new trajectory as veterans became aware of a substance called squalene.¹⁷ During the association's AGM in March 2002 much of the formal and informal discussions focused on squalene. A persistent allegation about the vaccination programme is that this substance was added as an adjuvant¹⁸ to the vaccines. The US and UK governments have denied the use of squalene in the vaccinations. However, in 2000 a Tulane University researcher, Pam Asa, claimed to have found antibodies to squalene in veterans' blood. The reason for this interest in squalene was largely due to a recent media story and the presence of its subject at the AGM. Gwen, a non-

17. A naturally occurring substance, squalene is produced by the liver to help metabolise cholesterol. It is found in shark liver oil, some vegetable oils, cosmetics and various nutritional supplements. It is also used as an adjuvant in some vaccines.

18. A substance used in a vaccine to improve the immune response so that less vaccine is needed.

deployed ill veteran,¹⁹ had been the subject of a television broadcast about GWS and vaccinations. The programme took Gwen to meet with Asa in the US and filmed her as she tested positive for squalene antibodies. After the programme was aired the GWVA contacted Gwen and she became a member of the association.

During the AGM an information sheet on squalene was made available. It said:

What makes Gwen unusual apart from her diagnosed Gulf War Syndrome is that she never actually deployed to the Gulf ... Thereby proving beyond a reasonable doubt that the vaccines made so many of us ill and not chemical weapons or environmental factors. Particularly not the stress of battle!

The information sheet also quoted Asa as saying that her findings ruled out the alternative theories of causation for GWS, something which was not taken up further by veterans as they continued simultaneously to subscribe to theories which involved other exposures. During the AGM one of the main interests was the taking of blood from participating veterans in order to test for squalene antibodies.

Genetic factors are also introduced as a causal agent in Mark's narrative (13); he refers to a specific paper which suggests this. As mentioned above, genetics are seen to contribute to GWS, outlined in Haley's theory. Given the central role of genetics in understandings of disease in Western culture, it is not surprising that veterans embed their understanding of their condition in genetic theories. Ann presented a long, jumbled list of causes of her illness, amongst other factors suggesting a possible genetic contribution, but introduced a different scientist to support her claim.

The MacNess team ... found was that all the Gulf veterans, regardless of how many symptoms they had had a 50 per cent reduction in this paronoxinase. Which detoxifies organophosphates. And what is it? It's an enzyme. And we have genetic differences in them. So that in some ways explains why some people got sick and some people didn't get sick.

In her discussion, Ann suggests a genetic pre-disposition or vulnerability to organophosphates and refers to a scientific paper

19. Gwen is one of a significant group of soldiers who were not sent by the military to the Gulf War, but have GWS. The suggestion is that some, like Gwen, were vaccinated in preparation for war, but in the end were not deployed. Others claim that they became ill after working on machinery, such as tanks and trucks, which had been in service in the Gulf War and were potentially contaminated with exposures, such as DU.

written by one of the "sympathetic" researchers to support her argument. This one part of her overall theory provides a grand narrative which makes sense of and links a number of factors. In so doing she points to scientific studies and experts, rooting her language in the medical world.

As demonstrated above, veterans encompass other theories and beliefs from the world around them into their system of knowledge, such as including a genetic reading of the condition. Mark and his wife also discuss food allergies and autism as being linked to GWS (16), as well as the MMR debate (20). Importantly, MMR, food allergies and autism have all received a huge amount of media and public attention over the past few years, making them accessible theories with which to work. Thus, many veterans and their children have been put on special diets, such as dairy-free and gluten-free diets. The reason for this is that advisors such as Hooper and his colleague Paul Shattock have suggested a link between vaccinations, gut permeability, autism and sensitivity to certain foods.

Risk

Veterans view the world as full of risk. GWS narratives are saturated with discussions of dangers in the form of chemicals, toxins and viruses. These risks are central to their theories of causation: Gulf War exposures rendered them ill and leave them vulnerable to other hazards. Like many of us, they are far more likely to view symptoms as pathological and interpret them in a medical rather than a social or normative context. The popular belief is that the physical world is a potentially hostile place, full of chemicals, toxins and viruses that are eroding health and well-being. GWS should be seen against the background of a larger cultural trend which has witnessed increasing anxiety about health and a heightened link between identity and the body. Although objective indices of health have improved during this century, surveys suggest that modern man feels less well and experiences more symptoms than in previous generations – something which has become known as the paradox of health (Barsky 1988; Barsky and Borus 1995).

Modernity is a risk culture (Giddens 1991: 3). The concept of risk has become fundamental to the way both lay actors and technical specialists organise the world (*ibid.*). In the contemporary Euro-American context, risk is impossible to ignore and is central to understanding health beliefs and behaviours. Three social scientists have written extensively on risk: the sociologists Ulrich Beck and

Anthony Giddens and the anthropologist Mary Douglas. Both Beck and Giddens see the world as entering a new phase, which they respectively label “reflexive modernisation” and “late” or “high modernity”. Risk is central to this transformation, with new perils being introduced that other generations have not had to face consciously.

Beck and Giddens emphasise the trend towards individualisation in late modernity, but Douglas’ work focuses more on the social nature of decision-making in respect to risk. In line with Douglas, an investigation into GWS reveals that the process by which people assess dangers is very much a social process, negotiated between individuals and institutions.²⁰ Furthermore, it is constantly re-assessed and re-negotiated as veterans are confronted with new information and experiences.

As her work on the subject is a continuation of her work on purity and pollution, Douglas (1966) also introduces *morality* in understanding risk and danger. She argues that distinguishing something as a risk is a way of making sense of the world as well as a method of keeping things in their proper place. Risk in our culture plays an equivalent role, Douglas states, to taboo or sin, but it acts in the opposite way: it protects the individual against the community.

Being “at risk” in modern parlance is not the equivalent but the reciprocal of being “in sin” or “under taboo”. To be “at risk” is equivalent to being sinned against, being vulnerable to the events caused by others, whereas being “in sin” means being the cause of harm. The sin/taboo rhetoric is more often used to uphold the community, vulnerable to the misbehaviour of the individual, while the risk rhetoric upholds the individual, vulnerable to the misbehaviour of the community. (Douglas 1992: 28)

Those that put others at risk are acting immorally. This feature of risk assessment is linked to the way in which blame is designated and explanations found for misfortune and illness. The blaming system:

[W]e are in now is almost ready to treat every death as chargeable to someone’s account, every accident as caused by someone’s criminal negligence, every sickness a threatened prosecution. Whose fault? is the first question. Then, what action? Which means, what damages? what

20. Beck and Giddens emphasise the trend towards individualisation in late modernity, but Douglas’ work focuses more on the social nature of decision-making in respect to risk. In this way, as Caplan (2000) points out, the way people deal with risk appears closer to Douglas than to Beck and Giddens.

compensation? what restitution? and the preventative action is to improve the coding of risk in the domain which has turned out to be inadequately covered. Under the banner of risk reduction, a new blaming system has replaced the former combination of moralistic condemning the victim and opportunistic condemning the victim's incompetence. (Douglas 1992: 15–16)

Linked to this new focus on risk is our inability to accept chance. As we see in veterans' narratives, every illness or misfortune must have a cause and someone must be held accountable. Institutions and large corporations are generally seen to be immoral and risky in that their practices put others at risk, and it is towards them that we point the finger of blame. The MoD put veterans in danger by injecting them with and exposing them to harm, even by the very nature of sending them to war. Mobile phone companies, the government, drug companies: all are responsible for putting us in peril and making us ill. Someone is responsible. It is in this way that people develop chains of causality.

We have witnessed a change in the meaning of risk; the concept now only denotes bad risk (Douglas 1992). Those institutions and apparatus that were once seen as benign, or even beneficial, are now seen as potentially harmful. Risk is invoked as a response to the abuse of power. "For those purposes *danger* would once have been the right word, but plain *danger* does not have the aura of science or afford the pretension of a possible precise calculation" (Douglas 1992: 24). Perceptions of risk are often linked with past experiences and theories of causation. Science is increasingly replacing mechanistic models of the body and illness by new interrelated discourses of environment, immunology and genetics and as a result there is increasing frustration with scientific explanation (Cohn 2000). Because of the multi-layered nature of these new discourses, people experience the diffusion of cause and the accompanying loss of moral resource (Cohn 2000). Cause (and blame) is no longer straightforward.²¹

The new concern with risk is partly a backlash against the great corporations (Coleman 1982 in Douglas 1992). Indeed, it would seem that faceless, large institutions, like the MoD are seen as inherently dangerous and risky. The "political pressure is not explicitly against

21. Critics of Douglas and Wildavsky have pointed out that they reduce real risks to metaphor and, by so doing, eliminate danger all together (Kaprow 1985 in Caplan 2000). Hacking (1982: 31) claims, "*Risk and Culture* sometimes hovers near the anthropological fallacy of thinking that everything we perceive is a cultural artefact. Every once in a while the reader has to cry out that some pollution is real."

taking risks, but against exposing others to risk” (Douglas 1992: 15) The anthropologist Ernest Gellner has convincingly argued that our movement into a global society is at the heart of risk being central to modern life (Gellner 1984). Modernity is characterised, he says, by new social relations as we move from the local community to larger national and international spheres. This is reminiscent of Weber’s description of the “iron cage” of bureaucracy (Weber 1930: 181). Douglas suggests that “liberation from the small community also means losing the old protections. The markets suck us (willingly) out of our cosy, dull, local niches and turn us into unencumbered actors, mobile in a world system, but setting us free they leave us exposed. We feel vulnerable” (Douglas 1992: 15). The focus of this vulnerability becomes invisible and ever-present dangers, such as toxins and chemicals. Thus, our late twentieth-century/early twenty-first century malaise is blamed on viruses and toxins, with the ultimate bearer of responsibility wresting on large institutions.

Conclusions

The veterans’ theory of the cause of their illness is not unitary and consists of a large number of possible explanations. Although there seems to be a finite number of advanced exposures, the different combinations provide a vast array of possibilities. Furthermore, individual differences, both in terms of exposure experience and bodily composition, add to the inclusive theories. It is necessary to see GWS and the veterans’ concerns in context. The veteran’s view that the world is full of risks is not unique to their plight. Over the past decades there has been the increasing perception that risk is ever-present and is in the form of invisible viruses and toxins. In the Euro-American context in which GWS emerged there has been an increased focus on risk, with a specific emphasis on the way in which toxins and chemicals impact health. An important characteristic of risk assessment is the way it allows for blame to be assigned. When veterans try to make sense of what caused their illness they present a series of possibilities, sometimes with conviction and sometimes with uncertainty; but the one thing they are certain of is that the Gulf War made them ill.