INDEPENDENT PUBLIC INQUIRY INTO GULF WAR ILLNESSES

MINUTES OF PROCEEDINGS

held at

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on

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DAY EIGHT

Lord Lloyd of Berwick, in the Chair
Dr Norman Jones
Sir Michael Davies

(From the Shorthand Notes of:
W B GURNEY & SONS LLP
Hope House
45 Great Peter Street
LONDON SW1P 3LT)

THE CHAIRMAN: Good morning, ladies and gentlemen. We have a very full day today, starting with Professor Simon Wessely and continuing with the Right Honourable Michael Mates MP and then Professor Nicola Cherry, who is expected at midday. This afternoon we will hear from Dr Harcourt Concannon at half-past one, then Dr Pat Doyle at half-past two and, finally, Dr Tony Hall at half-past three, by which time I suspect the tribunal will be completely exhausted! We hope to get through all of those witnesses today and that will probably complete our expert evidence, although it is possible we may sit to hear some more expert evidence at the beginning of September.

PROFESSOR SIMON WESSELY, Called

1. THE CHAIRMAN: Professor Wessely, thank you very much indeed for coming. You have a busy schedule. Could you start by giving your name and address for the purposes of the shorthand note? A. I am Professor Simon Wessely, King's College London.

2. THE CHAIRMAN: We have a list of your qualifications here and also various publications. I do not think we need go through them, but perhaps you could just state very briefly what your qualifications are for the purposes of the note? A. Sure. My first degree is from Cambridge, I qualified in medicine at Oxford, I obtained medical membership at Newcastle, I started training at the Maudsley Hospital, I did my Masters and Doctorates in epidemiology at the London School of Hygiene and I am a Fellow of the Royal College of Physicians, a Fellow of the Royal College of Psychiatrists and a Fellow of the Academy of Medical Sciences.

3. THE CHAIRMAN: How did you first become interested in the question of the Gulf War illnesses? A. Well, I do not know if it is helpful to take you through what it was suggested that I do which would answer that particular question. What I was going to do was start from when we became interested in this subject, which was ten years ago now. I am going to follow the old nursery rhyme of old, new, borrowed and blue to try and tease out the various threads of this problem and emphasise that what we are dealing with here is a very complex issue with no single cause. That is a little mnemonic I use sometimes.

4. THE CHAIRMAN: I am sure that is much the best course. It is entirely up to you how you deal with it, but do bear in mind that the shorthand writer is used to taking down words rather than pictures. Although we can understand the pictures, she cannot get that on to the transcript. A. She does not need to get this on the transcript. We are in 1994. This is the first ever newspaper article on Gulf War illness and it got me interested for two reasons. One is that you can see it is a classic story of a young man that goes to war, comes back and then develops strange symptoms. It says, "Once fit. Now I'm tired all the time". For ten years I had been running a research unit specialising in chronic fatigue and the problems of people who are tired all the time - they were not in the military, of course - and I recognised very quickly the kind of symptoms that veterans were describing were the kind of things that I was dealing with clinically and academically. The second thing it says there is "Shells that put our side at risk" and that is making what is an epidemiological observation. It is suggesting there is a certain hazard that has caused this man's illness. My other life and training is in epidemiology, which is the study of illnesses and populations. So it became very clear that this was a problem that would have to be solved by epidemiological approaches. You will know, of course, that by then it had become a very controversial issue and a very difficult issue to research, but we approached the MoD in 1995 and suggested that what they needed was an epidemiological approach but, in their wisdom, they disagreed. We

then applied to America and we received funding from the Americans in 1995 to begin the first ever UK studies of Gulf War illness.

5. THE CHAIRMAN: There is a suggestion in some of the papers that it would have been an advantage if the first epidemiological study had started a little earlier. A. Absolutely. I could not agree more.

6. THE CHAIRMAN: The war was over in 1991 and nothing started, as I understand it, until 1995. A. Yes, that is absolutely right. By the end of this morning I will hopefully have shown you what we are doing around the war in Iraq. I think lessons have been learned. We are now doing a very large study of 20,000 members of the British Armed Forces in Iraq and controls that began very soon after the conflict. You are quite right to say that if we had begun the studies that I am going to describe to you six years earlier life would have been a lot easier, but it did not happen. There was resistance, including from one of your witnesses, to carrying out research in 1995. It was really when we got money from the Americans that we started to get access and things started to happen. It was quite an effort at the start, that is true.

I have noticed some people are somewhat confused about the purpose of why we have to do epidemiological studies to answer these questions. If we were dealing with a thing like the rise of AIDS in gay men in San Francisco in 1980 we would not need these studies. It was blindingly obviously that something very new had happened. A cancer was appearing at rapid rates. A very rare illness was appearing in a group that had never had that illness before. You do not need epidemiology to see that some things happened there and it did not take very long before people worked out what it was, but we are not dealing with that kind of condition. Three thousand UK veterans went through the Medical Assessment Programme. Over 200,000 attended medical assessments in America under the registry programme. If there had been something like that visible we would not be here today, it would be obvious.

We need a population approach because we know there were 53,000 UK veterans, three-quarters of a million Americans, altogether almost a million coalition forces in the Gulf. Some of them will have developed every illness known to medical science. We can find, if we go looking, people with Parkinson's, people with epilepsy, people with cancer, people with depression or anything we want because we have got a million people getting older, getting ill. It is completely useless information without knowing the incidence rate in the veterans and in appropriate control populations. There is no other way of beginning. If we simply said we believed that Gulf War Syndrome was a form of Parkinson's or a degenerative disease and we were going to find some vets with degenerative disease, that might tell me a lot about degenerative disease but it will tell me nothing whatsoever about the relationship with Gulf War. You have to start with epidemiology as there is no other way, but that is a shame because it is very expensive and very difficult. On this slide I am describing the three UK studies that have taken place. In fact, I notice that you will be hearing from the principal investigators of all three of those studies today which is fortuitous. We have taken a random sample, the King's sample, but you will see there is also a Manchester study and a London School of Hygiene study and I am not going to mention those now that I know that Nicola and Pat are coming. We took a random sample for Gulf veterans that went. You can see the Gulf population was 53,000 and we have taken 4,000 of those vets. The key thing to understand is that this is a random sample, it is just under one in ten. We did it because that would give us sufficient power to look at the outcomes that we wanted to look at. It is totally random and that means the results from this cohort or from the Manchester cohort or from the School of Hygiene cohort can be generalised to all UK Gulf vets. There is no other design that allows

you to do that. A small case study of a few here and a few there does not allow you to say anything other than we have a few people here who are sick. We can take that and broaden it to say that this is the experience of the UK Gulf.

Then you have to compare. You cannot compare the military with anyone other than the military because they are different to you and me in hundreds of ways: they look different, they are physically different, they are psychologically different and they are socially different. We are comparing them with UK military that went to Bosnia at the beginning of 1992 and then what we call ERA: that is people in the military in 1991 who did not go to the Gulf or Bosnia.

7. THE CHAIRMAN: What is ERA? A. ERA means that they were in the military. There were 250,000 people in the Armed Forces back then and we have taken a random sample of all of those who did not go to the Former Yugoslavia or to the Gulf. We have got two control samples, an active duty sample and a background military sample.

8. THE CHAIRMAN: What do the initials stand for? A. It just means from the ERA. We never knew quite what to call that. As we go down we are going to do some epidemiology which I shall show you and from that we are going to select in Stage 2 sick Gulf veterans and well Gulf veterans - and that is called a nested case control study - and sick Bosnia veterans and sick ERA. We are going to look very intensively at those people who we have identified through the epidemiological study. We have information on 12,000 people and then we have smaller numbers we are going to throw the book at later on. The design is very easy in theory but it is an absolute nightmare to do in practice. I am not going to bore you with this. I was going to do it to get some sympathy from you, but I am not going to bother now. It took two and a half years. It was not me doing this, it was my staff. I am a professor, I travel the world and talk about these things, but it took a lot of people a lot of effort to find these people. They are very difficult to trace indeed and it is very hard to get a response rate, but we did it. It took a long time

What are we dealing with? What is the ballpark? We need to agree the areas we are going to look at. We knew from the start that we were not dealing with something that causes an increase in mortality. It is absolutely true that some Gulf veterans have died of various things, but the huge studies from America and the UK study that Nicola and Gary McFarlane did showed conclusively that there is no increase in mortality, the exception being an increase in suicide numbers and accidental death. I am sorry those figures have not come through very clearly. What that is showing you is that the numbers for disease-caused mortality in the Gulf sample is the same as in the ERA. In other words, in the military that did go to the Gulf, disease-caused death is the same as in the ERA, but there is a slight increase in external causes, suicide and accidental death. That is very well known and happens after all wars. When soldiers come home they have difficulties adjusting, psychological problems, they adopt risky behaviours, they do all sorts of things and there is always an increase in suicide and accidental death, but that is not what we are talking about here.

We know that, whatever else is happening in this cohort and whatever else we are going to study, it is not associated with premature death. We also know now, it was pretty clear for some time, that it is not associated with any hard physical outcome easily measured, for example like cancer or heart disease or anything that doctors find easy to diagnose and deal with. We are not dealing with an increase in hard physical outcomes. It is not going to be that kind of problem. I would say that there has been no confirmed increase in any well defined physical disease. An increase in ALS or MND (Motor Neuron Disease as it is called

in the UK) has been suggested but that is controversial. There has been no increase in the death rate from Motor Neurone Disease in either the US or the UK and that is important because unfortunately it is a universally fatal disease and you would be seeing an increase in mortality.

We are not in the world of hard outcomes, we are in this world and we are in the world of symptoms. This is a list of 50 symptoms that we did some focus groups on with Gulf vets back in 1995/96 and these are the symptoms that they were describing. It describes a whole variety of symptomatic ill health. The exact symptoms I am going to show you do not matter as much. This is covering the whole range of physical symptoms individual veterans were complaining about.

This is what we found and unfortunately this is a picture and it is hard to describe it in words but I will do my best. This is the prevalence of symptoms in our three groups. On the left we have common symptoms, and it does not matter what the symptom is. I will point that out to you. (Indicating) Here we have common symptoms like fatigue and headache that are very common in the population and here we have got unusual symptoms that are not. The yellow and red dots are Bosnia and ERA. The first thing to notice is that this reminds us - these are all men by the way, the women are just the same - that normal men on active service get symptoms, so they have headaches, they feel tired and they get chest pains. That is not necessarily proof of disease, it can be normal. Second, Bosnia and ERA are exactly the same, nothing is happening to the UK peacekeepers in Bosnia. You can obviously see the blue line that is Gulf vets is different. Gulf veterans are reporting twice as often each and every symptom that we asked them about. It is very important to note that this is every symptom, all 50. If there are one or two symptoms we did not ask about, that one there for example, that would be elevated. The shape of that graph is identical to the shape of the Bosnia and ERA graph. Some people talk about a Gulf War Syndrome, a specific condition unique to service in the Gulf, but if that was the case some of these blue dots would be here and some would be down there (Indicating), the pattern in the Gulf would be different from the pattern in Bosnia and ERA and it is not, it is exactly the same, they have just got more of it, they are experiencing more ill health. There is no unique syndrome here. We have published several incredibly boring papers to prove this statistically.

9. THE CHAIRMAN: If there were a syndrome you would expect to find not the top graph following the other graph down but what instead? A. Some symptoms would not be associated with Gulf War, they would be normal. Other ones specific to the Gulf would be up here. (Indicating) So it is each and every symptom. The symptoms are just the same but there are more of them and they are of greater intensity. So there is no unique syndrome. The structure of these symptoms is such that they cluster together, so you could have some neurological symptoms or gastrointestinal symptoms. There are clusters of symptoms, but they are identical to the cluster of symptoms in the non-Gulf. Clearly something has gone on. There is a big Gulf health effect.

Since we published our study there have been a whole series of other studies as listed there, all of them very large numbers, all of them from the very large epidemiological population studies done in the USA, San Diego, the CDC, an enormous London School of Hygiene study. This morning the Australians published their study in Psychological Medicine. No one has found evidence of a syndrome. There is one study from the VA that suggests a small neurological syndrome. Dr Haley has argued repeatedly for a Gulf War Syndrome but on the basis of a study that had no controls. If you are postulating a unique illness of Gulf War Syndrome for Gulf War veterans you have to show that it does not occur in soldiers who did

not go to the Gulf. If you just look at Gulf veterans you will show they have some symptoms which cluster in a particular way, but that proves nothing unless you can show that it is different from the symptoms in the controls. Dr Haley had no controls. He had 249 people from a single unit of reserve See Bees and therefore his study could not address the question of whether or not there is a Gulf War Syndrome and scientific bodies and review bodies have repeatedly pointed out that it is not adequate for that task. It is all a little bit of a red herring because, to be honest, not very many people probably care if there is a Gulf War Syndrome or not. What is important is that there is a Gulf War health effect, that something has happened and the Gulf War Syndrome debate - I have brought it up because it keeps coming up - is not really very important, it is really just of academic importance.

10. THE CHAIRMAN: What does the word syndrome actually mean to you? What is the definition of the word syndrome? A. It is a unique collection of either symptoms or signs associated with a particular health problem. So, when first discovered, AIDS was a syndrome, for example, before we knew the cause there was a collection of signs, symptoms and markers that came together. Depression is a syndrome. It is a certain collection of symptoms that co-occur and indicates an underlying psychiatric problem. We do not have a disease marker for it but it comes together. Gulf War ill health is not a syndrome because we find it, as I will show you later on, in many other places and guises. What is important is we are finding far too much of it in the Gulf, much more than we should, but it is not new and it is not unique. Clearly it is an unequivocal finding. I should say that all the other groups I mentioned who you are not hearing from, people like Greg Gray and from the Iowa group, the San Diego group, the Portland group, the CDC group, find the same. The Australians find the same, the Danes find the same. In fact, everybody finds the same pattern of increased subjective ill health in Gulf veterans. There is no increase in mortality, no increase in cancer as yet, it may change, we do not know, but there is an unequivocal change in subjective symptomatic health.

What does that mean? It is interesting to ask how Gulf veterans are physically functioning. This is a normal SF-36. (Indicating) Normal people like me, aged in our forties, score around 70. What this shows you is the importance of comparing like with like. As a group overall Gulf veterans are doing pretty well. A small number of them are not doing well, but overall, despite this increase in symptomatic ill health, their physical functioning is only slightly lower than those in the ERA and the Bosnia samples. There are lots of people who have got more symptoms but many of them are still in the Armed Forces and only a small number have got substantial disability and from the population perspective we are often very interested in this larger group of people who have had small changes in health than the smaller numbers of people who have had large changes and that is a normal approach in epidemiology. What has definitely changed for all of them is their health perception, their own rating of health. Despite the fact that I do no exercise and I have extremely bad physical habits, I feel pretty good, my health perception is normal. I score around 75 in this questionnaire. The Gulf veterans do not. They feel their health has been affected. Up to 20 per cent of them believe they have Gulf War Syndrome. So there are a large number of people who, for whatever reason, feel their health has changed as a result of the Gulf.

11. THE CHAIRMAN: That is only just less than normal, is it? A. If we compared them to the normal population it would be only slightly less, but they are not normal, they are military. Compared to Bosnia and ERA, which is the relevant population, they are substantially less. It is very important to compare like with like, not with you or me. Well, I do not know about you but not with me! That is not an appropriate comparison. You can

sometimes be misled in missing health effects where you have a population with a very high baseline health rate because these are physically screened and they are fit.

12. THE CHAIRMAN: Could you just go back to the previous slide for a second?
A. My interpretation of that graph is that, unlike other groups, many of them have maintained physical activity more than you would expect because of military culture. I think that is why physical function is better than we expect in the majority. That is based on the entire population. Clearly at the end of the scale are smaller numbers of people with substantial disability. When you take a population approach you see a picture of the whole deployment.

Clearly the cause of the ill health in Gulf veterans must at some level be their service in the Gulf because that is the only thing that distinguishes them from Bosnia and ERA. It has got to be something, whatever it is, about the Gulf. It cannot be anything else because it did not happen in Bosnia or ERA.

Who among the Gulf vets get ill? This is of incredible interest to sociologists and immunologists, this social class effect in the British Armed Forces, but it is probably not relevant to you. It is almost the last bastion of the class society in many respects. There is a large difference in health between upper and lower ranks. More of interest to you is what is on the right, that is what it is not associated with. It is the same health effect no matter what you did in the Gulf, if you were in the Navy, the Air Force or the Army. It is not more in the combat arms of the forces. It is the same in logistics, in medics, you name it. It is not associated with what people did in the conflict and that is really, really important because what that is saying is that if we find exposures, for example depleted uranium was mentioned, which was the cause of this health effect, we would not see that because it would affect predominantly people in the combat arms who scramble over knocked out tanks. Why would it affect the Air Force or the Navy or the logistics or the intelligence? So the health effect is all pervasive across the deployment, and I will come back to that because that is one of the big clues as to what might be going on. That is not to say there might be very small numbers of people who have discrete causes. We know there are about 18 US veterans who have depleted uranium fragments in their bodies and they are actually in good health. These individual exposures are only on small numbers of people in special situations and cannot explain what we are seeing. We have got something that does not influence mortality, it does not influence defined physical outcomes, but it does increase symptoms and self-reported health problems.

Let us have a look at something that could be the cause because this is something that was given to most of the deployment, which are the medical counter measures. That is a possible cause because it fulfils the criteria that nearly everybody was exposed to it. The medical counter measures were quite definitely things that most people were exposed to. I am just going to show you one piece of evidence because it is significant and that is the epidemiological studies we have done on vaccination. It is made slightly more difficult by the fact that most of the records for vaccination were destroyed after the war. I do not think it was for any particular reason. I just do not think they were thought to be necessary or worth keeping, but it made life a problem for us later on. All we are going to do is look at the third of people we found who had kept their medical records. We are going to ignore the two-thirds who we do not have medical records for because their information is going to be biased and bias is bad. These are what are called odds ratios. Where it is red it means they are significant. What we are saying there is that if you received the anthrax vaccine then you are 1.4 or 40 per cent more likely to complain of symptoms when we followed you up six or seven years later. Receiving the combination of anthrax and pertussis, which is Whooping

Cough, which was given together, you can see is significantly associated with subsequent ill health. It is not a substantial increase, 40 per cent in terms of epidemiology is not great, in lung cancer the figure would be eight or ten, but it is there and it is significant. It is not sufficient to explain everything we found but it is something that is going on.

13. THE CHAIRMAN: What does CDC stand for? A. That is the Centre for Diseases Control. For this one we were using a definition proposed by the Americans' Centre for Disease Control of Gulf illnesses. It does not really matter. We published that in the *Lancet*. We can take you a little bit further than that because we can say a little bit more. You will know from the testimonies you have been hearing that many people reported that they received lots of vaccines in a short space of time. There is no medical reason why that should be a problem. We do that to medical students all the time. It is completely normal. We looked at it and I have to say that I am surprised by the results because our immunological colleagues told us that this would not happen. We have got a dose response. The number of vaccines received is on the left and it goes from nought to seven. (Indicating) If you look at the next column, you can see those numbers of the associations starting to go up, 0.8, 1, 1.5, in a linear fashion. The more vaccines you received the more likely you were to report ill health later on. We did everything we could to try and explain this away. I can go through all the possible reasons that it is not. Is it just because those who kept their records were more sick or whatever? It is not anything. We could not find a confounder. We can be even more specific because the people who went to Bosnia also got a lot of vaccines because that is completely normal. When the military deploy overseas they give a lot of vaccines. The red line is flat which means there is no association between the numbers of vaccines received and ill health. Bosnia had a similar interaction with the Gulf and that is an extremely sexy and beautiful interaction. I would not expect you to share my joy in it, but it is a thing of beauty because it is telling something very, very important. It is saying there is nothing wrong with multiple vaccines *per se*. It is the very specific unique interaction of multiple vaccines going to the Gulf which we think is probably a proxy for stress. So each of these on their own is okay. It is when they interact together that you have a problem.

14. THE CHAIRMAN: Just explain perhaps by going back to the previous slide what 1.9 is 1.9 of? A. It is an odds ratio. It is the odds of getting ill that is increased by 1.9.

15. THE CHAIRMAN: It is twice as likely. A. Nearly, yes. It is the odds of getting ill. Where the ratio is one it means there is no risk. Where it is less than one it means it is protective. Where it is more than one it means there is an association. I think I have got a slide that makes it clearer. This is suggesting a very specific unusual interaction for the vaccine programme. This data only applies to the UK. It is only the UK that uses anthrax and pertussis. I do not know if you have already heard from Graham Rook or not, but Graham Rook, an immunologist at UCL, put forward a theoretical paper in the *Lancet* to suggest that the British vaccination policy of multiple vaccines with pertussis would cause a particular immunological change, a shift from Th1 to Th2. Now, please do not ask me what that means because I do not really know. A man has got to know his limitations and my limitations are immunology. You would need to talk to an immunologist to tell you what we found. This was the theory. That would indeed also be accelerated in the setting of stress because there would be high cortisol and it would further this shift. The question is: Did we find it? We looked. The answer is we did not. Mark Peakman, our Professor of Immunology, published this in *The Journal of Immunology* last year. We did not confirm that particular theory, but we have found evidence of immune activation. The immune systems of sick Gulf veterans are different from those of well Gulf veterans. There is an immunological change, there is immune activation and it is a Th1 increase, not the Th2 that Rook predicted. I would have to

be the first to say that not everyone agrees with this. The MRC reviewed these studies and did not find them convincing and it would be unfair of me not to tell you that. I think they are good but others do not. Quite definitely it needs replication, everything in science needs replication and one of the ways we are doing this is by a randomised trial of multiple vaccines versus single vaccines in US naval recruits and that will be the definitive test. Until that day all we can say is our evidence is suggestive but it is definitely not definitive. This is not an established finding, this is suggestive, but it needs replication by others.

16. THE CHAIRMAN: I think you will have to explain for me what you mean by saying that you have shown an immune activation. A. This is where I will have to phone a friend to get the answer to that! There are differences in the immune systems of our sick Gulf vets.

17. THE CHAIRMAN: Could you go back to the previous slide for a second? A. I am not sure that will help. Once we had identified the sick and well we then brought them to King's and we did a lot of tests on them, one of them being tests on the immune system. We found that the immune systems of the sick Gulf vets differed from those of the well Gulf vets, not in the way that Rook and Zumla predicted but in a different way, suggesting some on-going activation of the immune system, the memory cells, suggesting that at some time in the past these cells remember something that had happened to them. I am struggling because I am not an immunologist. Norman is closer to it than me. You really should speak to Mark Peakman. What I am saying is that there is a difference here, it is linked to the Gulf, but we do not know what its significance is and the best test will be when we know the results of the randomised trial that we are doing now with the Americans and also when Mark Peakman publishes his work looking at the immunological links between anthrax and pertussis, how they behave together and what that might do. I am afraid, other than saying the results are rather important, I cannot actually say what they are because, much as I respect you, I am even more frightened of the editors of the *Lancet*. I cannot reveal them. Mark would kill me if I did. Overall, this is an ongoing area for research and discussion. It is an area where not everyone agrees. Very respectable people who I respect are not convinced by this.

Where does that leave us? This is what we have shown. We are in the business of symptoms. It is not influenced by how you ask the question, that is a rather technical thing. It was of great interest to us to see whether or not if you talk to people and you do not mention Gulf War Syndrome they still report higher symptoms and the answer is that they do. So it is not reporting bias. We have suggested it is coming from multiple vaccinations. Men and women behave the same, there is no sex bias and no cancer risk. All the UK studies cooperated together and Gary MacFarlane led on that in the BMJ paper. Finally, there is not a particular Gulf War Syndrome.

We can take you further because there is a lot of interest in neurological outcomes. Our study is uniquely able to address this question because when we took the sick and the well Gulf vets in reasonable numbers they were representative of the entire deployment. That is why this is important. The findings we are going to get in this group are going to be representative across the cohort. This is work by Mike Rose and Mo Sharief who are our two senior lectures in neurology. Who do we look at? We do not know what the answer is before we do the study. What we have to look at is if there are going to be a neurological disorder where would we be most likely to find it? We reasoned that we would find it in the group who, first of all, are functioning badly, so those are people with physical dysfunction and, second, report neurological symptoms. In other words, instead of looking through the whole haystack, if it is going to be there it will be in that group. That is the case definition we used. These poor lads

had a terrible time. They had two days of enormous numbers of neurological tests and it is remarkable how they cooperated and even more remarkable that the controls did. We also had, as you can see, 50 control veterans who were completely well who we had to persuade on altruistic grounds to come and be tested for two days as a control for the sick Gulf vets and they did. What I am saying here is that the pattern of results is entirely normal. There are one or two people who have got peripheral nerve problems, but they are very small numbers and they are what you would find in the normal population. This is from neurology. There is no evidence there of peripheral nerve dysfunction or an extremely sensitive sense called single fibre EMG. The only reason you need to know that is because it is very, very sensitive to nerve damage. It is the most sensitive test there is of nerve damage. It does not tell you what is causing it. It tells you if there is nerve damage and you can look at that and you can see all four groups are exactly the same. This really pretty much excludes peripheral nerve damage that can be caused by organophosphates. If pesticide poisoning was an important cause in the cohort you would not have this result.

18. DR JONES: What were the numbers who underwent trials? A. It is 50 Gulf vets, 50 sick. It is the biggest study ever done. It is a very expensive study to do. I do not think anyone is ever going to do a bigger one. The whole study, because we have also got the same controls, is well over 100. Again, that does not mean that somewhere there are some individuals who have got isolated very high exposure to pesticides and who have documented nerve damage as a result. What I am saying is that that cannot explain the overall health effects.

19. THE CHAIRMAN: Could you just go back to the first of your pictures on Stage 2? A. The case definition is of people who have (a) physical dysfunction, so they are not functioning well, they have got problems and (b) those that have possible neuromuscular symptoms.

20. THE CHAIRMAN: What about Stage 1? A. Stage 1 is the epidemiological study where we do everyone and from that we select a random group of sick Gulf, well Gulf, sick Bosnia and sick ERA. These are people who are having health problems and well people. We used bigger numbers for the immunology study. It is the same design. It was just easier to get a blood sample than to get people to do two days of testing. What that is saying is that these tests were normal. We have not found evidence of peripheral nerve dysfunction. So the peripheral nervous system is intact. Let us sum up this bit. There is no evidence of peripheral neurological damage. I have not shown the results of the neuropsychiatric testing because it was pretty much normal. So on tests of attention, concentration, memory, cognition and so on and so forth - this is Tony David doing this, our Professor of Neuropsychiatry - we found subjective complaints but we did not find objective neuropsychiatric dysfunction and that is not compatible with the suggestion that these people have degenerative diseases. For example, if there was early Parkinson's or early Alzheimer's you would not have that finding, it would be very different.

21. THE CHAIRMAN: How did you establish that there was no significant brain damage? A. It is in the papers that Norman has, but there are certain papers on neuropsychological dysfunction and they all had a battery of tests of all the various cognitive functions, such as memory, attention, concentration, reasoning. (Same handed). Yes, here is a list of the various things that they had. I can go through them if you want, but it is attention, neuropsychological testing, trail-making, which is the frontal lobe, memory testing, motor skills.

22. THE CHAIRMAN: Am I right in thinking that that is the point at which there might be this difference of view between yourself and Professor Haley? A. Certainly. I think there are several points where we would disagree, but he would say that yes, there is a disagreement. I think my response to that would be that I take you back to first principles. There is no doubt at all that if you look, you can find some Gulf veterans who have early neurodegenerative diseases, but that is not the point. That is not the point and we know that. We know that they are not immune to Parkinson's. The point is: is that relevant to their Gulf service? You can only address that with a controlled epidemiological study and there is not any other way. Also I know that other groups have not replicated those particular findings.

23. THE CHAIRMAN: But that is the point of difference. A. One point of disagreement certainly. The other thing we found, and I know it has been mentioned, which we published, was looking at one particular enzyme, paraoxanase or PON, as it is called, which is the enzyme which deals with nasty substances, such as nerve gas and pesticides. There has been a suggestion that people who develop Gulf illness have a particular genetic susceptibility, so they do not have enough of this enzyme which would allow them to metabolise sarin nerve gas, for example. We did not find that. We found that there was no evidence of any genetic polymorphism, but we did find that the enzyme level itself was lower, so it is not a genetic effect, but they had lower levels of this enzyme, but it was across the deployment, so it was something about going to the Gulf as opposed to something about being sick and we do not know what that is. We are talking now with the Manchester group, Mike Mackness, about how we can take this further. Again it is an area where there is no consensus and we do not understand what it fully means.

Where are we now? We are suggesting that if you look at these hazards of the Gulf, we have found some evidence for a particular unique vaccinations programme which the British used in 1991 to be associated with ill-health, but it is an interaction. It is a very specific one, it has not been observed before and it is very hard to know how it could have been predicted, to be frank. All protective measures, all protective measures have side-effects and that is not in dispute. The question is not: do these things have side-effects? The question is: what are they and how can we assess them? So we are saying that there were side-effects, but it is very hard to see how they could have been prevented. There is no evidence that smoke from the oil fires - and this is not our studies, but this is lots of other people's studies - had any effect. Depleted uranium, as I have said, the epidemiology and the toxicology is wrong for that. NAPS, well, it is really difficult to study, this is the tablets, you know what they are, we just do not have an assessment of who took them, so it is just a very difficult area to study and we are not really able to look at it in any reasonable way because we do not know who got exposed. Pesticides, as I have suggested, the evidence is that overall there is not any clinical evidence. Chemical weapons, in the UK, as you know, there is no evidence that they were used, so it is not a likely cause.

24. THE CHAIRMAN: What is said, I think, is that you get the same effect from, for example, the blowing up of the Khamisiyah dump. A. Well, I think that is highly disputed. I really do not think that that has any – that is certainly not accepted scientifically. For the British forces to be affected by Khamisiyah, you know, we are not talking about low doses, but we are talking about homeopathic doses even if that event happened as described. The chances of that as responsible for ill-health in the UK Armed Forces, many of whom had already left the Gulf, are very, very slender. I am not saying it is impossible, but I am saying it is improbable and it is definitely not accepted and there is no scientific consensus on that. It is a theory and on my balance of probabilities, I put that pretty low on the list frankly. Likewise, the deliberate use of chemical weapons, I cannot believe that all the various senior

Armed Forces I have met over the years would have missed this, that they would not have known that chemical weapons were used, and the evidence, I think, is ----

25. THE CHAIRMAN: I think the main thrust of the argument the other way is based on Khamisiyah as impossible and also the blowing up of other dumps earlier on during the air strike. A. Well, it is very speculative. There is no evidence from, for example, Gray's studies that people, US people, under whatever Khamisiyah plume we hypothesise, have increased rates of ill-health and there are other studies as well. I really think that among the vast majority of scientists who study this area, that is not accepted.

26. THE CHAIRMAN: I think again that is possibly a point of difference between yourself and Professor Haley. A. Well, it is certainly a point of difference - that I accept. I think it is a point of fact that it is not an area of consensus. Now, the next thing we have to think about is this: is this completely new or has it happened before? Again we are very interested in this and this is a quote from Stephen Straus in *The Lancet* and you can read it later, but if you read it, what Stephen has done is taken a quote and, as you can see, it is very similar, referring to Gulf War Syndrome, talking about the Coalition forces coming back with breathlessness, fatigue, irritability, headache, insomnia, paresthesis, which has many symptoms with a poor prognosis, and then the confusion in the research mind that people did not quite know what was happening and all sorts of different claims, both physical and psychological, including claims of exposure to poison gas or psychological fear of poison gas, and that of course is a quote from the First World War. We know that chemical weapons were not invented in the Gulf and we know that there have been large numbers of young men who have come back from wars with illnesses similar to Gulf War Syndrome.

Myself and Edgar Jones, who is a historian, and this is on Agent Orange, the whole agent orange controversy, he is a historian of agent orange and he is just making a kind of journalistic point really, and this is from a newspaper and this is again a veteran describing his symptoms of fatigue, muscle pain, arthritis, insomnia, his son's problems. The quote is of a man who is a crippled by fatigue, muscle pain, arthritis and insomnia and who believes that his son's asthma and allergies, bronchitis and being a slow learner are linked to his father's agent orange exposure. It is a Vietnam story. If it was not that last bit about agent orange, this could be a Gulf War story, but it is another war, another problem.

What Edgar, who is a historian, and I have done is we have gone back to the UK war pension files going right back to the Crimea and we have extracted the medical notes from the war pension files of people receiving war pensions, going right back to 1855, and we have then removed all the details of period and just looked at their symptoms and tried to see whether there is any pattern to symptoms among the Armed Forces receiving pensions for illnesses, such as shell shock, neurasthenia, effort syndrome(?), disordered action of the heart, latterly Gulf War Syndrome. What you can see is these syndromes have all been seen before, but there has been a gradual shift over the century on the neurasthenic illnesses of the Victorians through the more cardiac and gastrointestinal presentations of the Second World War to our more neuropsychiatric illnesses of modern times, so the point we are making here is that we have seen these kind of illnesses before and that some people come back from war with missing limbs and some people come back with these kinds of syndromes and Gulf War Syndrome is not totally new in the history of medicine. So, summing up this area of research, there have been previous conflict syndromes which overlap with Gulf War Syndrome.

Gulf War veterans groups, and this is looking at social anthropology now because we are a very broad group, we have some social anthropologists who suggest that something has

gone seriously wrong with our veterans community and really there is a group of veterans now we have disconnected from society who are not being adequately cared for and we have other studies we are publishing at the moment confirming the poor reception and how the NHS is no longer configured to deal with veterans' problems. The era when every doctor had done National Service or been in a war is now gone and it is a study we are publishing showing that most veterans report that the health services are not particularly receptive to their needs.

27. THE CHAIRMAN: So what is the point you are making in the second one?
A. Well, actually it is not necessarily relevant, but it is Susie Kilshaw's work with the Gulf veterans groups, saying that there is a group of Gulf veterans who really got very disconnected, have left the Army, have left the military and have become very disconnected from civil society. They do not have jobs, they are not doing well, they have not socially adjusted very well, their health has been affected and they are very isolated. They are not homeless, but they are very cut off from society and they are not getting healthcare. It is a small number and the vast majority of people who have left the Armed Forces even after the Gulf have done very well socially, but this is a group who have not done well at all and really they get missed by the NHS.

28. THE CHAIRMAN: What size group? A. I do not think we are talking about very many. I think we are talking of a couple of hundred maybe or maybe slightly more, but you have to remember not 53,000, but it is a group who have got overlooked, I would argue, because they have not engaged with healthcare services.

29. THE CHAIRMAN: So these are not among the 6,000? We were working on a rough figure of 6,000. A. I think they are, yes. I would think they probably do come from that group as well, but they are the kind of extreme end, as it were, in which they have got a lot of social disadvantage. The glib term these days is "social exclusion" and this is a group who are socially excluded.

30. THE CHAIRMAN: Although we saw the graphs obviously earlier on, you have not mentioned a figure from your study of the total people who either are, or claim to be, suffering from Gulf War illness. A. Well, I can tell you the figure who believe they have Gulf War Syndrome, which was 17 per cent in our study, but that is a difficult thing. That just simply means people where we say, "What's wrong with you?", and they write, "Gulf War Syndrome".

31. THE CHAIRMAN: Seventeen per cent out of this 53,000? A. Yes, so it is a lot, but remember there are a lot of people whose health has been affected, but who do not think they have Gulf War Syndrome and there are some people who say they have got Gulf War Syndrome whose health may not have been affected, so that is just simply telling you that something is going on.

32. THE CHAIRMAN: That 17 per cent actually gives you a figure of more than 6,000. A. Yes, it is, but that is just self-report and that is socially important, but it is not necessarily medically important. Now, what is the excess ill-health in the Gulf group? Nicola Cherry, whom you are hearing from, has calculated it to be, funnily enough I think, around 20 per cent as well, but it may not be the same 20 per cent.

33. THE CHAIRMAN: You call that "excess ill-health"? A. Yes, but the reason why I am a little bit cautious about that figure is because what we are dealing with is a distribution

- sorry, I am making a sign of the normal distribution like we have of blood pressure - in which the whole population have shifted to the right. It is as if the whole population of Gulf veterans have gained a few symptoms. Some have gained a lot, so just to say, "Well, 20 per cent are affected and 8 per cent are not" is missing the point of what is a population shift. Now, Nicola's calculation is as good as any to put a categorical figure on it, but I am just slightly wary about that because I view it more as the population has been affected and many of them in small ways may not know this, it may be imperceptible. It is a difference really in how epidemiologists approach population health.

Now, it is about time we had a bit of psychiatry. Particularly when we talked about the legacy of shell shock and previous syndromes, you might conclude that I am now proposing that this is a psychological problem. Well, let's have a look. One of the things we did was to say that the only to determine psychiatric illness is through a psychiatric interview and that is what we did, so we got a psychiatric interview, and again we have gone back to our 100 Gulf ill, 100 Gulf well, over 100 Bosnia sick and well once again from that population cohort and we are now going to look to see whether they have an excess of psychiatric disorders. Well, the answer is yes, they do and on the bottom line you can see that there has been a doubling in the risk of psychiatric disorder from 12 to 24 per cent, so the relative risk has doubled and that is the same finding as everyone else. The Australians, I happened to notice this morning, have just published a study finding exactly the same. That is significant and it is important, but equally 76 per cent do not have psychiatric disorder and if you look at PTSD, which is the quintessential post-traumatic stress disorder, the rate has gone up by threefold, but only from one to three, so it is not sufficient to account for ill-health in the Gulf group. Therefore, yes, there is an increase in psychiatric disorder without a shadow of doubt, and I am slightly appalled to read one or two people who seem to think that war is not stressful. I think that is just nonsense, and we would predict an increase in psychiatric disorder and it is there, but no, it is not sufficient to account for all of the Gulf health effects, so stress is important, but it is not the solution.

34. THE CHAIRMAN: What sort of psychiatric disorders? A. Well, it is mainly, as you can see, in fact depression and anxiety, not actually post-traumatic stress disorder, so depression, mood disorder and anxiety, so any mood disorders, any anxiety disorders.

35. THE CHAIRMAN: Just give me examples. A. Well, depression, panic disorder, agoraphobia, but depression is the big one.

36. THE CHAIRMAN: Mood change? A. Yes, that is depression. You do not want to get into the ways psychiatrists classify depression because you will be here all night, so just take it from me, that is depression. So psychiatric disorder is important, but it is not the explanation and one particular thing we must not forget is the role of chemical and biological weapons and anxiety caused by them. This is American data published very shortly after the war, reminding us that the biggest anxiety-provoking factor among the military before the actual ground war was fear of chemical weapons, and that is hardly surprising frankly, I would have been scared witless, so the role of stress and anxiety is clearly important and we would think that one of the biggest stress factors, well, we know because it is evident, was concerns over the possible use of chemical weapons. I would just remind you as well, and I have to contradict one of your other witnesses, that psychiatric disorders, anxiety and stress can, and do, cause changes in brain function and chemistry, and they do. That is just a simple fact.

What do we show now? Psychiatry - yes, there is an increase in post-traumatic stress disorder, but the risk is not high overall. It is increased, but not enough. Depression and alcohol are more of a problem. We have shown that there is an increase in subjective neuropsychological problems, but, remember, not brain damage. We have also shown incidentally that the memory of what happened in the Gulf changes. We followed people up and their recollection of what happened to them changed according to their current health, so that is very important, when we are assessing exposures, to remember that memory is plastic and people remember different things according to how well they are. When people get better, they forget things and when they get sicker, they remember more things. Again I am saying that, on the whole, they have done socially well, but some of them have not done well at all and they are not doing well, they have not adequate treatment from the NHS.

37. THE CHAIRMAN: Were the numbers in your test sufficient to meet the increase in PTSD just for one person? A. Yes, it was very small.

38. THE CHAIRMAN: But is that enough? A. No, it is not, but it is enough to say that there is not a massive PTSD problem. To be honest, you would not expect there to be because the Gulf War was not traumatic in the way that the Somme or the bomber campaign or the Pacific War were traumatic. It was stressful because of the anxiety around CBW, but most soldiers did not do, or get exposed to, those kinds of things. We are not talking about the trenches, so you would not actually, if you think about it, expect PTSD. It has become a bit over-diagnosed, to be honest.

39. THE CHAIRMAN: My impression is that that is the exact picture which we were given at the very early stage by the other Dr Jones of whom you may have heard. My memory is, and I have not looked back at his evidence, that he did not think that PTSD was the answer to what he was dealing with. A. He sees a very selective population, remember, so you have to be careful.

40. THE CHAIRMAN: He saw quite a few. A. Yes, but I am sorry to be a bore on this, but there are 53,000 Gulf veterans and without a rate and a representative population, you are in danger of introducing bias. The final perspective I think which you need to address is that there are people around with Gulf War Syndrome who never went anywhere near the Gulf and all they have done is they have shown that the symptoms of Gulf War illness are remarkably similar, indeed identical, to the symptoms of chronic fatigue syndrome, which is where I came in. I see people who have no connection with the military, such as teachers, nurses and doctors who have chronic fatigue syndrome and whose symptoms are exactly the same as Gulf War veterans, so again we cannot look exclusively in the Gulf for the cause of problems and we have to take a broader perspective. Really there are overlaps between Gulf War Syndrome and many of these other illnesses, such as multiple chemical sensitivity, chronic fatigue syndrome, fibromyalgia, (?) syndrome, which have sometimes been called illnesses of modern life, or another paper published a few weeks ago called these “the contested diagnoses”. These are diagnoses about which there was remarkable controversy in medicine and I do not envy you your task of trying to come to a conclusion on the medicine of these because many, many people have completely failed. These are controversial areas about which doctors disagree profoundly, and Gulf War is one of these. It overlaps with these in many, many ways in the symptoms, and again some of the alleged aetiologies, such as pesticides, depleted uranium, pollution and so on have overlaps with the same kind of things that civilian populations are also concerned about, so there are links there.

Just to finish off with what we have done, it is interesting to note that there have been other Gulf War syndromes happen since 1991. The Dutch had problems in Cambodia with their own soldiers who developed illnesses, and I have interviewed them, which were just identical to our Gulf veterans. The Dutch also had problems in Bosnia, and I just love the headline. I am sorry about this, but it is *The Wall Street Journal* and it says, "Dutch Government decides to treat battlefield as a hazardous workplace". That just makes me laugh, I do not know why, but it just does. So the Dutch have had problems and the Canadians have had problems and again the reports of ill-health from Croatia among Canadian peacekeepers are remarkably similar to Gulf vets. On the El Al crash in Amsterdam, papers have been published directly comparing the similarity of that among the population and the same kind of theories, the same conspiracy theories, the same symptoms, the same problems arose there. Balkan Syndrome developed in the year 2000 with an enormous concern across Europe of Balkan War Syndrome with again very similar complaints and so on.

Now, how can we put this into context? Well, the USA have had the same problems that we have. The Canadians have had the same problems, but their CBW prophylaxis was very different. Australia have had the same problems, but much later. The Danes have had the same problems, though they were not actually in the war, but came on peacekeeping and they did not have CBW protection; they did not need it. Finally France, well, up until last week we did not think the French had any problems, but they have just published a report and I speed-read it in French over night and it does look as if they have got some problems after all, which does not surprise me, and it pleases me actually because they have been so smug about it, but it looks like they have had problems as well. They have just literally in the last few days published a report and I have not really had time to look at it.

I have said that you have got to explain something which affected all the coalition forces, affected large numbers of people, it is not a small thing, it affected morbidity, illness, but not mortality, affected all three Armed Forces, including those in the front and the rear, no matter what you did, and not related to combat exposure and yet it did not happen to us in the former Yugoslavia.

I am suggesting that there are only really three things which could fit that picture. What is it that everyone was exposed to regardless of what they did and who they were? Most of them, nearly all of them, had CBW prophylaxis, so that is a possibility. I would suggest that nearly all of them had anxiety about the CW threat and that for all of them war is stressful. Finally, all of them were exposed to media and social pressures on their return. I would suggest that it is a complicated mixture of these three things, probably with others as well, which lead us to the final thing, so, as I have said, we have got social changes, we have got the downsizing of the Armed Forces where some even lost their jobs when they got back, we have got some misinformation, things like that on the social side, we have got the long history of post-conflict syndromes, and then we have got the particular new things about the Gulf, and I think that is probably it. Just to come back to what I said, old, new, borrowed and blue, the old is war syndromes, the new is the new risks from biological warfare vaccines, the borrow is that some of the Gulf complaints resemble those seen in civilians as well, it is not unique, and the blue is that the psychiatry of the Gulf War is probably the psychiatry of depression, not the psychiatry of PTSD.

Finally, I have been talking, but I represent an extremely large and really quite brilliant group of people who have assembled at King's and have been working on this for many years.

41. THE CHAIRMAN: Professor Wessely, thank you very, very much indeed. It has been a fascinating presentation, if I may say so. I am going to ask Dr Jones to start the questioning, but did you mention that an Australian paper had just come out this very day? A. Yes, it is in the current issue of *Psychological Medicine*. The Australians have completed their studies and they have written their reports and there are about a dozen papers which they are publishing.

42. THE CHAIRMAN: These are the summary of that which we know? A. Yes, the report, I believe, is on the Internet, on the Australian veterans' site, I think. I am pretty sure it is.

43. THE CHAIRMAN: Would it be helpful for us to look at that? A. Yes, it would be in the sense that what they are saying is virtually word for word what I have told you now. There really are not any differences in what they found: increase in subjective health; no increase in cancer; no increase in mortality; no Gulf War Syndrome; twice the rate of psychiatric disorder. It is very, very similar.

44. THE CHAIRMAN: I think we had better look at it, but that was obviously done on a separate cohort. A. Yes. They did not send very many, so they were able to look at everybody, so it is a complete cohort.

45. DR JONES: Thank you very much for looking after my evenings' reading of the last few weeks by sending me 43 of your papers! A. I would not like you to get bored, Norman!

46. DR JONES: Now is my chance to get my own back! A. To some extent I would like to start backwards simply because your more recent slides are more fresh in our memories. This morning and in some of your papers you have queried the question of exposure to nerve gas. Have you yet had a chance to see the general accounting officers' findings on the Khamisayah plume in which they disagree with the Department of Defense and have come up with rather a nice explanation of why, depending on whether you were from the Lawrence Livermore National Lab Group or the DoD, you came up with totally different directions, and they explained that rather nicely, but really coming up with the conclusion that they think, it is their considered view, that it is virtually impossible now to exclude exposure of large numbers of the Gulf War forces and they doubt if it ever will be possible to prove one way or the other. A. Well, I think that is probably right. It is impossible to refute or confirm. It remains the position of most researchers that low-dose exposure is unlikely to have affected very many people and if it did, it would have been such low doses, such incredibly low doses, it is hard to see how that could have caused problems. You have got to remember that the purpose of nerve gases is that they are really horrible things. They kill people. They are a weapon of war. They are not a weapon designed to make people sick years later and no one at the time reported any symptoms or signs which would indicate the use, accidental or otherwise, of nerve gas. If they had, the picture would be different and it is just a general commonsense view to say that the doses were that low even at the time that it is hard to see how they could have an effect. People whom I respect who deal with the toxicology of chemical weapons, none of them find this at all convincing. You are right, strange things can happen in heaven and earth, but it is not likely.

47. DR JONES: On a point of detail, in one of your more recent slides, one of the ones dealing with your neurological investigations, if I remember it rightly, on the left-hand side you had symptoms suggesting in one group autonomic nervous dysfunction and on the right-hand side you just had a reference to heart rate. What aspect of heart rate? A. I cannot remember. We did tests of autonomic function which were normal.

48. DR JONES: I ask it because Professor Haley told us that he had a paper coming out in this month's American *Journal on Motor Neurone Medicine* using sleep reaction to heart rate. On the subject of the nervous system, I think you did put a question mark in one or two of your slides that the American experience, of which we have heard and been told about, suggests that the rate of motor neurone disease in American veterans anyway is now between two and three times the expected and climbing by the year. A. I know that and I was present at the press conference in the year 2000 when that paper was first described. It was not published for some years after. I think the problem there is that I am not convinced by that and the reason I am not convinced is, as I said, tragically motor neurone disease is fatal and the one unbiased source of information is death certificates. If there was a two or threefold increase in ALS, you would see it in mortality and Hang Kang sits in the VA and people here sit and monitor mortality of gulf veterans and you would see a change. If it was not a fatal disease, you might miss it, but it is and it has not been seen. If you look at that paper, you will see that what has happened is what we call "an over-ascertainment bias". They took the Gulf veterans and they looked very, very hard for evidence of ALS. Fair enough, they had websites, they had newspaper articles, et cetera, so they got very good ascertainment, but the real problem is the controls because they have got 250,000 controls and the controls do not know they are controls, so all you have got then is registries really and case notes and things like that, so they did not look equally hard in the two groups. The numbers are very small because, thank God, ALS anyway is incredibly rare, which is a relief because it is the most hideous thing I have ever seen, and it does not take very many - what you have probably got is early cases, diagnosed earlier on in the Gulf group in the controls, but the definitive test is, I am afraid, mortality. Unless and until mortality changes, I remain unconvinced that there is an ALS problem. Maybe, but the other thing to remember is that ALS cannot possibly explain what is going on because the one thing we know is that the vast majority of Gulf veterans do not have it. It is easy to diagnose and they do not have it.

49. DR JONES: With reference to your group's failure to find evidence of peripheral nervous system abnormality, as you know, Jamal (?) some years ago did find such evidence. Any comments? A. No. It is not just us, but Amato's (?) is a big paper on neurology as well and the Americans got the same results. I am really labouring a point here, but you can find, if you look, Gulf veterans with neurological, neuromuscular, neuropathic problems, of course you can, but that is not the issue. The issue has to be whether there are more, not whether there are some, but whether there are more than there should be.

50. DR JONES: The first paper I read, I am not sure if I am allowed to refer to it because I think it is still in press in the Annals Of Internal Medicine. A. It is actually out.

51. DR JONES: You refer there to a paper with which I am not familiar by Donta(?) which seems to rule out the mycoplasma. A. Yes.

52. DR JONES: That is in the same issue. A. It is in the same issue. It was published a couple of weeks ago. That is an enormous randomised control trial of doxycycline for

mycoplasma and there is no relationship between serology and illness and in my editorial, I think everyone would agree, mycoplasma is not the cause of Gulf War illness.

53. DR JONES: When we had Professor Haley here, I asked him if at least some of the apparent differences in findings between your group and his group could be explained on the basis of the epidemiological methodology. He rather favoured that view. Do you have any comments? A. Yes, I am sure that is right. Our studies are epidemiologically population-based, so yes, of course that is the case, and probably not in the way that he means it, but our studies are representative of the UK population just in the same way that the Portland group, the San Diego group, the Iowa group, all those other groups are doing studies representative of the US population and, with respect to Dr Haley, I just say that his studies are not representative of anything other than that battalion of the See Bees that he studied, the reserve battalion, whatever it is, and you cannot extrapolate from 22 people, from that battalion given brain scans, to three-quarters of a million US Armed Forces.

54. DR JONES: On the subject of brain scans, I have heard it alleged, although I have not yet checked the published and written evidence, that rather similar findings to the findings we heard about from Haley can be found in people who have used recreational drugs. A. I do not know. You would have to ask Tony David that. I am not a neuro-imager. Certainly it is true that all the classic psychiatric disorders cause changes on functional imaging and most of my institution is dedicated towards doing brain scans on various conditions. We have not done neuro-imaging on Gulf War veterans because we did not get funding for it, but we would very much like to and we are arguably one of the UK's leading neuro-imaging centres, but we have not had funding for that, so we have not been able to do it.

55. DR JONES: Just to confirm, you have published a study pretty well excluding anti-nuclear auto-immunity as a problem here. A. Yes.

56. DR JONES: Again I think you did answer this, but I would like it just highlighted, so to speak. Yes, you found a reduction in the paraoxanase activity overall, but no correlation with ill-health? A. No, it did not correlate with symptomatology and frankly I do not know what that means. It is something which has to be followed up, but I do not know.

57. DR JONES: It does seem to be a Gulf-exposure phenomenon. A. Yes, indeed.

58. DR JONES: The implication of what you were saying is that you rather suspect it is post-(?) rather than pre-(?)? A. It could be. To be honest with you, I do not know. It is an intriguing finding, but as with much of science, there are all these areas where we do things and we do not really know quite what it means and years later perhaps we find out.

59. DR JONES: I think I know the answer to my next question, but I think it might be helpful to have it spelled out. Somewhere amongst your papers, you alleged that those veterans who have attended the medical assessment programme are not really representative of the overall mass, as it were. A. Yes, that is right. These are the people who voluntarily come forward because they feel they have a problem and they want a medical assessment, so they are going to be the sicker people and indeed that is what we show. They are going to be the more ill ones with more health concerns, more health problems and that is indeed what you would expect and that is the purpose of that. Those studies are, therefore, not epidemiological, but they are important because what they do exclude is something kind of big going on. You know, if there was a cancer epidemic or a thyroid epidemic or something, those studies would pick that up.

60. DR JONES: The paper I passed to you on cognitive functioning and so on and so forth earlier, somewhere in it you did find that reduced constructional ability could be the effect of Gulf-specific exposures. I am afraid I do not understand that. A. Well, it was an isolated finding of, I think it is, an apraxia. I am not sure if other groups have replicated that or not, to be honest. Actually off the top of my head, I cannot remember, but if you do a lot of tests you do sometimes find abnormalities in one and unless and until someone else has replicated it, it would be a mistake to put too much on one finding. I am afraid I cannot remember. Tony would know, but I cannot remember. There have been quite a few other studies since then.

61. DR JONES: That is very helpful. Lastly, if you were Lord of the Rings, as it were, where would you now put money into future research? A. Apart from giving it to us, you mean! I think it is going to be, now that 13 or 14 years have passed, unlikely that we are going to find new aetiological stuff relating to 1991. I would like to see more done on social outcomes, on improving functioning, on access to services, I think, so health services research is, I think, very important. I would like to see a few loose ends tied up, such as neuro-imaging, but most of all I think next time round to be able to do prospective studies to pick up these health problems from the start and then to unravel some of the complexities which I have described which are not really unravelable now and we cannot sort out cause and effect. Then the most important thing, I think, now is to make sure next time that we are much better placed to use research to actually eliminate these health problems.

62. SIR MICHAEL DAVIES: I was going to ask a question similar to Dr Jones's final question because we were told by Dr Melling a week or two ago that there would be a law of diminishing returns over any further research. I was wondering what further research into these problems, and you clearly have found that there is a difference in the health problems of Gulf veterans, what that was likely to throw up, but I think you have probably answered it. A. Yes. Well, just to give you an example of what I mean by further research, we have highlighted what may be a problem with the way vaccines were used and the best way of addressing that is not in the Gulf group now, but it is to do with doing a study in US naval recruits which is a randomised trial of multiple vaccines against single vaccines, so that is addressing a Gulf problem. The question arose from the Gulf, but the Gulf veterans are not a good group in which you can solve that problem, so of course we should continue research on the issues which this has thrown up. However, it may be that with Gulf veterans there is a law of diminishing returns on what we can learn directly from them.

63. SIR MICHAEL DAVIES: Are you looking yet at those who have returned from the Second Gulf War? A. Yes. We are not supposed to call it the "Second Gulf War", are we, but yes, we are indeed. We have a study in the field now of 20,000 doing what we did last time, but I think better, more focused, looking at the issues which the First Gulf War threw up and at a much earlier issue and obviously medical countermeasures are very high on that list. I hope this time that we will have adequate records of exposures to immunisations, for example, which will help us which were not there the first time round.

64. SIR MICHAEL DAVIES: Perhaps this is not a fair question for a doctor to answer, but what do you think should now happen about those who are still complaining about their illnesses, apart from the fact that the National Health Service or specialists in the field should be more interested in their condition and perhaps more expert in those conditions? A. I do not think that is a fair question for me to address. That is a policy question. All I can do is say that our research has thrown up the problem which veterans have in assessing what you might call "veteran-friendly services". I think I have given the answer.

65. THE CHAIRMAN: You say that you thought that the best explanation for what you have done were, I think, three things: firstly, the medical countermeasures; secondly, the stress related to fear of chemical warfare; and, thirdly, the social and cultural pressures. A. Yes.

66. THE CHAIRMAN: I am not quite sure that I understand the third. A. Well, just to give one example, I have interviewed a lot of veterans who came back from the Gulf and promptly left under Options for Change, and one of the recommendations we made about this war was that, as far as possible, we do not discharge people as soon as they return from a high-intensity active-duty conflict, that, as in good social management, people need time to readjust, they need time to talk about these things with their mates, go drinking together and do all the kind of rituals that soldiers do on their return from war. It has been my impression that quite a lot of the sick veterans I have interviewed were kicked out, to put it crudely, almost as soon as they came back. Now, that is a social intervention and I do not think it is a very good one.

Then we have the role of misinformation. There were clearly things said about Gulf veterans' illnesses which in both America and Britain, in retrospect, were ill-advised and have led to a kind of loss of trust. There is an enormous loss of trust in the military and political authorities on both sides of the Atlantic. Another thing that I mean is that during the First Gulf War, for example, the countermeasures were given codenames, completely unnecessary, but I have interviewed one veteran who told me that he had, for example, the HIV vaccine. Now, that does not exist, but he gave the codename and obviously if you code something, then that is secret and all sorts of kind of strange things happen. This time round people were told what they got, no one was fooled, so it is in terms of communication and information where I think we can make big changes. I think where people get misinformation, then you do and you also get some very weird conspiracy views happening which I do not think are true, but have not helped, so again in the provision of timely, accurate information, it can actually be an intervention in itself.

67. THE CHAIRMAN: And you bring all that under that third head. A. Yes. It is not a medical problem, it is a socio-political issue really.

68. THE CHAIRMAN: We know that a number of people received the multiple vaccines but did not in fact deploy to the Gulf. Do we have any figures which suggest that they have not …? A. That is a very good question. In theory, that would be an absolutely ideal group to study and we did try to study them and, in our study, we had a lot of people who reported the receipt of biological vaccines who we knew were not deployed, but we then made big efforts to chase those people up and what we found in a number of them was the mistakes, that they did not actually have biological vaccines illness, that vaccines had not been issued to that unit and it was not plausible. We found very small numbers of people who had genuinely had the vaccines and had not gone to the Gulf, too small to analyse. So, again, there were a number of people who thought they had them but actually, when you found the records, almost certainly had not. They had had typhoid, for example, or something like that. So, what on the surface would have been a perfect group to study, we just could not. We published a little paper on that in J-Epi a few months ago, really reporting the fact that we could not identify that group, we could not confirm that group.

69. THE CHAIRMAN: That is a very interesting answer. Lastly, to go back to the questions which have been asked by both my colleagues, when the Government have been pressed, as they have been for the last seven years now, to institute a public inquiry into Gulf

War illnesses, they have said always that they would not do so, that they would not rule it out but that there was still research going on, and that has been the main reason for not instituting a public inquiry such as we are now holding. Do I understand from what you actually said in a letter to Dr Jones and also what you said in answer to our questions this morning that really the chances of finding out anything really significant as to aetiology now – of course, the research goes on – is not a reason for not doing something that can be done? A. It is not for me to comment on whether there should be a public inquiry or not.

70. THE CHAIRMAN: This is a public inquiry. A. I mean an official Government inquiry – and there is one thing that I would like to ask in a second – but our view has always been that we are independent scientists and will cooperate with any reasonable people. Just to emphasise, I am not saying that there should not be research in these areas, I am just saying that the opportunities of studying Gulf War veterans is the diminishing returns. With regard to the question of medical countermeasures, we still do not have that right and we are still getting problems with confidence with the anthrax vaccine now, definitely. We do not have that right but studying Gulf War veterans may not be how we are going to get that right. We are having to study new recruits and animal studies, for example, which we do not do but which others do. So, please do not misinterpret that I am saying that we should not do research into the Gulf War but the target may not be Gulf veterans.

Can I just asking something? I am sure you are not going to answer this but I would at least like to record that I have asked it. In my world, as you know from all my papers, I describe the source of my funding and it is considered very poor and I am not allowed to publish if I do not, and I have to say that I am not comfortable with the fact that I do not know the source of who is funding this inquiry. I do not expect you to answer that but I would like it to be on record that I am not comfortable with that.

71. THE CHAIRMAN: I am sorry, I did not quite follow you. A. I am not comfortable with the fact that I do not know who is funding/paying for the costs of this inquiry. I am not comfortable with that and I think that, in this age of transparency, I would like to record that I am unhappy.

72. THE CHAIRMAN: I entirely understand that but, as I think I explained in my opening statement, it is being funded by a charitable organisation which wishes to remain anonymous and we must respect that. A. I have recorded my views.

73. THE CHAIRMAN: Your point has been noted. Thank you very much, Professor Wessely. Would you leave open the Australian paper. A. I am sure it is on the Australian VA website.

DR JONES: Perhaps we could come to you for help if we fail to identify the evidence.

The Witness Withdrew

THE CHAIRMAN: We will continue with the Rt Hon Mr Mates, MP.

MR MICHAEL MATES, Called

74. THE CHAIRMAN: First, may I thank you very much indeed for coming this morning. I do not know whether you managed to hear any of the evidence given by Professor Wessely which was of great interest. A. No.

75. THE CHAIRMAN: Could you begin by giving your name and address, though I am sure it is known, to the shorthand writer. A. Michael Mates, House of Commons. I am an honorary parliamentary adviser to the Royal British Legion and it is in that capacity that I have sat for the last three or four years, maybe even longer, on the Gulf War Illnesses Committee, not in any way as an expert, entirely as a lay person. I imagine that is why you have asked me here and I will do what I can to help you.

76. THE CHAIRMAN: When did you first become involved? A. When that committee was set up and I am ashamed to say that I cannot quite remember when that was.

77. DR JONES: I think it was the mid '90s, roughly 1995/96. A. Well, it was later than that. It was after the '97 Election because that is when I first became involved with the Royal British Legion, so probably 1998.

78. THE CHAIRMAN: I should have introduced us. You have already met Dr Jones and Sir Michael Davies you probably already know. A. For a very long time.

79. THE CHAIRMAN: We are very anxious that you should tell us anything you would like about what should be the approach of the Government to the Gulf War veteran problem because that there is a problem has been made, I think, abundantly clear by the last witness who referred to the rate of illness being twice as high as he would have expected it to be.
A. There is no question at all that there is a problem and I do not think that anybody denies that. I think the Government's problem, and I do not just mean a Labour Government because it was the same problem that a Conservative Government faced earlier … Happily, this has been almost entirely free of party politics, it is all much the better for it. It is not, however, free from the juggernaut of the Government machine, if I can put it that way. I, as I say, have sat on this thing for six or seven years and heard a lot of experts talk about it and it reminds me of many problems that have faced governments before. They know something is wrong, they are not quite sure what – and I think that is a genuine problem here because nothing has been identified; if anything had been physically identified, if I can put it that way, then I think that consequences would follow – and it is still, as far as those who are responsible for the running of government are concerned, a mystery. It reminds me of so many other things where we all know that something went wrong but what do we do about it? The constant fear governments have, which I do not share, is of setting a precedent and one of the difficulties government have had over this, as they have over many issues and I will mention one or two, is, "We cannot do that, it will set a precedent for other things and it will open the floodgates." You are a lawyer, sir, and I am not. It may well be prayed in aid by future advocates. Nevertheless, I very strongly feel that there comes a time when it is quite clear that something has gone wrong through no fault of the individual, no one is quite sure what it is but something needs to be done about it.

I think the most apposite example, though not exact, that I could pray in aid is something I was very much involved with, the haemophiliacs who were given tainted blood. It was no one's fault really because no one had the knowledge at the time and the blood that everyone thought was safe had not been heated enough. I became involved because of a school for haemophiliacs in my constituency and the President of the Haemophilia Society is a constituent of mine. So, I looked into this for some years and struggled with governments for some years and, in the end, they said, "Okay, we had better settle this. It was not the individuals' fault that they received bad blood" and this is what they have done now. It is not an exact analogy but it is not the fault of the soldiers, sailors and airmen that they are now suffering from a mysterious illness, if one can call it that – one shies away from the word

"syndrome", I think – through no fault of theirs through either having been inoculated or not having been inoculated and that is part of the mystery. A friend of mine who was a sailor is now very, very ill indeed. He never went ashore; he stayed on board his ship. He had a glittering career in front of him and now that has gone. It is a mystery. He had no injections and never went anywhere near organophosphates or anything else but something happened.

80. THE CHAIRMAN: That does sound a complete mystery. A. Yes and there are many of them. I think the time is passed actually – and I was urging my own Government to do it – where they have to say, "Look, something has gone wrong and those who have genuinely suffered must be compensated" and I think that the Government can do this by making clear that it is a – I do not know what the legal phrase is – without prejudice payment or whatever, so that it is not necessarily setting a precedent but it is an act of goodwill which a government is performing for those who went and put themselves in harm's way, although it was their profession, and who have suffered as a consequence. It was a very long time before this happened, for example, in Northern Ireland. It was five, six or seven years, I believe, before the Government came to terms with the fact that people were getting killed and maimed there and it was not just the same as being involved in a traffic accident in England or in Germany. For a long time, those who were serving in Northern Ireland were worse off than those who were serving overseas because of the legal definition of active service which does not apply in the United Kingdom. Eventually, as a result of pressure, the Government moved. The Government will move on this when enough pressure is exerted. That is one of the laws of politics – lean hard enough at the appropriate time and something will be done. Who knows, this may be an appropriate time with an election not a million miles away for you to lean very hard indeed and finally topple them over.

I do understand why governments are reluctant to move partly. They are the guardians of the taxpayers' money and they need to be careful and they need to stay within the law. All of this I understand, it is all part of the machine with which I have been dealing for 30 years, but what this actually needs now is a political act of will. A minister has to say, "This will be done" and then it is done. That is our system. We have appealed to certainly successive ministers of defence, as I say, of both parties and we have appealed to both prime ministers and one of them one day has to say, "Okay, enough is enough, let's do it." Another bad analogy was the war widows when the Government strung it out for 20 years knowing that there was a category of war widows who were suffering discrimination because they fell the wrong side of a certain date. The cynic would say that when there were few enough left for it not to be a serious financial problem, the Government moved. They actually moved because I threatened to introduce a Private Member's Bill and they moved within a month. It is pressure which causes politicians to act. As I say, I hope that the pressure you are going to bring will cause them to do just that, but I do not believe now that it is question of solving the problem.

81. THE CHAIRMAN: That is extremely helpful, if I may say so. You say that it should be settled now but should perhaps have been settled a little earlier by some form of compensation. Have you thought at all about how the compensation would work? How familiar are you with the system of war pensions? How could it be done? A. I am relatively familiar but this is a major problem because of the different degrees of suffering that there have been and the only way you do that is you hire somebody, an independent adjudicator, to say that this is what shall happen. My best man, all those years ago, was for a long time deciding what compensation should be paid to prisoners for how long they had been in jail when their convictions were ultimately quashed, and others. There are people, legally trained people, who can, with an independent view, take a look and come to a conclusion. It

is going to be for the judgment of Solomon, it is not easy, and of course it will immediately spawn a whole lot of people saying, "He got that and I only got this and I am just as badly off as he or she is." These are problems that are much happier, I believe, to cope with than the problem of not acknowledging that these people need compensating. I would not know how to set about it but I would not think it is insuperable.

82. THE CHAIRMAN: I think it is difficult because one of the feelings one has is that the veterans are, in a sense, fed up with the whole process now after however many years of trying to get acknowledgement of their illnesses. A. I am not surprised.

83. THE CHAIRMAN: Do you think that some kind of across-the-board compensation could be paid to all those who have claimed up to now which could possibly lead to 6,000 claims? A. I do not think I am qualified to answer that partly because the variety of disability is so enormous. Some people are mildly affected. I was reading a paper this morning – I have not been at my desk for a week – there is a sample survey which has just been done of infertility rates. How do you judge that against somebody who cannot work and would it have happened anyway? There are all these myriad differences. I think that a flat rate for all is too unsubtle a tool.

84. THE CHAIRMAN: Do you simply just add 50 per cent, as it were, to whatever disability they are currently assessed at? A. I think you have to have a person or a small panel to go through it all. It is not that Herculean a task – there cannot be that many – and make a judgment.

85. THE CHAIRMAN: There are 6,000. A. So, there are 6,000. That is perfectly able to be coped with. You can if you like divide them into groups: those who are still working, those not able to work, those who have suffered in other ways. You can start at a base there and then make a judgment. I think if you simply were to say, "Give everyone £10,000", (a) that would not be particularly fair and (b) I do not think that it would satisfy everybody. I think you would probably create as many problems as you solved. That is just a personal view. I am just trying to look at what the man in the street, which I count myself as in this case, would think is fair.

86. THE CHAIRMAN: But something should be done. A. I have no doubt about that and I have been saying so privately and publicly with as much vigour as I can muster for some years.

87. THE CHAIRMAN: We had some very interesting evidence from the Americans at the beginning of last week. They told us that they detect a change, a fairly recent change, to the attitude of the American Government to these problems. Originally, there was exactly the same sort of resistance as they imagine may have been the position here but, quite recently, they have detected a change in their favour. Whether that has anything to do with the approaching American election I do not know. A. The cynic in me would not express surprise at that. Of course, the veterans' lobby in America is far more powerful than it is here.

88. THE CHAIRMAN: There are more of them. A. (a) there are more of them, (b) they are more organised and (c) they have their own department. I am not advocating it for this country because I think it would be wrong but I am very glad that we have a minister because we have the Ministry of Defence who has responsibility for this and I am sure that they will do their best.

89. THE CHAIRMAN: But now you think might be a good moment for some sign of change. A. I think now is the right moment to say, "Let's draw a line under this and solve it."

90. DR JONES: Apart from the compensation issue, is it your impression that the sick veterans are seeking anything else? A. I think they are seeking acknowledgement first that what they have suffered they have suffered because they went to war for this country. That, I think, is a very, very severe running sore. No one has yet acknowledged that the sole cause of their various disabilities has to be the fact that they went to the Gulf because of all the comparisons. I do not know of any other compensation because the one thing they have not lacked is proper care. That has been exemplary and the Ministry of Defence should be praised for this because they have bent over backwards to make sure that everyone who was suffering whatever it was as a result of the first Gulf War was given all the care that they needed, so I do not think that is a difficulty. I cannot think of anything else unless you want to prompt me into something else.

91. DR JONES: No, that is very helpful. A. I think it is the acknowledgement and that is what I think rankles, if I may say so, with the families of those people.

THE CHAIRMAN: You echo very much what was said by General Sir Peter de la Billier* who said memorably I think right at the end of his evidence when he was asked a similar sort of question … He thought for quite a long time and he said the one thing, just the simply word "clarity" for the families. That is what he thought was important, clarification.

92. SIR MICHAEL DAVIES: I have a question but I also want to respond to what you have just said to Dr Jones about the Ministry of Defence providing exemplary care for the veterans. Professor Wessely, whom we saw only a few minutes ago, actually said that he did not think that the care they had had from the National Health Service and the medical services in this country had been very good and indeed that was one area where he would think that greater expenditure should be put. A. I am sorry to hear that. I suppose we are now talking about people who have left and retired and gone out of the care of the MoD.

93. SIR MICHAEL DAVIES: Indeed and many of them have of course. A. I suppose they are suffering from the failures of the National Health Service in the same way everybody else is.

94. SIR MICHAEL DAVIES: Perhaps they are suffering from the lack of real knowledge about the cause of this. A. Everyone is suffering from the lack of knowledge about the cause of this. That is one of the difficulties that is afflicting even the most erudite experts because part of it is a mystery.

95. SIR MICHAEL DAVIES: Your friend who went to the Gulf and served on board a ship that never went to shore and did not have the vaccinations; could there not be a normal health explanation for his illness and how would it be assessed that he had suffered from the effects of serving in the Persian Gulf? It could be that whatever he is suffering from now was something he would have suffered from in civilian life. A. Well, once again, I am not an expert and it may be that Dr Jones has an opinion on this, but I think it is pretty rare that somebody is struck down to the extent that they can no longer work without anybody having the first idea what it is. Normally, these things are identifiable, I would go so far as to say almost always. "Sorry, chum, you have MND and there is nothing I can do about it." At least they know what it is, but they do not know what has afflicted this person. So, you come to the

conclusion that he went there fit and well and healthy and strong at 40-something and he has come back and he is now incapable of doing anything.

96. SIR MICHAEL DAVIES: Has he been before the medical assessment panel? A. I am sure that he has. He is not a close friend, he is just somebody I knew of. In fact, I went on board his ship myself when I was out there because I was Chairman of the Defence Committee at the time. He had a brilliant future in front of him.

97. SIR MICHAEL DAVIES: My final question is about compensation. Ross Paroe* whom we had before us last week said that many veterans would actually baulk at the idea of compensation and what they wanted were their rights basically, which was that they fought for not King and Country but President and Country in his case and that they should get what they would get if they had lost a limb, for instance, a full war pension. Is that not what they are after? It is not the idea of a gratuity, an ad hoc payment, it is perhaps a full war pension. A. Again, you are outside my area of expertise but those who have retired with a disability presumably are being paid disability pensions. They are being paid what you and I would call pensions.

98. SIR MICHAEL DAVIES: Yes but they are not getting 100 per cent war pensions. A. That is again the judgment of Solomon. Someone has decided that it is 50 per cent, 60 per cent, 30 per cent or whatever it is. That is the system with which everyone has had to live. When I say that they should be compensated, I am assuming that this is a compensation payable for a mystery which has come upon them because of their service without any prejudice whatever to what they may be entitled to in terms of disability benefits, retirement pension or anything else. It is a vastly complicated matter and if someone were to be appointed to judge all this, of course they would have to take into account the whole package. If someone is on a 100 per cent disability pension, if they have had all their needs catered for and looked after, then the case for compensating them is different from somebody who just fell the wrong side of every single line but whose life has nevertheless been very badly affected. This is why I say that I do not think you can do it by a flat rate, I think you have to find someone who is going to sit in judgment on this and it would be an extremely difficult and intricate task, but that is the fair way, as I see it, of sorting out the problem.

99. THE CHAIRMAN: And something worth doing. A. Absolutely.

100. THE CHAIRMAN: Is there anything else that you would like to tell us? A. I do not think so.

101. THE CHAIRMAN: How quickly did your friend suffer after his return from the Gulf? Did it come on straightaway? A. I think it happened within a year. I am not too sure. As I say, he is not specifically a friend, he is someone I know and knew and then heard about his suffering. I am by no means trying to cite this as a concrete example, it was just an example. I know others who had the whole cocktail and had no ill effects whatsoever. This is what is so strange. Those who were in where you would have thought the thick of the organophosphates and the burning oil were those who came out completely unscathed. It is a mystery.

102. THE CHAIRMAN: We have many references in the papers which have been provided for us by the Ministry of Defence to the reports from time to time made by the House of Commons Select Committee on Defence. How many of those were there

altogether? A. I do not know because, shortly after that, I left the Defence Committee after however many years it was.

103. THE CHAIRMAN: There are one or two which would obviously be of great importance to us which we must get hold of. A. I think you should. I know that Bruce George's Committee did look at this and produce a report on it.

104. THE CHAIRMAN: There are at least three. A. The Committee in my time did not because I left in 1992 when I was appointed to Northern Ireland, so I have not been involved in that ever since.

105. THE CHAIRMAN: What we have are the papers before the Defence Committee by the Ministry of Defence and then answers to the particular reports but we will obviously have to get hold of those. A. Everybody who has looked at it has tried to come up with some sort of clue but, as Dr Jones knows, all the leading experts know something is wrong and, if something is wrong, I believe it is down to the Government to put it right.

THE CHAIRMAN: Mr Mates, we are very grateful to you for coming. Thank you very much.

The Witness Withdrew

PROFESSOR NICOLA CHERRY, Called

106. THE CHAIRMAN: We are very grateful to you for coming to see us today because you are based in Canada now. A. Yes.

107. THE CHAIRMAN: And you just happened to be here. I hope you have not come all the way just to give evidence. A. I clearly would have done but I happened to be here.

108. THE CHAIRMAN: We are very, very glad to see you. We have before us a number of the papers of which you have been the co-author. How would you like to deal with your evidence? First of all, I think you should give your name and address for the purposes of the shorthand note and then perhaps just give us a brief account of your qualifications. A. My name is Nicola Cherry and I am the Chair of the Department of Public Health Sciences at the University of Alberta in Canada.

109. THE CHAIRMAN: Perhaps you could tell us how you first became involved in the question of Gulf War illnesses. A. I am a physician and an epidemiologist and I have spent most of my working life looking at occupational environmental exposures to chemicals that affect the nervous system and the reproductive system. In my previous job, I was Chair of the Department of School and the (?) Health Sciences at the University of Manchester and Director of the Centre for Occupation Environmental Health and, when the Medical Research Council put out a call for proposals to look at the problems in Gulf War veterans, it seemed an obvious thing for us and we put in a proposal, along with I think about 30 other proposals but ours in fact was chosen, to look in a two-stage project, first of all at how the Gulf War veterans perceived their health problems compared with the other military personal who did not go to the Gulf and, secondly, to carry out objective investigations into their health. The second was originally approved but, in the end, the MRC and Ministry of Defence felt it was not sensible to do. So, in fact we only had evidence from the self reports of the veterans and

also we did the first stage of the follow up of mortality of veterans, though that has since been done by the MoD themselves.

110. THE CHAIRMAN: I think you said that you were one of three groups who were investigating: there was your group, the Manchester group, there was Professor Wessely's group, the King's group, and there was Dr Doyle. A. That is right. The MRC selected the Manchester group and Dr Doyle's group from London because the King's group was already being funded by the US fund defence.

111. THE CHAIRMAN: Professor Wessely was giving evidence this morning, as you have probably gathered. Can you carry on with what you would like to say. A. Unfortunately, I do not have a presentation as such but perhaps I could tell you the main outline of what happened. I will just deal quickly with the mortality study because that was of all UK Gulf War veterans and a comparable size of people who were eligible to go to the Gulf but did not, so there was military personnel, and, in that first follow up which we published in *The Lancet* in 2000, there was no overall difference in death rates but, as with the US and now the Canadian studies, there was an excess of accidental deaths and less death from disease though, as time goes on, that gap is narrowing and to some extent it was due to the fact that people who went to the Gulf were initially fitter than people who did not go. So, that was the overall finding from the mortality study.

From the morbidity studies, we went to nearly 10,000 people who had been to the Gulf and some 5,000 who did not go and we asked them about their health. We were particularly looking to see whether there was some unusual new syndrome, so we were interested in asking questions about all aspects of their health rather than having preconceived ideas about what it might look like. So, we developed a system of questions about 95 different symptoms and indeed those who had been to the Gulf either were substantially or slightly worse on all 95 of those questioned symptoms. We then did some statistical work with the answers to those questions but we could not find any specific syndrome that was distinct before the Gulf and we found that both the health of the people who had been to the Gulf and who had not been to the Gulf could be clustered into six different sort of constellations of health going from well on all dimensions to not doing very well on anything and we found an excess of people who had been to the Gulf in the people who were not doing very well. So, that excess was about 14 per cent which would suggest that of those veterans who went from the UK, about 7,500 were unwell because of their deployment. So, the excess, the attributable risk for going to the Gulf, came up with an estimate of about 7,500.

112. THE CHAIRMAN: Is that excess morbidity? A. Yes, people who were less well than they would have been.

113. THE CHAIRMAN: I am not sure that I am quite following the six clusters. Maybe you are going to come back to this later. A. No, this is as good a time as any. The problem is that, if you have 95 different symptoms and they are worse on all of them, that does not give you much feeling about whether it is one person who is complaining of one thing and one of another or whether it is a group of people who are worse on everything with some people who are still well on everything. One way that we chose to look at that, both in the people who had been to the Gulf and those who had not, looking at them independently, was to look at how those symptoms fell together. So, some people, you and me perhaps, would say, "We are well on everything" and some would say, "We are poorly on everything" and we could see how many well people who went to the Gulf fell into the group that were well and how many people fell into the group that were less well and that is in effect what we

did to come up with this idea that, although I think it was 10 per cent who did not go to the Gulf were not well, 24 of those who did go to the Gulf were not well, so that gives the excess of 14 per cent which, when we go back and do the numbers, comes out as about 7,500.

114. THE CHAIRMAN: This is all set out in which of your papers because I think I was just reading this particular paper this morning? A. It is in this one, which is Part 1, the pattern and extent of ill health.

115. THE CHAIRMAN: There is Part 1 and Part 2. A. That is right.

116. THE CHAIRMAN: I just read those two this morning. A. That is Part 1 and I have tried very quickly to summarise what we have done in Part 1 but, if there are any more detailed questions, we would be very happy to talk about that. Then, in Part 2, we went on to say, given that people are indeed feeling less well, how does that relate or does it relate in any way to their experiences in the Gulf? So, for Part 2, we just looked at people who had been to the Gulf and tried to see whether, on their report of exposures, any of the ill health looked at in Part 1 that was correlated might be related to the exposure they had had and, as you will have heard from earlier evidence, there really is no objective measure of exposure and that is part of the problem. We did have, as Professor Wessely did, some of the veterans' records of vaccines, so we could check those people and we again found independently of Professor Wessely that people who had had more vaccines were more likely to have problems with their health. We could at least check with those who had their records that what they were reporting was indeed true and that is one of the great puzzles, if you like, that we do indeed find that the more vaccinations you have, the more likely you are to be unwell.

We also found that the people who had actually handled the pesticides – as you will know, there was some question about the type of pesticides that were used because some of them were bought locally – were more likely to have ill health and, in particular, the sorts of ill health that we might expect people who had been exposed to organophosphates to have. So, that was something that again came substantially out of the paper. People were also more likely to complain of severe symptoms if they had been exposed to the smoke from the oil well fires and if they had taken the NAPs tablets. Those were the main points.

So, on balance, in the absence of the proposed follow up to look for objective signs and again in the absence of any objective information on exposures, we were really left with the slightly unsatisfactory situation where people are clearly unwell and their poor health is related to the exposures that they tell us they experienced in the Gulf and we cannot take it very much further than that on that evidence.

117. THE CHAIRMAN: Foolishly, although I have read the two papers this morning and also I think there was a summary, Professor Ismale's* summary of your findings. A. Yes.

118. THE CHAIRMAN: Foolishly, I have not brought the papers with me but I know that Sir Michael Davies will not have read them and I am not sure whether Dr Jones has – I think he probably has but he may not have done. How would you like to go on? I feel sure that you have more that you would like to tell us. A. As you know, I have been in North America for the last four years.

119. THE CHAIRMAN: The two papers I have looked at were both at the beginning of 2002. A. No, 2001.

120. THE CHAIRMAN: Is your research continuing? What is the present position? Have you now run out of money? A. We did indeed ask for more money but, at that point, the Ministry of Defence said they had no interest in funding the research.

121. THE CHAIRMAN: I imagine that your interest in the subject has continued. A. Yes. In fact, I am a member in the US of the Veterans Association Research Advisory Committee on Gulf War illness and that occupies very much of my time. I am also a consultant to the Canadian study of mortality and the Australian study of morbidity, so I have stayed very involved. I am no longer as much in touch with the UK veterans as I was when we were doing these studies.

122. THE CHAIRMAN: Have you any reason to revise the views which you published in 2001? A. None at all, no.

123. THE CHAIRMAN: It is only further research in Canada or Australia that either confirmed or contradicted the results which you reached. A. The Canadian mortality study, which actually is not published yet, is very similar to the UK and indeed the US mortality studies.

124. THE CHAIRMAN: On mortality? A. Yes.

125. THE CHAIRMAN: We can more or less put mortality on one side, can we not? A. Only for the moment actually, in the sense that if we were to see an excess of cancers or neurological disease … That is only beginning to show now. You heard from the Americans last week about the excess of ALS.

126. THE CHAIRMAN: Yes, we heard about that. A. Though I believe that there is no excess in the UK war veterans at the moment.

127. THE CHAIRMAN: But in America apparently three times what one would expect. A. Twice.

128. THE CHAIRMAN: That is the United States, what about Canada or Australia? A. The Canadian study was published many years ago and it was generally a well done study and both studies showed the excess of almost all symptoms that people had been asked about. The Canadian one found a relation between pesticide exposure and so on. So, there a very similar experience to what we have here.

129. THE CHAIRMAN: The figure you have given us from your paper was 14 per cent excess, as I understand it. What does that actually mean? Does it mean that, in any group of 100 people, in one group of your symptom, whatever group you may take, you would expect to find and indeed you have found in your Gulf War group 114? A. It is not quite that. Supposing there were 100 people who went to the Gulf and 100 people who did not. We would expect about a quarter of those who went to the Gulf to be unwell but only 10 per cent of those who did not.

130. THE CHAIRMAN: I think you may have to say that again. One hundred going to the Gulf and 100 --- A. … comparable people who did not go to the Gulf. Amongst those who went to the Gulf, about 24 of those 100 would be unwell but only 10 per cent of those who did not go to the Gulf.

131. THE CHAIRMAN: So it is not 14 per cent. A. It is the 14 per cent excess.

132. THE CHAIRMAN: And Australia? A. I cannot tell you very much about Australia, to be honest. I reviewed the paper before it was published, the journal, and my memory is that they found a larger proportion of people who had been diagnosed by the military physicians as having post-traumatic stress disorder than you would expect to find from the other service but, unless you want to press me, I do not particularly want to go into it. I think there were some faults in the methodology of the paper. I am not the person to give evidence on that.

133. THE CHAIRMAN: I think we are going to get a copy of the most recent Australian paper which I gather from Professor Wessely is really all much to the same effect.
A. That is right.

134. DR JONES: Would I be right in coming to the conclusion that you have not really identified any possibly important difference between the UK or Canadian or Australian experience? A. Yes, I think that is right.

135. DR JONES: Again, I am really checking on whether I heard you correctly because I think you said that pesticide handlers had a greater chance of being symptomatic became unwell. A. Yes.

136. DR JONES: What do you mean by pesticide handlers? Are you strictly limiting that to the people who sprayed the pesticides? A. That is right. I am because you want to be sure that people really have been exposed to things. Many of the earlier studies looked at and reported that people, for example, had slept in quarters that had been sprayed felt unwell. It seemed to me that we had this one group who were of greater interest, if you like, those who were asked by the military to carry out the spraying. Many of them will have had previous training but many of them did not, they were people who volunteered to do it, a relatively small group, and it was those people we looked at particularly. We do have information, for example, on whether people who said they had lived in accommodation that had been sprayed were more unwell but that was not the case once we had taken account of things. There was a relation between people who had used lots of preparations on their body to discourage insects; they did seem to be less well but again I think that is quite difficult to interpret. The people who were actually asked to and were required to carry out the spraying do seem to have been affected.

137. DR JONES: We have had anecdotal – and I stress that word – evidence from different people with regard to the spraying of pesticides of people who were sleeping when, early in the morning, the sprayers came in and sprayed it all around and people who were eating and people who were bathing etc and clearly those are people who think they had a lot of exposure. We have also heard an allegation that, given the nature of the tenting and the nature of the sprays available in the army at that time, the exposure of someone, as it were, on the floor of the tent, whatever they were doing, would have been infinitesimal. Do you have any comments? A. I never like words like “infinitesimal”.

138. DR JONES: I cannot remember what word was actually used but the implication was --- A. Minimal?

139. DR JONES: That is right. A. I do try and be scientific about answering these questions and I have not been there and I did not take measurements and nobody took measurements. I would have thought that if the bottom of the tent were sprayed, they would have been exposed. There are again technical things which I am not an expert on but, if you

are fogging the area, that would tend to be higher up in the areas whereas if you are spraying directly and soaking the ground, I would have thought that you would be exposed.

140. DR JONES: For no one's fault, this morning we are swimming in epidemiology, so shall we move on to another subject because you have been interested in paraxonase in the past. A. Yes, indeed.

141. DR JONES: And I am referring to your study in sheep dippers, so obviously therefore you have an interest. What is your interpretation of the present state of affairs with regard to the paraxonase story? A. This goes into a rather bigger topic which I will go into but I will answer your question directly first. I think it is really unfortunate that no study has been done in the UK questions amongst those who we know did handle the pesticides. The basic tenet of molecular epidemiology is that you are looking at the effect of the differences in genotype in people who are exposed. If people are not exposed, you would not expect to find any difference and that is indeed something that we have tried to get funded in the UK without any great interest. Part of the background to the story – and it is very different in the US and the UK – is that there is the belief amongst the US veterans and indeed amongst many members of the Research Advisory Committee of which I am a member that very substantial numbers of people in the US forces at least were exposed to lower level nerve agents, particularly sarin, while they were in the Gulf. If large numbers were exposed or a very high proportion were exposed, you might then expect to find differences, perhaps, of genotype amongst those who were affected and those who were not affected. I do not, unless the perceptions have changed since I left the UK, think that we believe that large numbers of UK veterans were exposed to nerve agents, in which case I think we would expect perhaps to find difference in the capacity to detoxify organophosphates and those we know were exposed through their occupational use of pesticides but perhaps not by taking a random sample of Gulf War veterans which is really all that has been done at the moment. So, I do not think that the results, certainly in the UK, are very impressive results but I think it is partly because they looked at the wrong population.

142. DR JONES: Do we know whether the phenotypic profile of paraxonase differs between UK and American populations? A. I would be surprised if it did, but again I do not think we know all that much about what determines the phenotype. There is some evidence certainly that people's capacity to express paraxonase varies according to recent experiences for example. I would very strongly suspect that it differs if you are unwell for long periods of time. So, I think it is a very difficult to determine. Genotype, yes, I am happy to talk about genotype but phenotype I really think is a bit of a muddle.

143. SIR MICHAEL DAVIES: I hope I am not, so to speak, stirring up a hornet's nest in asking this question but I see that Professor Wessely is still here and he could put me right if I misinterpret what he said. You have ascribed the excess morbidity among Gulf War veterans to a much wider set of exposures than I think his group has found which has concentrated largely on the vaccinations. You have included oil wells and organophosphates and the NAPs tablets as well. Is this just a different way of studying the problem? A. I think if you ask Professor Wessely, he will be able to tell you that he did look at all these substances and they were all related to feeling unwell.

144. SIR MICHAEL DAVIES: But I think I am right in saying that he said that organophosphates was so nominal that it would have very little effect on the ill health of the veterans. A. My memory is that Professor Wessely did not ask the question about whether they had been the people who were actually doing the spraying of the tents rather than people

who had simply been exposed through spraying and that is why I was emphasising to Dr Jones that this group of people actually did the spraying.

145. SIR MICHAEL DAVIES: It is the sprayers rather than those who were exposed. A. Yes. If you look at the sheep dippers, it is the people who particularly handle the concentrate and who mix it who are at risk much more than the people who get wet.

146. SIR MICHAEL DAVIES: The burning oil wells you also identify as possibly --- A. I mentioned those but I am not personally convinced that that is going to be an important factor. People who have been exposed to or reported being exposed to oil well smoke had more severe symptoms, they did not have specific symptoms. They were also of course more likely to have been in particular parts of the war. People who were well back from the frontline probably were not exposed to oil well smoke in the same way and though we did our best to allow for that, I do not normally even mention it, to be honest. I was rather surprised, looking at the papers this morning just to make sure that I was not going outside my territory, to see that we have actually found apparently a dose response rate between the amount of exposure to oil well burning and the severity, but we certainly did any relation which we looked for, so we tested the hypothesis, that exposure to oil well smoke was more likely to make people report symptoms associated with breathing, asthma and so on, and we did not find that. So, the more danger you were exposed to oil well smoke, the more likely you were to report severe symptoms but not specific symptoms.

147. SIR MICHAEL DAVIES: My last question is about the 7,500 or 14 per cent that you found. Was this based on actual examination of these or was it just that they wrote on a form that they were ill? A. No. I have to get a bit statistical. We had the 95 symptoms and they rated on the 95 symptoms whether they were bothered at all. Again, in particular I have not gone into that detail but we had two Gulf War exposures, two identical ones, and non-Gulf. We clustered the answers to those 95 symptoms using a statistical technique to see which went together and we got very similar patterns for the two Gulf and non-Gulf but with very different numbers in each of these clusters. So, just imagine that we had a well cluster and a sick cluster and the well cluster was defined by people who said, "I am not bothered by anything" and the sick cluster was defined by people who said, "I am bothered by everything." In the well cluster, there were 90 per cent of non-Gulf and 76 per cent of Gulf and, in the sick ones, 10 per cent of people who did not go and 24 per cent of those who did go, so that is where the 14 per cent comes in, the difference between those people who felt in a general sense unwell as reflected on their replies to the 95 questions.

148. SIR MICHAEL DAVIES: So, the figure is higher than those who are claiming a war pension. A. I am not up to date but I did hear the figure of 6,000 mentioned earlier. Higher but not enormously higher and some of them died of course and you do not take up a pension if you die.

149. SIR MICHAEL DAVIES: No, of course. What it comes down to is that both your group and Professor Wessely's group has identified that there is a problem among this group of people. A. I will go to my deathbed swearing that there is a problem amongst this group of people.

150. THE CHAIRMAN: What I could not quite understand reading the papers is that you had 5,000 as your number one cohort that went to the Gulf. What was the purpose of the other 5,000 who went to the Gulf? My memory of the paper is that you have three columns. A. That is right.

151. THE CHAIRMAN: Why did you have, as it were, two Gulf columns plus your non-Gulf column? A. Part of the problem with doing statistical things of this sort is that you do not know what has arisen by chance and what is real. Remember that we started off looking for a new syndrome. We were saying, "Do we find a cluster of symptoms in these people who went to the Gulf that we do not find in those that did not go?" Had we found one, the next question I would have asked was, "How do you know this is real rather than chance?" Whereas, if we found exactly the same cluster in two independent cohorts, that would then have been a very strong argument that it was real. In fact, we could not find that but that is a different issue. We have also used throughout the fact that we have the two clusters to say that, if we find the same thing in both, it is much less likely to be due to chance. So, when we were looking at the part 2, the exposure date, which was just based on people who had been to the Gulf, we analysed these two clusters separately. So, in effect, it is only important if it appears in both.

152. THE CHAIRMAN: My memory is that you got very similar results. A. Identical.

153. THE CHAIRMAN: But a very different result among the non-Gulf. A. That is right.

154. DR JONES: Coming back to the question of smoke inhalation from the oil fires, when I first visited the MAP, medical assessment programme, in 1995 I think, it was then run by Group Captain Coker. At that time, I distinctly remember that he was becoming convinced that there was an excess of respiratory problems/illness. That subsequently seemed to disappear with the passage of time. I know that neither of us is a chest physician. A. I do quite a lot of fatal chest disease.

155. DR JONES: Is your knowledge of what might have been the consequences of inhaling unpleasant smoke on the lungs such that the abnormality might disappear with the passage of time? A. Can I bring something else into that before I answer that question? We did in fact do a study of children, boys at the ages of six and 12 at the time, who had been in Kuwait at the time of the oil wells to ask whether they were more likely to have asthma as a result and we did not find any excess. We did find that boys who had had asthma before the Gulf War or ill health were more symptomatic. So, in answer to the first question, would I expect more new cases, based on that, perhaps not. Would I expect them to have an exacerbation of the existing condition that we could still pick up 12 years later, which is really what we are talking about? I would not have been surprised to find a problem though it was only one of the hypothesis we looked at and we did not follow in a great deal of detail when it was negative but, had it come back positive, that would have not been unreal.

156. THE CHAIRMAN: I rather thought that when Professor Wessely was giving evidence this morning he suggested that your excess figure was more than 14 per cent, it was in fact 20 per cent although I might have misunderstood that. I understand that he was wrong. Well, it shows that I was paying attention! A. I do have in front of me, though I am not supposed to quote from it, the final draft of the Research Advisory Committee and there there is, partly quoting Professor Wessely's work, a suggestion that the excess is more like 24 per cent. So, I think it will probably be suggested that our 14 per cent – and it always depends on how you assess these things – was at the lower end rather than the upper end.

157. THE CHAIRMAN: Your view is that there was no syndrome but you cannot get away with that without telling us what you mean. I am collecting definitions of the word

"syndrome". I have one from Professor Wessely. Can you give us your definition of syndrome. A. I would probably rather not!

158. THE CHAIRMAN: What do you mean when you say there is no syndrome? A. Here I am saying that I do not think there is a collection of signs and syndromes (sic) that are specific to people who have been to the Gulf.

159. THE CHAIRMAN: Signs and symptoms? A. Yes.

THE CHAIRMAN: There is no collection of signs and symptoms which are specific.

160. DR JONES: Could I just clarify the use of the word "specific". Would you accept unique or not? A. You would not necessarily have to say "unique", would you?

DR JONES: I do not think so.

161. THE CHAIRMAN: Professor Wessely did say "unique"! A. I should say that I am only basing that on the sort of questionnaire studies that Professor Wessely and we did initially. You had the Americans here last week and I do not know who you had but there is there now a suggestion and indeed some data which suggests that perhaps a rather small part of the illness might be due to changes in the nervous system that are not measurable. My estimation of this is a very small number of that is true but perhaps there are one or two per cent of people who have become ill from exposure in the Gulf who, in the fullness of time, we will be able to show have changes in the basal ganglia or somewhere in a specific part of the brain and that would then become a unique but really rather limited syndrome.

162. THE CHAIRMAN: That brings me to my last question which I am sure you were expecting. Suppose, in fact contrary to what I think you told us, there was exposure among the United Kingdom forces to what is referred to as a low level nerve agent, then what? Does that then enter into the other possible causes which you listed? You listed three or four of them but you did not list low level exposure to a nerve agent, I think partly because you thought it could never have happened. Suppose it could have happened. A. You really are testing me! I have to say that I think it is biologically implausible.

163. THE CHAIRMAN: Implausible? A. Implausible that there would be sufficient exposure over a two or three day period for it to be a major cause in a large number of people. I have never said that publicly before but I think it is perhaps biologically implausible.

164. THE CHAIRMAN: By "biological implausible", you mean you would expect … A. I would expect most people and in fact Dr Jones were talking about perhaps people who were genetically susceptible, but I would think most people, unless they were being challenged in some other way and I am starting hedging now, would recover without long-term effect.

165. THE CHAIRMAN: To do him justice, I think Professor Hayley* was including stress coupled with the low level nerve agent. A. I perhaps would not put stress as being the more important. Again, I did not hear, so I should not comment on his evidence, but people were taking the NAPs tablets which have a similar mode of action or related mode of action to the organophosphate or the nerve gases. They were being exposed perhaps to both at the sane time and perhaps in some way this excess of extended number of vaccinations changed their

immune systems. I do not know. What I am saying is that if you and I were exposed to minimal level of sarin, I think we probably would be unlikely to develop long-term syndromes of the sort we have heard about.

166. THE CHAIRMAN: In one sense, could one wonder whether the difference between you and Professor Wessely on the one hand and Professor Hayley* on the other really matter? It is obviously of great importance academically and might be of great importance if one is going to take precautions in the future but, so far as trying to establish what happened or what was the result or what was the effect on those people, does that difference really matter? A. It just might if you are thinking of … A lot of the discussion in the Veterans Association Committee is about how we can improve treatment for veterans and whether there is any way in which we can intervene, and conceivably the way that we treat people might depend on what we think caused the illness.

THE CHAIRMAN: Professor Cherry, we are very grateful indeed to you for coming. If there is anything else which you feel we ought to know, do, please, get in touch with us. Thank you very much indeed.

The Witness Withdrew

THE CHAIRMAN: That, I think, brings us to the end of this morning and we sit again this afternoon at 1.30 to hear Dr Concannon.

After the luncheon adjournment

DR HARCOURT CONCANNON, called

167. THE CHAIRMAN: Dr Concannon, first of all, we are very grateful to you for coming. I have read your statement. I do not know whether that was prepared by you yourself or in your office or what. A. There is no-one else who does things like that.

168. THE CHAIRMAN: That is sad because I was about to say that it was one of the clearest statements that I have ever read on the subject. It is very clear indeed. A. I adapted some material we use for training.

169. THE CHAIRMAN: If I were you I would take responsibility for it quickly. Could you start by giving your name and address for the purposes of the shorthand note? A. My name is Harcourt Martin Grant Concannon. My business address is 55 Ludgate Hill, London EC4.

170. THE CHAIRMAN: Perhaps you could explain what your present function is and how you got involved in the affairs of the Gulf War veterans. A. Since August 1998 I have been President of the Pensions Appeal Tribunals for England and Wales. Scotland has its own Pensions Appeal Tribunal, as does Northern Ireland.

171. THE CHAIRMAN: I hope that you will pass on to the appropriate quarter my congratulations on that particular document because it does seem to me to set everything out very clearly. What would you like to do? Obviously, you are not going to go through that paper paragraph by paragraph as we have it here. I see you have got some notes. Would you like to develop the matter generally as to what it is that veterans may be entitled to apply for and how the process works? Also, we will want at some point some idea of numbers involved

and so on, but start with a more general explanation. A. Very well. I should perhaps start off by saying that I do not think it is going to be proper for me to comment on the medical evidence on the existence or non-existence of the condition of Gulf War Syndrome. Apart from anything else we have some outstanding appeals which focus on that very issue. Obviously, I am pleased to help the inquiry in any way I can by answering questions on any material I have mentioned in this submission or in cases which may have been referred to you by other people from whom you have heard evidence. There are some general comments I can make if you wish.

172. THE CHAIRMAN: That would be very helpful. A. Our experience of the use of the word "syndrome" as a tribunal is various and it is tied up with the labelling question which I have rehearsed in my submission. There are, of course, very tight approaches to the use of the word "syndrome". A classic example is Down's Syndrome but there are also much looser, more relaxed or casual approaches to the use of the word "syndrome". For instance, in the United States the Department of Veterans' Affairs, when it was dealing with the problem of tens of thousands of claims from returning veterans from Vietnam, for a while used the label "post-Vietnam syndrome" which indicates that it is an example of what I mean by a more casual approach to the use of the word "syndrome". Perhaps I could make a general observation. The perspective that I have, of course, comes from the tribunal's work and the tribunal's work is involved in dealing with appeals under, for the most part, the War Pension Scheme. There are one or two other schemes which are analogous but mostly it is the War Pension Scheme. The approach of the War Pension Scheme is very functional and therefore very different from the approach which might be taken by a medical specialist in a hospital who is concerned with questions of treatment and long term patient relationship. Systems such as the war pensions system in our country are concerned essentially with the question of whether or not to deliver a disablement benefit to a disabled veteran who is making a claim. There are pressures on that situation. There is a pressure to make a decision. You cannot say, "This is a difficult question. Come back in 20 years and we might be able to answer it", or, "Come back in 13 years and we might be able to answer it". Not only does the person making the claim expect a decision one way or the other but the public expect a decision. It is a political process. There is a minister responsible for veterans' affairs who is answerable to Parliament. The whole of the War Pension Scheme was set out by Parliament in the First World War. There is a public context to it which creates its own expectations and environment of pressure. There is also an administrative context to decisions in the war pensions system. I am not describing the tribunal but the work of the agency in this. They have to be able to cope with thousands of claims. When the scheme was first set up in the First World War there were tens of thousands of claims which came in from discharged and disabled veterans. They need an approach which enables decisions within the context of the administrative resources that are available to be made quickly. That may mean them taking a view on the label to use in dealing with any particular claim that is far from being ideal and that is probably recognised at the time as being far from ideal but will serve the purpose of the functions of making a decision on a disablement claim. Technically that does not necessarily matter that much because any label that has been used by the Secretary of State can be reviewed and changed later. There is a process inbuilt into the Service Pensions Order which enables that to happen. I am suggesting that that context, which of course spills over to us as a Tribunal because we are dealing with the way in which the war pensions system works in practice through the Veterans Agency, does give a rather different approach to labels than the approach which might be taken, as I say, by someone who is a specialist in hospital who is concerned with very different questions and very different relationships. It will not therefore be surprising if a system of armed forces disablement compensation adopted a different

approach to labelling from the one that is taken by medical science generally for the purposes of patient relationships.

173. THE CHAIRMAN: In other words the approach must be more robust, as it were? You cannot fine-tune the thing too much. Is that what you are saying? A. Most schemes do not present any problem because there is a recognised category of war injuries. I suppose a classic example might be gunshot wound, which is a characteristic of any war, I guess. Each war has tended to produce a category of claims which are rather different from anything which has been raised previously. I mentioned the Vietnam War so far as the American experience is concerned and how they reacted to that at first, by using the label "Vietnam syndrome". I suppose our classic example would be the First World War. We were faced with hundreds of thousands of claims from people who had experienced ancillary bombardment for days or weeks on end. All kinds of labels were used to deal with those claims which would not now be acceptable – "arm fibrillation" was one of them; nervous debility or neurasthenia. Labels like that would not be the currency of current medical opinion but they served their purpose at the time, albeit they were not ideal, because essentially the people administering the scheme were dealing with the problem of making decisions in a context of uncertainty as to what the right approach to take might be in the circumstances. I think to some extent the Gulf War raises the same kinds of issues in that what was being presented to the Agency, and indeed is presented to tribunals on appeal, is a situation where you have a set of signs and symptoms which are not disputed as to their existence. They are not saying the symptoms were not presented. They accept the symptoms were presented but they do not fit into any of the orthodox recognised categories of war injuries that one might find in the International Classification Directory, for instance, nor do they fit within the parameters of some of the kinds of new injuries that started to emerge in conflicts like the Gulf War, such as organophosphate poisoning, such as depleted uranium poisoning, etc, because one or other of the essential ingredients for that --- or maybe it was a question of fact: there had not been enough exposure, for instance, to pesticides, or not enough exposure to depleted uranium or whatever the case might be to give a diagnosis and label in those terms. You are faced, if you are administering the system (and you are faced as a tribunal) with the problem that you have a set of signs and symptoms which are not disputed as to their existence and there is a need to do something about it. It would not be acceptable to say, "I am sorry; we have not got a diagnosis. We reject the claim", although they could do that. As I said in the submission, one of the underlying principles of the war pensions administration is that you do not accept symptoms; you only accept underlying pathologies. You have to identify the basic injurious process which explains the symptoms. In principle you could say, "Yes, the symptoms exist but we cannot identify a pathology, so we are going to refuse the claim", but that is not acceptable in what I referred to earlier as the political context in which any system of disablement compensation for armed forces, not just in this country but in any country, is going to exist. That is not on. There would be an outcry so you have to react to that in some way or other. You can react to it in a number of ways, I suppose. You can stretch existing labels beyond the boundaries that they really justify or you can find another label, such as "signs and symptoms of ill defined conditions", which is what the Veterans Agency did, or you can identify something, I suppose, as Gulf War Syndrome. I think you have to do something, albeit that it may not rest on a consensus of medical opinion at the time, because there is a need to react.

I think there are some problems in doing that. Whether you call it "signs and symptoms of ill-defined conditions", or whether you call it something else like Gulf War Syndrome, I think there are some problems in doing that. One of the problems is that you are

probably straying beyond the margins of medical legitimacy. I would certainly say that one of the essential ingredients of decision-making in a public system of armed forces disablement compensation is that the labels that you use are seen as passably legitimate in medical terms. You could not simply invent a label out of thin air which had no support whatsoever in the medical community. That is simply one problem when you are into the area of using an entirely new label which has not been tested in that way. A second problem is a practical problem in that any label which is, shall we say, Gulf War Syndrome or "signs and symptoms of ill-defined conditions" necessarily, almost by definition, is a kind of umbrella label that encompasses a whole array of separate symptoms, some of them physical, some of them perhaps psychological. If any use is going to be made of that disablement decision the next stage in the War Pension Scheme would be to make an assessment of the degree of disablement, but you cannot do that without more information as to exactly what the signs and symptoms were that were being recognised by the label, so you have to go into a second stage of definition in giving the award under that kind of label in which you actually define what the signs and symptoms are that have been accepted in the circumstances of that particular case as part and parcel of the accepted condition. It starts being almost a play on words. The label is no more than a wrapper for accepting a set of symptoms. I am not necessarily criticising that. It may be the only thing that can be done in the circumstances, but that is what it is and it does create a number of secondary problems, particularly when it comes to the question of assessment, or much later down the line when we have appeals in which people have been given labels, such as "signs and symptoms of ill-defined conditions". They have got a total disablement percentage or 50 or 60 per cent perhaps; they put a claim in for one of the supplementary allowances under the War Pensions Scheme. Let me take an example – mobility supplement. That requires an entry of 40 per cent assessed disablement, but there are certainly claimants under the scheme who satisfy that. You then have to decide whether problems in walking are related to the accepted disablement so the question becomes, "Has this person got difficulties in walking because of signs and symptoms of ill-defined conditions?", and I am just putting that as an example. That is a pretty difficult thing to do if all you have is a label which is as diffuse as that. You have to in effect re-examine the circumstances in which the entitlement awarded for disablement was first given. You have to look at what the symptoms were which were recognised and how they might lead on to other consequential symptoms. That is the problem about that kind of label. It is not unique for things like that because we get it in other situations, but there is no doubt that it is a problem for the agency, for us and indeed for claimants. They want to know whether they are entitled to anything else, and that would be quite difficult to establish. Those are the general comments.

174. THE CHAIRMAN: Thank you very much, Dr Concannon. Those are extremely clear, if I may say so. I am just wondering whether we could in a sense go back to trace through chronologically what happens when somebody makes a claim, how it is dealt with and how it may come to your tribunal by way of appeal, what is decided at each given stage, as it were. I suppose strictly speaking one starts with the definition of "disablement" itself which is at page 12 of your paper, which is about as wide as it could be – "physical or mental injury or damage or loss of physical or mental capacity", and there are injuries defined in it, including "wound". Although in your case of a gunshot wound that is very clear, the definition itself is very much wider. Disablement there must be. If there is no disablement then there is no claim at all to a war pension. That is right, is it? A. It is right, yes.

175. THE CHAIRMAN: So what happens is that a man comes back from the Gulf and feels different from how he went out to the Gulf, and he feels it due to something that happened while he was there. He has no idea what it was due to. What is the starting point?

He makes a claim under the scheme in which he simply defines his symptoms? That is a sufficiently good claim, is it? A. There has to be a claim. It does not have to be in diagnostic language.

176. THE CHAIRMAN: No; he simply says, "I do not feel right", or, "I can't sleep", or whatever it is. A. Yes.

177. THE CHAIRMAN: And that claim then goes to whom exactly? A. The claim is made to the Secretary of State, to what is now the Veterans Agency. They would then call up the service medical records from the Ministry of Defence. If the person making the claim had seen the medical officer in the unit or whatever, all of those records would be passed on to the Veterans Agency.

178. THE CHAIRMAN: One problem, of course, is that we know that the medical records were pretty inadequate. A. Yes, and some were destroyed. It depends on what is being claimed but they may then go into various other stages of information retrieval. They may go to the person's general practitioner and ask for a general report or a copy of the notes or pose specific questions.

179. THE CHAIRMAN: And we are talking about the Veterans Agency? A. We do not do this; yes.

180. THE CHAIRMAN: Which is now part of the Ministry of Defence. It was not but is now? A. Yes; 2001. They may make other inquiries. If someone has been treated in hospital, which they would pick up from the GP notes probably, or they might pick it up from the claim form itself because some claims forms give quite a lot of information about background, they might go for copies of the hospital case notes. If there have been consultant reports which have been obtained at various stages, if they thought it was going to be helpful, they would ask for copies of those. Essentially it is an exercise of gathering together and collating existing material which appears to be relevant. They may decide to go out for further new medical evidence of their own. In a PTSD case, for instance, it would not be uncommon for the agency to want to get a report from one of its own nominated consultant psychiatrists, so they may originate the collection of evidence rather than just collecting what already exists.

181. THE CHAIRMAN: Unless they do that this evidence has been collected by a non-qualified civil servant, has it, or not? A. The process is handled by one of our medical advisers, so the claim is received by a lay officer in the Veterans Agency but the file would then be passed to a medical adviser who would make decisions on what information should ----

182. THE CHAIRMAN: He is a fully qualified medical practitioner? A. Yes.

183. THE CHAIRMAN: But employed by the Veterans Agency? A. Yes, mostly full time. Some are part time.

184. THE CHAIRMAN: So he then has all the records coming in and maybe he has gone to an outside assessor, but more likely probably just goes on what he has received. Then what happens? A. They probably will go through a stage of originating their own information, if not by going out to a consultant, by having what they call a medical board, which is a medical practitioner near where the appellant lives. This will be a local doctor who will do that, which

also produces further information on the claim. Then the medical assessor makes up his or her mind as to what to do.

185. THE CHAIRMAN: Give me an idea: how many medical assessors are there in the Veterans Agency roughly? We know that there are 6,000-odd claims. How many people? A. I am guessing – about 20.

186. THE CHAIRMAN: It is just a rough idea. So the medical assessor within the Veterans Agency, on the basis of what information he has got, says, "Yes, we accept your claim". You take it in your own words. What is the next stage before he comes to a percentage of disability? A. It depends on whether the decision is going to be positive or negative. If the medical assessor accepts that disablement within the definition of the scheme has been established he or she will issue what is called a certificate of entitlement. This is a decision of the medical adviser; it is not a lay decision. That gives disablement in terms of the certificate.

187. THE CHAIRMAN: And the test which the medical assessor is applying is that he will accept the claim unless he can show that the claim is ill-founded beyond reasonable doubt? What is the test at that stage? A. It depends whether it is a claim within seven years or after seven years.

188. THE CHAIRMAN: I am assuming for the moment it is within seven years. A. The first thing that the medical adviser would satisfy himself or herself about would be that disablement is shown. They would then look at the evidence. They may go into labelling. They may have to consider, if the claim has been made in lay terms, simply in terms of symptomatology what label was shown to be the relevant injurious process shown by the evidence as a whole, not just on what the claimant said but on all the information which was in front of the medical adviser. They would have got a label in their own mind. If they are accepting the disablement they accept it under that label, having been satisfied, if we start with a full claim, that the evidence does not show beyond reasonable doubt that there is no causal relationship between that disablement and some kind of military service. That is a positive decision. If it is a negative decision, if the medical adviser has not been satisfied, they write a memorandum in the claim file to that effect and it is passed to a lay officer in the Veterans Agency who then issues a decision in the name of the Secretary of State rejecting the claim, but usually rejecting it in terms of the label which the medical adviser has advised is the appropriate label to use describing the pathology.

189. THE CHAIRMAN: If he cannot think of a suitable label – and I do not mean to be disrespectful – he can make up a label, can he? "Signs and symptoms" is a label. A. There may be different approaches by different medical advisers to that one. The principle is that you do not accept symptoms. You would not find an award for pain, but on the other hand some labels in fact say that but in Greek, like arthralgia, which usually indicates that they have accepted that symptoms are there but they are not quite sure what the evidence shows.

190. THE CHAIRMAN: Have they at this stage got to the point of saying whether it is attributable? Is he at this stage considering causation? A. Yes. It comes in that. Acceptance decisions are made by the certificate of the medical adviser and rejection decisions are made by the Secretary of State. It is not for me to discuss the Veterans Agency's affairs, I suppose, but it does seem pretty clear that it is the medical adviser whose views on rejection are -----

191. THE CHAIRMAN: But supposing the decision is that his claim is on the basis of symptoms which, if he had been in the Gulf, he is twice as likely to have got than if he had remained in England and not been to the Gulf. How does he factor that equation into his decision? Take symptoms which obviously people, whether they have been to the Gulf or not, might have but which, having been to the Gulf, they are twice as likely to suffer from? A. Article 4 claims are extremely difficult for the Secretary of State because the burden of proof is against the Secretary of State to a very high degree – the criminal burden, in fact. The reason why an Article 4 claim is rejected is usually going to be that the disablement has not been accepted as existing. It is what I describe as the *Royston* point in my submission. *Royston* was a decision of the court in the 1940s in which Mr Justice Denning, as he was then, decided that there was a preliminary issue in which Mrs Royston's case had to establish that she had back pain when the hospital records did not show that, so that she failed on the preliminary point, but usually when that issue is taken in an Article 4 case that is simply because once disablement has been established it is then extremely difficult, because of the burden of proof, to discharge the burden of proof. It is not impossible because you get claims that are constituted of conditions that, given the literature, the aetiology, on that particular condition, would be very unlikely to be attributable to service, although they might be aggravated by service. It is not impossible to discharge the burden of proof but in many of the appeals it is extremely difficult to discharge that point; hence the disablement point that is taken by the Secretary of State. There may also be an issue about labelling, however, because the appellant may feel that the medical adviser has used an inappropriate label to deal with the claim, and certainly since the High Court's decision in the *Rusling* case it has been perfectly clear that we have got jurisdiction to deal with disputes about labels, not only the other questions.

192. THE CHAIRMAN: Just to complete the chronology, the medical adviser or assessor – is he the medical adviser or medical assessor? A. Adviser.

193. THE CHAIRMAN: He then, having accepted that there is disablement within the definition resulting from the Gulf War, has to obviously give a percentage of disablement. That is the next stage, is it? A. After the acceptance of a disablement it has to be assessed in terms of percentage, yes.

194. THE CHAIRMAN: How is that done? Is it just the degree to which he is disabled? A. That is a good question. We are often asked what are the principles. It is a question of applying an objective test, looking at someone the same age and sex and discounting things like the effect on employment, which our statutory duty disregards: to what extent is this person affected by the accepted disablement? That is aided by custom and practice, by schedules of disablement which essentially come from First World War experience in dealing with amputation cases, which are also used in the Industrial Injuries Scheme's assessment process, which gives you a kind of weather-gauge on the disablement. For instance, someone who is totally blind would be 100 per cent disabled under the schedule, although, of course, many people who are 100 per cent blind are able to lead fairly reasonable lives. The 100 per cent disablement is not to be equated with someone who is totally unable to do anything at all. Essentially it is a matter of art and judgement, I suppose.

195. THE CHAIRMAN: And the percentages go from 20 per cent up to 100 per cent? A. Nought to a hundred, yes, in bands: up to 20 per cent, when the bands become ten per cent bands.

196. THE CHAIRMAN: Then if the veteran is dissatisfied with the percentage he can then come to you? A. It is appealable, yes.

197. THE CHAIRMAN: How does that work? What is the system for appealing? A. They appeal against the Secretary of State's assessment decision, thus in relation to both the percentage and the period which the Secretary of State may determine.

198. THE CHAIRMAN: What do you then do on the tribunal? A. We get a bundle of papers which sets out the medical background to the Secretary of State's decision, which includes the opinion by the medical adviser. I should have said that medical advisers do not actually see claimants.

199. THE CHAIRMAN: Whereas in the case of the tribunal the claimant will come before the tribunal? A. But before making the assessment decision they will arrange for a medical board in the claimant's locality so that you have the clinical findings of the medical board to act as the base for the assessment decision which is made in the context of all the other information as well. If it is appealed the appellate is invited to attend, and of course you have the benefit of not only any other documents they choose to present but also of their oral evidence, and the tribunal's medical member can examine as well if he or she wishes to do so.

200. THE CHAIRMAN: So what rough proportion of appeals get allowed? A. In the sense of being revised in some way or other, we normally look at the date. Quite a lot of assessment appeals have the dates altered, even though the percentage is not altered, which would give a misleading impression as to the real impact of the appeal process. Most decisions are revised in some sense. The number that result in a substantive alteration in percentage is probably about 30 per cent.

201. THE CHAIRMAN: Thirty per cent of appeals are allowed? A. Yes.

202. THE CHAIRMAN: And are upgraded from 20 to 40? A. The percentage is revised.

203. THE CHAIRMAN: Supposing the claimant then thinks of something else that may have gone wrong. Does he come back to you or does he go back to the agency? A. The assessment will always be in terms of the disablements that have already been accepted. Nothing prevents the claimant making another claim and if so, and there is an award of further accepted disablement, there will be a new assessment of the whole array, and that is appealable.

204. THE CHAIRMAN: So a claimant who has made a claim on the basis of stress disorder, PTSD, would be able to go back, would he, and say, "That is something else that I think is wrong with me"? A. Yes.

205. THE CHAIRMAN: "I have got 40 per cent on stress disorder. I want another 20 per cent because of something else"? A. Perhaps I misunderstood your question. There are two different processes potentially at work there. The claimant may think of another disablement altogether and can make an entirely new claim, but they can also ask the Secretary of State to review the assessment of PTSD, say, and that decision is appealable.

THE CHAIRMAN: I have asked you enough questions now. Thank you very much. I should have introduced Dr Jones and Sir Michael Davies earlier on. I am so sorry.

DR JONES: I do not think I have any questions.

206. SIR MICHAEL DAVIES: Suppose people say they are unable to work, which a lot of the veterans we heard from a few weeks ago said, that they were now incapacitated for work: would your Pensions Appeal Tribunal accept that as a total disablement or on what basis would you make your decision? If someone says that they are so ill now that they cannot work would they qualify for 100 per cent war pension? A. The answer to that I think probably comes in two parts. So far as assessment itself is concerned there is statutory disregard of the impact of the disablement on employment, so that cannot be taken into account. However, the War Pension Scheme provides a range of supplementary allowances. Two of the ones which are relevant to this are, first of all, employability allowance, for which there is an entry gateway of, I think, 60 per cent disablement. If you qualify for that there will be an addition to the basic war pension which is based on the percentage disablement. There is also another potentially relevant allowance called allowance for lower standard of occupation, which copes with the situation of someone who, for instance, had been a bus driver before he joined the services but now cannot be a bus driver because of disablement, he can only get a job which pays less than he would have earned if he had been able to continue being a bus driver. The allowance for lower standard of occupation deals with the pay differential, the loss in pay which is caused by the accepted disablement.

207. SIR MICHAEL DAVIES: But that is not part of the War Pension Scheme? A. It is. It is conceived in terms of what I might call a basic war pension which is based on the percentage assessment, to which can be added various other supplements. Mobility supplement is one of them, constant attendance allowance is one, unemployability allowance is one, allowance for lower standard of occupation is another one. I think there are about 25 allowances altogether but those are probably the main ones. They can make a very substantial difference. They are all paid in one, so they can make a very considerable difference to the total amount of money that someone is paid.

208. SIR MICHAEL DAVIES: But it must add to the stress of people to have to claim these different sums of money and to have to think of what they are entitled to. We know from civilian life how many people are not aware of the benefits that they are entitled to claim, so presumably it would ease the plight of some war veterans if the matter was handled in a more global way. A. It is certainly not holistic. I am sure you are right that there is a lot of stress involved in making a range of different claims for essentially the same issue. In practice it does not seem to cause that much of a difficulty. The information systems are quite good inside the ex-service community. Organisations like the Royal British Legion and so forth are very good at feeding information to their members. I am sure that what you said is right though. It is not for me to say, I suppose. We have to cope with the system as it is. Any other way of dealing with it might be a great deal more complicated. For instance, you could have a situation where, if anyone raised a claim on any matter and the Secretary of State had to adjudicate every conceivable part which might be raised, that would certainly be a recipe for delaying the initial decision just in terms of the quantity of information which you would have to engage in in order to make that decision, and it might be a waste of time because I think in a lot of cases you would discover that there was not any merit in them. To distinguish between the cases – not to do it automatically but to create discretions to do it – I think raises even more problems. It is a matter of administrative convenience, I think, as much as anything else.

209. SIR MICHAEL DAVIES: How many appeals have you handled from Gulf veterans? I think you answered Lord Lloyd on the basis of 30 per cent of appeals allowed. A. Assessments.

210. SIR MICHAEL DAVIES: Sorry – assessments. I was wondering how many cases are brought to the Pensions Appeal Tribunal from the initial assessment made by the Veterans Agency. A. We do not keep account statistically of cases which originate from particular conflicts. I could not tell you, for instance, how many of our appeals in the last year relate to incidents in the Second World War or the war in Korea or the Malayan emergency or the Suez campaign or anything else. We just do not keep that information. The 1991 Gulf conflict is in the same category. It is also quite a difficult question to answer. My impression is, because I sit on tribunals as well as in head office, that probably the majority of claims and appeals which originate from people who have served in the first Gulf War – in fact I am sure – are not in terms of Gulf War Syndrome. They are disputes about whether depleted uranium poisoning was correctly rejected, whether organophosphate poisoning was correctly rejected, whether PTSD was correctly rejected, etc, etc, so although they are about something which is part of the spectrum of Gulf War Syndrome they are not specifically in terms of an argument about the existence of "Gulf War Syndrome". The number of cases in which that has been directly raised is actually quite few. I am sure Mr Rusling has referred to his case. That is typical of a very small number of cases in my impression in what one might call the first phase when people started making claims in terms of what was Gulf syndrome rather than Gulf War Syndrome (in this case the same thing). His case was one of a small number of cases in which there were rejection decisions in terms of a claim where they rejected Gulf syndrome, or Gulf War Syndrome in this case. Very soon afterwards they adopted a different practice which was, if the claim had been made explicitly in terms of Gulf War Syndrome, to side-step that, to leave it to one side, and deal with the symptoms which were suggested either in the claim or in the medical evidence which they would gather as part of the process that I was talking about earlier, so you would get claims which mentioned Gulf War Syndrome but which led to decisions in terms of a range of other things which might be acceptances, which might be rejections, but did not give the Secretary of State's view on Gulf War Syndrome itself. Then more recently there were decisions in which they did confront the issue. We have got one or two of those appeals to deal with – in other words a claim for Gulf War Syndrome rejected as such by the Secretary of State and appealed as such by the appellant.

211. SIR MICHAEL DAVIES: If the government were to make a change of policy on this matter, a political decision that they would be much more generous towards Gulf War veterans, where would that, so to speak, begin? Would it be in the guidelines that the Veterans Agency medical advisers were set? How would the process start in the assessment of war pensions? A. You are asking me a question which I cannot really answer. I am not sure it is proper for me to answer it. There are a number of ways in which it could be done. It could be done quite formally by the Ministry of Defence adopting a policy on the matter in the public arena.

212. SIR MICHAEL DAVIES: But there would still have to be assessments, would there not? A. Oh yes.

213. THE CHAIRMAN: What do you mean by a policy? What sort of policy might they adopt? A. I suppose there is nothing to stop the Secretary of State for Defence saying, "We accept the existence of Gulf War Syndrome and we will deal with any claims for that in terms". It is open to them to do that. It would depend, I guess, on medical advice. There is

no indication that that is likely. It could be done informally. There are many other ways of running things. I do not doubt that they have discussions about what to do.

214. THE CHAIRMAN: More ways of skinning a cat, I suppose. A. We do not know about that, of course. We just see the formal position.

215. DR JONES: Can you tell us anything about any discernible pattern in the number of claims made since they first started up until now? A. Claims for what?

216. DR JONES: For Gulf War pensions. A. Specifically in terms of Gulf War Syndrome?

217. DR JONES: Yes. A. I suppose one thing that surprises me is that there have not been more appeals because there is no doubt that you see an appeal bundle which on the face of it is about, for instance, rejection of chronic fatigue syndrome or some such thing, and when you look at the claim form actually the claim has mentioned Gulf War Syndrome or something which is analogous, "My problems relate to Gulf War Syndrome", something like that, and you then see a rejection decision by the Secretary of State for chronic fatigue syndrome which is appealed but the claimant has not actually picked up that in making that decision the Secretary of State ignored that part of the claim which dealt rather specifically with Gulf War Syndrome and has not pursued it. The main comment I would make in answer to your question is that what surprises me is that there are not more cases in which that has been pursued.

218. THE CHAIRMAN: You have got your war pension system, which you have explained very clearly, leading up to 100 per cent disablement pension, and I think we know the figure, although I forget what it is. What do they get for a 100 per cent war pension? A. I have no idea of the answer to that. We do not have that responsibility.

219. THE CHAIRMAN: In addition to that you have the allowance system tacked on to the war pension, which you have also explained, but there is another method altogether by which compensation is payable, is there not, whereby a veteran has been discharged on medical grounds? Can you tell us anything about that? A. So far as the War Pensions Scheme is concerned?

220. THE CHAIRMAN: This is aside from that. A. Perhaps you are thinking of the service occupational pension system where, if someone is entitled to a service occupational pension there is an additional element to the pension if someone has been medically discharged.

221. THE CHAIRMAN: That only applies if he has been medically discharged, as I understand it. Is that right? A. Yes, that is right. That does not come within our purview. That is a matter for the occupational pensions administration system inside the Ministry of Defence and it is not appealable. They deal with disputes by internal review mechanisms.

222. THE CHAIRMAN: So that is not in your field? A. Not at all, no.

223. THE CHAIRMAN: Out of the 6,000 or so veterans who have made claims – and I think you have said you do not know the answer to this – how many pensions are currently being paid? A. I do not know.

224. THE CHAIRMAN: Somebody must know. A. The Veterans Agency would know.

225. THE CHAIRMAN: The Veterans Agency would know that figure? A. Yes.

226. THE CHAIRMAN: And the Veterans Agency would be able to give us, of the total figure being paid pensions, how many are receiving 100 per cent, 80 per cent and so on? That would all come from them? A. I am sure they have very good statistics relating to claimants from the Gulf War. They have a unit which deals with it.

227. THE CHAIRMAN: You told us that the percentage of success is 30 per cent. You may have answered this. How many appeals altogether have there been in relation to Gulf War veterans? A. We do not keep those statistics.

228. THE CHAIRMAN: Would the Veterans Agency know that? A. They probably do because they have a unit which deals with Gulf illnesses and claims, not restricted to appeals, not primarily to do with appeals, I think, but claims which are obviously relating to service in the first Gulf War go through that unit, so they should be in a position to give you all that information. We just do not collect it, I am afraid. It would be hard to know how to collect that information and we would have no practical use for it ourselves.

229. THE CHAIRMAN: The last and I suppose most obvious question of all: why is it that the Secretary of State does not accept Gulf War Syndrome as being in itself a ground for claiming a pension? In the end, as you have explained clearly, it depends on the percentage of disablement which itself depends upon a cause accruing during the Gulf War. Why, from the Secretary of State's point of view, does it matter what that is called? If he is accepting that it is caused by the Gulf War, if he is accepting that it was ten per cent, 20 per cent, 50 per cent or whatever disablement as a result of the Gulf War, just explain again why is the great hang-up in the use of the phrase "Gulf War Syndrome"? What has he got to lose by accepting Gulf War Syndrome as a convenient term to describe all the symptoms which we have had described to us in the expert evidence and which show that these symptoms occur up to twice as frequently among Gulf War veterans as you would expect among the population at large? A. It is not for me, I am afraid, to explain the Secretary of State's thinking. We are quite independent of the Secretary of State. I imagine the argument is, because, as I was trying to indicate earlier, there are functional considerations which rather answer your question, that if you do see the war pensions system of labelling in terms of it being a vehicle to deliver goods and you are going to accept the symptoms anyway, in that sense it does not matter too much what label you attach to it. To pick something like Gulf War Syndrome, which is after all in *Black's Medical Dictionary*, is not outrageous. It is not inventing something which has no basis whatsoever. I am afraid you will really have to ask the Secretary of State because it may not be entirely clear to some of us why that is so. There are difficulties in doing so which I have also rehearsed in that it raises almost as many questions as it solves.

230. THE CHAIRMAN: You said there were two problems which it raised if you call it Gulf War Syndrome. I noted them both down. We will read again what you have said. At any rate, you have helped us greatly. A. I hope I have been able to do so.

231. THE CHAIRMAN: You have indeed, and we are very grateful to you. Thank you very much. You are still hard at work as President of the Tribunal? A. Yes.

232. THE CHAIRMAN: How many years do you say you have been doing it? A. Six.

233. THE CHAIRMAN: And there is no sign of the work coming to an end? A. I think the expectation was when it was set up in the First World War that by 1925 or so the thing would pack up. It was renewed in the Second World War, and then of course we were into other conflicts, including Korea and so forth. Every time they made a forecast that the system was coming to an end --- it is a continuing thing. Although the Ministry of Defence propose to replace the existing War Pensions Scheme with a very different concept there is obviously a continuing need.

THE CHAIRMAN: Thank you very much indeed.

The witness withdrew

DR PAT DOYLE, called

234. THE CHAIRMAN: Professor Doyle, first of all, thank you very much indeed for coming. We are very glad that you have been able to do so. Could you start by giving your name and address for the purposes of the shorthand note? A. Yes. My name is Pat Doyle. I work at the London School of Hygiene and Tropical Medicine and I am Head of the Department of Epidemiology and Population Health.

235. THE CHAIRMAN: You are, as you have probably guessed, our third epidemiologist today. We have had a representative of the King's Group, we have had a representative of the Manchester Group and your group. You are the Chairman, as I understand it, of that group. A. Yes. If you have that background I will not say anything about that.

236. THE CHAIRMAN: Please do add to it because we gather that you three groups are all ones which are being financed by the MoD. A. That is correct. What happened was that the government decided to take a cool look at what research was needed in about 1997, late in the day but there we go. That is hindsight.

237. THE CHAIRMAN: That was confirmed this morning, that if it had only happened a little earlier it might have been that much easier. A. For epidemiologists it was a very difficult situation, asking about people's lives seven years or more ago. Basically, we were invited by the MRC to put forward proposals for research, so it was a normal process for medical research. In that sense it was independent in that any research group was invited to put forward proposals. Two were on the health of the veterans themselves and one was on the health of their offspring, or their own reproductive health. Here (looking at computer screen) we have the title of the talk. The question that the MRC posed was, "Were the veterans of the Gulf War at increased risk in terms of their offspring's health and their own reproductive health?". Myself and my group – Noreen Maconochie is my main collaborator – were successful in obtaining the grant and we set forth on this study. I do not really want to give a lecture and I am sure you do not want a lecture, but I am sure you have noticed that scientists want to give you a lecture, so please stop me. I just wanted to summarise the results in the best way I could, and I think that is often useful visually rather than verbally.

238. THE CHAIRMAN: Just remember that the shorthand writer cannot draw pictures. She can only take down words, so you have got to explain it as well. A. Good point. Have you copies of the published articles?

239. THE CHAIRMAN: I cannot pretend that I have yet read everything that I have been given but all that I have to hand are the two press releases, and we were glad to have those, one on reproductive health and the other one. I think they were both issued just a few days ago, 13 July 2004. That is your document. A. Yes. That may be a bit misleading because there is another (non-reproduction) paper wrapped up in that. I would like to clarify where we are standing: We published as a group three papers on the reproductive side. Also, as a bit of a sideline we have recently published a paper on the self-reported ill health of the veterans themselves. That may be a bit confusing and that is not covered in this talk. To give you a flavour of that (latter) paper, it was not our initial objective to look at the health of the veterans themselves because that was the primary objective of the Wessely Group and the Nicola Cherry Group, but we were the only group looking at all the veterans or attempting to question all of the veterans, and so we popped in some questions because it seemed a chance worth taking. We asked the question about their own health in a different way. We asked them whether they had reported new medical symptoms since the Gulf War and what were they, and we simply asked them to write them down. We did not enter all the text into the computer because, as you can imagine, we were faced with an awful lot of data entry, which I will come on to. What we did was code it up as we went along into groups of symptoms, Basically the primary results were very similar to the Wessely Group's, not surprisingly, since the Wessely Group and also the Cherry Group were sub-samples of the sample we used, which was all of the veterans.

240. THE CHAIRMAN: You had the unique characteristic of doing them all? A. We attempted to do them all, but I will tell you about a disappointment which came up. We attempted to question them all. We sent questionnaires to them all, 53,000 plus 53,000 ERA, so we ended up sending out a quarter of a million questionnaires with reminders and so on. I had not intended to talk about that study very much in the sense that it was a repeat of the Wessely findings.

241. THE CHAIRMAN: It is also quite important, I suspect. A. I am happy to talk about it, of course, but I have not got it in my talk here.

242. THE CHAIRMAN: Perhaps you could in your own words at whatever is a convenient moment just mention that because I think in a sense, in so far as it is confirming the views expressed by Professor Wessely and Professor Cherry, that is all very helpful. A. Can I come back to it at the end since it was not my primary objective? I do have some handouts. I think you have the handouts and the audience have not. This was a study of reproduction, which is my background The study design is a little bit boring but basically all we did was to get hold of the whole cohort via the MoD. The MoD selected for us a suitable control group which we are calling the ERA in the sense that they were all in service at the time of the Gulf War, were fit to go and were matched by age, sex, rank as well as fitness. I think maybe Simon Wessely has gone through this, and maybe Nicola Cherry, so I will not go through it again if you have seen it before. The way we did the study was that we had a specially designed questionnaire which we worked on in our previous study and modified it. I am happy to show you those but I am sure you have enough documents to look at. We did ask about exposure. The outcomes we were interested in I have summarised into three : The first one is foetal death and that is split into miscarriage and stillbirth. We then have malformation and infertility,. . Response rates were disappointing, I must say, in the sense that for men there was only around 50 per cent response overall. That was disappointing, having sent out all these questionnaires. The refusal rate was very low. We sent reminders and the only thing we could do at this point to make the study valid was to make sure it was not biased, because the obvious question is that those people who are not responding are not responding either

because they have problems or because they do not have problems. That is the epidemiologist's nightmare. What we did then was to conduct a very in-depth study of a sample of the non-responders, getting hold of them by telephone eventually to say to them, ". We understand you do not want to respond but tell us why". From that study, which was a lot of hard work, of course, we found the reasons for non-response were mainly nothing to do with reproduction or their own health, the answers were things like, "Oh, I forgot", or, "I am not interested. I do not have children", or, "I am suspicious of the MoD. I do not want to take part". As far as we can ascertain. The reasons were not related to reproduction. This information is published in the *Methods* paper . Hence we felt fairly confident to carry on with our study. . The women's response rate was much higher. Women tend in my experience to be much more willing to fill out questionnaires than men. . These were the numbers of pregnancies we ended up with at the end of the day conceived since the Gulf War, so since 1990/1991. The Gulf men reported 16,500 and the comparison group 11,500 pregnancies. The women, of course, reported a lot less. We had very few women in the Gulf, as you know. We ended up with a thousand pregnancies to analyse overall. That is to give you a flavour of the numbers we had. We had good numbers for most things. The issue of power was not a problem for most of the outcomes. It was for some.

243. THE CHAIRMAN: On that last one it was 16,000 pregnancies among the Gulf veterans but only 11,000 among the control group? A. Yes, but that is not very significant because the response rate was lower for the ERA group. I am just giving you a flavour of numbers. There is no significance in that, but I will be talking about infertility in a moment, which I think is probably what you are thinking about. Foetal death we have divided into early and late, termed miscarriages if it is under 24 weeks' gestation (40 weeks is the maximum for normal gestation) and after 24 weeks we call it stillbirth, but it is all combined in the term foetal death. For the men, on page 2, slide 4, to talk you through these numbers, we had almost 3,000 miscarriages reported by Gulf men and 1,500 miscarriages reported by ERA men. In terms of percentages that works out to 18 per cent of pregnancies ending in a miscarriage reported by Gulf men, 14 per cent ending in a miscarriage reported by the control group, the ERA men. What we did in the statistics then was to try and do something with those two risks, and we calculate this thing called adjusted odds ratios. We do not have to worry about it. It is just a relative figure wrapping up or comparing the two risks. It is a ratio. If there is no difference it would be 1.0. That is the basic principle. We find 1.4. We then have to look at the in-brackets figure for the statistical confidence we have around that figure, and that is to do with what is called random error: if we did the whole study again where would that ratio lie? It is estimated, using statistical theory, that it would lie between 1.3 and 1.5. It does not include 1.0; hence we are sitting up paying attention because that is called now statistically significant. . It is an important result; it appears that there is a 40 per cent excess. What we did then was to look at that result in a lot more detail.

244. THE CHAIRMAN: The 40 per cent excess being the 1.4? A. Yes, so another way of saying it in everyday language is a 40 per cent excess. What we did notice was that, having previously conducted a study on the nuclear industry, the proportion of pregnancies ending in a miscarriage by the nuclear industry workers, both those who were exposed to ionising radiation and those not, was around 18 per cent, so this we found quite interesting in the sense that -----

245. THE CHAIRMAN: Sorry – where is your 18 per cent figure? A. The 18 per cent figure was the proportion of pregnancies ending in miscarriage reported by the Gulf fathers.

246. THE CHAIRMAN: Oh, I see, yes. A. When we started looking at this data to try and make some interpretation we found that in fact the 18 per cent looked reasonable compared to this other study and it was the ERA group that looked slightly low. It looks as though Gulf War service on the face of it is associated with a 40 per cent increase of miscarriage but we are a little worried that the ERA group was a little low, and that is why we were very cautious in our interpretation.

247. THE CHAIRMAN: In which case it would not be a 40 per cent excess but a 30 per cent excess? A. It may be, or 20 per cent excess. We did do some calculations and we worked out that in fact if you have 20 per cent what is called under-reporting in the ERA group, that would explain the results. That is just a little word of caution on that result because that was one of our main findings. The reason why I am so cautious is simply that we were concerned that maybe the ERA figures might be low. Could I add for the statisticians who may scrutinise all this, and of course did before we published the paper, that we made all the appropriate adjustments for these analyses. --

248. THE CHAIRMAN: On the 40 per cent figure, just from your general knowledge or just general medical experience, would you expect a slightly higher percentage of miscarriages among the ordinary population? A. We would expect, reported by men, around 18 per cent. We were very careful not to use a population control group because that would be very misleading. I do not know if that was discussed with the previous expert witnesses. To use a population control is misleading in this work. We had to use the control that was chosen specifically for this group, ie, they were at war or actively in service elsewhere. They were in the armed services. It is comparing like with like apart from the one thing that was the Gulf War. On the next line of that table is later foetal death, which is called stillbirth, as I have explained. The bottom line of this result is that we did not find any excess. Time is going on. I had to spend some time on that result because it was one of our main findings. The next slide , is for women, and of course we have fewer foetal deaths simply because we have less women and fewer pregnancies recorded. We actually found no evidence whatsoever for an increased risk of miscarriage, which was good news for the women. There has been some concern for women returning from the Gulf War in the States. We did not find such an effect. We could not analyse stillbirth because we only had four reported, as expected. This is a rare condition. That was the finish of the results from foetal death. The next outcome is congenital malformation, as I indicated. That one has not come up on the computer screen and I will talk to it: It is on page 3, the third slide. This is just numbers given on this slide and we had approximately 1,000 offspring with recorded anomalies reported by men and only 27 reported by women overall. If we could return to the first row, on the face of it five per cent of all offspring reported by men who went to the Gulf had some anomaly. That could be minor or major. In the population as a whole in the UK you expect three per cent, which is slightly lower than we found for the ERA men, which was that 3.5 per cent of offspring had one or more anomalies reported. Here “offspring” means not only live births but also stillbirths and terminations. As you know, if a child is diagnosed with, for instance, Down’s Syndrome, there is an offer to terminate that pregnancy. You have to include those in this analysis. That has been criticism of a lot of the American work, that it has only looked at live births. The beauty of this study is that we did not just look at live births. For the women we only had 28 pregnancies. It was not enough to do any more with, to look at what type of malformations there were, so I am going to stop talking about those now and go back to the men and say let us explore that difference of 5.2 per cent and 3.5 per cent, because potentially that is a very important result.

249. THE CHAIRMAN: In the strict terminology of "excess", what does that mean? A. If you made a ratio it would be about 1.4, 1.5. That is unadjusted.

250. THE CHAIRMAN: That would be the same? A. Yes, about the same. In a way it is very misleading to look at all malformations because you can have a minor one like an ear tag versus a major heart malformation when the baby dies. The best thing to do is to look at each malformaiton t by type. That is what we have done in this table here. You can just about see that. I am sorry for all the numbers but basically if you look down the column with numbers on you are looking for a 1.0, meaning "no effect". Anything above 1.0 means that there is an indication of a higher risk in the Gulf fathers but, looking in the brackets, if 1.0 is included in the range then that figure is not statistically significant. It is a bit of a statistics lesson which I do not think you want to hear, but if you run your eye down there is very little evidence of any strong effect until you get to the two I have little arrows pointing at which are the urinary system, where you have a 60 per cent excess, and the musculoskeletal system where you have an 80 per cent excess within a range. This is discussed at length in the paper. That is potentially very interesting and statistically significant. I have got a lot more detail about what those anomalies are. We have not go time to go into it. The next thing we had to do was get medical verification of what these diagnoses were. This is called the validation exercise and the pattern that evolved from it was that the most easily visible structural malformations,which are easy to diagnose, were validated, but often the "softer" conditions were not. Let me just clarify that. When we repeated the analysis on these validated conditions only, meaning I had paper evidence of the diagnosis, so that if the parent said "a heart problem" we had paper evidence saying this child has a systolic murmur or whatever.

251. THE CHAIRMAN: I am sorry; I am not sure I have got that. Is this the graph in the top left hand corner? A. Yes. It is difficult to see. I will leave the file so that it can be printed out again. These are conditions that were not so easily diagnosed and were given a as non-specific label, as was discussed by the spevious speaker Often you have a condition which is hard to code or classify or give a label to and it is wrapped up in what is called , for example, "other malformations of the urinary system". With all the "other" malformations within each system we found a slightly increased risk. To us that indicated that perhaps these were not such serious conditions. The bottom line of all of this discussion, and you will see in the paper when you have had a chance to read it, is that we have found some interesting findings related to the urinary system and musculoskeletal system but for the major malformations we did not find an effect for Gulf War service. I would just like to point out one more thing. That is that the cardiovascular systemmalformations were not raised as was reported previously in the States by Araneta et al. We did not find, interestingly, any evidence of raised risk of chromosomal malformations and that is one of the things we could use as a marker of, radiation damage. Conditions such as Down's Syndrome, Turner's Syndrome and so on. That is dead flat. This is quite a technical discussion and I think it is necessary to read the paper. I am just trying to give you a flavour of our conclusions. The final outcome of interest is infertility. You can define infertility in many different ways. It is quite a difficult thing to study because people can move in and out of infertility. We defined it as a period of trying for a pregnancy for more than a year unsuccessfully since the Gulf War, and a report of consulting a doctor. Again, there is a paper we published recently which I think you alluded to at the beginning. I am sorry there is no data on the screen but on the paper copy it is page 4, slide 3. We found again an excess of about 40 per cent : seven per cent of men said they and their partners failed to achieve a pregnancy despite one year of trying and consulting a doctor compared with five per cent of the comparison group. It is a small effect but quite important. Two other things to add. We had a great interest -----

252. THE CHAIRMAN: You said that is a small selection but the numbers involved there were 732 with the cohort. A. Yes. In the paper we have analysed several other ways -----

253. THE CHAIRMAN: It is more compared to your overall number, obviously. Yes, I see. A. There are two other things to add about that. We actually had some indication of the reasons for infertility because, of course, we were trying to tease out what these problems are because it could be female factor infertility. It could be blocked tubes, for instance, or it could be the male, and of course that was the side we were interested in. We did find some evidence that there was a higher proportion of Gulf men with infertility who had abnormal sperm. That is called *teratospermia*, but unfortunately the numbers were extremely small so, despite our large study, we could not conclude too much from it.

254. THE CHAIRMAN: I see. It is the number of people with *teratospermia* that is small. A. Terribly small. It is about six in the Gulf War. It was 21 in the Gulf veterans and six in the non-Gulf veterans, so we are talking of very small numbers, but it is worth flagging up as something we cannot ignore but the confidence around that result is rather low. The second piece of additional evidence is that the pregnancies fathered by Gulf veterans who did not report infertility problems, when we asked them how long it took to conceive this particular pregnancy, was longer for Gulf veterans than ERA. Some of you may jump up, quite rightly, and say, "Did you ask about sexual relationships?". We did not. We simply asked, "How long did it take you to conceive this pregnancy?". It is a crude question. We freely admit that that is crude, and it is often used in epidemiology as a very crude indicator of some environmental damage. I am not particularly a fan of this outcome because I think it is too crude, but I am reporting it because we did ask it and we did find that there was a longer period needed to conceive a pregnancy from Gulf veterans. Again, all the tables are in the paper itself. In terms of conclusionsfor the women, because we had less data from the women, so I will start with them first, we did have enough data to look at miscarriage and we found no evidence of an increased risk of miscarriage. We had too few data to look at stillbirths and infertility and malformations. For the men though, and we are now on page 5, top slide, I am going to start with the negative results. I have been criticised for this in various press reports because it looks as if I am trying to downgrade the effects I found. That is not the case. The reason I start with the negative findings is that I think it is good news. One thing that has happened over all the years of my experience of talking to veterans is that they are never told when there is no effect found. . This is a very emotional subject for them, so I decided to be very up-beat about where we did not find, and had confidence that we did not find, a real effect between service in the Gulf War and outcomes. These outcomes were stillbirth and most of the structural malformations, chromosomal malformations and syndromes. But we did have some weak evidence for increased risk of malformations of the urinary system and the musculoskeletal system. If you look at the next slide, we did find that the risk of miscarriage was higher in pregnancies fathered by Gulf War veterans -----

255. THE CHAIRMAN: This is the 1.4? A. Yes, and that the risk of reported infertility was higher for Gulf War veterans and that pregnancies fathered by Gulf veterans took longer to conceive. We did analyse all of these outcomes according to the exposures reported by the veterans and we found absolutely no relationships at all. This is self-reported exposure because it is the only exposure we have to go on. We are still on the second slide on page 5. Turning to the third slide, the interpretation of these findings has to be very cautious because, as I indicated before, my concern is the role of bias. I have some hard evidence of that for the miscarriage result. Although I am saying we found some associations, what we cannot at this stage conclude is that they are causal. That is a typical epidemiologist statement and I do apologise for that but this is putting together a jigsaw and this is one piece of evidence. As

for the recommendations for further work, I would say that we have complete the analyses of the data we have. I am personally at the moment comparing my results to those of Araneta who has recently published on malformations by grouping, which nobody else has done because we are the only two groups that have done that, but she used a different grouping. She used the American system; I used the European system, so I have gone back and re-coded and I am still in the process of doing that. Secondly, and I think most importantly, one of the big lessons – and I am sure this was discussed this morning – is that, looking at things retrospectively is very difficult. When it comes to reproduction, which is full of emotion and voluntary control because people stop attempting, we have to take on board the fact that ideally we need to do surveillance prospectively and there is no question that that has to be done. It would be a serious omission not to do that. We have to survey people as they come back from any conflict and include their reproductive health as part of a health screening procedure, because reproductive health is often ignored but it is an important part of all our lives. At the moment we have included some of our questions in the OP TELIC study that Simon Wessely is just undertaking, so we are going some way to doing that. We would like to extend that to look at possibly taking some semen samples but that, as you understand, is a very tricky approach to take. It is a delicate issue, it will not be popular, and it is also not scientifically easy because semen quality varies by individual, and so to do it properly would be expensive and complex but we are getting our heads together to try and design a good study. That is the state of play at the moment.

256. THE CHAIRMAN: Have you got the money for that study? A. No. We have not even got a proposal together yet but we are putting one together. I still have some doubts about semen quality. . It is not easy because quality varies by state of health, sexual activity, alcohol and so on, so you have to control all of those things, and to ask veterans to give semen samples is not easy. It has been tried and Nicola Cherry has been involved in the study of this and she had lots of problems. We will talk to her about that and see whether it is feasible at all, or we may be able to do it in a selective way, to flag people who are displaying problems and then go for the semen quality.

257. THE CHAIRMAN: Thank you very much indeed for that extremely interesting presentation. There is one question I wanted to ask you at the outset on this study, but you are hoping to come back, I know, to the other study you mentioned right at the beginning. Is there an obvious explanation for why the rate of stillbirth should be roughly the same but the rate of miscarriage should be so much higher? I can think of an obvious explanation but it probably is not the obvious one. A. It is a very good question. The causes of early foetal loss are very different from the causes of late foetal loss.

258. THE CHAIRMAN: Are they? I do not know enough about obstetrics. A. Early foetal loss, especially very early foetal loss, is related to chromosomal abnormalities.

259. THE CHAIRMAN: I was just thinking that the more miscarriages there are the fewer stillbirths there are. Is that not so? A. I think you are thinking of it in terms of one pregnancy, multiple foetuses. Basically a woman at the end of her life will have lost on average 20 per cent of her pregnancies. It is quite surprising. It is a very common outcome. People do not realise. I am working on a study of population based miscarriages.

260. THE CHAIRMAN: And going the full term, if that is the phrase, the number of stillbirths would be? A. Oh, very low; less than one per cent. It has come down over the years because it is an obstetric problem often. It can be an intra-partum problem. The baby dies during delivery. It is a debate about the causes of the two things. Early miscarriage is

very separate from late stillbirth. We are getting, if you like, environmental causes of foetal loss which would manifest themselves early in the pregnancy, less likely in late pregnancy.

261. THE CHAIRMAN: This has nothing to do with what we are discussing, but is it also the case that the number of miscarriages is coming down over the years compared to Victorian times? I imagine in Victorian times miscarriages would have been much higher than 20 per cent. A. It is a fascinating question because we do not actually know the population rate of miscarriages at the moment. If we look out there we cannot say with any confidence what the rate is. We estimate about one in five. I have just conducted a population based survey of 60,000 women in the general population and we have come up with 20 per cent. I cannot answer the question about whether it has changed over time. In fact, when we look at it, it appears to have increased and I think I can explain why.

262. THE CHAIRMAN: What, the rate of miscarriages? A. Yes. The reason is that pregnancy is diagnosed earlier and earlier. We now diagnose a pregnancy after two days' missed period, whereas in the Victorian times people would wait for four or three missed periods before they would say, "I am pregnant", but then the rate of miscarriage might be on the way down. We have to consider all these technical issues.

263. DR JONES: If we may stay with your studies on reproductive health to start with, you yourself referred to a possible criticism in the finding that Gulf War fathers took longer to conceive than non-Gulf War fathers, but you did not ask about things like frequency of sexual intercourse. Did you have a reason for not doing so? A. We did consider it. Interestingly, in our previous study in the nuclear industry we wanted to go that way but it was considered totally inappropriate. We did ask a few veterans would they find it acceptable and they thought it was possibly not. It is to do with acceptability.

264. DR JONES: I thought it might be. A. I think if it was a study of females it possibly would be more acceptable. Even then I am not sure. A proper study of what you are getting at, which is fecundability, which is the probability of conception at each cycle, needs careful diary entries of sexual intercourse per day, plus dates of the menstrual period, ovulation and so on. That is terribly difficult. It has been done but, as you can imagine, it is difficult to get buy-in to that. It is done in the infertility world to a certain extent when people have kept diaries to try and detect what is going on. I think it is a big flaw in our study of fertility.

265. DR JONES: I realise that in effect I was asking you to take a jump into a minefield with that. Do you have any thoughts on the possible mechanisms for the increase in miscarriages? A. Top of my list I think we should consider bias. In terms of looking at real effects one of the things of interest to me is exposure to organophosphate pesticide because that has been reported in the literature. As far as we know officially there is little exposure to organophosphate pesticides. We found no effect on self-reported exposure to pesticides but *a priori*, sitting down with my colleagues, this would be the exposure we would be interested in. That would be the one I would pull out as the most obvious. The thing that we very rarely talk about but we have spoken about in a few lines in the paper is stress, but of course this is miscarriage in females and it is the males that are having the stress. That sounds far-fetched but it may not be as far-fetched as we think, given the fullness of time and with the studies ongoing. Stress we know has a huge effects on lots of different outcomes. DR JONES: It is not inconceivable that stress can be catching. A. Yes, stress can be catching.

266. DR JONES: Turning to your big study of the symptomatology, leaving the reproductive one, in your paper you make, very understandably, quite a lot of the fact that this

is a very big study compared with previous studies which have taken random samples and much smaller numbers and so on. Does that imply that you are a bit suspicious about the results of those earlier studies? A. Not at all. In fact, their studies were set up, again *a priori*, with the specific aim of looking at symptomatology and they are experts on symptomatology and I am not. That may have been misleading in the paper. It was more that serendipitously we used the data we had. But we asked the question in a different way and it was a study on reproduction. In other words, we may have got a different kind of answer whereas the respondents to the Cherry and Wessely specialised studies knew it was about themselves. It was clearly about them and about how they felt. As I said, our study was about their children and I think people do respond differently. We had a help-line and people were very happy to ring us up and talk about their problems and their children. It almost seemed like an aside to them – "And, by the way, how are you now?". We thought that that was a worthwhile thing to look at.

DR JONES: You deal with that on page 4 of your paper and you have really anticipated my next question, so that is fine. That is all.

267. SIR MICHAEL DAVIES: You have touched on this. Could I ask whether you are following up your studies into those returning from the second Gulf War, if that is the term to use, the Iraq war? You said you were associated with Professor Wessely. A. The only thing we have done, at no cost at all, is to add some questions to the Wessely questionnaire. It would have been good to add pages and pages of questions but it was not feasible for their work. I think it is good enough as a flagging question but if there is any indication of abnormalities in any of the outcomes I have described I would like to get back to them. On this question of doing semen analysis, we are still thinking about if we can do it, how we can do it and how much will it cost. That must always come into the equation. We are going to make a proposal to do a follow-up of the flagging question on the Wessely questionnaire. I do not think that would be terribly expensive but we will see how the MoD respond. Semen analysis we are still thinking through the methodology . I think that is possibly the only way to go. I have thought about this a lot – is it worth going back to the Gulf War one group again with more questions? I have a feeling it is not simply because of the problems we face with biased response, time and so on. What we get back from what we have put in is diminishing returns. To be fair to the veterans, they need answers and I feel slightly compromised by the fact that my answers are relative answers, as all scientists do when giving those answers, in saying, "Yes, we have some effects but we are not saying it is causal". I think that is always the case. You feel a sense of responsibility to science and to the veterans but I do not think it is worth going back for another large study because I think the answers would be the same.

268. SIR MICHAEL DAVIES: You have talked about bias and how you feel that the findings may have a bias in them. From what you have learned from what you have done would you say that there was a Gulf War problem in the studies you have done? Is there something that one can say is due to the Gulf War? Both our earlier experts this morning have admitted that there is a problem even if they cannot identify what it is. Would you say that there is a problem? A. I avoid using the word "problem". As I said in my conclusions, we found associations between increased risk of miscarriage, some odd malformations and infertility, and I think that is as far as I would go. If you would like to call that a problem, yes, it is a problem.

269. SIR MICHAEL DAVIES: It is a problem for those who have come before us saying that they are suffering. That is what I mean. A. I cannot as a scientist say. You are talking

about a policy. I think as a scientist I cannot apportion blame or attribute blame to the Gulf at this present time. It is a disappointing answer.

270. DR JONES: Turning to the future, and, sadly, to the present as well, if I may quote from page 11 of your paper on the symptomatology, "In order for more rigorous aetiological studies of post-conflict illness to be undertaken in the future there is a need to improve routine health surveillance and record keeping, both pre- and post-deployment". I think it would be very difficult to disagree with that. Do you know of any evidence that that is happening? A. As far as I understand there has been an improvement in record keeping. You referred with the previous speaker to lost medical records. I think the general level of attention has gone up, and I know that there is some work being done in DASA now. I do not know the details. They are much more involved in health surveillance as routine, which is a very good way forward, but I am afraid I cannot answer the question in terms of detail. I think you need to talk to the people from DASA, if they are appearing, who are developing record keeping. With all this work epidemiologists are obsessed with record keeping and it really is at the root of answering the questions. If we do not have the data we will always be in this position. As far as I understand it important lessons have been learned.

271. THE CHAIRMAN: Is there any evidence yet about infertility being carried forward to the next generation, or is there nothing? A. We have not questioned any of the offspring at all.

272. THE CHAIRMAN: You just do not know at the moment? A. The answer is we do not know.

273. THE CHAIRMAN: I have not got your main paper yet but I have got the press release. What it does not say here, but I am sure it does there, is the ratio between the Gulf War illnesses and the rest of the population at large. You say in your second paragraph of the press release simply that Gulf War veterans were more likely to report mood swings, memory loss, lack of concentration, etc. What was the actual ratio? Is that in your paper? A. Yes, it is, and it is 2.7. This is for all things. One or more new symptoms was 60.7 per cent in the Gulf versus 36.7 per cent in the non-Gulf. This comes out, if you want to put an odds ratio on it -----

274. THE CHAIRMAN: That percentage is given at the top of the second page. I was not sure that I quite understood that. You say that 61 per cent of the Gulf War veterans reported at least one new medical symptom since 1990. I was not sure what you meant, and I think you have now explained it, by "a new medical symptom". You mean that they were healthy before 1990 and are not healthy now in respect of one symptom? A. We simply asked, "Have you developed any new medical symptoms since 1990?", so if they suffered migraine before the Gulf and still suffer migraine they would not have reported that, if they had interpreted the question correctly.

275. THE CHAIRMAN: And 37 per cent of non-Gulf War veterans have reported one new symptom? A. Yes.

276. THE CHAIRMAN: And therefore is it as simple as saying that is two to one? A. Yes. That is an odd that you have just quoted. You instinctively calculated the odds. The reason it is not just two in the paper, it is 2.7, is because it is what is called "adjusted". It has taken account of certain effects of age and other things.. Of course, we would all expect new

medical symptoms since any time ago because we are all ageing and things happen. It was a doubling, which is very similar to Wessely and Cherry.

277. THE CHAIRMAN: The full paper, what is the date of that? Is that the same date as the questions? A. This is one of those funny publications that appear on line. It is only on line and not on paper and I think it came out the day after the press reslease. Yes, I have it here. It is 13 July. It is free access to all which is why we try to publish it there. It is free access to veterans who have access to the internet.

THE CHAIRMAN: I think that really is the last question. Thank you very much indeed for coming. You have been a great help. At least you are remaining in this country for the time being and not going back to Canada.

The witness withdrew