



Type T Patch Code (New Document)

For use with Documents with Protective Markings up to and including

CONFIDENTIAL

Document UIN

2 0 0 0 1 0 0

PM

Caveat

0 0

0 0

NOTE: UK EYES ONLY (UKEO)
and other Caveats are
NOT PERMITTED.
Give document special handling.

Prepared By

Number of Sheets

0 0 9

1 2 8

Note: See coding sheet for Protective Marking (PM), Caveat and Prepared By codes.

For use with Documents with Protective Markings up to and including

CONFIDENTIAL



COMMONWEALTH REPORTING SERVICE (21E)
Level 4, Commonwealth Courts Building
451 Little Bourke Street, Melbourne 3000 (03) 6071262
(03) 6071263
TRANSCRIPT OF PROCEEDINGS

© Commonwealth of Australia

21
ROYAL COMMISSION INTO BRITISH

NUCLEAR TESTS IN AUSTRALIA

MR JUSTICE J.R. McCLELLAND, President
MRS J. FITCH, Commissioner
DR W.J. JONAS, Commissioner

TRANSCRIPT OF PROCEEDINGS

AT MELBOURNE ON TUESDAY, 30 OCTOBER 1984, AT 10.02 AM

Continued from 29.10.84

Secretary to the Commission

Mr John Atkinson
GPO Box 4044
SYDNEY NSW 2001

Telephone: (02) 264 5155

MR McCLELLAN: Dr Lokan, I think, your Honour, was - - -

MR BREZNIAK: Your Honour, just before the witness is called, my name is Brezniak, solicitor New South Wales.

THE PRESIDENT: Yes, Mr Brezniak.

MR BREZNIAK: Your Honour, if I may just tender the two photographs from last week from the witness John Baker that the commission called for. I tender those two photographs.

MR McCLELLAN: They came from Mr Baker, did they?

MR BREZNIAK: They came from Mr Baker.

MR McCLELLAN: They can be included as part of exhibit RC108.

MR BREZNIAK: Your Honour, I might just say in addition that in accordance with your Honour's rulings, there would be no attempt to cross-examine the witness from any other party, but in relation to other witnesses I would be seeking at the appropriate time your Honour's direction.

THE PRESIDENT: Very well.

MR McCLELLAN: Nothing further to be said at this stage. I think Dr Lokan was being cross-examined by Mr Eames.

THE PRESIDENT: Yes. Yes, Mr Eames.

KEITH HENRY LOKAN:

MR EAMES: Dr Lokan, perhaps I should start by, if it was not clear yesterday, making it clear what I am putting to you and specifically what I am not putting to you. As I think I said yesterday, the study which has been conducted this year by the Australian Radiation Laboratories you understand will be of considerable importance, not only to the Royal Commission's terms of reference for future land use, but obviously of considerable importance to the aboriginal people who would be wanting to live on the land. Do you understand that?---Certainly.

Now, I raised with you yesterday the question of the AIRAC 4 study and criticisms which had been made of it, and if I did not make it clear - and I know that you have re-read that material last night, as indeed have I - if I did not make it clear, would this be a fair statement of the situation, that so far as the annexure to AIRAC 4, being the report of the Australian Radiation Laboratory scientists, is it fair to say that

the criticism that was levelled at AIRAC 4 was not levelled at the competence or the skill of that study so much as levelled at the conclusions which were drawn by AIRAC 4 based, or purporting to be based, on that study and on the other studies which formed appendices to the report?---If I can intrude a comment, the document in fact directs its discussion specifically to the plutonium aspects.

Yes?---And the Australian Radiation Laboratory studies were concerned specifically with the major trials, and in fact we did not provide technical input into AIRAC 4 on that subject, as a laboratory.

Yes, I appreciate that, and that is the point I wanted to clarify, that the ARL study which formed an annexure to AIRAC 4 did nonetheless refer to studies done with respect to animal and plant life in the zone; is that right? ---That is correct, yes.

They also in their report referred to the question of the risks of plutonium being ingested as a result of wind-borne resuspension?---Yes.

And although there were further studies which went into those aspects in rather greater detail - in particular a study from Mr Trefry of the Bureau of Meteorology, Mr Ellis, I think, of the Atomic Energy Commission, and I think Mr Douglas of the Department of the Environment was also referred to - those studies took the matters rather further than was referred to in the ARL report; is that right?---Correct.

But nonetheless ARL made some references to those aspects and AIRAC 4, or AIRAC, when it came to write the report for AIRAC 4, appears to have relied on all of those reports, would you agree?---Yes.

Now, could I ask you as a general proposition: having had the opportunity to re-read it, do you believe that the conclusions which AIRAC reached on the basis of those reports, and specifically on the basis of the ARL report, was a fair summation of what ARL was saying in its report?---You have caught me a little flat-foot. I must admit I spent most of my energies last night re-reading the material relating to plutonium and - yes - - -

All right, well, perhaps I can take you to specific aspects which might assist. Could I ask you firstly - and I said I wanted to explain the purpose of the questions - the study which was done in 1977 which formed the basis of the AIRAC report of the AIRAC 4, was the terms of that study, insofar as it involved the ARL, similar to what the study has been this year?---I believe that the study which has taken place this year, which is largely concentrating on plutonium, as I said yesterday, for the reason that we believe we understand well enough the major trial history and

predictable future behaviour, the plutonium contaminated minor trials sites we felt were not - represented a much more complicated problem. We appreciated that the study done in 1977 was limited and we believed that the appropriate thing to do was to devote all of our efforts to a proper study of plutonium contamination on the range.

Yes?---Now, to put that in perspective, we are probably investing 20 times the effort now in studying plutonium in particular than was spent in 1977 in terms of man use, and it is a very thorough study. If I can make one further comment, I feel that yesterday you and I were in some sense talking at cross-purposes in that I think it is - - -

Talking crossly, anyway?---It was within the minds of us in the laboratory that the basis of undertaking that study was to provide the best possible information and the most detailed information in order that the best technical future judgments can be made about appropriate management, rehabilitation and whatever of that site.

Right?---And I remember that you opened your remarks with expressing a concern for the future radiological condition of the range in terms of its impact on the Aboriginal owners of that area.

Yes?---I do not think that there is any conflict at all between your purposes and our purposes in that regard.

Fine. Well, could I take you to page 24 of the AIRAC 4, which is in fact about the second or third page of the ARL report, and you will see at page 24 there is a heading The Present Survey, that is the 1977 survey? ---Unfortunately I have got a truncated copy of AIRAC 4 and I do not have our own report within it.

And find page 24?---Yes. I have found it.

If I could just read that, it says of the present survey:

The present survey for which the field work was carried out in August 1977 was undertaken with two major purposes by geodetic survey are plotted in figures 1 and 2.

Could I ask you: to what extent would the survey of 1984 differ from the scope of the survey referred to there?---Well, the paragraphs that you have quoted related to the study of fission fragments and neutron activation products from the major trials, not from the minor trials. That is the first point. The second point is that our present study is a much more - although it is not of those particular areas, but is now of the plutonium contaminated areas - has been

done on a very much more closely spaced grid and with an enormously greater volume of quantitative data.

Yes, and how many people are involved in the exercise now?
---In the field parties this year so far we have had a trip in May, as I mentioned yesterday, a follow-up trip, which was more concerned with supervising the installation of fences but allowed for the acquisition of more data. There is a further trip in mid-November and then a third trip coming up in December. The number of scientists and technicians within those parties vary slightly, but is usually six to eight full-time professional workers, who put in two weeks at a time.

Was one of the difficulties in the 1977 survey, apart from the ones that you have mentioned about person power and instruments and so forth which were available, was one of the difficulties that the people conducting the survey did not have full information from the British about the minor trials, and in particular about the major trials?---I am not competent to answer that. I joined the laboratory in 1978 after that original study was --long after it was planned, and in fact after the collection of field data had been carried out. I do not know how - some other witness will have to provide that answer.

Well, could I put it another way: to your knowledge, after the survey was completed, did additional information come to light about radioactive substances which were in the field area which had not been known about apparently at the time of the survey, either in terms of scope or type?---I am not aware of any, except for that which has occurred this year. Can you suggest
- - -

Was the presence of cobalt known in 1977?---The presence of cobalt 60 associated with the Tadge explosion?

Well, apart from Tadge, in respect to any of the minor trials, was that known?---Not to my knowledge. It is hard to be categorical, but I cannot think of circumstances that I know of now where there was cobalt associated with at least the trials of interest to us now, that is the plutonium contaminated ones.

Well, so far as the plutonium itself was concerned, was it subsequent to 1977 or subsequently from 1977 discovered that there was a spread of plutonium much wider than what was expected or understood to be the case in 1977?---No, I think that is not correct. I think the formal records provided by the British, not necessarily in the Pearce Report, but partly in the Pearce Report, but in other working papers, did outline the - approximately the boundaries of plutonium contamination. It is one of our present purposes to make certain that that is right and to extend it with improved sensitivity.

Well, that is one of the things I was coming to, but was the extent of knowledge about the burial pits as complete then as it is today, in other words, as to how much material was buried in those pits, and indeed how big the pits were?---The dimensions of the pits and their location is well known. Their contents are not too well - are not too precisely documented. I think at this point it is probably somewhat indeterminate. For example, inside the Taranaki area, to put a figure on how much plutonium is buried within there, and in fact that is one of the reasons why we are doing our present work, is that we hope to acquire a quantitative knowledge of what is in the pits because we know the total quantities of plutonium used. We believe that we will be able to work out how much is on the surface in one form or another, and then by difference we will ascribe the rest to be within the pits.

Were any pits discovered after 1977 in the cemetery area that contained cobalt that were not known about in 1977?---Not to my knowledge.

Well, is the situation this, that certainly so far as the present survey is concerned, given that you have got additional people concerned in those tests, is it an essential starting point that you have full knowledge of what was involved in the minor trials and the major trials if you were to be able to look for the right things?---It depends what you mean by full knowledge. We have no particular interest in understanding the purposes or the military significance, if you like, of those tests. It is to our advantage to know the quantities of materials that were dispersed within each experiment, and I should say that information has been supplied to us. We need to have a reasonable understanding of the nature of the dispersal, and we have had a lot of that information from the beginning after each trial when the - those responsible for the trials mapped the distribution immediately of plutonium that was recorded, and we have been able to, and will be able to, draw on that information. I believe that we are in a position with what we can and are measuring ourselves and with the auxiliary information that we have available, and perhaps we will need - we know we will need to ask Aldermaston for some particular additional information to ensure that our interpretation of what we are measuring is accurate, but I do not at this stage believe that we will be in - have major problems with it.

Well, does that mean that you are, at least to that extent, dependent on the British officials giving you accurate and full information in response to any queries that you make?---That is a bit hard to answer. I would like to say that we are fairly professional and we believe that we can get to the right conclusions ourselves. It would be very nice to confirm our conclusions by asking particular questions of the British when we got them properly formulated.

But are you conducting these surveys on the basis of records which were in existence at the time, that is, during the minor trials and the major trials? Were you conducting your survey on the basis of new information which has been made available to you?---I guess we are conducting the surveys using pre-existing information as the starting point, that is, a knowledge of the locations where trials were carried out, and using our own growing knowledge to - as in any technical study, you tend to step forward from what you have already discovered, and I think it is fair to say that our planning, which changes from month to month as we find new things, is more controlled by what we are finding than preconceptions about what is there - though I must admit in the beginning we did have preconceptions

that everything was in the form of inhalable dust.

I suppose the question is from which field is your knowledge growing. Is it one that is forever England, or is it basically the Australian fields that you are ploughing to find this relevant information?---I think that is a good comment. One of our assertions to ourselves has been that we see it of great value to establish a competent, independent, world-based Australian understanding, based on our own measurements, rather than depend on information supplied to us.

Well, I do not wish to put you on the spot, but was a reason for that decision an assumption on your part that you might not be getting the full picture from the British?---No. I do not know quite how to answer that. I guess it may have been in the back of our minds that it would be desirable to be able to say that we knew the answers because we had worked them out for ourselves.

Does that carry with it a problem that if there are any chemical components that were used in any of the minor trials that you are not aware of, that you could miss substances simply because you went out there with instruments or with a plan, which would not necessarily have found them?---That is always conceivable, but I think - well, our concerns are, of course, more with radiation emitting atoms.

Yes?---We are a radiation laboratory. Perhaps I might say that we have in mind as a sort of insurance, or a piece of good housekeeping, that we plan in our December visit to take to each minor trial site - even the ones which everybody has long considered to be entirely harmless - a high resolution instrument to make an on-the-ground measurement just in case there are things there which we do not know about, but in fact to confirm our expectation. Perhaps that is putting it a little strongly, but to confirm, or establish as a fact that those sites which we believe from the record to be inert are indeed inert. We are not making assumptions simply because we are told they are inert that that will be the condition.

But would not a simpler approach to this be to ask, and be assured, that you had been given a total picture - ask the British what substances were used; what exactly did you do, and then start from that point, rather than, are you not, starting from an assumption of a lack of knowledge and attempting to find out?---No, not entirely. We do have a great deal of information about the nature of radioactive materials used at each of the minor trial sites. Our expectation is that that will be accurate. We will be in a position of confirming for ourselves, and perhaps, as you say, providing for ourselves the assurance that we have a complete understanding of the radioactive materials, or the present of the - current presence of radioactive materials.

Well, what about the non-radioactive substances? Will the survey involve any people looking for those?---Yes, in a somewhat more restrictive way we will - planning and have under-way the analysis of soil samples from each site for beryllium.

Now, just taking beryllium, was that a substance which was discovered, as it were, by accident, or was it a substance that was being looked for?---It is something which we have known from the beginning was used at minor trials for particular purposes. We sort of understand those purposes. We have the expectation that there was beryllium there, and we have the knowledge from the Pearce Report, and from other reports, that beryllium was used and we are merely planning to provide a quantitative number for the concentrations of Beryllium to see whether it is a potential inhalation hazard.

I may be wrong, but there were two versions of the Pearce Report, were there not, one which was edited to some extent and one which subsequently - which was released? ---That is right. I understand that the earlier version that was released was a somewhat truncated one which left out detail which at the time was thought to be potentially undesirable to release, for example, the exact co-ordinates of burial pits. One could imagine scenarios where people who wanted to make mischief would find it easier to make mischief if they knew exactly where to find burial pits, so that sort of information was left out.

You may - you may not be able to answer this, but was beryllium referred to in the edited version which was first released?---I do not recall.

Well, we have been told that the minor trials amounted to some hundreds - 2, 3 hundred. We do not - no one seems to know the precise number. Have you received information from the English on all of the minor trials which were conducted?---Not in a unique sense describing each individual trial, no, but we know each area that was used and we have an understanding of the nature of the trials that were carried out. Perhaps I should expand that - - -

Yes?--- - - - slightly. There were 4 sites at which plutonium was used. They represent a very small number of total minor trials. The most significant minor trials, in our view, are those that related to plutonium, and in particular, the ones at Taranaki, because at Taranaki most of the plutonium that was distributed on the range was associated with 12 particular studies carried out at Taranaki, and that is the one which is attracting the lion's share of our effort. There were 3 other sites where much smaller quantities of plutonium were used. They are being studied with

the same degree of intensity but they only cover a few acres each. Beyond that there were many - I suppose one should call them weapons engineering development trials. The details of them I do not understand. I know they are associated with - and this is why they use beryllium - many of them are associated with what are called initiators, that is, the development of a pulse of neutrons that is used in triggering an A bomb - and I should say that until a couple of years ago I did not even know the word "initiator", but one learns in this business. There were many trials in well-defined areas of differing natures which used, in the main, short-lived radioactive sources - that is, things which decayed in typically 100 days, half lots of 100 days rather than many years - use beryllium because the radioactive sources interacting with the beryllium produced neutrons and frequently were associated with natural uranium as a non-fissile, that is, it would not form a nuclear explosion - - -

Yes?--- - - form of uranium as part of these technical engineering weapons development exercises. Now, most of the minor trials were associated with those sorts of programmes. We know where they occurred, and it is those areas in particular, we are going back to to look to satisfy ourselves that there do not remain any residual long-lived radioactive materials, nor hazardous concentrations of beryllium.

Did you find any evidence that any of the minor trials were indeed major; that they were atomic tests?---We found no such evidence at all, and I - to be honest, I think we would know, because a nuclear explosion leaves a very firm thumb-print on the ground in the form of residual radioactivity produced by the neutron flux at the time of the explosion, and all of the - no, I should not say that - higher altitude tests, like one that was conducted from a balloon, left very little impact on the ground surface.

Doctor, is it a fair comment to say that had these tests been conducted by the Australian Government, and you were now asked to do the survey that you are doing, you would not be going about it this way at all, would you? What you would be doing would be to say to the Australian Government, "Can we have all the records, please, and our starting point will be that we will go through all the records - not just the published, but the unpublished records, and create for ourselves a composite picture of what occurred at all of those trials; then, on the basis of that total knowledge we would then design and conduct our survey." I mean, that would be the obvious way you would do it had they been Australian trials, would it not?---I am not sure that is true. I - I may proven to be wrong, but I believe that in terms of radiation health related information we are not so far encountering

any impediment from the British in getting information, and I do not know that the things that relate to the details of weapons design add or subtract anything to our understanding of the radiological condition of the ranges.

Well, that may be so - - -?---That might be wrong. That is perhaps - - -

- - - but would not the situation have been had they been an Australian series of trials that you would have at the very first point have asked, and expected to receive, the whole of the material, even if you decided that large portions of it proved unnecessary for your purposes?---I find that hard to answer. I really do not know what would have been the attitude of, say, an Australian Ministry of Defence conducting such trials to releasing to our laboratory information that was not relevant to radiation health, but which had secret military implications.

All right, well, has a request, to your knowledge, been made for the purposes of your study? Has a request been made of the British asking for the whole of information which may be relevant to any radioactive substances on the range?---Again, I am not the best person to answer that. I have myself talked to the British. I visited Aldermaston earlier this year, - and they made it clear that they would be co-operative in supplying any information which was relevant to the understanding of the radiological condition of the range.

And who was to judge the relevance?---At that stage we were not exploring that detail. I expect that the way it will come about is that we will ask for information relating to particular trials, because we can see that as being relevant to our understanding, or confirming our understanding, and, well, I really cannot predict, but I expect that it will be in - we will have access to material offered in response to questions that we ask.

Doctor, you do not think that this is a little bit like Pin the Tail on the Donkey, or the lion, as it were? The process of going about finding information? You do not think that that runs the risk that the people who are doing the survey have to always think of the right questions to ask - - -?---I do not think you are doing - - -

- - - before information will be obtained?---I do not think you are giving us much credit. I think we have a good deal of background understanding of what was done with what materials on the ranges, on the various ranges. I suspect, but I would not be firm about it, but we have at this point an adequate background understanding from materials that are in our hands, and many of which have been in our hands for a long time, to enable us to

make the best possible decisions about our own measurements and surveys. I cannot guarantee that, of course.

Well, I am probably not allowed to ask you this because it is probably a secret, but are you aware whether the information which you have obtained for the purposes of this survey, all of that information has been made available to this Royal Commission?---I do not know what information has been made available to the Royal Commission, I am sorry. I have supplied some, but I do not know what has been supplied elsewhere.

THE PRESIDENT: Would you expect the British to volunteer all the information in their possession?---I believe that the British could be expected to - - -

Without being asked?---Yes, sir, I believe that they - well, I do not know. I suspect they have volunteered information which relates to radiation health and an assessment of the radiological condition of the range. I am certain that they are unlikely to volunteer information which carries what they would perceive as military implications - implications of military secrecy, but I honestly do not believe that that has very much to do with our concerns, or your concerns. Our concerns are with - - -

Well, we will be the judge of what our concerns are, doctor? ---I am expressing an opinion. In some ways it is nice not to be contaminated with too much knowledge of - about military matters.

Well, that may be so, unless any of those military matters contain information which may be relevant to the future health of people using the range; is that not so?---Yes, but as I have said several times, I believe that is a very unlikely circumstance.

Well, doctor, you have said, before I leave this topic, you have said that you are not the appropriate person to be asked about this. Can you identify who the person would be who would be having these negotiations with the British, that you have been describing, in obtaining the information?---Well, the contact department is the Department of Resources and Energy.

And is there a scientist there that you report to about your requests and they pass them on to the British? Or do you deal directly with the British?---The requests which we would make to the British would be passed via the Department of Resources and Energy to the UK High Commission or pass them to the Ministry of Defence.

Is there any request that you have made through those channels to the Department of Minerals and Energy that has resulted in, what to you has been, a less than complete response?---So far, in information which we have sought, and that is the information which we have sought is information about the quantities and nature of the plutonium used at Taranaki and the other sites contaminated with plutonium, that information has come to us in the form that we required, a fairly complete form.

Yes?---It does not tell us anything militarily, but tells us what the materials were. And how much - - -

Well, is that another way of saying that you know when you received the information, that there is information missing, your assumption being that the information which is missing relates to weapons, that is weapons in a military sense?---Yes, I am not prepared to assert that there is information missing that is - on that particular point - which is relevant to our study. We have asked for that particular information and it has been forthcoming.

Well, do you believe that you now know how much plutonium there has been buried at Maralinga?---I believe that we know very accurately how much total plutonium was used at Taranaki. We do not know how much of that has finished in burial pits at this stage. As I said, we will infer that for ourselves on the basis of identifying all that which has not been buried, if we can.

But can I just take you to that point. I mean, is not the knowledge of how much plutonium is buried there, is

that not something that you would expect the British to have records of, that were accurate records, that they could answer the question for you?---I believe they do not have such records.

Is that because you have asked and they have said they have not got those records, or because in the past it has been discovered that there was more plutonium there, as indeed was the case in 1978, there was more plutonium there than was thought to be the case previously?---I do not think there was anything discovered, I am sorry, in 1978.

I might have that wrong. Was it 1978 when the repatriation as it has been described occurred-- -?---Yes.

- - - of what was - half a pound - - -?---About half a kilogram, yes.

Half a kilogram. And at that time when that plutonium was repatriated, was it understood that that was the last of the discrete plutonium that had been buried, and it had therefore been repatriated for that reason? ---No, I think what was understood that that was the only significant readily retrievable quantity in a designated spot, that was known about. That was a consequence of a number of experiments that were carried out at one site where the plutonium had been caught, and it was buried and identified in the Pearce Report. And the timing of its repatriation, from memory, came about because of the fact that the information that was in the Pearce Report defining it became public knowledge.

Well, do you now know how much plutonium remains buried in pits at Taranaki or anywhere else on the range?---At Taranaki, we do not know the distribution of what is buried in the pits. We do not know which pits is likely or not likely to contain plutonium. We will know reasonably, I believe, the total quantity that is buried in those pits at Taranaki, because we do know accurately the total quantity of material that was used and we believe that we can get a reasonably accurate estimate of the quantity of plutonium that exists on the surface. I guess the reason why the British did not or could not quantify what had gone into the pits was because, in a given experiment which may have consumed up to two kilograms of plutonium, which was dispersed explosively, that which was close in on the ground, on the firing platforms, whatever they were, went into the pits, but it is not easy to give a quantitative answer of what fraction of it was within reach and got buried in the form of being simply retrieved and buried at the time, and what fraction of that particular experiment was thrown anything up to 20 kilometres away, in the form of a fine aerosol. And it is that aerosol component that we think we can quantify reasonably.

Could I just come back to something. I am not sure if I understood your answer. Is it your understanding that the British kept no record of the amount of plutonium that they buried?---It is my understanding that they kept precise inventory control over the amount of plutonium that was used in each individual Taranaki study.

Yes?---The consequences of that study were dispersal of that plutonium. Some of it was not moved very far. That which - the nature of those studies were explosive studies, conventional explosive dispersals. That which was close to the firing pad in the course of cleaning up was buried; that which was identifiable was buried; but it was not possible to put a quantitative number of how many grams of that material was buried - just all that was within reach, reasonably within reach, I suspect.

Well, I think it was published at the time of Pearce, and I am afraid I cannot now remember the amount, but it was published the total quantity of plutonium that was said to have been used in the whole of the test series, and it was a 20 kilogram - - -?---Yes, that is approximately - figure.

Does it mean that if half a kilogram has been repatriated, that Australia has 19½ kilogram of plutonium left, either buried in pits or spread around the place? ---The half kilogram, in fact, came from a different site, but what you are saying is true in a sense that we know from the British to the nearest gram, fraction of a gram, the total quantity of plutonium that was used in minor trials at Maralinga. As you say, a half kilogram has gone back to Britain. We will find out from the laboratory how much of it is present on the surface, either as distributed aerosol or these fragments, that I talked about yesterday, and we will make the assumption that that which we cannot account for from those Taranaki trials as being on the surface in some form or other is by difference within the - I forget the number - 18 or so pits that are contained within that fenced area.

Well, can I take you back to AIRAC 4 from which we strayed somewhat, but - - -?---I think it was a useful straying.

Yes. If - can I take you to the Australian Radiation Laboratory's part of that report, or their own report, would you agree - and I perhaps make the page references for you so you can find it - page 33, at the top of the page, dealing with the uptake - it actually starts over the previous page - says:

There is limited direct evidence
of the transfer
red bone marrow is the critical organ.

Sorry, "where red bone marrow is the critical organ". Then the next sentence:

Extrapolation to unrelated dietary patterns is not a significant health hazard to any population group.

Now, would you agree that what the ARL report is doing there is really sounding a note of caution to anyone who is proposing to read that report and draw conclusions? It is specifically saying we do not know about aboriginal diet?---It is including that caveat, yes.

Yes. And further, if I can take you back to page 29, dealing with vegetation, at the bottom of the page:

Plant and animal material. In all 21 samples the problem did not arise with the rabbits.

And then on page 30, at about the second paragraph, dealing with the analysis of the organs and tissues, or the third paragraph:

The nuclide concentrations in the plant and animal tissue.

as I am going to get into strife - it is a nanocurie per kilogram, is it, or - - -?---Yes..

Brilliant:

of fresh material as summarised in table 6 and 7 does not apply to the results obtained of the animal tissue.

Now, again, would you agree that a qualified statement and it is intended to be a qualified statement to anyone who wants to draw conclusions from that report? ---It is a technical qualification, yes.

Yes, and indeed as you would be aware from reading the Scientists Against Nuclear Arms material last night, it was one of the aspects that they criticised, both the - not of the ARL, but they criticised the conclusions drawn by AIRAC, both as to the numbers of samples that were taken and were actually studied, and secondly, as to the fact that because contaminations had occurred, there was danger in drawing conclusions about them. As a general proposition, would you agree that is what SANA appeared to be saying?---Yes, it said rather more than that, but it made that point.

I appreciate that. Then, if I can take you back again to page

22, and you would be forgiven for thinking I worked backwards on this last night - dealing with europium 152. This is under abstract, the fourth paragraph:

The distribution of europium 152
. distances
of the order of a kilometre.

And I think they also noted, and this is page 33, they note that there had been dispersal of radioactive substances by wind, at the bottom of the page, second-last paragraph:

Evidence of wind dispersal of
radioactive
tended to be towards the east
and northeast.

and so it goes on, saying strontium - what is CS 137?
---Caesium 137.

Caesium; and that is europium, is it, 155?---Yes.

It goes on:

from the present survey plotted
on accords
with this interpretation..

Would you agree that what the authors are there saying, and the conclusion which should be taken from it is not that wind dispersal presents little or no hazard, but that wind dispersal is taking place and therefore could be a hazard?---I have some reservations about your last point about certain
- - -

Well, certainly that it is taking place?---Certainly it is taking place very slowly. It was interesting to be able to infer that in a very clean way, because of the original - because of the knowledge that the original formation of europium 152 was symmetrically around the ground zeros, and that had there been no dispersal, it would be the only place where one would now find it because - well, not the only place. Small amounts of it can be produced as fission products; but the main source of europium 152 is in the activation which occurs very close to the ground zero; and the fact that one finds it systematically pushed northeast up to about a kilometre and clearly within some of the sand dunes was technically unambiguous, an indication that there had been soil movement from the major trial sites. Now, if I can add a comment, and perhaps wrongly anticipate what you may be going to ask me next - - -

Right.

There is very clear visual evidence at Taranaki, at least, that there has been - I cannot say no soil movement, but the grader tracks that were produced in 1967 still look very fresh. The, there appears that in the Taranaki area, the surface crust is fairly stable, and the signs are that even after, what is it, 1967 to 1984, 17 years, there has been no significant erosion or not enough significant erosion for soil movement to obliterate the earthmoving - the tracks made by the earthmoving vehicles at the time.

I am afraid you do not win the prize, doctor; that was not the question I was going to ask?---It is an interesting point, nevertheless.

So far as the ARL Report was concerned, you have agreed that there was specific qualifications which a scientist would understand to be qualifications noted within its terms; is that so?---Yes.

Now, I do not know if you had the opportunity to read the other appendices to the AIRAC 4, the report from Mr Ellis, the report from Dr Trefry on the meteorological patterns in the area, and I think - I did not ask you to last night, but at some stage have you seen the report by Mr Douglas from the Department of the Environment in South Australia on the burial pits at Maralinga; it is the one which featured the rabbits burrowing down into the impregnable bunkers, as it were. Would you agree that all of those reports, to a greater and lesser extent, all made such qualifications of what they were putting forward?---Yes, that is usually the way that one writes a technical report. You draw attention to qualifications that limit the interpretation of your data.

One of the areas of qualification was the limited time that people had to conduct the survey?---Yes, that is so in - certainly in one report.

Another was the limited sampling that was available in the time; is that so?---That - it may have been; it is likely; I am not exactly certain.

Indeed, I think one of the problems was that the radiation laboratories simply did not have the size to be able to cope with the amount of sampling which could be required of them; and in fact, I think only four rabbits in the end were sampled - or, sorry, four rabbits were tested out of the 19, or whatever, that were brought in?---I would - I am not quite certain whether that was at our laboratory or within the Atomic Energy Commission that those analyses were done.

Well, in any event, that was the end result of it, was it not?
---Yes.

That four rabbits got sampled, and the complaint was that those four rabbits may have been contaminated each to the other; that it was difficult to know, when they were tested, what radiation was found on rabbit A, rather than on its brother, rabbit B, because they had been rubbed together?---I do not recall that comment; I thought it was the comment was that they had - the samples had been bulked and analysed collectively.

Well, technically, it amounts to the same thing, does it not? You cannot then determine, if you find any radioactive substance in rabbit A, whether it in fact came from rabbit A or whether it had - the substance you have analysed was part of rabbit B?---That is true; I think what was done was to find an average for those that were, were - - -

The implication of that, of course, being that if you have worked out where you found rabbits A and B, it rather destroys the point of the analysis to know how far away the rabbits were that were contaminated?---I, I am - it is difficult for me to answer that, because as I say, that occurred before my time.

All right, well, let me take you - - -?---I am not certain it is a valid point.

Let me take you to the report by AIRAC - AIRAC 4. Now, you have told us yesterday that - and correct me if I have got this wrong, that you retain a concern about the burial pits; is that right?---Yes; I do not remember saying it yesterday, but that is true.

Well, is it the situation that the burial pits, because they have got a slab only on the top; it is known that rabbits are burrowing down to them, and simply because of the fact that there is only one slab at the top, that, if one had a choice, would not be the choice for how one would dispose of plutonium?---I would certainly agree with that.

Yes. So that, given that knowledge is expanding all the time, the state of knowledge as of today, would certainly be that that is not the appropriate way to dispose of those sort of dangerous substances?---That is certainly the doctrine of 1984 and, and waste management, of high level radioactive waste, is different from the way it was disposed of in 1959 or '63 or thereabouts.

But not so different to 1977, was it? In 1977, it would have been known that that was not a particularly safe way to have disposed of such dangerous substances?---I am - I am not sure that I can get my historical dates right on that. You see, when one was - one is talking of plutonium in 1984, one is talking really in terms of how do you cope with plutonium associated

with its production in nuclear power reactors, and that body of knowledge is evolving now. I do not believe it was so apparent as a body of knowledge in 1977 as it is now, and it is fair to say that even now there is no agreed conventional wisdom for what is the appropriate way of handling plutonium in these sorts of quantities. I think there would be agreement that the way in which it was done in 1967, would not be considered an appropriate way; but I am not really prepared to assert that a discussion on high level waste management would have been apparent in the minds of anyone in 1977.

All right, well, perhaps if I could take you to the report. We have dealt with the appendices that formed the information that was supplied to AIRAC from which to draw its conclusions. Now, if I can take you to page 2 of AIRAC 4 - well, perhaps before I get to that, should be page 1, "Summary and Conclusions" - paragraph 4, after referring to the experiments between '56 and '63, it says:

These experiments were concerned with the effects sufficient to have left residual health hazards.

Could I just ask you there, is that a conclusion that you would draw from the information that was made available to AIRAC?---Yes, I think so. I can see what you are getting at: you have gone in some detail through the limited amount of information available about dispersal. - - -

Yes?---And what is in rabbits and so forth.

Yes?---With the implication that if people were living on a diet of those rabbits, then they might be taking up quantities of plutonium. I think we went through a couple of paragraphs which suggested that some modelling had been done about uptake of strontium, which indicated that was no - unlikely to be a problem, even though there was a caveat.

Yes?---But the implications were that it was not a problem.

Well, could I put it to you this way: in 1984, would you write that paragraph, if you were doing the writing?---I am not sure; I might ask some additional questions.

Yes. What would the questions be?---Well, I would perhaps ask the question, though I think I would know the answer; the question would be: how many people can and do live on a diet based on materials coming from the - those hundreds of acres of land at Maralinga which are contaminated with plutonium.

Yes?---At the present time, I know the answer to that is, none; well, I believe the answer is none.

Well, would it shock you to know that there is an aboriginal camp of about 200 people ten kilometres south of Maralinga village?---I know about that.

Well, is it not a distinct possibility that if they are hunting,-- that animals that they could be hunting could indeed come from the range area?---That is a possibility I would then need to model, calculate; model the transfer of plutonium through the food chain. I guess if I were writing this in 1977, I might not have seen that as an important perspective, since I did not know of the camp of 200 near the south gate at that time.

Yes, well, could I take you on to paragraph 6: in 1966 the United Kingdom government informed the Australian government that it had no further use for Maralinga, which was very good of them, and intended to relinquish use of it. A programme of decontamination was agreed upon between AWTSC and the British authorities. The objectives of this programme were, in essence: to make the range safe, should it be completely evacuated? It was recognized that long-term occupation of the contaminated areas was unlikely, even in the distant future, but that all the range should be made safe for at least short-term occupancy, and that this criterion should be improved upon, where practicable. The criteria for acceptable radiation doses were those that the ICRP, which are recognized by most national organizations responsible for radiation protection, including the National Health and Medical Research Council in this country. And as you have just said, that - the assumption that was made in '77 obviously could not be the assumption that one would make today for such a survey; agreed? Then, paragraph 7 - it talks about the Brumby Operation, and says that at Maralinga the operation covered the sites of major weapons tests, of experiments other than nuclear explosions, and of laboratories and support areas. The AWTSC reported that radiological surveys at Maralinga in 1967 showed that their requirements outlined above had been met. Do you agree with that today?---The requirements of the time had been met. I think you drew attention to the fact that at the time, there was the view in the back of everybody's minds, no doubt, that the land was unoccupied and likely to remain so.

Yes?---We now think, perhaps, differently.

All right, well, paragraph 8: the levels of radioactive contamination and induced radioactivity at the ground zeroes of the nuclear explosions after decontamination in 1967, was such that the dose rate from external gamma radiation to a person standing at them, varied from well below .6 millirem per hour - .06 - at three sites, up to 5 millirem per hour. The value .06 corresponds to the ICRP limit of 500 millirem per year for members of the public. Levels at the other ground zeroes were such that a person remaining continuously at

them, would reach the ICRP annual dose limit only after four days or more. Possible doses from beta radiation and from internal contamination at the nuclear test sites were not considered significant. At two areas used for non-nuclear tests, there were known to be appreciable levels of plutonium contamination in the soil, but it was not thought that these would lead to atmospheric concentrations in excess of the ICRP limit for members of the public. Would you agree with that today?---Yes, I think so. That is - in terms of inhalation hazard of plutonium, I think we would still agree with that.

All right. Can I take you right down the bottom of page 2, under paragraph D: The study - this is the study which had been conducted - has confirmed that the burial pits have provided adequate retention. A meteorological study has shown that the presence of a frail soil crust in the area provides considerable restraint to soil migration under normal, that is, undisturbed conditions. Then, over the page: however, observations on the locations of the activation product, Europium, show that there has been some dispersion by wind. Would you not say, doctor, that that was a rather optimistic and a rather too confident assertion to be making? In 1977?---What, that - - -

The burial pits had provided adequate retention?---It is a matter of words; I believe that relates to the, the drilling underneath the burial pit, to see whether there were any signs of migration through the ground from plutonium presumed to be buried within the pits. Now, I think in that sense, it is a reasonable statement. I already alluded to the fact that it - well, it does not relate to pits - but it seems as though, in that area of Taranaki, the surface cell does not move, although it does at the major trial sites.

All right. Well, could I take you to page 16, under the heading, "The Present Situation at Maralinga 1977":

In 1967, at the completion of operation Brumby or ingesting radioactive materials

Stopping there. Is that a conclusion which you draw today?---Yes, I think so. It hangs a lot, of course, on what one means by casual visitor. But all of the numerical estimates within that report indicate that one is unlikely to - to be exposed to hundreds of millirems.

But unlikely is not the same as no possibility; is it?---Yes. I guess I should not have used the word, unlikely; one resorts to relate it to a scenario.

Yes?---If - if you can define as a casual visitor, somebody who, say, pitches a tent on a ground zero and decides to stay there for 500 hours, then he would receive the occupational limit, if the radiation field was one millirem per hour.

Well, go down to the next passage under the heading, "Risk from Gamma Radiation". You will see at about the fifth last line, it is described as "essentially trivial" and they speak of a person determined to over-expose himself:

Must be at the worst spot 12 days in order to accumulate the 500 millirem accepted as an annual quota

?---Yes.

Do you not think that that is rather playing down the danger of the situation?---No, I do not.

Right. And the risk from dispersed plutonium, in the next paragraph:

There are practical difficulties in measuring considerably in size.

They then go on to discuss Taranaki and TM 100 and TM 101. They say:

For the purpose of estimating hazard from of plutonium from the soil.

Do you not think that that is a rather bold assertion about the risks of ingestion from resuspension?

---Risk of inhalation from resuspension.

Yes, sorry?---It may be bold, but I think it is fairly accurate.

All right, fine. Page 17, the second full paragraph:

Although low concentrations of
plutonium were
animals present a hazard.

Now, in view of what was in the reports, which were written, not only by ARL, but by Mr Ellis, Mr Trefry and Mr Douglas, would you not agree that that passage appears to totally ignore the qualifications that were attached to those reports?---Well, certainly, they are not present there. It is a long time back and I do not recall the judgments at the time, and I do not recall whether or no - we made calculations on that point. I could readily believe that it is an accurate statement of fact, but I would have to do some calculations.

Well, would you not agree that, if a document is written and - would you agree that AIRAC documents are written not just for scientists; they are written for ministers; they are written for members of the public; they can be purchased a government printers? Would you not agree that an assertion such as that, for someone who reads the report rather than the appendices, can give a totally different colour to what the scientists, who actually did the study, were trying to say, and de-colour the qualifications that they were putting forward?---Yes. I am not clear that those qualifications would necessarily have much impact on that assertion.

Well, could I take you over the page - page 18, the last paragraph:

Little information is available on
the animal
at Maralinga is quite small.

Would you not agree, that in view of the fact that we are there talking about four rabbits, which the report has made clear had been - the sampling had been mixed to the point where it was difficult to draw conclusions about where they had come from, that that paragraph represents a considerable or - sorry, it does not represent a clear statement of the qualifications?---I - I think, to be fair, it does no more than suggest, in the last sentence, does not it?

All right. Well, let me take you to page 19, "The Future at Maralinga":

In fifty years or so there will no longer be any area public interest and emotion which have developed about the issue.

Now, would you say that the conclusions that were being drawn there, about the future at Maralinga, were rather more sanguine, or rather more confident, that there was no risk at all, than you would be prepared to assert now?---Yes, I would, but from a different perspective from the one we have been discussing for the last few minutes.

Yes. What would your perspective be?---Well, I - I see problems in leaving of the order of 20 kilograms of plutonium without surveillance in the area from many perspectives, not the least being the capacity to make mischief. I do not feel comfortable at the thought of that. There are other things which I do not think were apparent at the time; for example, all of us in the business of radiation regulation are used to a requirement that radioactive sources - plutonium sources, for example - need to be managed in a - generally, in a way where the user understands them well. We require him to be licenced. We require that he looks after the sources and returns them to the origin, either the - usually the place where he has purchased them, when he has no further need for them or, at least, takes the advice of his licencing authority about how to dispose of them, and - and that is a social purposeful thing. I therefore feel uneasy about the thought of a sprinkling - a considerable sprinkling of radioactive plutonium sources lying in an uncontrolled fashion, unlicenced, unmanaged - I am sorry, not unmanaged: they are under surveillance with a permanent police force at the moment. They have a very long half life. I do not find that a very credible position for our society to sustain permanently. It is issues like that which I believe are quite important, and not only from your perspective of Aborigines living in the area, but I would agree that that is very important from that perspective as well.

Could you understand, doctor, how someone could read that paragraph from AIRAC, speaking about public emotion developing about the issue, and this is the issue with future risks from plutonium, that one could very easily draw a picture of a group of scientists seeing themselves in battle by disbelievers?---I do not know; that had not occurred to me.

Well, would you say that your position today, in terms of how you view the sort of risks, has in fact changed from what it may have been in 1977?---Yes, in some respects. Partly because of the additional knowledge that has come my way since that time. Additional experimental knowledge about the condition at Maralinga.

To some extent, those emotional people may have been just laying prescience, may they not?---I would not make any comment on that.

Well, would you agree, given the sort of criticisms that we have dealt with about AIRAC 4, that it is - it is very clear that the study which you are doing should not fall into any of the traps that have been levelled against AIRAC 4 conclusions, or, indeed, the studies; -that is, that they are limited in scope, or that they do not cover the field, as it were?---Well, I think that judgment has to be exercised. You know, it is very easy to say, let us cover the field, and, for example, postulate that there may be consequences all over the continent from Maralinga, and embark on a hugely expensive survey of continental Australia. Now, that would be stupid.

Yes. But, it would not be so stupid, would it, knowing now that we are talking about people who actually have the title to this land, it would not be stupid to say that if they are proposing to set up an outstation at Lake Deydey or near Lake Maurice, that the government should be prepared to spend the money to make sure that there is a complete radiological survey done in that area, including the water, the animals, the plants, the whole exercise; would you agree with that?---No, I would not agree with that at this stage. I would need to think about it more. I think, everyone would need to think about it more. You would need to think about it more.

Yes?---I can see, as an alternative view, that, as we discussed briefly yesterday, one starts from a range and uses ones growing knowledge of dispersal from the range to define the realistic outer limits of contamination, and do it from that basis.

Well -- yes?---You know, there is a concept about, as low as is reasonably achievable, social and economic factors being taken into account.

I understand that.

THE PRESIDENT: Mr Eames, may I ask you a question? When you say, the government should spend the money, which government are you referring to?

MR EAMES: Well, I have always thought guineas were very attractive, your Honour. This is probably something which will form part - yes, now pounds, apparently. This is something which will form part of the submissions, but, I would not like to anticipate that, except to say, your Honour, it would seem abundantly obvious -if that is not anticipating what I am going

to say - it would seem abundantly obvious that it
should be the British government. But, if the
Australian are prepared to pay, and the British
are not - - -

bratom 30.10.84
t3473-5 5 ah q

1998-1999

K.H. LOKAN

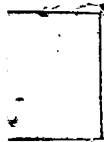
THE PRESIDENT: Well, I was wondering whether that made any difference to Dr Lokan's answer. He might think that that is an unreasonable expectation, according to the way he views the problem, that such a burden should fall on the Australian Government. But, perhaps, if it were to fall in another place he might think differently, and perhaps you could put that to him.

MR EAMES: Doctor, is your view about the question of conducting such a survey as I have described, is the question of reasonable cost a factor in that exercise? And, if we remove the question of reasonable cost - and, indeed, remove the question of it being a cost to the Australian taxpayer, would you then say that, certainly, if one has got the facilities to do such a study, it should be done?---No, I would not say that. I do not believe that was part of my judgment. I still believe that when money is spent on investigations that relate to public health, which is really what this is, that one retains some rationality, and you invest the money where it will produce the greatest good in terms of public health, and I guess I could describe plenty of scenarios where that sort of investment could be better spent on other things with a much greater impact. That is just off the top of my head.

Well - - - ?---But that is the sort of judgment that needs to be brought into it.

I am not wanting to put you on the spot; I understand that I have just thrown this question at you, and it is obviously one that you would like to consider; but, could I just take you up on that, doctor? It is all very well to talk about internationally accepted standards of risk as low as reasonably acceptable, which is the current basis, but that is a question which relates to an entirely different proposition, does it not? If one is talking about a discreet group of people who are, in fact, going to live in an area of land which is known to have been in the area of nuclear bomb tests, the concept of risk being as low as reasonably acceptable, the factors you are putting forward are really factors for government to decide, if they are prepared to spend the money. It is hardly a factor one would expect the aboriginal people to regard as being terribly interesting?---I think it would be very interesting to know in what way the aboriginal community themselves might like to see their health best protected - whether it might be in terms of diet, other public health measures, or this particular measure. They might want to - - -

Or perhaps compensation paid in other ways?---I do not know.



Just one final thing: the question of it being as low as reasonably possible. Your assumption there about this sort of survey appears to be that, as you were describing yesterday, if you start a grid pattern search from the area where the tests occurred, and work outwards, and your instruments then stop recording, that you have reached the outer limit, and you presumably make some allowance over and above that again, for safety. Does that ignore the possibility of hot spots?---No; well, you have to define what you mean by hot spots. Are you talking about bits of fission fragment fall-out from remote locations, or - - -

Yes?---Or bits of plutonium?

Well, I suppose we should take both, but in either case?---Well, we have been using the term hot spots yesterday to describe the local high activity that we observed at Taranaki.

Yes. It can, of course, be used in the other sense, can it not, as, I think, the Americans did in their Nevada tests?---Yes. I think that is a separate issue, and that is not the one that I was addressing. I was addressing the one of dispersal of plutonium where one has reasonable physical models for dispersal, which one can confirm by on-the-ground experiment, and rationally argue that when you run out of readings, as it were, and consistent with one's model of dispersal from a point source. And, as you say, making allowances for uncertainties and going a bit further for safety, one can probably rationally argue that that is a proper description of the event, and it is a very remote possibility that perhaps one needs to go and investigate areas hundreds of kilometres further away.

Yes?---Now, on the other issue, which is quite a separate issue, of course one has to - if there is a physical basis for having non-representative local hot spots away from the recorded pattern of fall-out - then one might have to investigate them. To be honest, I am not closely enough aware of the American record. I know that there are hot spots, there were hot spots following particular tests at Nevada. I do not know what the distance scale is that that relates to off the top of my head, but I would agree that one would need to investigate those and cover those adequately; but you do that within the framework of a proper physical theory - the theory of meteorology and so forth. They are not astonishing anomalies though.

Doctor, do you say you have currently got the resources to enable you now, if your study was to be expanded to take into account the sort of factors that I have raised: aboriginal dietary habits, water in areas - and, let us say that we expand it, water in areas near Lake Dey-Dey, Lake Maurice, has your study currently got the sort of funds that can cope with that?---No, that would be very expensive and very time consuming. It would require a lot of close judgement, detailed judgment, about the odds on finding anything at a remote location and whether it was a worthwhile expenditure.

Do you agree that that judgment of the odds perhaps need not be done by scientists, with all due respect to scientists? That is very much a political issue, and an issue involving the aboriginal people as to how big a risk is, for how much money should be spent to eliminate it?---I agree it is a social judgment.

Yes. You have agreed, I think, in the course of our discussions, that it is important for your study that these sort of factors are taken into account - certainly the aboriginal dietary habits and future intentions? ---Yes. I cannot remember exactly what the words were that I agreed to, but - - -

Would you agree finally, doctor, that it is equally important that a study done of this sort, given that it will probably be the only one, cannot be subject to any criticism that the conclusions are in any way being edited, are in any way being tailored to fit a predetermined assumption? I am not suggesting you have done it, but do you agree that it is absolutely essential that that not be done?---I am not certain where this is leading us. Yes, I would say that one does not want to tailor a conclusion to a pre-conceived notion.

Yes. One should have no sense of - - -?---One should not bend the data.

Yes, there should be no sense of being embattled, or having to preserve a line, or defend against the infidels, or anything of that sort?---Well, they are your concepts. I was not aware of them until you raised them.

I have no further questions.

THE PRESIDENT: Yes, Mr McIntyre?

MR McINTYRE: Doctor, is it the case that currently the British authorities are providing an inventory of all radioactive materials that were used in the Major and the Minor Trials? Is that a matter that you were aware of?---I am aware of Minor trials, but I am not aware of that detail about the Major trials.

And has that inventory been supplied in full yet, or is it only partially completed?

MR JAMES: Well, I object, if your Honour pleases. If the witness does not know that it is being provided, how can he answer that question?

THE PRESIDENT: I think that the question is permissible.

THE WITNESS: Can you ask that again?

MR McINTYRE: Let us go back to the first question. Are you aware of an inventory - - -

THE PRESIDENT: That has been disposed of.

MR McINTYRE: Yes, your Honour.

Are you aware of the extent to which information has been supplied for the purposes of compiling that inventory?---I am not fully aware. I know of some specific information which has been made available to us and which relates to the Minor Trials - quite detailed, specific information about quantities and that type of material.

Are you aware whether or not there is further information yet to be supplied for the purposes of compiling that inventory?---I am not aware of that.

Was it at the request of your authority that that information or that inventory is being compiled?---The information that we have received certainly came in response to a request originating with us.

Right, and what was that request?---The request was to obtain details of quantities and the isotopic proportions of plutonium isotopes that were used in each of the experiments conducted at the four Minor Trial sites at Maralinga.

Was the request limited to descriptions of plutonium isotopes, or did it encapsulate all radioactive materials that were used by the British through the Minor Trials?---No, it was a specific request relating to plutonium.

Has there been, to your knowledge, any request of the British authorities to identify - or to provide an inventory - of all toxic substances as opposed to radioactive substances used by the British authorities in the Minor Trials?---I cannot answer that to my own knowledge.

Are you aware whether the British have indicated whether they have records, or they do not have records, of the amounts of plutonium buried in the burial pits subsequent to the Minor Trials?---I know that it is - we have not been provided information in that form and I know that there is some ambiguity amongst the British scientists about how best to infer that information; but it is, as I explained earlier to the other gentleman, it is not readily available in that sort of quantifiable bookkeeping form.

Are you aware of whether they have, or have not, records of the precise amounts of plutonium located in the various identified pits?---I believe that at Taranaki, the precise amounts in each pit are not known.

Is that from what you have been told by the British, or what your laboratories have been told by the British or what you infer from the general nature of the information that has been supplied?---It is really what I infer from the general nature of the information that has been supplied and my perception of the difficulties inherent in being able to develop that information.

Coming to before Airac 9, of which you were a - - -

THE PRESIDENT: Mr McIntyre, if you are going to be a while

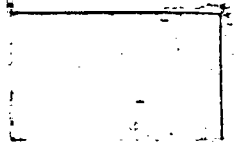
- - -

MR McINTYRE: No, your Honour, I will be fairly short. Say, possibly about five minutes; it might not

.

THE PRESIDENT: Go on.

MR McINTYRE: The members of Airac that subscribed to that report, number 9, are in total 10. One can see from the date of the terms of reference from the then Minister to the date of the report that something in excess of two years elapsed between the request and the report. What was the frequency with which the council met in the course of that period to consider the matters referred to it by the Minister? ---It - at the beginning it may have still been meeting monthly. It tended to, in the course of that period, the number of its meetings gradually extended so that currently it tends to meet about every three months. I would think that on average for that period it was meeting every two months; but that is from memory not from consulting any record.



The letter from the chairman of the council to the Minister in January last year, refers to the commissioning of the member of the committee, Dr Watson, to undertake extensive research to examine the relevant documents. Are you aware of the extent of clerical or administrative support that Mr Watson had in the execution of that task?---No, I could not really answer that accurately.

Are you aware of the extent to which searches, or inquiries, were made to identify and collate relevant documentary material to be examined by Mr Watson; or is that a matter of which you are not aware?---I know that that was fairly early days in the co-ordinating material held by various ministeries and that he did encounter a lot of difficulties. I do not think there was any lack of goodwill. I think it was merely a lack of adequate cross-referencing between ministeries. I know he spent an enormous amount of time himself in Canberra reading and consulting records. I do not believe - to refer back to your last question - that he had permanent secretarial support. I think he felt he was - he had difficulties in knowing just how much material did exist and he worked very hard at - I am sure with assistance from the Ministry of - the Defence Department - in trying to acquire all he could.

We can certainly ask him those matters, doctor, when he is called. But, referring to the questions that were sent to the council by the then Minister, was there any request or any instruction given to the council as to whether it was to make its determination or its review by reference to documents; or whether it was to invite participation from members of the public to come forward and recount their experiences or their recollections of events at any of the particular trials?---I do not think there was any such reference. I think it was a decision of council to proceed the way that it did. I do not believe it was given a lead of any sort that I can recall.

And during the course of the deliberations by the council, and particularly by the work by Mr - - - ?---Dr Watson.

- - - by Dr Watson, was it ever suggested that the inquiry of the council be undertaken in a form which would involve the wider casting of the net to acquire information than that which was being undertaken?--Not to my recollection.

Yes, thank your Honours.

MR McCLELLAN: Your Honour, perhaps I could indicate, I have a few questions of Dr Lokan. If your Honour is proposing to take the adjournment, it might be appropriate to.

THE PRESIDENT: Well, Mrs Fitch wants to ask him some. Well, perhaps we had better take a brief adjournment, first.

MRS FITCH: Dr Lokan, yesterday you were describing the 1984 surveys which were concentrating on detecting plutonium contaminated fragments, how deep beneath the soil surface could such a fragment be and be detected? ---I - it, of course, depends on the - its activity. As you all know, the property which is being detected, is the 60 kilovolt radiation emitted americium 241, which derives from plutonium 241, which is present along with the other plutonium isotopes. That, incidentally, is much easier to detect than the lower energy emissions from plutonium itself, and I did not say so yesterday, but that is one of the reasons why the earlier surveys, back in the sixties, would have had more difficulty than us, because not enough time had elapsed for sufficient for americium to have been created - so we had an easier job. I should have made that point, perhaps, yesterday. Now, off the top of my head - and I have not done the arithmetic - I would say that anything that is within a couple of inches of the surface would be detected. But, of course, a stronger source, deeper, would be detected and a very weak one at 2 inches might not, but - perhaps some of my colleagues might want to correct me later on that, but I would - I would guess that we are really sampling the top two inches of soil.

What depth of soil, do you know, was disturbed - or ploughed if you like - back in 1967, during operation Brumby? ---The records will say 4 inches. Our experience is that it is very variable and depends on how much

surface soil was present. In many areas, our experience has been that there is a very thin cover of soil, and the limestone is almost at the surface, and in those areas, the mixing with soil was therefore not so effective. My recollection is that it is unlikely that the soil has been turned over to a depth much greater than 4 inches.

Sir, would you say it is possible, then, that there could be plutonium contaminated fragments in that topsoil at a depth at which they would not be detected by your survey?---Yes, within the ploughed areas and of the weaker samples.

Can you tell me - turning now to the buried plutonium in burial pits - what was the difference between the plutonium that was repatriated and the plutonium which has not been repatriated?---I guess the essential difference was that that which was repatriated, was that which was readily available. It happened that the experiments, in which it was used, were such that it was immediately retrieved, but it was not dispersed in the way that the other plutonium was, and so it was then readily available for handling by itself. As material, it is - I - no, I cannot answer whether it was different from other material. I do not know. Is that the answer - - -

So, do I take it, you do not know, then, whether there is any - would be any difference between, say, the ease with which plutonium could be recovered from the material which was repatriated and that which has not been repatriated?---I cannot provide an authoritative answer. I believe, though, it would be - it would have been much easier to extract the - certainly, much easier to extract the plutonium from the repatriated sample than it would be say, from the amalgam of rubbish within a given burial pit at Taramaki.

Now, one other topic: in AIRAC, number 4, there were some references to dose limits, or gamma radiation exposure to members of the public - 500 milligram. I just do not have the page at the moment. Mr Eames referred to it, and I think it occurs in more than one place. Would you say that that is still, in 1984, the dose limit recommended for members of the public?---Yes. It is the current limit for members of the public, and perhaps for information, it is worth stating that that limit - annual limit - represents roughly five times the natural external background radiation that comes to us normally from the environment.

And has there been any recommendation by ICRP, or anybody else, that for long-term exposure, that limit should be reduced?---Yes. There is an ICRP - not so much a

recommendation, but a piece of advice that for those members of the public who are likely to be - what is called chronically exposed over a long period - a lower figure should be used. They should not receive 500 milligram per year.

Has there been any advice as to what the lower figure should be?---Yes. To be honest, I cannot remember which of the figures that we are likely to adopt within Australia. We have had some debate about it. Would you mind if I asked some of my colleagues?

Well, I do not think that is necessary at the moment, but I was just interested in the - whether ICRP itself had recommended any particular lower figure?---In order to get it correct, I would prefer to provide a response, a written response.

I think we can find that out from perhaps another witness at a later time. Those are the only questions.

THE PRESIDENT: Mr McClellan?

MR McCLELLAN: Thank you, your Honour.

Dr Lokan, I just want a little bit of information, further, if I can. Firstly, do you have area 9 there?---Yes.

Page 51: we talked yesterday about table 15.1. I just want you to help me, if you would. The table, as I understand it, sets out, in relation to aircraft identified by number, the dose in which is a reflection, as I understand it, of the time in the cloud, and the gamma radiation maximum activity, there expressed, in the cloud. Do I understand the table correctly?---I believe so.

milliweber

Well, can we have it better than belief? That is our starting point, you see, for the discussion?---You are asking me to recall the basis on which that was computed.

Well, there is a note down the bottom; have you had the chance to read that note? Using a lawyer's mind, you see, I am trying to - - -?---Yes.

- - - construct the table?---I cannot see the note you are referring to.

Well, sorry. It is just the discussion. You see the discussion below the table says:

The second column gives the estimated gamma radiation dose to the crew members of each aircraft referred to as penetrating radiation

and so on?---Yes.

Now, the reference there to the second column, gives the estimated gamma radiation dose. Do I assume that is a product of the time in the cloud and the column gamma radiation maximum activity in cloud?---The measured - the measured radiation dose rate in the aircraft while it was passing through the cloud - - -

Well - - -?---Multiplied by the time that was spent within the cloud.

These are things I want to understand, you see. Where does the final column come from? - What information is it based on?---I cannot recall the source of the information on activity in the cloud; that kilopascals per cubic metre.

And would I be correct in assuming that if, in fact, there was not an operative instrument on board any aircraft to measure the gamma radiation activity, then the consequence would be that, at best, column 3 or column 4, is nothing other than an estimate?---No. I think column 4 will derive from experimental sampling, which was the reason why the aircraft flew through the cloud. That column 4 is a measure of the number of radioactive atoms in each cubic metre of air which is, as I understand it, is the purpose of those flights.

So, it is your understanding that the fourth column became - from looking at the information in relation to the - - -?---What was sampled.

Samples?---Yes. That is a different quantity. The second quantity is, it does - gamma ray does.

I appreciate that?---The fourth quantity is account of the concentration of radioactive atoms.

I appreciate that. Do you know where, now, the records of what was sampled, are kept?---No, I do not know.

Now, do I understand it correctly that if you fly an aeroplane through a cloud, and it is not a sealed aircraft, that after the aircraft has left the cloud, by reason of what has been picked up on the way through it, it may still be radioactive and capable of giving off, to those who are within it, penetrating radiation?---That is a possibility, yes; that there will be radioactive atoms stuck to the interior surfaces of the cabin, and present in the air until it is ventilated out.

It would seem - and you may have heard this from records and also from anecdotal evidence - that it is clear that some of the aircraft that went through the cloud, remained radioactive for significant periods of time after they left the cloud?---Yes.

Are you aware of that?---Yes.

Well, then can you tell me, if that is so, the calculations purportedly made at 15.1 does not reflect the true picture of exposure, does it?---I am not prepared to say that without - - -

Doctor, if the calculation is based only on time in the cloud, and the concentration of material in the cannisters on the aircraft; it would seem, would it not, that one important, perhaps significant, source of exposure has been forgotten about altogether?---Yes. That is why I am not prepared to accept that point because I am not certain, at this time, whether the calculation of external dose - that is column 2 - was obtained by integrating the measured dose rate throughout the time of the flight. That is, taking the product of that by the time of the flight, or whether it was restricted to the time that it was passing through the cloud.

forgive me, but the table in column 3 speaks of time in the cloud, does it not?---Yes.

Does not suggest any other ingredient in the calculation, other than time in the cloud, does it?---No, but it does not deny any other ingredient either.

Is it usual for scientists to report, in a table such as this, time in the cloud when, in fact, they were intending to report time exposed to radiation?---I think it is useful to know that. Without checking the numbers, I would expect that the major part of the total dose would derive from time spent within the cloud. I would also expect that, in calculating the dose, one would allow for the dose rate measured by instruments in the aircraft after it emerged from the cloud, until such time as landing.

I think that the fourth column is an estimate; it is not a measurement?---The fourth column?

Anyway, for present purposes, that does not matter. Do you know whether or not anyone from AIRAC made any attempt to compute out, other than this table, the potential exposure of air crew who flew through the cloud?---I do not know directly, no.

I want some help also in relation to a document which was written in nineteen fifty - - -

IDENT: Just a minute. Mr McClellan, before you leave that, Mrs Fitch wants the matter clarified. She thinks there is a little error.

CH: Table 15, point 1, appears to me it could have an error there in the column headings. Does that gamma radiation belong on top of the fourth column or, in fact, on top of the second column? It appears to me that it should belong on top of the second column, and that may be causing some confusion. In other words, the heading for the second column, I believe, should be Gamma Radiation Dose. The heading for the fourth column should be Maximum Activity in Cloud, which is quite a different matter?---I would agree with that comment.

ELLAN: That is certainly right, but I do not think that alters the debate that you and I have just had, does it?

CH: No. It is just that it could cause some confusion.

ELLAN: Doctor, can you help me, as I say, with a document published, or written, in 1959? And I should tell you that it is a minute of The Atomic Weapons Test Safety Committee. It is, in fact, the minutes of the fifty-second meeting, and I do not want, in any way, to deprive you of the written words, so if I may look at it with you over your shoulder. The document is marked

Top Secret Atomic, but it has been, so I am faithfully assured, de-classified, so we do not have to worry about talking about it. What I want to direct your attention to is the item headed, Assessment Trials at Maralinga 1959, and the comment is made there:

The chairman read to the committee, a letter he had received from Sir William Penny, in which it was proposed that the present series of assessment trials be extended to include two experiments involving the burning of small quantities of plutonium in controlled petrol fires.

Now, to burn plutonium - and speaking in terms of the chemistry or the science involved - does one need a very intense fire?---I am not a chemist and I cannot give a complete answer to that. I know that in those particular experiments - and I only know because I happened to have read the reports of those experiments that were written a couple of years later - the plutonium was placed in a chimney with a petrol fire underneath, at a point within the chimney where the temperature was about 900 degrees. The object of the exercise was to establish the distribution of plutonium oxide down wind from that burning.

So, do I infer that the purposes, as you understand it, of the experiment was, in fact, to deliberately release plutonium oxide into the atmosphere?---Yes, it was, and to map its distribution on the ground, down wind from that chimney. The quantity involved, from memory, was about 100 grams of plutonium in each case.

Was the basis of that experiment to see what happened to it in the atmosphere?---The basis was to establish that if there were an accident or burning, for some reason or another, of plutonium, how far would it disperse; what sort of radiological hazard might it become.

Then it goes on to say - well, perhaps you might like to read down to item (d), if you would not mind?---Do you want me to read it out aloud, or just read it?

No, just read it to yourself and then we will come back to it? ---OK, I have read it.

Now, you see there the document indicates that the hazards which are said to be associated with the airborne and deposited activity arising from the two experiments, have been estimated, and safety procedures were proposed, including prohibition on entry. Do you see that?---Yes.

It goes on to say:

From the estimated maximum ranges of contamination arising from the experiments, it was clear that they could be mounted so that no materials would escape beyond the boundary of the restricted area.

The word, material, there: what did that mean to you as a scientist? "No materials would escape"?---I understand that to mean that no plutonium would escape.

Continuing reading:

Experiments related to the evaluation of the hazards which might result from accidents in either the civil or military aspects of the nuclear energy programme. The committee was asked to consider the proposal before a formal approach was made to the Australian Government.

So, it would seem that the committee had been approached informally and there was to be an approach to the government. It says the urgency for an early decision was stressed. The committee's advice was sought for the most expeditious means of obtaining formal agreement should such a course be recommended. It then says:

The possible political importance of the use of fissile material - - -

plutonium was emphasized.

Although the material involved would be very much less than that necessary to constitute a nuclear weapon.

Now, I just want some help with what, you would understand, might be the question raised by the comment there is "political importance of the use of fissile material." Does that relate to, as you would understand it as a scientist, the prospect of the release into the atmosphere of plutonium, having put it through the fire, as it were?---No. When is this dated? Is this - - -

'59.

THE PRESIDENT: Who is the document from, Mr McClellan?

MR McCLELLAN: It is a minute of the fifty-second meeting of the Atomic Weapons Test Safety Committee, your Honour.

You see, what I am trying to find out, doctor - I am trying to understand the nature of the Minor Trial, which involved the use of plutonium. You commented earlier that so far as you were aware, they did not involve nuclear explosions?---Correct.

But, do I take it that by the raising of the question of the "political importance of the use of fissile material," they fell half-way between a nuclear explosion and some other experiment of the time that had previously been conducted?---Well, no, they do not. I cannot really comment on what was in the minds of the people who

attended that meeting or wrote those minutes, or what their discussion was, but I know that they were concerned with understanding, because I have seen the final report. They were concerned with understanding the nature and range of disbursal under known conditions. If one has a fire where plutonium aerosol is produced in the smoke - as I say, it was a modest quantity in each trial, of the order of 100 grams. My recollection is that something like 6 grams of it was lost in the smoke. The remainder of it, in fact, stayed in the stainless steel cages, in which it was supported, in the fire. Now, I am quoting this from memory, and I am happy to provide a copy of that report if the commission so desires. I do not see that as being anywhere near mid-way between a nuclear explosion and - I forget what else it was you said. It was a consciously designed, safety-oriented study of the disbursal properties of plutonium and its radiological implications if it should catch fire.

Well, can you tell me then why it could be that there could be possible political overtones?---I can understand why that committee may have felt that the use of plutonium on the range - after all, plutonium had not been used in nuclear detonation since 1957. I can understand why it would be perceived as capable of misunderstanding.

Would that be because it was related to the negotiations with respect to the nuclear atmospheric test ban treaty which were under way at the time?---I cannot say whether that would be or would not be, but it is certainly a concept that comes to mind.

that what is in your mind?---Yes, that is in my mind.

PRESIDENT: You mean the negotiations that led to the non-proliferation treaty?

McCLELLAN: Yes.

WITNESS: No, no, negotiations for the Atmospheric Test Ban Treaty.

McCLELLAN: Yes,, Atmospheric Test Ban Treaty, I am sorry. And that would have involved consideration of whether - I assume, I ask you - whether or not plutonium should have been released to the atmosphere?---Well, I suppose the sensitivity could have been that it could be interpreted that the local dispersal of a fraction of 100 grams through burning at Maralinga could be interpreted as related to the dispersal to the total global atmosphere of plutonium in a nuclear explosion. It seems a little remote. They are very different exercises, and - but, as I say, one could understand a sensitivity that way, but I have no knowledge myself that that was the source of sensitivity.

h respect to your knowledge of the minor trials, where have you gone to accumulate your knowledge, what documents have you had access to?---You mean in terms of historical knowledge or total knowledge?

1, in terms of what happened with each trial?---To define the locations and some idea of quantities, we have a good deal of material, material which in the first instance used to reside, perhaps still resides, in the files of the sort that you have got there, files associated with the Atomic Weapons Test Safety Committee.

11, have you had access to these files yourself?---I am not certain that I have had access to all of them. I have certainly read a number of them in order to extract for my understanding information about the nature of minor trials.

know there may be others who can help, but it does not seem that these files have very much about the minor trials at all. Do you recall that being the case when you read them?---Well, to be honest I - - -

saying these files, we are referring to the minutes of the Atomic Weapons Test Safety Committee?---OK. It is perhaps not in minutes. It is in other papers then which contain things like maps of measured distributions of plutonium on the ground immediately after trials, designation of prohibited areas or red areas or yellow areas and so forth, quantitative numbers for concentrations in per square metre on the ground, things like that.

But what about what was involved in the trial itself? For example, the question that has been debated this morning, how much plutonium was in fact used?---No. My knowledge - - -

Where have you gone to to try and get hold of that?---My precise knowledge of that comes from information supplied fairly recently to us by the United Kingdom. That is accurate, very accurate information of the exact quantities used in each trial. My knowledge before that is - - -

And does that constitute information in written form?---Yes.

What, in a letter to you, is it?---In a - not a letter addressed to me, but in a letter addressed to the Australian Government. I cannot remember who it is addressed to right now, but supplied by the United Kingdom High Commission to the Department of Resources and Energy, who have made the information available to us.

Do you know whether or not that information has ever previously been made available to the Australian Government? ---In a qualitative sense I knew already a fair bit about the quantities. I knew that there was about 20 kilograms used at Taranaki, for example, in trials where about an equal quantity was used in each case, and that has been confirmed by this more definitive data.

I think we are talking though in quantitative terms. For example, what I am coming to is: how do we know how much plutonium was in fact burnt in the course of the trials referred to in that minute?---That information has now been supplied to us in a very precise form.

Was it ever available before to the Australian Government? ---Yes.

Well, where was it available?---My - again, I could be wrong, but I do not think I am wrong. I believe those numbers are presented quantitatively in the report that was subsequently written and made available by agreement to Australia on those burning studies.

Do you know whether or not that information was available before the test took place?

THE PRESIDENT: Before what?---Before - - -

MR McCLELLAN: The test, the trial referred to?---Before the 1959 trial, I do not know that. I have certainly read of it in the report that was written subsequent to that trial.

Sorry, my friend is curious. Can I say again what I am referring to: the minutes of the Atomic Weapons Test Safety Committee. The report you are referring

to after the trial would be an AWRE report?---An AWRE technical report, the description of the experiment in its conclusions.

One of the things that will look like - - -?---A yellow-covered document, yes.

Yellow or blue or - it will have nasy letters or words stamped all over it saying secret and guarded, do not look at it. Finally, can I just take your mind back to the discussion yesterday with respect to AIRAC 9, and you have been asked questions by various people in relation to that document, and also the letter that was written in August, 13 August this year by AIRAC, which is part of exhibit 67. You indicated to me, sir, yesterday, that, I quote you: "Fuller cataloging of technical reports may erode some of the conclusions expressed in AIRAC." They were the words you used yesterday?---They were. Perhaps not the words I used, but words which I agreed to when they were used to me.

Well, I will not hesitate to debate that, but let me ask you this: there is no suggestion in the letter of 13 August 1984 that AIRAC would concede that any of the views expressed by it in AIRAC 9 in any way could allow for modification, either at August or at some later point in time. Would you agree with that? ---Yes. I think my comment was in response to the - I think I made it, from memory, in the sense that I was prepared to concede that there may well emerge information of which AIRAC had no knowledge, that I had no way of knowing whether it would or would not, but there were signs that more information was surfacing and that one had to concede that there was a possibility that it could modify some AIRAC conclusions.

Well, can you then explain to me why it is that AIRAC did not suggest that in the letter that it wrote?---No, I cannot. I cannot recall that particular possibility being discussed when that letter was drafted.

Would you agree with me that that was probably a mistake on AIRACs part not to make at least that concession? ---I could see the advantage to making such a concession, yes.

It was a mistake not to make it?---Well, I am not certain. I am not certain whether such information does exist or will exist.

But surely scientists, responsible scientists, faced with two events that had occurred before this letter of 13 August, firstly the Kerr Report, and secondly the formation, and indeed the commencement, of the Royal Commission - surely responsible scientists at that point should have made at least that concession, should they not?---Might have made that concession.

Now you went to Maralinga in 1957, I think, is that right?---Yes.

And you anticipated that after going to Maralinga you would go Aldermaston in the United Kingdom for briefing in relation to the operation Antler series of tests?---Right.

You indicate that until the eve of your departure for Maralinga you were told nothing, and you were given nothing, as you say, about radiation safety precautions or risks. You went to Maralinga in March '57, and you refer in your statement to a letter that you received detailing information which was given to you, and on page 3 you indicate the persons that you were apparently supposed to contact while you were in the United Kingdom, and paragraph 14 you indicate that you stayed in the United Kingdom for some ten days?---Right.

While you were there you were given instructions, and you record the fact that you were apparently not allowed to take written notes of what you were being told?---Very true.

In was in part, a memory test?---Very true.

Now, you say that during your discussions in the United Kingdom there was no discussion of health risks. All you were told, or you were given an assurance that protection would be given to you; is that so?---Well, of course as you mentioned earlier, and I said in here as well, that I had a few days at Maralinga before I went to the UK, and I was well aware, of course, by then as to what happened, because I was taken to the forward area by Mr Turner, Harry Turner.

You refer on page - or paragraph 19, to your main discussions taking place with Mr Saxby. Now are those discussions in the United Kingdom before you returned to Maralinga? ---They were all at AW - at Aldermaston.

At Aldermaston?---Yes.

You came back to Australia in April of 1957 and went back to Maralinga, and you indicate that you then proceeded to carry out the duties under the guidance of Mr Saxby. The blast that you were concerned with, at that point in time, was to be a tower explosion, and you apparently were required to construct buckets which were steel and inserted into bunker size diggings. Now, just explain this to me. Do I take it that you were required to organise the digging of holes in the ground?---Correct.

Called bunkers?---Well, we called them bunkers, and they had to be exactly the same size as the steel containers, the cubes, because they had to fit tightly in. There were three sides, same heights, on the side towards the road or where the equipment comes in, a ramp.

And how large were the steel containers?---They were mainly six foot squares. There were other sizes as well.

Six foot by six foot - - -?---Cubes, rather. Six foot by six foot, by six foot.

Right. And how thick was the steel, thin or - - -?---Oh gosh, I would say about 5/16ths, or 3/8ths. I am not quite sure.

Now I take it that you placed a number of these in the ground at the time?---Yes. In fact I never completed that particular job. I started on the diggings, because I handed over my duty around about July to the British Troup Commander who had arrived in the meantime, also the sappers from the UK, Royal Engineers, because the range chief engineer, Colonel Harvey Williams got ill and had to go back to the UK, and they needed another officer to replace him. In fact the duties were split between myself and a naval officer. They are the duties of the range chief engineer, which I am talking about at the moment.

You say in the time prior to the explosion you had to do work in the contaminated area. Now, firstly, how did you know the areas in which were working were contaminated?---The whole contaminated area was wired off with - on pickets and single strand wire.

Do you remember the sites of those contaminated area, by their names?---Not really, because the area - it was not various areas, it was just one large area. We had areas originally, I understand, from Buffalo in 1956, and there was one large area taken, and they were all enclosed, really, by that one wire, or whatever it is.

Were you preparing bunkers for the three blasts of the Antler series?---Yes.

So that is Tadge, Biak, and Taranaki?---Correct.

And would you look at this map over here? It is RC4, I think?---Can I get closer?

Yes, certainly. Do you see Tarnaki?---Yes.

And Breakaway, Biak, Marcoo, Tadge and One Tree, are all shown?---Yes.

Now, at the time that you were preparing your bunkers, relative to the earlier blasts, had the names there shown - stay with the plan, if you would not mind?---All right.

Whereabouts were you?---Over there. I was mainly around this area here.

MR . . . : You are not being picked up on the tape.

MR McCLELLAN: You indicate an area shown on the plan, below the word Rainbow and between Fresh Bore and Alkara; is that right?---Rainbow, Fresh Bore, Alkara, and we also been towards Gona.

And you went out towards Gona?---.

All right. Now, in this area were there any fences present at the time?---In the areas inno. Only the areas where we started off were no fences.

Just let us get it clear. In the area between Fresh Bore, up to Rainbow, up to Eagle, down to- - -?---Yes, it is in the fence.

And down to Alkara- - -?---It is.

- - -was that area fenced?---Yes. That was in the area fenced, yes.

Well, you say there was an area fenced. Was the whole area fenced or not?---Oh gosh. I never been around the whole area.

I see?---I have only been into the area direct to where we had to go.

Right. What sort of fencing was it that was located there? ---The fencing, as I said earlier, string. That is all I can say because- - -

String. Do you mean by that a single wire strand?---Could be a wire strand, yes, with some- - -

Star pickets, I think they are called?---On star pickets, but with coloured - that is near the contamination areawere, some fluffy ribbons, or whatever they had around there.

Were the sites of the earlier blast, which would have been Breakaway, Marcoo, and One Tree?---Yes.

Were they fenced, to your recollection?---The sites themselves were not fenced to my recollection.

Right?---I have not noticed any fences on the sites themselves.

Right, OK. Well, you can go back to your seat.

You say that before you went into the contaminated areas, you were required to go through a health physics caravan and you put on protective clothing before you entered. Now, did that protective clothing include anything over your face?---Yes.

What did you have over your face?---Respirators.

Respirators, did you? And when you went in, were you required to wear a Dosimeter?---Yes.

Is that a thing like this, that I have here?---Yes.

Right. What about - Mr Secretary, what about a film badge? Were you given a film badge?---Yes. We wore a film badge.

Sorry?---Yes, we wore a film badge.

The secretary will find one for you and I just want to make it clear it was that sort of device?---Yes.

Now, can you tell me, sir, before going into the forward area, you went into the health physics caravan, did you?--- Yes.

And was it there that you were issued with the Dosimeter and the film badge?---Right.

Sorry? Right; do you mean by that yes, you were?---Well, the caravan - the caravan had two main departments. Coming into the caravan, you had one department where we left our clean clothes; walked through a door and through a small compartment where we returned to later, to where the showers were; and around the side of a bench where we found our clothes which we had to put on.

Right. What I want to know, you see, is whether or not you were given a film badge at any other time than when you were proposing to go into the forward areas?---No.

Never?---Never.

Now, each time that you went into the forward area, were you given, so far as you were aware, a new film badge? ---Well, I understood that it was - - -

I do not mean by that, a brand new one?---No.

I mean a different one to the one you had before?---No. I understood it was a clean film badge.

A clean film badge?---Yes. We had no way of checking that.

Right. And was it true that on every occasion you were given a dosimeter?---Yes. But we had to pick it up because

we had to help ourselves; we had no assistance from health physics.

You had to pick it up and help yourself?---Yes.

Well, was that true of the film badge?---Correct. I was the officer in charge of the people that went forward, and I had to ensure that they were wearing their film badge and that they had a dosimeter.

Well, you had to ensure that they were wearing it; what record was made when they were issued with it, of the fact that it had been issued to them?---None.

None. Well, let us go through that carefully: assume that I am one of your men, and I am about to go with you into the forward area. As I go through the caravan, I would get a film badge, would I?---Just before you leave the caravan, yes; once you are dressed.

How would I get it?---On the side was a board - - -

Yes?--- - - on which the film badges hung.

Yes?---And each man was issued with one.

Sorry? Each man?---Each man was issued with one.

Well, did I, myself, take it off the board?---Sometimes yes, once you got used to it; not at the beginning, but later on, yes.

And if I took it off the board, would I write it, or would I write a record of the fact that I have taken a film badge off the board?---No, there should be your name on the film badge, or your initials.

My name would be on the film badge, would it?---Name, initial, or number; I cannot remember offhand, because they changed.

Mr Secretary, can I have that film badge, for a moment?

Was the film badge of a type similar to the one that I show you, which is exhibit RC12?---I cannot remember; I am sorry.

Well, whereabouts was provision for the name on the badge?---I think it was - name or number - was put on over here or there, or somewhere - - -

All right?--- - - - but on here probably. But I cannot really remember.

You say name or number. Was it name or was it number?---At one stage it was name; and then later on it was number. They had changed it and there was apparently a list somewhere for the numbers. But I cannot - I have never seen it.

Do I assume correctly that at the time it was done by numbers, each man knew his number?---Yes.

So that having been into the forward area, I then come back. What would I do with my film badge? Would I put it back onto the board?---Put it back on the board.

Back on the board?---Yes.

And do you know what happened to the film badge thereafter? ---They - I have never seen it but they were supposed to be collected by health physics, the same as the dosimeters, and the same as the clothing.

Collected what? After that sortie into the forward area or - - -?---Yes. After the sortie.

Or collected at some - - -?---Yes. Sometime - - -

After each sortie?---Yes. I do not know after each sortie or whether it was each evening. generally, when I was up there only - actually our group going out of that particular caravan

Now, what about the dosimeter? You say that each man was issued with one of these, and I take it that at the time I am getting my film badge as I go through the caravan, I get issued with one of these, too, do I? ---Yes.

And has that got my name engraved on it, or my special number, or are they just indiscriminately issued?---No. The dosimeters had - now, let me think - I think they also had a number which was put on. I am not sure whether it was on the board - I think the number was on the board.

All right?---On the pocket.

All right. Can I ask you this question? Did your men - the hypothetical me - did I have a personal dosimeter as well as a personal film badge, or not?---No. You did not know whether it was the same one each time.

I knew that I had the same film badge each time, but I did not know whether I had the same dosimeter?---No, because we had to put our number on it - - -

You say - - -?--- - - - every time we took one. Took a clean one.

Took a clean dosimeter?---Yes.

You had to put your number - - -?---Yes.

- - - on what?---I think we had a kind of sticky tape, which was put on to that.

On to the dosimeter?---But I am - again, that varied. At one stage that was something we had to do, and then later on there was a pocket for the dosimeter with the number on and our number and we took it out. Now, whether that was the same dosimeter every time, I do not know.

But, what you are saying, is that a numbering system was used to identify the particular dosimeter that a particular person was wearing on a particular day?---Yes.

Now, when I come back in from the fields with my dosimeter, I have hung the film badge up; what do I do with my dosimeter? Do I give it to someone?---No, put it back in that pocket with your number on it.

Put it back in the pocket on the wall, do I?---Yes.

And what do you understand thereafter happened to the dosimeter?---It was collected.

Collected? And what was done with it?---Well, health physics. I do not know what they did - read it, obviously - - -

Did you - - -?--- - - - I assumed anyway.

Were you trained in reading dosimeters yourself?---We were not trained in reading dosimeters. All we were told was that there was a marking in there, inside the dosimeter; that we were not to exceed that marking.

Do you recall - perhaps you will look at this one for me? You might need to look out the window, but do you recall, by looking at that dosimeter, what the marking might have been that you were not allowed to exceed? ---It was a different dosimeter to this one.

It was different, was it?---Yes.

I have got another one here. Would you like to have a look at that one? Is that one that you recall?---Yes, it is similar to this. I think it is about the same, sir.

Well, does that help you to tell me what was the level that you were told not to exceed?---We were - there was a marking on the screen, which we were not to exceed.

You mean as contrasted with the scale - - -?---A red marking on the scale.

- - - on the - oh, there was a red marking on the scale?---A red marking on the scale.

I see. So neither of these fulfils the bill?---No.

Do you recall at what level the red marking was placed on the scale?---No.

No. Now, were you told anything about how often you were to check and read the Dosimeter?---Well, we were told frequently.

You were told frequently?---Frequently.

Did you do it frequently?---Whenever we could.

Sorry?---Whenever we could.

Well, how often did you do it well?---If possible, every 20 minutes or half an hour or something of that description.

And did your Dosimeter ever exceed the red marking?---Not to my knowledge.

Did anyone else in your company exceed the red marking?---Not to my knowledge, as long as I was there.

You say in your statement that you were aware that Dosimeters did not always work well. What were the problems that you were aware of with them?---Well, I personally went out with the - with one of the chaps one day to keep an eye on a dozing job of a track, and we were working the same area. I probably copped more dust than what he did on the dozer itself, and then we went back and compared the dozer readers just, you know, according to the line. He had a different reading. In other words, the distance from the red line was different. - like, it was - - -

Was it of significance?---Well, it was quite a lot, yes.

Do you remember then - - -?---About one-third difference.

One-third difference?---Yes, in the scale.

So one was reading a third higher than the other?---Yes.

Did you ever have a similar experience like that elsewhere?---Not personally, but with two other chaps who came to me and said that their Dosimeter had read differently when they came back.

Did you take that problem up with anyone in command?---No, I did not.

You then describe how it was that you went through the health physics caravan, and in para 27 you describe an incident involving aborigines. Now, is that the incident which has been called the Pom Pom incident, to your recollection?
---Never heard that expression.

You have not heard that expression?---No.

You say that you think it was in about May you were going from Roadside to the decontamination area?---Yes.

Does that mean that you were moving from Roadside to some point some miles away, or just some short distance away?

---It was a fair way away, the decontamination area.

Was it up closer towards the front?---Yes, that is a dirty area.

You say you were by yourself and you had a clean vehicle, and you were in your ordinary clothing in the clean area; you say you were stopped on the way by a group and was told that they thought there were aborigines in the dirty area?---Correct,

Who stopped you, do you know?---I would not have a clue.

Would not have a clue. Did that concern you when you were told that there were aborigines in the dirty area?---Of course it did.

Why did that concern you?---Well, nobody is supposed to be in the dirty area unless they are in protective clothing.

You say you then went to the decontamination caravan and you spotted a male aborigine approaching you from the contaminated area. Now, was he approaching you in particular or was he just coming towards the caravan? ---I do not know that. He came certainly towards the caravan.

Was he very far away when you first saw him?---He was a fair way away. I would say about 200 metres.

Did he have anyone else with him?---No.

And was he making signs or motions indicating the nature of his needs?---No. I did.

You did. What did you do?---I waved him towards me.

Right. Were there other Army or scientific personnel around at the time?---No. It was very early in the morning.

You were the only person there?---Correct.

No one else at all?---No.

Well, you have indicated he was coming from the direction of a bomb crater. Do you mean by that that he was walking from the general area where a bomb crater was located, or that he was walking from a specific bomb crater? ---He came from the area where a bomb crater was located.

Did you see him come out of a bomb crater?---No,

You say you went close to him; you stayed on the clean side of the wire; you kept him on the dirty side; you tried to communicate with him but, due to his faults with English and yours with pidgin, as you call it, you did not have much success. Is that so?---Yes.

But you gave him some cigarettes and then you got on to your two-way radio and advised others that you had located him. Was this two-way radio in your car?---Yes, it was.

And who did you call up?---I tried to ring - call headquarters. No answer. I rung - I then called security.

And who did you speak to?---The security officer on duty.

Do you remember who that was?---No.

And you record that some health physics people and security officers, I assume, arrived. Do you recall who came?
---No.

Do you recall a Mr Turner?--- say Harry Turner. I think Harry Turner was there, but I cannot remember. I cannot say for sure.

Do you recall Sergeant Smith?---No.

Do you recall Mr Hutton?---No, I did not know the people at the time personally. I only knew Harry Turner personally.

You say you did not see the rest of the aboriginal group; you are sure there was a family; and you did see some movement on the horizon. Now, you then say that you have no other personal recollection of what occurred. Do I infer that you left the area?---I left the area because I had to be back to get my people working. I had to go back to Roadside, and in fact I went forward that morning because somebody on my - one of my chaps told me that he thought that steam was escaping from the - between the steam generator and the caravan, and I went out that morning to check whether that was the fact. Otherwise I would not have gone forward at that time.

Do I take it that the whole event was a matter of considerable concern to those in charge?---It certainly was, very much so, and at the same time we were warned - everybody was warned to keep the whole situation quiet.

Who warned you of that?---I think everybody did. It seemed to - kind of a thing that just went out.

You record - - -?---I do not know who started it,

I am sorry?---I would not know who started the warning,

You record the fact that you were told there was a bit of a scuffle during the showering operation, Now, who told you that?---I would not have an idea now.

Is that a recollection of what you were told at the time, or is it something that you have been told much later?---I was told that at that day - that afternoon.

That afternoon?---Yes.

You also say that you were told they were contaminated. Were you told that on the same day?---Yes, I was.

Do you know who told you that?---No. I would say that it was the same person who told me about the problem with the lady not wanting a shower.

What were you told about that?---Well, apparently whoever told me at the time was forward, or came forward at that time, and heard that there were - there was quite a lot of cahooing and screaming going on because the female did not want to have anyone else wash her under a shower, and her husband apparently also objected to the fact that she was going to go under that shower.

This is what you were told on the same day?---Yes.

You then record the explosion, and you indicate that you have a belief that you have been exposed to radioactivity, or excess radioactivity, because of your subsequent problems which - but you cannot point to a specific incident?
No.

Are you aware that in fact you are shown in British records as having received a dose of radioactivity?---Yes.

You are aware of it?---Yes.

And you are aware of the amount, are you?---I have been given a figure.

What is the figure you have been given? You do not recall?---I cannot recall offhand. I might - if I may?

Yes, look at your note, yes?---May I look at it?

Yes, sure. Well, Mr Marqueur, I wonder - we will come back after lunch?---Yes.

You might like to find that , find it during lunchtime?---All right.

But you indicate further in your statement that you believe that part of the problem may have been that in your opinion there was not adequate separation between clean and dirty areas in the decontamination area?---Yes.

And you say that in your opinion there should have been an airlock. Were you ever conscious of airborne dust in the health physics caravan?---Would you please repeat the question?

Were you conscious of dust in --airborne dust in the health physics caravan?---Well, dust, yes.

When you were going through it?---I was.

You were?---Yes.

Significant amounts of dust or not?---It depended where we had worked earlier. The worst I struck was after the dozing of a track.

And when you came into the health physics caravan dressed with your protective clothing, was anything done to move initial dust from you?---Well, we shook some of it out outside before we entered the caravan.

What, you shook your -- grabbed hold of your clothes and shook them, did you?---Yes.

Did you have a respirator on when you did that?---Yes, at that time we still had the respirator on.

What about -- --?---We were still fully dressed at that time.

What about the use of a vacuum cleaner or a compressed air -- --?---We had none of that.

Either outside or inside the caravan?---Correct.

And when you came inside then you took your clothes off, did you, and, what, threw them in a basket?---Containers.

And then you discussed the problem of dust, and you also discussed the medical problems that you suffered in recent years, in your statement? Yes, well, with the exception -- --

THE PRESIDENT: Well, we will adjourn till 2 o'clock. Will you come back at 2 o'clock, Mr Marqueur?---Certainly, sir.

All right then.

LUNCHEON ADJOURNMENT

MR McCLELLAN: Mr Marqueur, I think you found, did you not, that record of the information you were given?---Yes, I found that.

I wonder if you could tell me, who did you inquire of for your dose reading?---I got the figures from a Dr Donovan from Department of Health in Canberra.

What did he tell you?---He told me that the so-called official radiation received on Maralinga service was gamma 130 MR, and beta .4.

.4 or .040?---.40.

.40 was what he told you?---That is what I was told.

Did he tell you anything else?---No, nothing officially. We just discussed various matters, and at that time he drew my attention to the AIRAC pamphlet - that was in March '83 - and asked me to perhaps get a copy of it when it was published, because at that time it was not tabled at Parliament.

Was that AIRAC 9?---AIRAC 9, yes..

He suggested you might like to read that?---Yes, correct. And he drew my attention also to the fact that it mentioned the aborigines; he asked me about aborigines, and I told him then what happened, so he said, "Well, then, you are really in AIRAC 9, so therefore you might want to get it and have a look at it."

Yes, you had a look at it, did you? Did you find yourself? ---I eventually got it about 18 months later, because it was not published, I think, for purchase.

Are you sure that that figure of .40 was not .040?---Unless I misunderstood him - - -

You are shown in the records that I have here as having a, an aggregate I think it is, dose of .170, or 170 millirem, of which the gamma component is suggested as 130? ---Yes. Mr Donovan, after we spoke about the aborigines, he said, "Did you ever touch the aborigines?" and I said, "I tried not to, but I was touched by the aborigine." And he said, "Well, were you checked afterwards through health physics?"; I said, "No, I was not checked through health physics." So, he said, "Well, perhaps one or the other figures may not be accurate."

Right, well, there is one final matter I want to ask you about: the aborigine that you saw - did he have anything on his feet?---Not that I noticed.

And he was walking, I assume, over bare earth?---He was.

Yes, thank you. Yes, I have no further questions.

THE PRESIDENT: Mr James?

MR JAMES: Mr Marqueur, you have had major surgery on a melanoma of your back, have you not?---Correct.

And, indeed, you believed that that melanoma would kill you?
---Well, I was told it was likely to do so.

You have had the lymph glands removed and, in 1975, the same thing on your left arm? And then further operations?
---I had one lymph gland removed a year after the melanoma, which was in 1973; the second lymph gland in 1975.

Following that, you became very concerned as to whether you had, whilst at Maralinga, sustained a dangerous dose of radiation, did you not?---Yes, I was not sure.

And in 1980, I think you were in England?---Right.

And as part of your concern, did you see and speak to a person in England about the dose of radiation persons could have received at Maralinga?---Yes, I made it my business to contact an old pal of mine, Mr Saxby.

Now, who was Mr Saxby when you first heard of him?---I met Mr Saxby at the time when I was briefed prior to moving into Maralinga to work.

That is at Alder Maston?---That was at Alder Maston.

And was he one of the people whom you were asked to contact to obtain your briefing prior to setting up shop at Maralinga?---He was.

And on what did he brief you at that time?---He briefed me on the - in conjunction with other officers - on the tasks to be carried out at Maralinga.

And I think you actually still have your original letter, asking you to report to Alder Maston and to speak to these various people?---I do have it, yes.

And you will produce it to the commission, if the commission should require it?---I certainly will, yes.

But you have set out a summary of it in your statement?---Yes, I did.

Now, when you saw Mr Saxby in 1980, did you discuss with him the question of persons receiving a dangerous dose of radiation at Maralinga?---I started off to try and find out whether I could possibly get a figure of radiation for myself, and it was over a luncheon to which he had invited me; and he said that he was now the officer responsible for collating all the data on Maralinga; he did not specify which test.

That is - did he indicate collating the data on dosages received at Maralinga?---He did.

And did he indicate to you that there were people who had received dangerous doses of radiation at Maralinga?
---Yes, he did.

Did he indicate to you as to whether you were or were not one of those people?---He said that he did not have the figures in his head, but he did not think that I received any dosage that was dangerous to my health.

Did he indicate to you further that he would ring you and tell you if you were - had received a dangerous or an innocuous dose?---Yes. He said he would check and if he finds that I did have a dangerous dose, that he would ring me at my cousin's place where I stayed.

Did he ever ring you?---No.

Did he indicate to you the number of people that he said had received a dangerous dose?---He did not. He just said, a few - very few.

Did he indicate to you in what activities they had - those persons had been engaged?---No, nothing further was said.

Did he indicate to you, over what period - to what period he was referring?---He did not.

Or what tests?---He did not.

And you have heard no more?---No more.

You have been provided now with the information by Dr Donovan and that by Mr McClellan, as to those figures. One thing I wanted to try and get clear: the only instruments of which you were aware, in your time in Maralinga, that could have monitored your personal dosage were the dosimeters and the film badges?
---That is correct.

Those dosimeters and film badges were left in the health physics caravan?---Right.

When you were going into the forward area and taking your troops into the forward area, was there ever any health physics personnel in the health physics caravan?
---Never at any time whilst I was present.

And when you were coming out from the forward area and leaving the dosimeter and the film badge in the health physics caravan, was there ever any health physics personnel in the caravan then?---Only on the very first day that I took troops out; never afterwards.

And who was that person that was there on that first day?---I could not recall who it was.

Do you have, however, an inkling that it was Harry Turner?
---That is right.

Do you recall, at any stage, a Lieutenant Andrews?---No, I cannot say.

Or Chief Petty Officers Monihan or Leal?---No.

Do you recall any naval personnel, at any time whilst you were at Maralinga, associated with health physics or decontamination?---No.

Now, did you speak, at one stage, to Harry Turner about the layout of the health physics caravan?---Yes, I did.

When was that?---That was after I had moved back into the city. One evening, I was mentioning to him the fact that I was not happy with the layout of the caravan between the dirty area and the cleansing area.

When you say "moved back into the city", do you mean by that, Maralinga Village?---Maralinga.

Which must have seemed somewhat of a city?---It was. It was.

When was that, approximately? Can you time that in relation to any of the tests?---Probably, late August. But it would have been before the test.

All right. And you moved back in to Maralinga Village, and you spoke to Harry Turner, and what did you say?---I just mentioned to him that I did not think that it was very safe to have the open space - I mean, a bench between the dirty area and the cleansing area, and that I felt that there ought to be some kind of an airlock.

What did he say to that?---He said it has proved to be safe; he thought it was safe.

Did he give you any indication of why?---No.

Now, do I understand that whilst you were in the forward area, you inspected the ground zero sites of various explosions?---I did visit some of them, yes.

Which ones?---May I refer to the map, please?

By all means?---Because I remember - I forgot the names.
. Biak. I went close to Marcoo but not on to the site itself. I think they were the ones. I am not sure about Wewak.

Looking at Marcoo, you said you went close but not on to the site itself. How close did you go?---Almost to the rim of the - of the site itself, which was a dished

A crater?---Crater, yes.

Did you see any signs of glazing?---I saw what I thought were green peas. Yet, when it was disturbed and the sun got on to it, it was just like small ballbearings, pea size.

Made of glass?---Steel or glass. It just looked like a ballbearing.

And what did you do with them?---Well, being game at the time, I picked a few up in my glove, to just have a closer look at them, and through them away.

What were you doing, on that occasion, up in that area?

---Following a survey for future surveys - I only had one surveyor with me - for the instrument lines and other lines, which were cable lines and so on, that were required for the tests.

Who was the surveyor, do you recall?---I cannot think of the name immediately.

There was no markings of any kind separating off that Marcoo crater from any other area in the forward area?
---Oh, no, it was in the forward area.

Why was it that you picked up these peas and held them in your glove?---Curiosity kills the cat.

You did actually see one of the explosions?---I did.

And which one was that as far as you can remember?---I think it was Taranaki.

Taranaki. Whereabouts were you standing in relation to that explosion?---At the ramp next to the shed from where the bomb was exploded.

Next to - - -?---The control.

The control?---Yes.

Are you able - could you have a look at the map for me and identify the Taranaki site as best you can?---Yes.

Now, are you able to see on that map approximately where you would have been standing?---I would say possibly somewhere in this area here. Fresh Bore.

You are now speaking of the junction of the roads. There are two roads, or three roads joining there. What is the word printed just above them?---What - - -

About one inch above there appears to be a word printed?---Fresh Bore. It would have been near Fresh Bore.

Right. And how far away from the site - the explosion - as far as you knew were you standing?---At the time somebody mentioned two miles and it stuck in my mind.

I see. You do not know whether that is correct or not?---No.

And indeed over the years have you attempted to do the best you can?---I never thought about it anymore.

How old were you in those days?---Forty-two.

When you went to England - I am sorry, these steel cubes - - -?
---Correction. Forty-five.

Forty five. These steel cubes that you placed in the bunkers - or you made bunkers for?---Yes.

Whereabouts did they come from - the steel that is?---Most of them were welded out from steel plates - from cut steel plates, and there were a number of cubes that, I was told, came from Buffalo.

What, they were being recycled as it were - used again?---It looked as if they were recycled, and somebody also mentioned that some of them were recycled. Retrieved they said.

And these were placed in bunkers and instruments, in due course, were put inside of them - the steel cubes?---Right.

Now, when you were in England you told us that nothing was said or done in relation to safety matters in terms of instructions given to you personally or in terms of general instructions by way of general briefing?
---Yes.

But was there mention of safety matters in terms that you would be briefed about them later?---Yes, and when I get back to Maralinga I was told I would be fully briefed.

So that you were told in England that you would be fully briefed when you got back to Maralinga?---Right.

But did that full briefing that you had been led in England to expect ever take place at Maralinga?---If you consider the cleansing procedure as full briefing, yes, then I was fully briefed.

When you mention the cleansing procedure you are talking about your experiences in the health caravan and decontamination?
---Yes.

I see. Can you recall now any explanation being given to you at Maralinga concerning the risks of picking up dangerous dust or particles?---Yes, it was mentioned that you should preferably leave things alone as they are.

And who gave you that briefing?---Health Physics. I do not know whether it was Mr Turner himself or one of his offsidiers.

By way of a formal lecture or written instruction?---No, purely conversation.

And did you, from time to time, seek to contact Mr Turner to ask him about Health physics matters?---No. Once I was shown how to operate the cleansing process I did not speak to him again until I actually moved into the village late July early August.

And that is when you raised this question of the health caravan with him?---That is correct.

But had you tried to find him during that period?---A couple of times I tried, but you just could not get hold of him. He was a very busy gentleman.

I see. I suppose - what could one say. Did you put your trust in Mr Turner?---Oh, yes, he was the only one whom I considered being able to tell us what to do or knows what to do.

I suppose you had to trust somebody?---That is right.

It was when you moved back into - I am sorry, it was when you were handed over to the British in July/August that you moved back to Maralinga village. Is that right?---No, I was not handed over to the British.

No?---It was the Australian Forces and an Australian commander who ran Maralinga.

Yes. No, I am not talking about that I am talking about this function that you were performing with the bunkers and the steel cubes?---I had that before I moved back into Maralinga village.

Right. But you did not complete that I think you told us?---I did not complete that. It was just near Roadside at the old airfield of Eniwetok Atoll - 56.

And you handed that function over to - - -?---Captain Palmer.

British officer?---British officer.

And you then took over half of the duties of the range chief engineer?---That is correct. In conjunction with a naval officer.

And you then moved back into the village?---Yes.

Who was the naval officer?---Lieutenant - about four names - about four names - Lieutenant Townsend - Lieutenant-Commander Townsend.

All right. Now, were there any questions of designs concerning the Health Physics caravan or matters relating to safety precautions submitted to you in your capacity then as a chief range engineer?---No.

I want to see if I can understand this procedure that you adopted in the health caravan, correctly. Do I understand that you took the view that as officer-in-charge of your party, it was your responsibility to ensure that they were properly kitted up?---Correct.

Who did the monitoring of these people when they came back in? ---I did the monitoring after they came back in. It was my responsibility.

Who undressed them when they came back in?---They undressed themselves before they moved to the shower area on their bare bottoms.

All right. Now, the monitoring that you did how did you do that? ---Well, I wore a pair of - after I cleansed myself and monitored myself very quickly I made sure that as they came out of the shower and dried themselves that they put, first, their hands into a static tester, and I had a small hand Geiger counter and went over their whole body - back, front, down the legs, feet and made sure that there was no response from the Geiger counter.

And this small hand Geiger counter - where had that come from?---That was at the caravan.

It lived there?---Lived there.

Did you have any Geiger counters with you out in the forward area?---Never.

Now, the small hand Geiger counter, did it ever give any response?---It did a couple of times, yes.

And was there ever an occasion on which it gave a response for you?---Not until I left Maralinga - on my last day at Maralinga, and that was not in the forward area that was at the security area.

And what happened in the security area on your last day at Maralinga?---Bells ring and lights flickered.

Why, what happened?---And the security officer was very excited about the whole thing, but what happened really was that I had not taken my watch off.

In that monitoring function that you performed with your men, do you know whether the instrument you used was something called a 1021D?---No idea.

Who had explained to you how to use the instrument?---The chappie who was there on the first day, which, I think, must have been Mr Turner - or was Mr Turner, I am not sure.

What explanation was given to you as to how to use it?---Just - I was just shown how to use it.

I see. Turn it on; run it over somebody and - were there dials?---No, only a sound.

And you listen for the sound?---Yes.

And if you get a chatter or a buzz send them back to the showers?---They send them back into the showers. It was the whole procedure again.

Now, the dosimeters you used, do you now recall that the scale was of a somewhat different nature to the scale in the dosimeters you were shown this morning?---Yes, I have an idea that it was a vertical and not a horizontal scale, and I just cannot - I cannot honestly really say exactly. It was too long ago; I just cannot remember.

And the numbers or names on the badges - do I understand by that that there was a board with a number of badges on it with a name above each badge or on each badge?---No, I think it was just a number - finished up with. There must have been a separate list of the distribution of the numbers to each person.

A service number or was it the number of the badge?---A local number. I do not know where that number came from.

And you do not know what it related to?---No.

Well, how could you identify the particular people in your party with any particular badge?---I did not do that. Everyone was responsible for his own number and that was it.

Well, was there an allocation of numbers for people?---Oh, yes.

When did that take place?---I could not say. There were various changes in procedure.

Do you recall your own number?---No.

I see. The aboriginal that you saw - could you describe him as best you could to us. Was he a tall thin person?---I cannot really describe - he was probably my height but thin.

How tall are you?---Five-four and a half. Five foot four and a half.

And was he carrying anything?---He was carrying nothing.

No billy-can?---No.

No spears?---No.

Was he walking in a peculiar fashion lifting his knees high?
---I did not take any particular notice.

You had come from Berlin in 1915?---No.

You had been born in 1915 in Berlin is the way I should express it?---Yes.

And you had come out to Australia?---Yes.

Would you have noticed if he had been walking by raising his knee dramatically up in the air?---If it had have been dramatically I would have noticed it, but I do not think it was dramatically.

THE PRESIDENT: Do we need all this detail on this incident, Mr James?

MR JAMES: Your Honour, my question is whether it is the same incident - - -

THE PRESIDENT: I do not think there is much - I do not think there is much doubt that it happened, is there?

MR JAMES: Not at all, not at all.

THE PRESIDENT: I do not think that would be disputed anymore.

MR JAMES: But my question is whether this is the same incident, in fact. This is why I raised the matter, precisely.

THE PRESIDENT: Well, differences in detail of human remembrance of an incident like that of 30 years ago are understandable.

MR JAMES: If your Honour pleases. There is one last matter I would seek, your Honour.

Did he have any scars across his chest?---Not to my notice.

I have nothing further of this witness, your Honour pleases.

THE PRESIDENT: Mr James.

MR EAMES: Just a matter of clarification, Mr Marqueur: reports written at the time about that incident, one by Mr Turner on 18 May 1957 and one by the acting security officer, Mr White, on 16 May 1957, both speak of there being an engineer party commanded by you which, taking Mr Turner's, "A party of engineers in the charge of Captain Marqueur sighted a family group of natives approaching the Health Physics Control at Pom Pom," and Mr White says, "An engineer party commanded by Captain Marqueur working in the vicinity of Pom Pom observed an adult male aborigine approaching from the north" - just goes to show I am wrong. Can I try that again. Mr Turner, when he speaks of a party of engineers in the charge of yourself sighting a family group of natives, are you quite sure you were on your own?---Quite sure, because I had to hold that person. They had nowhere else to go and I had to leave him to get to my car to get to that radio and call back, and nobody at all was there.

And the suggestion that you sighted a family group of natives is not accurate, as you told us you sighted the male aboriginal?---Yes, but I also did in the distance - the male was on his own, but in the distance I could see some movement.

Yes, all right. Whilst you were at Maralinga over this time, did you have any other dealings with aboriginal people? ---No, except that I visited the mission at one stage.

Yes. That was a Lutheran mission, I think, was it not, at that time?---Yatala, or Yalata.

And did you know any of the pastors there, get into any discussions with them?---No. It was just a short visit.

And did that appear to be a fairly active mission, a lot of people about, a lot of aboriginal people about?---There were.

And during the time of that visit, did you learn anything about people's movements, or was that not something which was discussed?---No, it was not discussed.

You said in your statement that you handed some cigarettes to the aboriginal person who you saw. Did he smoke them?---Yes, and how. I could not feed him enough, but I rationed them out. I smoked half, then gave him the other half, and told him to sit down. Sometimes it worked, sometimes it did not, and when he thought it was due for another cigarette, he used to tap me on the back, and then eventually, after I

dragged it out a little bit, I gave him another one, and so we shared the cigarette. I smoked first and then he had the rest.

Well, it sounds like a fairly expensive shout. How many did you go through?---I have no idea. Luckily I had some with me.

Yes. Well, at this stage whereabouts was he when he was smoking the cigarettes?---If that is the wire, he was there and I was here.

Yes?---We were just a foot apart.

A bit like that advertisement on television with the fence dividing you?---Yes.

He was on the dirty side, you were on the clean side, separated by just the strands of the fence?---That is all, that is all.

This strand fence that you are referring to, is this one which ran east west away from the caravan?---Yes.

And about how long was it?---I have no idea. I never followed it.

It was just a case of a simple what, one, two, three strand fence?---No, it was just a single strand.

Single strand?---As far as I could see, yes.

Not exactly an impenetrable barrier, I suppose?---No, no.

Tell me, having had cigarettes there yourself, was there any restriction on the smoking of cigarettes on the range? ---Once you come to the caravan, that is where they stay. All your clothes, everything, stays there.

Right?---Once you go to get dressed to go out in the area, you have got nothing but yourself, or maybe you may have a pair of underpants or a singlet or something like that.

Yes. Your Honour pardon me one second.

Yes, thank you, Mr Marqueur.

THE PRESIDENT: Mr McIntyre?

MR McINTYRE: You have mentioned the fence that ran out from the side of the health fitness caravan; did that run for about a hundred yards and then stop, or did it keep going for quite some distance?---I would have no idea. I said I never followed it.

Well, did it stop after a hundred yards or did it appear to go on?---I never looked along it. I had no cause to do that because we went straight off north really

You said that you were in charge of a party of engineers. How large was that party, do you recall?---That varies. Either two or four chaps generally.

Was that described as a troop that you were in charge of?
---No, no, half a troop.

Who did you take your orders from in the sense of who was the person that directed you what work was to be done on the range?---Mr Saxby.

You have mentioned Colonel Williams as the chief engineer. Was he in that job when you arrived at Maralinga in 1957?
---He arrived shortly after me.

What was his job as far as you were concerned?---Overall tasks engineering-wise in the village and assisting in getting provisions and supplies for the forward area.

Your directions were taken from Mr Saxby?---Yes.

What was his job there, do you know?---He was the chief engineer, I think you might call it, for the test area.

Was he an Englishman, or he is from Britain?---He is from Britain, right.

Do you recall a lance corporal working for you called Lance Corporal Woodley?---No, not Woodley.

He has given evidence here and he said that he was a person that called you Rudi?---Could be.

Do you remember a lance corporal calling you Rudi?---Could be, there could be.

Do you recall a lance corporal Woodley being with you at the time that you found the averages?---No, I could not visualize it now. I had so many people before and afterwards with me that I could not single him out. There is only one chap I can particularly single out.

Yes, thank you, your Honour.

THE PRESIDENT: Yes.

MRS FITCH: I would just like to ask you about your watch. What kind of a watch was it which set off the Geiger counter?---That is the one.

You still have the same watch?---Yes, phosphorus on the dial.

Phosphorus?---Yes, on the lettering it is phosphorus, and that is at the - - -

Who told you that?---Pardon?

Who told you it was phosphorus?---That is what I was told at the security centre by a security person.

Did it concern you you might have had some radiation exposure
from your watch?---I do not think so.

Have you ever had it tested since for radioactivity?---No.

THE PRESIDENT: Mr McClellan?

MR McCLELLAN: No, I have no further questions.

THE PRESIDENT: You may stand down, Mr Marqueur, thank you.
That is all, thanks?---Thank you, sir.

THE WITNESS WITHDREW

MR McCLELLAN: I call Mr Last..

BRIAN JAMES LAST, sworn:

MR McCLELLAN: - Would you sit down, Mr Last, please. Your full name, I think, is Brian James Last; is that correct?
---Correct, yes.

You live at 22 Stanger Street, Yarraville, Melbourne, in Victoria?---Correct.

You have made a statement in relation to the matters before the commission. Do you have a copy of that statement there?---Not with me, no.

Oh, you do not.

THE PRESIDENT: Neither have we.

MR McCLELLAN: I withdraw that. Well, I think the position is that you joined the Australian Air Force in 1944?
---Correct.

And then in 1956 you went to Maralinga?---Correct.

You were a sergeant fitter, driver of motor transport?---Correct.

Is that so?---Yes.

You went to Maralinga via Adelaide, and I think you ended up in what became camp 43?---That is right, yes.

And you stayed there for some time; is that so?---Yes

Sorry?---Yes.

Now, I think that while you were there, at camp 43, a visit was made by members of the camp, under the command of Squadron Leader Steptoe, to Emu?---Yes, that is right.

Did you go on that trip?---No, I did not.

Did you ever go to Emu?---Yes, I did, on a couple of occasions.

And did you ever hear a suggestion that Emu had been hurriedly evacuated?---No. I read, years later, in a book called Maralinga, that it had been - that was the first time I had heard about it.

And do you place any credence in that, from what you saw?---No.

Now, I think that you received briefing on the dangers of radiation, in your early days at Maralinga; is that correct?---That is correct. Yes.

And I think that you indicate that on one occasion when you were at camp 43, you observed an incident where uranium was being used?---That is right. We had a sports day - an Anzac Day sports event and -

And I think during that event you observed some scientists using some uranium - you say to hot up a ballbearing?
---That is right, yes.

Well, could you explain to me what you saw them doing?---Oh, they had a piece of - I had never seen uranium before, but they showed me a piece of this uranium, which I thought was a particularly good-looking metal, a nice piece of - nice-looking metal, and they had a dish of ballbearings, and they held this - one of the ballbearings to this piece of uranium, dropped the ball back in the dish, and swirled them round, and you would bet on the - wagered on which ball you thought was radioactive. They got their Geiger counter out and checked the ball, and if you had your money on that one, you won.

MR: Camp 43 roulette.

MR: Certainly not Russian.

MR McCLELLAN: Now, I think while you - or after 43, you moved to Maralinga village?---That is right, yes.

Is that so?---Yes.

And I think you indicated, there you were given a film badge; is that so?---We were issued film badges originally, when we were at camp 43.

I am sorry - that happened when you were originally at camp 43? ---That is right, yes.. Yes.

Was that a badge like this one I have?---Yes. Similar to that.

And you were given it at camp 43, and what were you told in relation to your obligations to wear it?---Oh, we were told we had to wear them at all times.

And did you wear it at all times?---Yes, I did.

Was the badge ever checked while you had it?---On about two occasions, I think.

And what happened when it was checked?---Nothing showed up.

Well, what did they do? Did they come and take the whole badge away from you?---Yes. That is right. Yes.

And give you another one?---Well, I do not know whether it was the same badge they gave us back, or another one.

You were given another one?---Given another badge, yes.

And when you left Maralinga, did you take a badge with you?
---That was still attached to my overalls. My daughter still has it today, I think.

Your daughter still has it today?---Yes.

You say that, I think, that some people were a bit curious about their film badges?---Yes.

What did they - what did you observe happening to them?
---Some of the members opened them up to see what was inside.

Did they open up just the badge?---No. They pulled the film out and

Let us do it together. Now, the badge - you mean they opened it up and took out that section from the inside?
---Yes.

And did they do anything to the bit they got out?---No. They just opened it up to see what was inside it.

I see. And what - did they put it back in then?---Yes.

Was that a frequent event?---Well, I saw two or three fellows doing it, and I told them that, you know, they had better get a new badge, having exposed the film in it.

Did they go and do that?---Well, I told them to. Whether they did or not, I have no idea.

Now, I think your duties at Maralinga mostly related to the servicing of vehicles?---That is true.

What sort of vehicles were you called upon to service?---Oh, a variety. We had. Land Rovers, Austin Champs, Commer four wheel drives, two heavy Scammell instructors, earthmoving equipment, semi-trailers: - - -

And were you required to carry out your duties in the village itself, or where?---Well, we - originally we started off at camp 43 - - -

Sorry, yes, you started at camp 43. When you moved to the village, whereabouts did you - - -?---Oh, we had a transport section down adjacent to the village.

What - within the village itself?---That is right. Yes.

Now, are you familiar with the system that apparently was maintained, of clean and dirty vehicles?---That is right. Yes.

And the vehicles that you were servicing: were they clean or dirty?---Clean. All clean.

All clean. Did you ever have occasion to service a dirty one?
---Only on one occasion.

And what was that occasion?---A surveyor, Len Beadell, broke down in the desert. We went out - a party of us went out to pick him up, and he required a new front end for his vehicle, so we had - the only one of that model

was an old vehicle from Emu tests which was - had been stored at Kittens. And we pulled the front end out of that and took it back up in the desert and placed it in his vehicle.

And was that a dirty vehicle?---Yes.

How do you know that?---It had the signs on it.

What were the signs?---It was painted in, oh, a peculiar fashion. - I cannot recall. It was red, and had some sign on it of some sort. I - - -

Did it have lettering on it, or was it just coloured in some way? ---Well, it - what is a - some sort of a badge which denotes radioactivity was painted on this vehicle.

Was it? Do you recall what the badge had on it?---

Now, I think that you were also responsible to operate a winch; is that so?---That is true. Yes.

And I think that - you understand that you operated the winch which was used to hoist a bomb to the top of the tower? ---Yes. That was the first test.

That was One Tree, was it?---One Tree, yes.

Did you carry out that function in relation to any other bomb? ---None. No, I did not.

I think as a consequence, you, and perhaps two other people, were the very last to leave the forward area, before the firing of that bomb?---Well, that is true. We - I hoisted the bomb to the tower on, I think, 14 occasions. Because of the weather, they had to lower it to the ground again, but on each occasion the security officer, Commonwealth policeman, left the site, the armourer went up the tower, armed the weapon, came down, and then I drove him back to the place where the weapon was fired from.

And after you fulfilled that function, did you observe the bomb going off, from any particular location?---That is true, yes.

Whereabouts?---From the actual point where the firing took place.

Was that Roadside?---I cannot say it was Roadside. It was roughly six miles back from where the weapon was fired on the town.

I think also, before the first test, you had an occasion to conduct a scientist around the forward area, opening boxes; is that right?---That is true.

What had happened there, that made this venture necessary? ---We had about 29 Holden utilities which had no

radio suppressors fitted, spark plugs and coils, etcetera, and despite entreaties and pleas to bring them in for suppressors to be fitted, none of them that were at the sites would bring them in, and of course they would drive around the area, and once you pressed the radio, interference from the vehicle was sufficient to set off these traps which we used to collect dust and fallout from the explosive.

I think you had no duties in relation to the second firing; is that so?---The second one, no. It was at Marcoo, I think, with the ground explosion.

Yes. Yes, I do not think you were at - - -?---No. No. No.
.....

You did, however, go to the site of that explosion some time - - -?
---I have an idea it was the following day when - - -

Did you go in protective clothing?---No.

Well, let us look at this in detail. Why did you have occasion to go to the Marcoo site after an explosion?---Curiosity, to see what happened.

Did you have to go through health physics to get there?---No.

Are you sure it was within a day of the explosion?---Roughly. I think it was the next day, or it could have been on the following day, but the - when I drove out there, I left the truck that I was driving and went and had a look over the edge of the crater, and there was a Major Magee and another chap down the crater at the time. They invited me to come down and have a look, and I declined. I said I would rather be up where I was.

Did they have protective clothing on?---No.

And do you know what they were doing there? Were they equally curious like - - -?---Curious. That is all.

That is all. Was there anyone else around at the time?---Not to my knowledge. There was a - I think there was an army sergeant and myself in the vehicle I was driving, and there was - the only other two was Major Magee and this other chap in the bomb crater.

How deep was the crater?---Oh, it would be a good 15 foot deep, I guess.

Fifteen feet?---15 - yes, I guess 15 feet.

What - a bit more than a ceiling?---Oh yes. Yes.

A lot more?---Well, that is 12 - yes, 3 foot, I suppose, because I could not see anybody down in the crater until I got up and walked up to the edge of it. That is how deep it was, you see.

And then you saw Captain Marqueur. -- I am sorry, Major Magee?
---Major Magee.

Major Magee. And he was just wandering around in the crater,
was he?---Yes.

Are you sure this was not some many days after?---Well, I - it
is - as I say, it is 28 years ago. It might have been
the next day. It was within a couple of days, anyway,
of the actual test.

It could not have been a couple of weeks later, could it?---I do
not think so, no.

You do not think so. Was the crater in any way fenced off, at
this stage?---No.

Was there any indication that you should not go there?---Well,
I do not think a great many people had access to the
forward area at that time, because there was - - -

How did you manage to get the access?---I had a particular pass
which - - -

Why did you have that pass?---Because I was required to hoist
that - the atomic weapon, the first time, I was given
a pass that enabled me to move about fairly freely
around the area.

And you used that in order to pursue your curiosity?---Well, I
was not even asked to show it. I just drove past the
constable on duty. I guess he knew me long enough to
- - -

There was a constable on duty, was there?---Oh yes. Yes.

Just the one?---Yes. Generally when they were proceeding to set
up for tests there was more than one, but I think on
this occasion there was a house on
the road which everybody could pass in and out.

I think you also recalled an event before the first firing, on
many occasions when you were hoisting the bomb to the
top of the tower, and you sat down on a crate and
smoked a cigarette?---I recall that, yes.

Was this before or after you had hoisted the bomb up?---While
waiting. Army service life is one continual wait.
This was sitting on the crate waiting while they were
getting the bomb ready to hoist to the top of the tower,
and I smoked a cigarette, and I asked one of the
. what was in the crates.

What was in the crates?---He said, radioactive filters.

He said what?---"Radioactive filters. We will get rid of them
when the bomb goes off."

In other words, a radiation incinerator; is that - what did you understand by radioactive filters?---Filters being currently used to collect dust from some process, or something they had done there.

And you were sitting on the crate?---Yes.

What was the crate made of?---Wooden crates.

Was there any protection for the filters inside, or could you see them through the - - -?---No, no. That was a solid crate.

A decent sort of box, was it?---Yes. I did not look inside it.

Did you take any steps to get yourself checked after that event?
---Yes.

What did you do?---I took my badge and got it checked.

And what were you told about your badge?---I do not recall. I do not think I was told anything.

Now, I think you did not have blood tests before the trials.
Did you have any blood tests after the trials?---Yes.
We did.

What happened?---I - we were given x-rays, and they took blood tests, examined the old film badges. I think the only remark I had from one of the technicians - radiographer, I think they call them - the fellows that take the x-rays. He said that in the course of his duties he received more radiation than the majority of us had received.

I think you have read the book by Tame and Rowbotham on Maralinga. I think you say that a number of things in there are not correct, in your experience?---That is true.

I think, firstly, you were never requested to sign anything resembling an obligation under the Secrecy Act or Security Act?---Originally, when we went there, we had to be vetted - is that it - or they - - -

They checked you out, did they?---Oh yes. Yes.

But did you have to sign any document offering an undertaking?
---Not that I recall. No.

Were you ever told not to talk about things?---We were asked not to talk about any particular thing about the atomic weapon that we saw, but apart from that - - -

Nothing else?---We were not told we would be put in gaol if we told anybody where we had been, or anything like that.

Sorry, you what?---We were not told we would go to gaol if we told anybody what - where we had been; nothing like that.

Yes, thank you, Mr Last.

THE PRESIDENT: I do not think you have tendered that - - -

MR McCLELLAN: No, your Honour, I am not in a position to do so, I am sorry.

THE PRESIDENT: Mr James?

MR JAMES: If your Honour pleases.

When you saw these people opening their film badges, and taking or exposing the small piece of film, was there any discussion that they were doing it to try and see what colour the film badge had gone?---No, they just wanted to know what was inside the badge.

I see. And when you were at Marcoo, was there green glazing or green glass or green peas, or something that looked like green peas around there?---I did not notice any - particular any colour. It was sort of - the ground was not glazed like that but there was pieces of glazing, you know, portions of, I suppose, fused rock or what it was.

Like slag or - - -?---Yes, yes. But - - -

That was in and around this?---Yes, that is right, yes.

Was that Major Owen Magee?---I cannot recall his Christian name.

You knew him?---Yes, knew him well.

Do you recall if he was wearing white overalls?---No.

Do you recall - does that mean there is no recollection of what he was wearing or - - -?---He just had - well, I had a pair of overalls on myself, you know, working overalls. I think he had his normal working gear on.

What was his normal working gear?---They wore greens - green pants and green shirt.

Did you ever wear protective clothing whilst you were at Maralinga?---No.

You have seen pictures, I gather, in the Maralinga book of Sergeant Smith - - -?---That is right, yes.

- - - in white gear and respirator?---Yes.

And Major Magee was wearing nothing like that?---No.

And do I understand that you were given a briefing about safety precautions, about the use of film badges and dosimeters, and so forth?---That is true, I was.

Who gave you that?---I cannot recall. It was immediately after arriving at the village. I was a couple of weeks late in arriving there, because clearances were held up at the previous unit, and I arrived there with a party of three or four other air force chaps, and somebody then told us about what was going on there, what - because we had no idea what was going on there at all. They told us what was going on and what we were about to do.

Was this somebody an officer or - - -?---I cannot recall. I mean, it could be an NCO, maybe an officer.

Were you given any pamphlets or instructions or anything in that order?---No. No, just - they spoke to us and said so many rems or rads or something would be - would do you damage, if you got 20 per cent of that amount, you would be sent out of the area.

Rems, rads or Roentgens?---Well, that - - -

Over the years - - -?---That is one of those things - terms
- - -

Were you ever aware of anybody who was told his badge result?
-----No.

Nothing further, if your Honour pleases.

MR EAMES: Mr Collett.

MR COLLETT: Mr Last, I think you said you went to Emu on a couple of occasions whilst you were at Maralinga?
---That is true.

How long were you at Maralinga?---I do not know - just on 11 months, I think.

Did you go anywhere else out of Maralinga apart from to Emu?
---I went further north from Emu; I went another 120 mile further north from Emu.

Where was that to?---The surveyor, Len Beadell, was making a run down from Giles across country and he broke down in the desert. We went up to - he almost ran out of petrol and was immobilised so we went up in a couple of four-wheel-drive vehicles to bring him back to Maralinga.

Did you go through Emu on the way?---Going and coming, yes.

Did you see any aborigines at any stage when you were at or out of Maralinga?---Not at all, not at all, not on the range.

What about off the range?---The nearest ones, I think, were at - we went down to Cook one day and Ooldea another time,

Ooldea, Ooldea on another occasion. That is the only time I saw a native.

When you say Cook, was that the railway siding at Cook?---The railway siding, yes, yes.

And how many aboriginal people did you see there?---I saw a couple there. Not so many people at all, I just saw a couple of children and - - -

They appear to be people living at the railway siding?---Well, I would not know where they come; I just happened to see them there.

What about at Ooldea; how many aboriginal people did you see there?---Oh, these were only people I saw along the railway line at - near Ooldea. It was only two or three people, something like that, there.

Were they near the old mission at Ooldea? Were you familiar with the mission there?---I do not know. I never went to the old mission, no. These were just people alongside the railway line.

Did they appear to be attached to any siding or railway house? ---No, I could not say. I just happened to see them there and we went by in the

What were they doing?---Standing by the railway line.

They look as though they were still in their traditional ways, carrying spears or - - -?---No, no, no. These were dressed as Europeans.

Did you see any other indications of aborigines, apart from actually seeing aboriginal people?---None at all. Oh, well, travelling across country, sure, we saw signs of, you know, what do they call them, trees with the bark cutting - things they carry their goodies in, but outside Emu, up on the hill, there was a ring of stones apparently of some tribal significance, but how old that was, I would not have a clue.

Which way from Emu was that?---As you come into Emu from Maralinga.

And was that a particular configuration of stones, was it? ---Yes, it was pointed out to me by the surveyor named Beadell. I would never have noticed it. It was pointed out to me.

Did he give it any particular name or tell you anything about it? ---All he said was, I think, it was an aboriginal site of some sort. I did see another thing on that day where we went to pick up these traps that had been set off. There was a fault in the land then and some - could have been aboriginal activity there, but how long ago or before or what age it was, I could not have a clue.

I will come to that in a second. Mr Beadell did not call the configuration of stones he showed you a stonehenge or any name like that, did he?---No, no.

Now, I think you just mentioned a sighting of something or other when you were picking up traps; is that what you said?---Yes, when we went to re-set these things that pick up and, you know, they went off - to collect the dust from the fallout.

And where was that?---There was a road - 25 mile or 25 right around the forward area.

And what did you see there?---There was a fault in the land. There was a cliff and it had various holes in the cliff and there was bundles of bones of some sort - long thin bones been bundled up and put in place in holes in the cliff, which I take it had been put there by aborigines.

Did they appear to be human bones?---Would not hazard a guess - they were some sort of animal bones, but they were long thin ones, very thin.

What sort of length?---About so long, but they looked like - could have been leg bones, but, you know, the on each end of them.

You are indicating about eight or nine inches in length?---Yes, that is how long, 10, 12, 10 or 11 inches, something like that.

When you say a bundle, were they actually bundled together? ---Bundled together and they were stuck together with - aborigines make a - something out of spinifex - a glue of some sort to attach their spearheads to their spears with, and these appeared to be stuck together with the same sort of material.

And you said they were in holes. Were there a number of compartments with these bones?---There was holes - about that size there - six, eight foot up the cliff, the various holes bored in there with the bundle of bones placed in each one.

Roughly how many?---Well, I had pulled out three or four. I did not go and count the whole lot. I pulled out three or four to see what they were, and put them back.

How many bones per bundle?---Could have been 10 or 15 bones in the bundle.

Did you have anybody with you?---The other two chaps were sitting down having lunch.

Did you tell them about it?---Yes.

Who were they?---Escaped me; I cannot remember.

Mr Johnson one of them?---No.

And did you report that to anybody at the camp?---No, I did not.
It was not until later I wrote to the museum of
Western Australia to find out if they knew what they
were.

And did you get a reply from the West Australian museum?---Yes.
They said they did not know what they were. They could
not identify them without samples.

And did you endeavour to provide them with samples?---Well,
I have never been back there.

Now, are you able to say where that spot was where you found
the bundled bones by reference to the map behind you?
---Sure, yes.

Care to just have a look. Come over and have a look at M4 and
can you - I show you a map which is headed, Restricted
Flying Area 1961. Does that indicate the area in
which you were looking?---Yes, that is the track there.

Now, you are pointing to a track which bears the name, 25th
Avenue?---Yes.

And are you able to indicate on that - along that track where
you found the - - -?---Along here somewhere - across
there, there is a fault in the land.

Would you care to make a mark on the map?---If I can - I will
not say it is terribly accurate but I would say round
about there.

And bearing in mind that the commission does not have this map
in front of them at this stage, can you indicate the
direction of 25th Avenue from the Maralinga village?
---It is due north.

Due north?---Maralinga village is back here.

Right and about what distance would you say from the Maralinga
village?

MR McCLELLAN: Mr Collett, I think Mr McIntyre might have some
copies of that map there.

MR McINTYRE: I have some spare copies of that map.

MR McCLELLAN: The map has not been tendered. Perhaps, you
might like to tender it, Mr McIntyre.

MR McINTYRE: I can produce - well, I could tender a copy of a map
entitled, Official Use Only, Restricted Flying Area.
There are three photocopies here. I have given copies
of this map to my learned friends at the bar table.

. grid pattern set out above the
test area, that is referred to by Major Magee in
- - -

MR McCLELLAN: I think it can be marked AG 4. Perhaps, Mr
Collett might just re-trace - - -

MR COLLETT: Now, you were indicating a position of the site
on 25th Avenue, which appears to be the top road
mentioned on the map?---That is right, yes.

And were you indicating a position towards the - - -?---Towards
the Emu Road.

Towards the Emu Road and apparently in the eastern half of
25th Avenue?---That is right, yes.

Can you indicate roughly when this was that you saw these bundles?
---No, I - what, the month?

Well, by reference to the blasts?---It was prior - prior to the
blasts.

Prior to all of the blasts of '56?---Prior to all of them, yes,
yes.

And did you ever go back to that location?---Went past it, on
a further occasion, yes. I did not stop there.

So, I take it, that you inspected the bundles, put them back
in their holes - - -?---That is right.

- - - and that is the last you have seen of them?---Yes.

Yes, I have no further questions.

MR McINTYRE: You mentioned - you referred to 25th Avenue, when
the map was shown to you. Was that a road or a track
that you knew was there present at the time when you
saw this bundle?---Yes, the track had been dozed,
I think.

Was it referred to then as 25th Avenue?---I cannot recall, no.

Was it one of several tracks in the area, or was it one which
sticks out in your recollection as running east to
west from the road to Emu?---It sticks out in my
recollection because I had to drive around it to
rectify these traps that had gone off, because the
fellows driving vehicles down
there.

There was certainly a track closer to Maralinga village than
it was to Emu?---Oh, sure, yes, yes.

Now, you mentioned the first trip to Emu, when you had to assist in the repair of Mr Beadell's vehicle. We have heard evidence in Sydney from a Mr Johnson. Do you recall whether he was with you in your party?---It would not be when I would pick up Mr Beadell?

Yes?---Yes, he accompanied us as far as Emu.

All right. Can you recall the circumstances whereby he came to become part of your party?---No. Well, I asked - we had a Corporal White who was in charge of the drivers - and I asked him for a couple of support drivers to accompany me as far as Emu.

All right, and did Corporal White nominate Mr Johnson and somebody else?---Yes.

How many vehicles went to Emu?---There was a Landrover driven by a surveyor; Landrover driven by myself; and a Commer 4B4 driven by Johnson.

Right, and did those three vehicles travel separately or in the one group?---In the one group.

Who was the person that navigated the route to Emu?---The surveyor.

And did Mr Johnson drive his vehicle beyond Emu or stay at Emu? ---No, he stopped at Emu, off-loaded petrol and supplies, and then he was told to go back to Maralinga.

Was he told by you or by somebody else?---By myself.

Did you expect him to remain there that night?---No, I did not.

Right. Did he give any indication to you that he was going to stay there that night?---None.

What was the purpose of his inclusion in the party, do you recall? Sorry, I withdraw that. When you got to Emu, do you recall seeing any signs warning about radiation hazards around the settled area of the village at Emu?---Not round the village, no, not at all.

You say the part that you took to repair Mr Beadell's vehicle was taken from another vehicle back at the Maralinga area? ---That is right.

Was this before any of the explosions had taken place? Was it before round one?---Yes, yes.

And I think you said you thought that the part was taken from a vehicle that was not clean?---That is true.

If this occurred prior to round one, where do you think that the contamination of that vehicle might have occurred?---It occurred at Emu, because the vehicle had been stolen by the army chaps and driven back to Maralinga.

Well, the time you made this trip to Emu when Mr Johnson accompanied you, what was your understanding of the

purpose or the use to which Emu had been put previously?
---We were told that atomic weapons had been fired from there.

All right. Was that known by you as a secret, or was it common knowledge around - - -?---Common knowledge.

- - - camp 43?---Common knowledge.

That is at the time that you made that journey?---Yes.

You have told us about your visit to the crater, where you saw Major Magee. You said it was, you think, the day after. My learned friend, Mr McClellan, said, "Could it have been a couple of weeks later?" and you said you did not think so?---No. No, I am sure - - -

Well, you have also described that you saw some portions of fused slag on the area?---Yes.

Well, was that a complete sheet of slag that you saw?---No - - -

Or was it a number of - - -?---No - - -

- - - small patches?---No, just little patches of fusion.

Little patches?---Yes..

All right, and was that right up to the edge of what you thought was the crater?---Well, it surrounded that general area.

Did it surround it in little patches, or did it surround it as one large sheet?---No, it was not one large sheet, no.

All right. So do you say that up to the edge of the crater there were little patches of this - - -?---Yes.

- - - slag?---Well, they were by the crater as well.

And you say that the hole was about 15 feet deep?---Yes, I think so, yes.

What made you think it was the crater itself?---Because I had been told where Marcoo test was from and I had seen the site prior to the test.

Did you think it might have been a hole that was being dug for some other purpose?---No.

And you are quite certain that Major Magee was not wearing protective clothing?---To my knowledge I cannot recall him having protective clothing on, no.

You see, might not this have occurred well after round two?---Not because I was curious to see what had happened to the area where the thing had gone off.

Was it a matter of some surprise to you to see an army major at the bottom of the crater the day after the atomic explosion?
---I was very surprised.

And did you mention that to him at the time? Did you say, you know, "Why aren't you wearing protective clothing?"
---Well, it was surprising then. He just said, "Come and join me," and I said, "No, thank you. I'll stay here."

And you are quite certain this could not have been some weeks later?---Well, it was - it would not be weeks later, no. It was a short time after the - the test.

When you say a short time, could it have been ten days?---Well, no. It was only a few days - a few days at the most because - very curious to see what had happened out there.

And when you went there did you see any health physics caravans? Sorry, I withdraw that. When you were at Maralinga did you ever see any caravans that were generally described as being health physics caravans?---Yes.

Did you see any of those anywhere near the crater - - -?---They were - - -

- - - that you saw Major Magee in?---From Marcoo, from memory, they were off to the right.

How far?---Could have been a couple of hundred yards to the right from Marcoo.

And did you go past those caravans when you went to drive up towards Marcoo?---Oh, sure. We passed them regularly, yes.

Well, did you drive on a road as far as the edge of the Marcoo crater - - -?---No - - -

- - - or did you drive across country?--- - - - it was off the road.

Did the road towards Marcoo go past the caravans which you saw? ---I - I recall, I think Marcoo was to the left of the road, was it? Left?

Do you recall driving past any caravans shortly before you got to the crater?---Yes.

How close did you come to the caravans? A few feet, or - - -? ---Oh no, it was a fair distance away from where I went past.

Well, a few hundred yards, or what?---Well, it would be - probably a hundred yards, would it - a hundred yards, something like that.

Were you by yourself or was somebody else in the vehicle with you? ---No, I was with a sergeant - an army sergeant. I cannot think of his name. He got me in the - in this Landrover.

Did you see anybody around the vicinity of the caravans?---Not that I recall, no.

Did you see any signs of any life anywhere, apart from Major Magee down in the bottom of the - - -?---Oh yes, there were other people moving around that area.

Did anybody suggest that you should have gone through the health physics caravans before going up to the crater?---No.

Nobody stopped you at all?---No.

Any sign of life around the health physics caravans?---As I say, there were people moving around, but whether they were in the - round the health physics vans or - I do not know.

Did you see many people around the site of the crater?---No, no.

It was pretty deserted, was it?---Yes, because - two vehicles there, as a matter of fact.

I get your pardon?---Only two vehicles there.

I see. Yes, thank you.

THE PRESIDENT: Mr McClellan, is there not a photograph of the crater in evidence? I have seen a photograph at some time.

MR McCLELLAN: There is a photograph - yes, there is a photograph in evidence somewhere.

THE PRESIDENT: Could that perhaps be shown to the witness?

MR McCLELLAN: Yes.

THE PRESIDENT: And ask him whether he can identify that.

MR McCLELLAN: Mr shakes his head, but there is a photograph.

THE PRESIDENT: I do not know whether one was tendered - - -

MR McCLELLAN: I think it was. It was tendered - - -

THE PRESIDENT: - - - but I can clearly recall having seen a photograph at some stage.

MR McINTYRE: There was a photograph taken during the Antler series - - -

MR McCLELLAN: From the air; was it not?

MR McINTYRE: - - - by the sergeant who said he thought it was the Marcoo crater. It was just - showed a lot of dirt and the hole.

MR McCLELLAN: And there was one from the air, too. I do not know whether Mr can find it. He has left his computer in Sydney. And we have seen it on film, of course, too.

THE PRESIDENT: Well, that may be where I saw it.

MR McCLELLAN: We have seen it on the video film.

THE PRESIDENT: Yes, perhaps that is where I saw it.

MR McCLELLAN: Perhaps while we are looking for that, Mr Last, can I ask you these things, sir: you knew, did you not, that the site of the atomic explosion was likely to be contaminated - - -?---Yes.

- - - after the explosion?---Yes.

And you knew that as a consequence there would be a danger in going to such a site after the explosion?---Yes.

You knew also, did you not, that people were provided with protective clothing to go to these sites?---That is correct, yes.

And you knew that that protective clothing was designed to assist in eliminating risks for persons who might go to the sites after the explosion?---Yes.

Can you tell me then why, sir, you say that you went to this site within a day of the explosion without protective clothing? ---I think we had been led to believe the health physics chaps had been in there with their testing gear and, you know, they were in their suits, their anti-contaminant suits, and they had been right through there. They went through, I think, immediately after the explosion and checked the place out, and they gave us a reassurance that some of the places were not, you know, as badly contaminated as others.

Right. So you went there after you had been assured that it was safe to go?---Well, no. They did not say it was safe to go, no.

Well, did they say it was unsafe?---Well, they said it was not highly contaminated.

Well, do I take it you went there at a time when you did not think there was a risk to your safety in going?---Well, as I said, I would not go down the hole, because - - -

Maybe you would not go down the hole, but you are not suggesting that you went to this crater deliberately at a time when you knew other than you had been told it was safe to go there?---They said it was - they did not say it was safe, no. They said it was not - was not highly contaminated.

And you are suggesting to the commission that you were prepared to voluntarily go to a place which was not safe?---Well, as I say, it was not safe; but it was not highly contaminated - yes.

Well, what are you saying? Are you saying to the commission that you deliberately exposed yourself to a risk that you knew about?---Well, yes, it was a risk in one way, but it -

as they assured - the health physics fellows said it was not highly contaminated.

They had assured you, therefore, there was no risk, had they?
---No, they did not say that at all.

All right. Well, what - did you believe - - -?---They just said it was not highly contaminated.

Did you believe there was a risk in your going there?---I suppose there was as risk, yes, but - - -

Did you believe at the time there was a risk?---Yes - a small risk, yes.

A small risk?---Yes.

A small risk that you were prepared to take?---Yes.

Did you believe that you were - in going into that area - that you were acting consistent with your commands, or did you believe that you were acting contrary to them?
---Well, I should not have been there in the first place, but out of curiosity I went there anyway.

You said the hole you saw was about 15 feet deep?---Yes, that was - I could not see anybody in it from about 10 foot back from the edge, so - Major Magee, if I recall, is a bloke about 6 foot 2 and I could not see him until I walked up to the edge of the hole and looked over and then I could see him down there - so it would be twice his height, at least.

Are you sure it was not something like 10 times his height?---No. No way; it was not that big, no.

It was not that deep?---No. No, it was not 60 feet deep, no.

It was not 60 feet deep. How far across?---From what I can recall it would be probably - I guess, you know, maybe the length of this room in diameter.

The length of the room across?---Yes.

No luck with photographs. Yes, thank you, Mr Last. Oh, sorry, there is just one further thing; I should clarify this with you. This is the plan of points you marked - the site that you referred to - and the plan is not very distinct and we need to have it better from you. Could you mark with my green pen. - - -?---Yes.

MR EAMES: Just before my learned friend asks the witness to do that, your Honour, in my submission the precise location of this place may be of peripheral concern to the Royal Commission, but may well be of rather more considerable concern to the people that I represent. Could I suggest, your Honour, that if the map is to be marked with the precise location of these matters which are referred to, the map should become restricted. Although we would be

the last people to ask for things to be restricted, in my submission in the circumstances here it would be quite appropriate that it be restricted from being made available to members of the public, apart from the commission. Alternatively, could I suggest, your Honour, that unless it is clear that the precise location is of importance, other than the obvious and general importance of the point which is being made, then I would submit that it is to be a document that is made generally available but a precise location not be placed on it.

THE PRESIDENT: Now this is the location of what?

MR McCLELLAN: The location of the site which contained the bones, as I understand it, your Honour.

MR JAMES: We would support that application, if your Honour pleases.

THE PRESIDENT: Yes. In what way do you mean restrict, Mr Eames?

MR EAMES: Your Honour, my concern would be that in fact even the map itself is almost like a little treasure map. My concern would be that if it was made generally available, even although it is a restricted area up there, as these things often happen it could well eventually prove to be the case that copies were made of it and people would at some stage find an irresistible urge to go looking for these objects. Now, I do not know whether they are there or not any more, your Honour.

THE PRESIDENT: Well, in the light of that, Mr McClellan, is there any useful purpose served by marking it at all?

MR McCLELLAN: Well, your Honour, there is only this: at the present time the transcript reads by reference to a mark which is totally indistinct on the plan. I do not know whether my friend Mr Collett, who got it out - if he proposed to rely upon it in any way, then it is clear that we should have it clearly marked. But if that is not required, then it is perhaps of no concern.

MR COLLETT: I was happy with it as far as it went orally, sir, namely a point on the road.

THE PRESIDENT: Well, I think in the circumstances Mr McClellan might desist from any marking.

MR McCLELLAN: If your Honour pleases.

MR EAMES: Thank you, your Honour.

THE PRESIDENT: Have you finished?

MR McCLELLAN: Yes, I have no further questions.

THE PRESIDENT: Well, that is all right, Mrs Fitch can - excuse me. Just a moment. Mrs Fitch?

MRS FITCH: Mr Last, when you saw Major Magee in the crater, do you recall whether he was carrying an instrument?
---No, I cannot recall, no.

Did he give any indication to you of whether the place was highly radioactive at that time?---All he did was invite me to come and join him down the hole and I declined, because I thought it would be a bit more free of radiation where I was than down the hole.

Thank you.

THE PRESIDENT: All right. Thank you, Mr Last; you are excused?
---Thank you.

THE WITNESS WITHDREW

MR McCLELLAN: I call Mr Hughes. I indicate, your Honour, I cannot tender a statement in relation to this witness either.

WILLIAM JOSEPH HUGHES, sworn:

MR McCLELLAN: Mr Hughes, would you state your full name, please?
---William Joseph Hughes.

William Joseph. Whereabouts do you live?---At St Albans; 14 Anna Street, St Albans.

I think you are - I am not sure. When were you born?---January 20, 1913.

I think that you were present both at Camp 43 and Maralinga in 1956?---That is right.

I think you were there as a driver?---I went up there as a fitter. As a fitter?---Well, fitter/driver DMT.

With the Army or?---No, Air Force - Royal Australian Air Force.

And I think that while you were there, do you recall, on occasions, going into the forward area; is that so?---I walked up all around the forward area.

I think this was after explosions?---Before and after.

And after the explosions, I think you recall being given white suit protective clothing and respirators; is that so?
---That is correct.

Can you tell me were there any problems with the respirators, that you experienced?---Well, they were a service type of respirator, probably quite good for gas but if you were working in awkward conditions under a vehicle that is decontaminated, the dust and everything could still get in.

Sorry - it does not?---Dust and various things get in. I mean, if you are moving around under a vehicle, the respirator sometimes was useless.

Were you required to move around under a vehicle with your respirator on?---Yes.

And when you say it was useless, what used to happen?---Well, the conditions up there were not very good, when you had certain jobs to do; the heat and also it was a hot vehicle, and if you lay underneath like that you would move the respirator sideways and you could not concentrate on the job easy. You would have to move it back.

What happened inside the respirator?---Oh, it steamed up.

Yes. Anything else?---You could not clean it. You would have to cope. But that it just like it was - it would be a tight fit on you, but it still made very little difference.

Did you get any dust inside?---Oh, once or twice you would get dust in.

If it steamed up, what did you do about the steaming?---You could not do anything about it.

Well, did you make any effort to clean it?---Well, you could not.

You could not?---Not if it is a radioactive area you were working on. Once you clean it and prepare it before runs gas you prepared the respirator with this demisting thing and if it does not work, it is too bad. You have to wait until you have finished the job or hope it will unsteam itself to carry on.

Now, when you went into the forward area, were you issued with a film badge?---Yes, I was issued a film badge originally and a dosimeter.

Every time you went into the forward area, and you were given your protective clothing, did they give you a film badge?
---Yes.

A different one each day?---Every day.

Every day, and one of these things as well?---Yes, one of those dosimeters.

And were they checked when you came out?---Yes. They registered a number and everything when you went in and they returned the same day and checked the radiation on them.

Were you given any other film badge which you wore around the village or camp area?---No.

Never?---The only film badge I had was when the start - for the job was done. They were given then and then they were discontinued after a while. The dosimeters were carried right to the very end, every day, one a day

registered, the number down and your name and everything on it, noted in by the officer in charge from the DC area.

Yes, thank you, Mr Hughes.

MR JAMES: Mr Hughes, what is a DC area?---Decontamination area.

Who was the officer in charge?---The Air Force officer staff but he was only in charge of the Air Force. The officer in charge was a Dr Stevens, as far as I know.

Stevens?---Stevens.

And you watched Dr Stevens registering the badges in and - - -?
---Well, he had a staff there. Him and there was Dr - I used to call him Mr Butement but as it turns out, he is a doctor.

Right. So it was Dr Stevens or Dr Butement - - -?---Yes.

- - - that registered these - - -?---There was - no, an Army lieutenant was sitting there doing the reporting in the - - -

So that it was this Army lieutenant that registered all these badges - - -?---He registered them all on a list.

Right, and he did this - it was the same fellow every time registering - - - Oh, somebody else might share it but there was somebody there doing it any time you went to the forward area.

So that it was Dr Stevens, Dr Butement, the Army lieutenant or somebody?---Yes, there was somebody there.

And the ranks of this somebody - - -?---Oh, a lieutenant as far as I - - -

- - - how low did they go? Were there Chief Petty Officers from the Navy?---Not down at the - when I was there, the whole time I was there, there were no Navy officer down near the DC area at all.

NCOs from the Army?---NCOs? There was - it could be a sergeant or staff sergeant. He worked with me sometimes on the survey.

And he registered these dosimeters and film badges in and out?
---Well, whoever was in charge of the registering would have done it.

What about corporals?---Well, I was the only corporal there. There was a Canadian corporal but I do not think he would have to do that. He was a fitter as well.

All right. So that this registering process that you noticed always happened in and out. It involved a man sitting there writing something in a book?---Yes.

And you went - your film badge and your dosimeter were checked every day for the radiation?---Every day.

For the radiation?---The amount on it, you see.

And you were told what those amounts were?---Yes.

Every day?---Every day they told you whether you were getting too high or you were getting over it; anything like that.

So it was your understanding that every film badge that went through that unit was developed every day?---Well, I would not say how it was developed because I do not know what system they did about collecting those. But I know the dosimeters were checked when they came back.

When you say you do not know what system they had for collecting those, do I understand then that the film badges were not registered in and out every day?---Well, they would - for the people that used them they would be, as far as I know.

Did you use a film badge?---Yes, I used the film badges.

Was yours checked - registered in and out every day?---Yes. I handed them back when I came through.

And each day were you told the reading from your film badge? ---No, not every day. Only they might say it is higher; it is running near the limit, that is all.

What I am trying to do is to separate out the film badge from the dosimeter?---Well, I cannot give you any definite information about that because I never asked about the film badges. I knew they took longer to process maybe than the dosimeters. That was an instant reading when you came back.

And you assumed your film badge was developed?---Yes, I assumed it was. I was told after

Who told you your film badges were developed?--Oh, I would not - I could not tell you. I would say one of the scientists. Harry Turner was down there eventually and Dr Stevens and Butement . They said they would be developed and reported and that and if anything - if there was anything dangerous we would have been told about it, because we were told, if you got too much you do not work any more on that area.

Were you ever told you got too much, not to work any more in that area?---No.

In that sense I take it you have never really been told whether your film badges were developed or not?---No, I got no definite information from anybody.

Now, your dosimeter? Did you ever look through it?---Yes. I used to set them myself, charge them up in the morning sometimes.

And were they all put in a basket or box somewhere?---No, they were put in - they were issued with the serial number on the side of it, about a five or six figure number.

Before we get to that though, were they all put in a box or a basket somewhere?---Yes.

For people to pick up?---No, they did not. They were given and we clipped it on to the uniform you were going to use.

So the person issued with those dosimeters would take the dosimeter from the box?---Yes.

Record the number?---Name.

Hand it to the person?---Yes.

And clip it on to his overalls?---Yes, that is right.

That happened in every case?---Every case.

And the name of the person to whom it was issued would be recorded? --That would be put in the list.

You saw that list?---Yes, I saw the list.

And during which period did this happen, as far as you can remember?---Well, it started off after the bombs went off, up until I left on 20 December.

Which bomb in particular?---All four bombs.

Right. So it started after the first bomb or after the series of bombs?---After the first bomb went off.

Right, that was at One Tree?---No, four. I was in charge. I started, built and prepared the whole decontamination workshop. I worked with them right through from the first bomb to the last in December, before I left; four bombs.

Which was the - do you recall now the name of the first bomb in the series?---One Tree

One Tree?---Yes.

So you had been responsible for setting up the whole decontamination centre?---No, not the centre; the workshop. I worked in the workshop, preparing the vehicles. But I knew the layout of the thing. I knew what I had to do; had to go through it in the morning, get ready we had to go through the whole system from start to finish; change our clothes, get into working clothes - white clothes - whether there was bombs or not, before it started.

All right. And who was with you in that unit?---There was only one other service bloke, LAC Johnson. There were only two of us there from the RAAF.

And you would - - -?---I am sorry, just to have said - there were Canadians there as well, but I mean, I was the only Australian serviceman and LAC Johnson, in that area.

Right. You would not recall his christian name at all, would you?---Johnno? No. I do not know whether it is Keith or who it is. Johnno was all I ever knew about him. He worked with me in the transport earlier on, on the night shift.

Rick Johnson?---It could be Rick Johnson. I recognised his photograph in the pictures that were sent back to me, with Chloe the dog. It was definitely the same Johnson.

Chloe the dog?---Yes, that is right. Somebody gave me a printing of the dog we had up there, or the Army had up there, and Johnson was in khaki drabs. I recognised Johnson, but all I ever knew him as was Johnno.

Your Honour, I am placed in a slight degree of embarrassment in relation to this witness and the last witness, bearing in mind the rulings your Honour had made earlier on, and the presence of Mr Brezniak. I have not sought in any way to poach on areas that could create any dissention at the bar table, but really, I think it will be better if I do not cross-examine this witness, now I know this material.

THE PRESIDENT: And what, that Mr Brezniak should?

MR JAMES: No, your Honour, that it be left so that if cross-examination is necessary, we can worry about that in the future. I do not think it would be necessary.

THE PRESIDENT: All right. If you do not want to ask any further questions, do not; that is quite in order.

MR JAMES: I have no further questions I would ask. That is my difficulty, your Honour.

MR BREZNIAK: Your Honour, if I could say a few words? I have no objection to my friend examining, and I cannot understand the source of embarrassment for my friend. If I can be allowed to ask a few questions, then my friend could be unembarrassed.

MR JAMES: Well, I should indicate, your Honour, I have nothing further of this witness, so that would leave Mr Brezniak - I am simply bearing in mind the interim submission and the reference that was made to me in it, which is why I feel I should not cover this particular area.

THE PRESIDENT: Well, Mr McClellan, have you got any guidance to offer on this embarrassing question?

MR McCLELLAN: I have not, your Honour. I am embarrassed by not really understanding what it is all about. We are all embarrassed.

THE PRESIDENT: Yes, I am embarrassed by my inability to understand the embarrassment.

THE WITNESS: Your Honour, may I make a remark?

THE PRESIDENT: No, not at this stage, Mr Hughes. This is purely a little squabble among lawyers. It is a good idea to keep out of that.

MR JAMES: Your Honour, let me make myself clear. In the interim submission that Mr Nelson tendered on behalf of ANVA New South Wales, it indicated that I had neither the capability nor should I, in any way, hold myself out as or assisting in holding myself out as being prepared to act on behalf of ANVA New South Wales or its president. And in those circumstances, I would feel embarrassed in raising any matters that might go directly to Mr Johnson, bearing in mind I do not appear for ANVA or for Mr Johnson.

That is where my degree of embarrassment comes up. I have no further questions of this witness except on that topic, and I would not put them unless I was asked to do so on behalf of ANVA New South Wales.

MR McCLELLAN: Your Honour, it would seem in those circumstances that there would be no further relevant questions. The Royal Commission has not been set up, with respect, to investigate the Johnson case.

THE PRESIDENT: That is right. That is what I was about to say, Mr Brezniak, since that explanation has been made by Mr James. I do not think we should litigate Mr Johnson's action here.

MR BREZNIAK: Oh, your Honour, that would not be the intention
. it would only be to ask questions
- - -

THE PRESIDENT: Well, I do not think that - - -

MR BREZNIAK: - - - which it is felt by ANVA New
South Wales should be asked for the benefit of the
commission.

THE PRESIDENT: What do you say, Mr McClellan? I think perhaps

MR McCLELLAN: Your Honour, it seems to me at this stage, that
- - -

THE PRESIDENT: Would it be very lengthy, Mr Brezniak?

MR BREZNIAK: It would be most brief, your Honour.

THE PRESIDENT: All right. Well, in the circumstances, I think
we will make an exception. You go ahead and ask your
questions.

MR BREZNIAK: Thank you, your Honour.

Did you ever go to the decontamination chamber yourself, or enter
it?---What do you mean by the chamber?

There was a - - -?---I do not know what you mean. Do you mean
the mobile homes and things like that? The mobile
decontamination premises are under decontamination
centre. Well, I had to go through it when I come
back and forward, when I went to work in the mornings.
When you went down there, you had to go through the
office, there is a combination lock was the outside
of it. You went through there and you completely
changed your clothes; left your working clothes and
got into whites to work in the workshop. And that
was the system used before, practiced before the bombs
went off and afterwards. When you finished work for
the day in the dirty area, you had to come right through,
do all the checks and everything and come back in again
before you could go home.

And that is what you did?---Yes, that was done.

And you supervised the man, Johnson, who you mentioned?

---Johnson and I worked together nearly all the time
that we had to work together. He might be working
with the Canadians on one job and I worked with some-
body else on a job, but there was only two of us down
there in the workshop.

And you were supervising him in the works?---Yes, supervising
him.

Thank you, your Honour.

THE PRESIDENT: Yes. Mr McIntyre?

MR MCINTYRE: Yes, I would. You are next, Mr Eames.

MR EAMES: No. We are staying out of this. No questions, your Honour.

HIS HONOUR: Oh, I am sorry, I have missed you, Mr Eames.

MR MCINTYRE: Just a couple of brief ones, your Honour if I - if I can be brief, I will.

Mr Hughes, your job, was it not, to operate the service and repair workshop at the decontamination centre just outside Maralinga village?---That is right.

And that task involved the repair and servicing of contaminated vehicles that had been brought back to that centre from the forward area?---Yes.

And they were brought back from the forward area, down what were known as - - -?---Dirty Road.

- - - what were known Yellow Roads - - -?---Yellow Road or Dirty Road.

They were serviced in your workshop?---That is right.

And sent back up to the forward area to continue to be used as part of the yellow fleet?---Yes. That is right.

And the work you performed there was to service those vehicles adjacent to the village?---No, they did not touch one or the other at all.

No. But your work was to work in the workshop at the decontamination centre?---Yes, yes.

And it was at that centre that you were issued with the protective clothing?---Yes.

And it was at that centre that you were issued with the film badges?---Yes.

And those badges and that clothing were issued to you for your work to be performed at that service and repair facility at the decontamination centre?---That is correct.

THE PRESIDENT: Mr McClellan?

MR McCLELLAN: Mr Hughes, you are not by any chance a squadron leader, are you?---Pardon?

MR No, he is not.

MR McCLELLAN: You were not by any chance a squadron leader? ---No. I was only a corporal.

A corporal, were you? I am looking at some English records. Were you ever told that you had in fact received a radiation dose?---No, well, I got a radiation dose, but up - up to the limits - - -

Well, yes, just - you got a radiation dose. Who told you that? ---Well, there would be just a scientist down there, whoever was doing the checking. When the dosimeters were checked when they come back, they had a range to go on. He said, you are running on the top; you are slightly over the range.

Did he ever tell you you were running over the range?---No, he did not say I was running over the range, because if I had been running over they would have stopped me going out the next day or working on the vehicles.

He did indicate to you, however, that you had received a dose? ---Oh, yes, I had received it because, obviously, if I come through the dirty area and working on a vehicle I would probably have had a higher one, because the monitors in the workshop recorded the high and you had to wash and keep on washing until you had brought yourself down under the red range, the danger limit.

You would not know of a Squadron Leader Hughes who was present at Maralinga while you were there?---Yes, Squadron Leader Steptoe.

Squadron Leader Hughes?---Squadron Leader Steptoe.

Hughes. Was there a Squadron Leader Hughes?---Yes, I think he was, but he was, I think, English. I would not say because I got mixed up with his pay.

Was there a squadron leader - oh, I see, right. So there was a Squadron Leader Hughes but he could have been English. Is that right?---Yes. I think you heard that joke. It was a joke on me, but I would not have minded getting his pay, but it turned out I was better off than he was. He was an English one. I saw "Cl" - it looked like "Cl Hughes" and there was no initials, so I signed across it and the officer-in-charge said, well, sign your own death warrant, he said, without looking at it. Well, I said, what is that? He said, "Cl" it is a squadron leader.

Yes, yes, thank you.

I have no further questions..

THE PRESIDENT: Thank you, Mr Hughes, you are excused?---Thank you.

THE WITNESS WITHDREW

MR McCLELLAN: I call Mr Taylor,

HUGH WEYMOUTH TAYLOR, sworn:

MR McCLELLAN: Would you sit down, please, sir. I think your full name is Hugh Weymouth Taylor?---That is right.

You live at 11 Ivan Street, Bayswater?---Yes.

You have made a statement in relation to the matters before the commission. Do you have a copy of that statement with you?---Yes.

I wonder if you would get it out for me?

I tender the statement and it can be marked RC 110.

In the statement, sir, you indicate that you were a member of the RAAF and you went to Emu in May or June of 1953. At the time you were a leading aircraftsman. Can you tell me what function a leading aircraftsman was required to perform?---Well, it is actually a rank. It is roughly equivalent to a lance corporal in the army.

All right, so that - - -?---It is a trade rank actually.

- - - as a consequence you could have a variety of duties, could you?---Well, I was a driver/motor transport.

A driver/motor transport?---But my rank was leading aircraftsman, yes.

Now, I think you indicate that before the explosion you were given a familiarisation programme. Is that right? ---That is right.

And that included a film that you were shown called "God and the Atom." Is that right?---Well, if I may tell you in my own words, we went there to do construction work. We built the roads, the airstrip, the whole works, and there was much conjecture, of course, as to what was going on. We were not actually told right from the start but, you know, many heads sort of put things together and said, well, we have got a pretty fair idea. And eventually, one evening in the mess we were told officially. And from there on they gave us lectures on what would happen and that film, "God and the Atom," I remember showing it. That was given as a bit of a demonstration to the troops, just to let them see what an atomic explosion looked like. But we were given a briefing on, you know, what would happen; what the explosion was like, and all the hazards associated with it.

THE PRESIDENT: How did God get a guernsey?---Well, it was the title of the film, your Honour. From recollection, I think it was one of the Moody Bible Institute things. They actually used to produce some rather good documentaries, but I do not recall how God come into it, but that was part of the title.

MR McCLELLAN: I think perhaps his Honour might be interested to know that the padre indeed provided the film?
---Yes, the Church of England squadron leader padre sent it up from Woomera, actually.

You also say you were given lectures about the dangers of radiation, and prior to the tests you were issued with one of these devices. Is that right?---Film badges, yes.

You say that there were a variety of film badges, consistent perhaps with the national colours of the - - -?---Well, from what I can recall there were three colours.

- - - country involved. Red, white and blue?---Yes, well, they doubled as identification checks for the personnel in specific areas. Now, from what I can recall - - -

Do you mean - - -?--- - - - anyone who was strictly on the base area, back at the camp that is, at the village, wore blue. I mean, I could be wrong - - -

That is a badge in which the case was blue, is it?---Yes, yes. The actual casing itself was coloured.

Right?---It was thin plastic with the strip of 35 millimeter film inside it.

Right?---And I think red was used for the people working in the main control area, and anyone going into the hot areas, which was after the bombs, wore white ones. I think those colours were right like that. But we had to wear the badges for, oh, I suppose, two to three weeks prior to the actual test, to make sure everyone wore the things and got used to them, the same as when we went overseas we had to wear dog tags, or identification discs, to get us used to them.

You indicate in paragraph 11, that after the tests - after the test, after the explosion, it was your job to assist by driving scientists around the radioactive area?
---That is right.

And you did that for the purpose of assisting them in measuring the degree of radioactivity - - -?---That is correct.

- - - that remained on the ground?---That is correct.

And for that purpose, were you given protective clothing?---Yes, very definitely.

Were you given a respirator?---Well, it depended on the area we

were going into. The actual suits we wore were a very special type; we could not get in or out of them ourselves. They were done up at the back. From recollection there was a zip, lacing and crossover press-stud flaps. The - initially when we went out we had respirators on, and the scientists did a fairly general survey to get the varying levels of radio-activity and - pardon me - if we went into a very hot area, we were - wore full respirator, hoods, special boots, the whole works. If it was only a lightly radioactive area, we dispensed with the respirators, because they were not exactly the most cool outfits they gave us to wear.

Were they always worn when they were supposed to be?---Yes, definitely.

Now, I think also, in the forward area, you were issued with a dosimeter?---Yes.

At that time. And you indicate that the film badge was - - -?
---That is right.

- - - issued to you. Were the dosimeter and film badge collected off you again after the explosions at Emu?
---Yes, we had a - the arrangement at Emu, when we came back from the hot area, we would step into the dirty side of the special building we had and there was an attendant there, also in protective clothing but without a respirator. He would collect the scientists and my dosimeters and film badges and put them in a special box which was compartmented. And then he would run the Geiger counter over us and he would help us then to get undressed, or undo the back of us, help us get off and then we would hop into the shower.

You indicated in the statement on paragraph 17, you say the scientists that you were with could look at the dosimeters and they would say, that is enough, we will go back, and then you would go back. Do you mean by that that when you were out in the field the scientists would look through this device and say you had copped enough and it was time to withdraw. Is that what you are saying?
---Well, depending on the area. I mean, we might be working for a couple of hours in a fairly light area and we would not reach the amount, but we would just - we would go back anyway after he had completed his, or their, survey.

Yes, and?---But if it was a - if we were in one of the really red hot areas, the three of us would continue to look at our dosimeters - or dosimeters, however you like to pronounce it - and generally one of the scientists would say, well, look, you know, we are getting a bit close to the mark, we had better toddle back. But there was no specific instruction to say look at your dosimeter every quarter of an hour, whatever, we would just sort of keep a general check on them.

Do you know whether or not you would have been exposed to radiation so that it would have registered on the dosimeter in your group on any occasion? You nodded your head?---Oh, yes.

You were. Were you ever told what reading might have come off your film badge?---No, not specific figures.

You have not changed your name or your initials since the 1950s, have you?---No.

You have always been H.W. Taylor?---That is right. The only thing that I - pardon me - did get was last year, I think it was, from the commonwealth, I had a phone call informing me, after we had filled out all those blue, multi-page blue forms, stating that I had got a level of radiation lower than background, which I found a little odd.

Yes. Who told you this?---Well, initially they sent out a blue form which we all had to fill out with all the bums, and I had a phone call from a gentleman here in Melbourne, a doctor, who said that the message had been passed on through him to contact me and this was the, you know, I had got the radiation at such and such a level which was below background, and I said, well, that is a little hard to believe. So he got back to Canberra and the next thing I had a letter from Canberra stating that even though the records are not complete, we do not think you were exposed to a lot of radiation, or words to that effect.

What did you say to that?---To be quite frank, I thought it was a load of twaddle.

You realise probably now that I am looking at the British record and your name does not appear on it at all?---Well, I definitely was there.

I do not think we doubt that?---I can tell you the name of the commanding officer and everything.

What was his name?---Brigadier Lucas.

Was there a commander of the group you were with in the forward area?---Oh, well - - -

Or do you recall the leader you might have been with all the time?---I can remember - I can recall one of the sergeants, his name was Maddock.

Was he an Englishman, was he?---Yes.

Can you remember any Australian who might have accompanied you regularly on your forward sorties?---No, they were both British scientists that went out with me.

THE PRESIDENT: Do you mean that Brigadier Lucas was the boss of the whole show?---Yes, your Honour.

MR McCLELLAN: Well, you describe then, the process of decontamination in this statement. Tell me this, now, did you go into the contaminated area after both Totem explosions?---Yes.

So, you would have gone in on a number of occasions?---I could not tell you how many, but I did not actually come into the straight out testing programme until, oh, possibly, a week, ten days after T1 - that was the first explosion, and I carried on with the checking. We used to traverse a network of bulldozed roads through the sand dunes which had been laid out before the explosions, and the scientists had a clipboard with everything on it and we would traverse these areas and they would take the measurements as we proceeded.

You record in paragraph 28 on one occasion, you say:

We came across a piece of the tower
. hundreds of thousands of
roentgens.

?---Well, the Geiger counter we were using was like a pistol grip arrangement, with a power pack in the landrover, and the scale went from 1 to 10, and then you could go up in graduations - 1 to 10, 10 to 100; 100 to 1000, 1000 to 10,000, and so on. We saw this lump of twisted metal which we recognised as part of the tower and we put the Geiger counter on it and I think at that stage it could have been set at say, a thousand, and it just screamed its head off. So we it up, and thinking back, it could have been 75,000, it could have been 175,000. I cannot remember, but it was screaming its head off.

It was measuring roentgens, was it?---Yes.

Did you hang around there for any length of time?---No. We were not too impressed with it. As soon as we got the reading we took off. Oh, we moved about 20 feet and then took a background reading on the road, and that was much, much lower. It was just around that immediate area of that piece of tower that it was, you know, rather warm.

Yes, thank you, Mr Taylor.

THE PRESIDENT: Mr James?

MR JAMES: Mr Taylor, did you have blood tests whilst you were there, at all?---No, not at Emu, no.

Did you have blood tests before you went there?---No.

Blood tests after you left?---No - well, not - well, the normal service ones that you might have every - - -

Twelve months?---Twelve months, or whatever, yes.

In this decontamination centre, do you recall who the attendant was?---No, I am afraid I could not. Too many years ago.

Do you recall whether it was an Australian?---I think so; I would not be 100 per cent sure on that.

I take it you would not recall what branch of the service he came from, or whether he came from the services at all?---Well, you see, it was a little hard, because basically we were army and air force and everyone wore the same gear.

Yes?---We were all issued with army clothing - khakies, the inside/out jackets and what have you, and nine times out of ten you could not tell who a fellow was unless you knew him personally.

And when you would come into the decontamination centre you would be with the two scientists?---Yes.

Would there be other people being decontaminated in there at the same time?---No.

Did you ever have occasion to have more than one shower?---Once, I think, from recollection. The chap used to put the - he had a Geiger counter with a metal probe arrangement, and he would run it over your body, and occasionally you might find a fellow would get a little bit, perhaps, around the neck, or perhaps the wrists, so he would say: back in the shower again, which did not impress us because it was ice cold, and he would have to scrub the offending portion and then back out and he would run the probe over again.

Were you ever made aware of a substance called sequestrol? ---No.

Or a cream being used in the showers?---Not that I can recall. The only thing we ever used was a liquid soap to wash yourself with.

Was that Teepol, was it?---Just a liquid soap; what its brand name was, I could not tell you.

Only one other matter. Did you show a number of other films? ---Yes. For some time I was the projectionist, you know, for the troops.

And indeed, was there a standard library of films, a list of which we might have seen before, including God of the Atom and Miss Grant Takes Richmond? Do you recall that one, at all?---About the only one I can remember with clarity was one on Heddy Lamarr - for those who are old enough to remember the lady - and as most of the fellows had not seen a lady of the fair sex for quite some time, they all sort of went oo, oo. I remember she was doing a rather exotic Arabian dance, but I am afraid that is the only one I can remember with clarity.

You see, what I want to suggest to you is the film God and the Atom - or God of the Atom, whichever it was called - was not part of a formal briefing, but it was something of interest that the padre had sent up?---Well, it was - he sent it up, and I can remember him saying that, you know, on pain of ex-communication or whatever, "Don't you dare damage this film, it is a very rare copy", but it was used - you know, the CO and so forth said this is a good film and gives the boys and idea of what is going to happen.

Right. The lectures you have referred to, were there many of them?---I could not remember the number. I mean, the general effects of what was going to happen were told to everyone, and it was impressed upon all that they must wear their film badges, what the radiation would do, the destroying of the corpuscles and so forth, and you know, observance of signs and so forth. You were not to - - -

Obey orders?---Pardon?

To obey orders, in short?---Yes, yes.

Were you told that the radiation that you were likely to experience might destroy corpuscles?---Well, they said that the radiation - I mean, it was described as it does destroy corpuscles, yes.

No, but were you told that?---Yes, it was explained to us the effect that it has on the body and tissue.

I have nothing further, if your Honour pleases.

THE PRESIDENT: Mr Eames, Mr Collett?

MR COLLETT: Mr Taylor, you were at Emu from approximately May to December '53, is that right?---Well, no, I think it might have been June because I remember I boarded the aircraft for Woomera on the day of Her Majesty's coronation, so it would have been June, I think - anyway, six months, approximately.

And in the time that you were at Emu did you come across the native patrol officer from Woomera, a Mr McDougal, at any stage?---Not that I can recall. I could have done.

Did you come across - were there security officers stationed at Woomera - at Emu at that stage?---We had - I think we had one up there, one or two. The next one down the line - the next ones down the line were at Mabel Creek.

Which was, what, east - due east - of Emu, was it?---Yes. It is on the north-south road on the highway from Adelaide, and that was the access road through Tullaringa Well, to Emu.

Yes, but were there actually security officers at Emu whilst you were there?---I think there were, from recollection, yes, I think there were. There was at least one there, anyway.

And did you see any aborigines during the time you were at Emu? ---Not in the area, only at Mabel Creek.

And those at Mabel Creek, were they - did they appear to be people living or working on a station?---Oh, yes, they were stockmen and their families.

Did you get to know any of them by name?---No, because we were travelling through. You see, the only time I actually went through Mabel Creek was towards the latter part after the second test, when we were ferrying equipment back from Emu, back to Woomera, and invariably we did not stop there; we just drove straight through. We sort of saw them and waved to them.

Camping in the creek?---Oh, just working around the homestead.

How far was Mabel Creek from Emu?---Oh, now you are asking me something difficult. I can remember how long it took in a truck, but the actual distance, I will take a punt and say 200 miles.

Were there any barriers along the road between Emu and Mabel Creek to warn of the approach of the Emu field, of the danger of going to Emu?---After the tests, the access road which we had from Woomera - or from Mabel Creek - had to be moved because quite a bit of it got in the fall-out pattern, and we re-routed it and there was a short section - I cannot remember if it was a couple of hundred yards, or a quarter of a mile - that was very, very clearly marked with large signs with a skull and crossbones, and danger, radioactive area, do not stop. You did not have any option; you had to follow the track, but it was very clearly marked that you must not stop there on this short spell. It was not very high radiation, but, you know, if you had sort of sat there for a week, it probably would not have done you any good.

That is one thing, but what I was really getting at was whether there was anything to stop the casual tourist or anyone coming off the north-south road?---Well, the police -

the security police at Mabel Creek, plus the homestead people, themselves, kept an eye out. You know, any strange vehicle sticks out in the outback. Also, the ferry aircraft, going backwards and forwards practically every day, they followed the road and kept an eye out for anything like that. Plus we had our own regular supply vehicle going backwards and forwards, and he kept an eye out as well, so it was fairly well covered.

But beyond that, there were not any fences or booms or barriers across the road?---No, nothing at all.

Yes, thank you, Mr Taylor. I have no further questions.

MR. McINTYRE: Do you recall Dr Penny being present at Emu?
---Yes.

Was he the person who was in charge of the whole series?---He was the top boffin, as we called them, yes.

Brigadier Lucas was the senior Australian officer present?---Yes, that is right.

~~He was in charge of the joint service contingent that was there at Emu?---Yes.~~

You mention in paragraph 28 of your statement the reading on the Geiger counter of hundreds of thousands of roentgens. Do you recall how many scales there were on the Geiger counter that you had? Was it more than one?---As I say, it was 1 to 10.

Yes?---And then if you turned the switch one click it became 10 to 100, and the next click 100 to 1000, and so on, but I cannot remember the total number.

On this occasion when you came across the piece of tower, did the machine give the highest possible reading, or something less than the highest possible reading?---When I made my statement, I suppose I was casting my mind back 30 years, but I remember it screamed its head off; it could have been 75,000 or 175,000. It was extremely high.

Do you recall which scale that you had the machine on?---Not off the top of my head. As I say, I am taking a rough recollection of approximately what it was reading.

Yes, thank you.

THE PRESIDENT: Mr McClellan?

MR McCLELLAN: Can you recall at Totem any of the following people? Sergeant Ilsley?---Ilsley?

Yes?---Yes, Jim Ilsley, yes.

Did he work with you at all?---Yes, he was a sergeant transport driver.

Did he go up front like you did?---Not that I know of; not that I can recall. Access to the forward area was very strictly limited.

What about Sergeant - sorry, Corporal Wade?---Wade? I do not recall the name.

Do you recall Squadron Leader Thomas, at all?---The name rings a bell, but I cannot put a face to it - to him.

What about one of the other ranks - I cannot tell you what - Parker, a man called Parker, do you remember him?
---Parker? I am afraid my memory on names is not 100 per cent. I can recognise a face. Andrews was one, we used to call him Darky Andrews, he was a plant operator.

Is that M.J. Andrews?---I thought it was Neville Andrews. I could be wrong on that one. As I say we knew him as Darky Andrews, but I think it was Neville. I could be wrong on that point.

Can I tell you that - - -?---Parker, was he a welder?

I cannot tell you that?---No, it is just that - I remember, in the services it is a little hard - one knows each other generally by nicknames. I can remember a welder; I thought it was Bob Parker; we used to call him Ballpoint, but still - - -

Can I tell you, sir, that we have discovered you in a different record, which is an Australian record of operation Totem, and you are shown there as having received a gamma dose of .05. I have no further questions.

THE PRESIDENT: All right.

You are excused, Mr Taylor?---Thank you.

THE WITNESS WITHDREW

MR McCLELLAN: I call finally today, Mr Turner.

RAY TURNER, sworn:

MR McCLELLAN: Would you sit down, sir?---Thank you.

Your full name is Ray Turner?---Correct.

You live at 8 Morrison Crescent, Doncaster, Victoria?---That is right.

You have made a statement in relation to the matters before the commission?---Yes.

Do you have a copy of the statement?---Yes, I have.

I tender the statement, if your Honour pleases, to be marked RC1.

In the statement you indicated that you, having joined the air force and then gone onto reserve, you rejoined it in 1950 - in September of that year - and you remained a member of the air force until February 1975?---Correct.

I think you were a signaller before the Monte Bello tests, and on the occasion of the first test, Hurricane, you had occasion to fly to Broome, together with your flight crew, and there, I think, you flew, or you were attached to, Lincoln bomber number 51?---According to the log book, that is correct.

Do you have your log book with you, sir?---I do.

I wonder if you could get it out for me? Do I take it that the flights recorded in the statement are those which you have taken from your log book?---That is right.

You say the Lincoln was non-pressurised, and you say air could flow freely. I take it you mean it was draughty, was it?---Yes. They were very draughty and very noisy, Lincolns.

Now, you say that the aircraft which you flew - 51 at Hurricane - was fitted with a collection of canisters under the wings, and also there was a small white box, which had a meter on it, and which you were told was there for the purpose of measuring radiation. I think your statement indicates that you were the person responsible for reading this instrument?---That is correct. It was a portable sort of - it looked like a portable little radio at the time.

How large was it, sir?---I would say roughly about 15 inches by about 4 by 4; something like that from recollection.

And what did it have, a needle on it?---It had a needle that I can recall, yes.

And a scale?---A scale, yes.

Do you recall what the scale went to?---No, I do not.

Do you recall whether the instrument was graduated so you could flick a switch and take it from one scale to another?
---I do not really, but I would say that - I think it only had the one scale, but I could not swear to that.

You indicate that you were given no instructions before flying about eating or the dangers of radiation, and you did not have dosimeters or film badges?---No, not virtually.

And you indicate also that you were not told to use oxygen at any particular time. Do I infer that the standing order from RAAF was that you would use oxygen over 10,000 feet?
---Ten thousand feet, and sometimes at night, yes. They would use oxygen at night for night flying.

Why was that?---Apparently it improved the eyesight and - - -

It improved the eyesight?---Yes. I do not know.

Now, you say you flew, I think, twice at Hurricane in search of the cloud?---True.

You say, "On neither occasion did the meter - did the needle on the meter move at all"?---No, I did not get any readings whatsoever.

Were you ever told whether or not the equipment functioned satisfactorily?---Never.

Did you ever investigate whether it functioned satisfactorily?
---It was not our job to. We asked people, but we did not get any answers. The scientists were pretty close-mouthed on the whole thing.

Were they?---Yes.

What about when you brought your planes back? The canisters were removed; were you ever told anything about whether or not they had picked up radioactive material?---No.

Did you ever see any occasion when a British scientist might have been unusually happy about - - -?---I cannot say I did personally, no.

So, I take it that the presence or otherwise of radioactive clouds, so far as you are concerned, at Hurricane remains a complete mystery to you?---Yes. I think as far as the crew were concerned, we did not think we had been near the cloud; we did not know what we had found.

Now, I think you went back to Broome, then to Amberley, and then on to Totem. Is that correct?---Yes, sometime later; that is correct.

Well, I think that you went to Totem in Lincoln 47 - this is paragraph 19 - on 26 September 1953. Is that right? ---Yes, that would be right. I will just get to the log. That is correct, 47.

On this occasion you had, instead of a white box, what you refer to as a bigger black box?---Yes. I think that was fitted inside the aircraft, from my recollection.

It was attached, was it?---Yes.

Was the white box attached?---No, it was portable.

Portable?---The one at - - -

This was a fixed one?---Correct.

And again you had to monitor it?---That is right.

Is that right?---Yes.

And on this occasion did it have a needle and a scale, also? ---I cannot really recall what the operation of the box was. I know we had to monitor the thing and make a reading when we got a reading on the scale.

THE PRESIDENT: Mr McClellan, there must be a mistake in paragraph number 21.

MR McCLELLAN: Twenty-one, your Honour?

THE PRESIDENT: The date?---Yes, it says 15 November.

MR McCLELLAN: Yes. 15 October, I think it was?---Yes, that is correct, 15 October.

15 October. We can change that, can we?---Yes.

Now, you say sometime after take off on this flight the meter went right off the gauge?---That is correct.

You mean it had gone to the top and it - - -?---It went the maximum; that is correct.

You say:

It departed through a cloud of red dust and followed the cloud all the way to Codnadatta.

Did you see this red cloud?---Yes, we certainly did.

Sorry?---Yes, we certainly did.

Was it clearly visible?---Yes, yes. It was - I think - from recollection, when we first got the reading and reported it, the pilot said, "Oh yes, that's the dust up ahead," and we raced up and had a look. We could see this big cloud of red dust, and we went into it and we stayed in it. We never came out of it. We were trying to get to the other side of it, but we did not come out, so we returned.

Well, you say you tried to get to the other side, or you did not come out of it?---Yes.

Do you mean you visibly stayed in it, or the meter kept on reading high?---The meter was reading high and we were visibly still in the dust, from my recollection on it.

You could still see it for hours?---Yes.

You then flew back, but you say the needle would not ease off and stayed right up to the extreme until the flight was finished, and stayed right up to the maximum reading until the end of the flight?---From what I recall, the needle was still on maximum when we left the aircraft back at Woomera.

And during that time you say you ate your in-flight rations; is that so?---Correct.

By the way, did you smoke on board this aeroplane?---No, you were not allowed to smoke; the aircraft are a bit dangerous to smoke in.

Did everyone obey that order?---As a rule.

As a rule? What does that mean? Some did not?---The rear-gunner might sneak down the back turret, but they were not allowed to.

He was not allowed to, but he used to do it?---No, not very often.

Not very often?---No.

What about you yourself? Do you smoke?---No. I did in those days, but I did not smoke in the aircraft.

You did not smoke on board?---No.

Not even after lunch?---No.

You say, to the best of your recollection during the period when the meter was at the extreme position you were not using oxygen?---Yes. I cannot recall being on oxygen.

Would you have been high enough to require you to use it?
---I do not think we would have been, otherwise we would have been on the oxygen.

Yes?---I cannot recall the altitudes.

Does your log book help with altitudes at all?---No, it does not.

So, is it your recollection that the altitude you were flying was not such that the RAAF standard operating procedures would have required you to use supplementary oxygen?
---From recollection.

You were not told to use it - use oxygen, that is - because of the presence of the cloud?---No, not at all.

You say you landed, proceeded to get out of the aircraft in the usual way, and you were met by some chaps who appeared to be scientists?---Yes.

And you say they started to check you with Geiger counters?
---Right.

And you say they were going off like machine guns. What do you mean?---Well, they were making a hell of a noise - rather loud and rather fast.

Rather loud and rather fast?---Yes.

THE PRESIDENT: This is at Woomera, is it?

MR. McCLELLAN: Yes.

I assume this is back at Woomera?---This is back at Woomera after we landed.

You say:

I was surprised at the high readings.
. hands near your
mouth.

?---That is right.

And you thought that was rather ridiculous, because you had been flying and eating, and now when you landed on the ground you were told that - - -?---Yes, I remember that vividly; I thought it was ridiculous.

However, you were sent to an area where there were showers, and you were told, what, to have a shower?---Yes, that is right.

Take your gear off?---Yes, to leave - I think we left our flying suits and so forth outside and had a cold shower.

Which you think you did not see again?---I am pretty sure they took our flying suits away; that is correct.

And you say you had some - more than one shower, and they kept checking you with Geiger counters, and after two showers they seemed satisfied with your state of radioactivity, but some other members of the crew had more than two showers?---Yes. I could not swear to the exact numbers, but I think - I know I went back a second time; I am pretty sure.

Can you tell me this: whereabouts on the aeroplane were you required to sit?---For the reading?

Yes, when you were flying in the cloud?---It was back of the radio operator.

Well, that does not help me very much?---Well, it is. - - -

Halfway down the plane?---Yes, it would be - about halfway down the plane.

About halfway down the plane?---Yes, towards - - -

Did you have a window near to you?---No, you do not, really.

Pardon?---No, no windows.

Where did you see the cloud from? How did you - - -?---By going up the alley-way and looking out through where the pilots sit up front, or you can look out of the astrodome - a dome near the radio operator.

You say that the next day you understand that the ground staff refused to work on the aircraft, then afterwards they were also issued with film badges?---Yes.

Of this type, I assume?---No, I cannot recall seeing them like that. I thought they were all a square blue thing, but I could - - -

A square blue thing, were they?---I could not be certain on that one.

And I take it you went and gave your blood, did you?---Yes. The service police came along when I was out and told my wife that I had to report to Laverton, so out I went and had a blood test.

But you were never told the result of it?---No, I - the medical people did not release to me the facts of it.

Describe the medical problem you have had with the growth on your lower lip which was removed?---Yes, I think - thinking back, I think that date would have been closer to - in the middle of 1960, not 1970 - about 65, I would say. But I cannot say that that is connected with the test.

You record, in paragraph 40, a number of other occasions when you flew aircraft 47?---That is correct.

And that is again taken from your log book, is it?---That is right. The facts are from the log book.

And then, I think, ultimately in 54, you noticed a group of Lincolns which were isolated at Amberley? And you were told they were the aircraft from Woomera that were radioactive?---Right.

Now, could you just tell me, sir, your rank when you finally retired from the air force?---Squadron leader.

Squadron leader. Yes, I have no further questions.

THE PRESIDENT: Mr James?

MR JAMES: I would like very much to check with you the correctness of something which may have been dealt with already by counsel assisting the commission: at the altitude at which you flew in the aircraft that sampled the clouds, did RAAF standard operating procedures require you to use supplementary oxygen?

THE PRESIDENT: Which tests, Mr James - which tests?

MR JAMES: At any time, your Honour.

THE WITNESS: Did they

MR JAMES: RAAF standard operating procedures require you to use supplementary oxygen?---Well, normally above a certain altitude - - -

Yes?---10,000 feet, to my recollection, and at night time, and I would say go on to oxygen directly from take-off.

Right?---Depending on the altitude you - - -

Did you fly with oxygen at any stage, during the tests, while sampling the cloud?---I cannot recall being on oxygen at all.

Right?---But, I cannot swear to that.

Can you recall anything about the height at which you were flying the cloud sampling flights on any of the occasions?---The only thing I have in the log, and I do not know why I recorded it, was a wind find at one stage in the Woomera area on 28 September 53 in Lincoln 57 - a local wind find, and I have got altitudes 8 to 20,000 feet.

Can you think of any reason why anyone should assume many years afterwards that you would be on oxygen for these flights?---I do not know, maybe they are correct and I am wrong - that we were on oxygen. That is the only thing.

Ever heard of a body called AIRAC?---No, I have not.

Did anyone come and ask you?---No, not that I know of.

Can you remember who your pilot was?---Which - in Woomera?

At Woomera?---The pilot at Woomera was - actually the captain of the aircraft was a Flight Lieutenant Bucchan, but the CO of the squadron went along on our flight who, at the time, was Squadron Leader Roy Roberts.

Right. So - do you recall handing in the film badge to any specific person?---No, I do not.

Do you recall what colour it was?---I thought it was a blue - bluey colour.

And were you given any blood tests subsequent to the Laverton test?---No.

It was one test only?---That is correct.

I have nothing further from this witness.

THE WITNESS: I could add there that I think when I was discharged in 1975 I had a blood test, but I think that was just a normal medical when I was going out of the air force on retirement.

MR JAMES: That is a fair while later of course?---Yes, it is.

THE PRESIDENT: Mr Collett?

MR COLLETT: Thank you, sir.

Mr Turner, can I just ask you about your flight on the day of Totem 1? I think you said you were in the air for 7 hours 45 minutes?---Yes, that is - well, the statement is right, yes, I was.

What sort of speeds would your plane have been travelling at, would you know?---I cannot recall the Lincoln speed now, to be honest. I do not know.

Did you see this red cloud at any stage during that flight?

---Yes, when - after we got this maximum reading, and the message was sent out of the position, the pilot said, "Yes, we can see the dust now." That is when I had a look out

And where was it? Was it all around you or - - -?---Yes, yes, it was.

What did it look like?---Just red dust in the sky.

To what extent did it affect visibility?---I think they were flying on instruments while they were in it.

Did it look like a dust storm, or was it darker, or - - -?---Yes, correct. It looked like a dust storm.

And are you aware exactly where that flight went?---Well, I - from recall, I think we turned back at Oodnadatta. That - I do not know why that has stuck in my mind, but I think we went straight over - north is Oodnadatta and went back to Woomera.

Might that be because there was an airstrip at Oodnadatta?---No. I think the duration of the flight had been long enough and our readings were not altering, and I think they decided well, that is enough. We were not coming out, and - I gather.

Are you aware whether the flight took a direct route from Emu to Oodnadatta?---No. No idea, no idea.

Are you aware of any other places that the flight went over on the - - -?---No.

Its way out or back?---All our positions were sent in latitude and longitude. The navigators were the - - -

And you were not the navigator of the flight?---No, no.

Did you form any impression as to the dimensions of the cloud? ---Not really.

Are you able to say whether it extended down to ground level? ---I could not say.

Can I take you to Totem 2? Were you involved in a cloud sampling flight on the day of Totem 2?---I have very little recollection of Totem 2 at all. After the other one, it was an anti-climax, really, I think. I cannot recall much about it.

Can you even recall whether you had any contact - whether your plane had any contact with the cloud?---I cannot.

Yes, thank you, Mr Turner.

THE PRESIDENT: Mr McIntyre?

MR MCINTYRE: I take it by the time of the second flight of Totem, that you have recorded as taking place on 27 October, that you were, yourself, aware of the potential risk that was posed by the radioactivity of the cloud?---Well, I do not know that we were too upset. We had not been really frightened or anything.

Well, I was not suggesting that. But you made a note here in your statement that you think you were issued with film badges, but you cannot be sure?---Yes, that is correct.

Is it your recollection that there was something that was different on the second flight, in terms of any precautions that might have - - -?---Well, I know that precautions were coming out, because the ground crew, they did not want to work on the aircraft after the first flight. I had the idea then they were radioactive, or something.

Well, do you have any recollection that on the second flight at Totem, that you might have been under instructions to use oxygen for the whole flight?---I cannot recall.

Do you have any recollection of any instructions being issued to use oxygen while you were in contact with the cloud on the second flight?---No, I cannot recall that.

Do you think that might have been the case, but you now cannot recall it?---Yes, that could have been the case. I will not swear to it. As I say, I cannot - - -

THE PRESIDENT: This is for Totem 2?

MR MCINTYRE: Totem 2, your Honour, yes.

THE WITNESS: Totem 2, yes.

MR MCINTYRE: Now, when you were using the oxygen that was supplied in the Lincoln, was that a mixture of oxygen from tanks and the outside air or was it a mixture of oxygen and air that came from a contained cylinder?---They came from cylinders, but as far as I was concerned all I did was plug in the hose, and you took out a cotton reel which let the oxygen come to you. How it was fitted up, or anything else, I never went into it. I did not have much idea of the workings of the aircraft, only the radio and the guns - leave the turrets.

Just to come briefly to the flights - the flights you had at Monte Bello in 52; do you recall one of the small white box - which did not show any readings - was already fitted to the aircraft when you took off from Amberley, or was that white box fitted to the aircraft at Monte Bello?---From what I recall, the box was handed to us on the tarmac before we went on board on the flight.

That is Monte Bello?---Monte Bello, yes.

Was it handed to you by a scientist or by a service person?
---I think it was a scientist.

Did he give you any instructions as to how to operate it, do you recall?---Well, he would have said, you turn it on this way and turn it off that way, I think, and read it this way.

And did that same scientist, or some other scientist, take the instrument from you when the flight finished?---I cannot recall if it was the same person.

But - was it a scientist that took it from you?---I am certain it would have been.

Do you recall saying to the scientist that it apparently had not registered any findings?---Well, I must have, because we were given a sheet to record any readings on, and we just - - -

You were given a sheet, were you, to record readings on?---Well, I suppose - yes, as far as I know.

I will show you a sheet from a document which is entitled RC78. It is entitled Monitor Observation Log. Do you recognize that sheet there at all as being - something you might have been handed to make entries into?
---Well - I am pretty sure this is it. When I see this down the bottom, "A zero check shall be made every half hour, and if necessary the zero reset." There is something about the zero being reset, yes, I am pretty sure that was the log

Well, there is a second instruction which reads, "If the reading is over 600 LR, i.e. half scale on X100 range for more than five minutes, the captain should be informed." Does that jog any recollection you might have about any instructions you were given?---It does not really jog anything, no. It possibly was on that matter.

Do you now recall the form, or was that something which you have not been able to - - -?---I think that is the form, but I could not definitely swear to that.

And did you make any readings on that - any notations on that form, do you recall - like, nil?---Possibly - possibly did.

Well, that is the document which is entitled Monitor Observation Log, which is appendix E to that portion of the document which is now RC78?

THE PRESIDENT: What - which test does that apply to?

MR McINTYRE: That is Hurricane. Yes, thank you.

THE PRESIDENT: Mr McClellan?

MR McCLELLAN: No, I have no further questions.

THE PRESIDENT: Thank you, Mr Turner, you are excused.

THE WITNESS WITHDREW

MR McCLELLAN: Your Honour, that is all the witnesses I conveniently have today. Can I indicate tomorrow - my friends have been divided in statements from various witnesses I propose to call, but, also, I understand that Mr Robotham will be available tomorrow, and I propose to call him at 2 o'clock tomorrow afternoon. I give my friends due warning of that.

.: I have got to read the book again, have I?

THE PRESIDENT: And you will read the book again tonight, gentlemen, I take it?

.: I did not feel like sleeping anyway.

MR McCLELLAN: Can I indicate that I do not know that the book is so important but, obviously, his participation in the Kerr committee is a matter of significance.

THE PRESIDENT: All right. Well, we will adjourn until 10 tomorrow morning.

AT 4.37 PM THE MATTER WAS ADJOURNED
UNTIL WEDNESDAY, 31 OCTOBER 1984