

IN THE HIGH COURT OF JUSTICE
QUEEN'S BENCH DIVISION

1990 R No 860
1989 H No 3689

ROYAL COURTS OF JUSTICE
 THE STRAND
 LONDON

Thursday 12th November 1992

Before

THE HON. MR JUSTICE FRENCH

ELIZABETH REAY

Suing on her own behalf and as
Mother and Administratrix of the
Estate of DOROTHY REAY (deceased)
and as Widow and Administratrix of the Estate
of GEORGE REAY (deceased) (Plaintiff)

V.

BRITISH NUCLEAR FUELS plc (Defendants)

AND

VIVIEN JANE HOPE (Plaintiff)

V.

BRITISH NUCLEAR FUELS plc (Defendants)

APPEARANCES:

For the Plaintiffs:

MR B A HYTNER QC
 MR B F J LANGSTAFF
 MR G S READ and MISS T GILL
 (Instructed by Messrs Leigh, Day &
 Co. Solicitors, London)

For the Defendants:

MR K S ROKISON QC
 MR M G SPENCER QC
 and MR C J BUTCHER
 (Instructed by Messrs Freshfields,
 Solicitors, London)

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INDEX TO TRANSCRIPT

	<u>Page</u>
DISCUSSION	1
<u>JOHN WHARWICK STATHER Recalled</u>	
Re-examined by MR. ROKISON	12



NINTH DAY'S PROCEEDINGSTHURSDAY, 12th NOVEMBER 1992

A

MR. HYTNER: My Lord, Mr. Rokison and I with Mr. Spencer have been considering the timetable. My Lord, it always seems remarkable that the one thing we can always agree on are the timetables and how the case should be, as it were, progressed, subject always of course to your Lordship's consent.

B

My Lord, Mr. Spencer and I agree that even with the lessons we have learned up to now from the length of Dr. Hilton-Smith and my somewhat optimistic assurances about the cross-examination and Professor Jones and so forth, with all that, we do not see how the medical evidence can last more than two days.

C

MR. JUSTICE FRENCH: This is the diagnostic evidence?

MR. HYTNER: Yes. The best estimate that we can give your Lordship is probably under a day, but things can always go wrong. Taking everything into account and giving a factor of two as the factor for uncertainty, we say two days.

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My Lord, subject to what your Lordship feels about the written submissions, what we anticipated was that Mr. Rokison and I would put in some written submissions, but then it may be that your Lordship would find it more helpful if you then treated us as you would treat us in ordinary litigation at the end of the case. In other words ---

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MR. JUSTICE FRENCH: Without tying yourselves to the submissions that you make on an interim basis?

F

MR. HYTNER: My Lord, it is not just that. Again I do not want to anticipate what your Lordship wants. We are really enquiring what your Lordship feels will be the most helpful. As your Lordship knows, if this was the end of the case, if the only issue was dose, then we would not be heard in total silence as we read out our submissions. We would be getting, as it were, a fusillade from your Lordship.

MR. JUSTICE FRENCH: Some interchange!

G

MR. HYTNER: Yes. What we were interested to know is whether your Lordship would welcome such an interchange at this stage or whether your Lordship anticipates that that would be left until the end of the case. If there is to be no interchange, then it seems to us that the written submissions should simply stand, that they are put in, and if in the view is taken that it is a public court and the public should have them, the public can have them as they are in writing.

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DISCUSSION

A If on the other hand there is to be an interchange, bearing in mind the issues, we doubt whether the interchange will last more than half a day. My Lord, if that is right, the feeling that we all have is this: subject again to your Lordship, we would rather not be under pressure of time to put in the written submissions. These also are subject to some interchanges. My Lord, in those circumstances, bearing in mind that Mr. Spencer and I are giving your Lordship a virtual undertaking, which we sincerely hope will not be broken, about the length of the medical evidence, we feel that perhaps if we had the whole of next week free of court and we then started on the Monday, we would then have a straight run through with submissions, medical evidence, and then the epidemiology on Thursday. My Lord, that would give us time to prepare the written submissions without pressure.

C MR. JUSTICE FRENCH: The answer to your question as to whether I would welcome oral supplements to the written submissions is one I find hard to answer without first seeing the submissions.

MR. HYTNER: Yes.

D MR. JUSTICE FRENCH: I further have this in mind: that as we experienced over and over again with the experts' reports, expert A gives a report, expert B gives a report, expert A sees B's report, he then has a second report, expert B sees expert A's report, and so it goes on with reports answering each other. I am not suggesting that that would happen quite like that between yourself and Mr. Spencer or Mr. Rokison, but it may be that when one side has seen the other's outline submissions, there will be matters that one or other would feel should appropriately be dealt with straight away. Do you follow?

F MR. HYTNER: My Lord, we have discussed this as well and again, maybe surprisingly, we have come to an amicable agreement. My Lord, the way we approach it is this: strictly speaking, Mr. Rokison should go first. If in the ordinary way Mr. Rokison were asked to go first on dose, it would be grossly unfair and absurd because, as he points out, we have not called any evidence, it is his evidence. On the other hand, if we exchange our submissions, it would be appropriate then, he having then seen our full submissions, for him then to go first if there is to be an interchange. My Lord, it may well be that he would then wish to supplement.

G My Lord, there are two problems: supplementing the submissions from our side and interchange with your Lordship. It may be that Mr. Rokison would certainly welcome, and I think I would welcome a chance to have a go orally, having seen the written submissions, and then the question simply is whether it is to be a submission in silence or whether it is to be interrupted.

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MR. JUSTICE FRENCH: As far as you understand it, which is the preferable course?

A MR. HYTNER: My Lord, this is one aspect that I have not discussed with Mr. Rokison, nor have I taken any instructions from my own point of view as an advocate. My Lord, I always prefer final submissions to be an interchange rather than totally one-sided. My Lord, you never know where you are going if there is no interchange. If the view is taken by Mr. Rokison or your Lordship that that sort of interchange should wait till the end of the case, so be it, but this is all fresh in our minds.

B
C From my own point of view, although it is not necessary for an interim judgment on the environmental dose, and never has been, whereas it would have been on occupational dose, for my part I would also welcome an interim judgment on the environmental dose; we see where we are going then. But it is not necessary for your Lordship to do that for the rest of the case to be heard sensibly. That is something again that I have not discussed with Mr. Rokison.

D MR. JUSTICE FRENCH: I think Mr. Rokison is quite keen to say something.

E MR. ROKISON: My Lord, I do not disagree with very much that my learned friend has said at all. I regard it, as my learned friend has said, as being slightly absurd if we were simply to put in our submissions, whether in writing or orally, before we really know what my learned friend is saying on this aspect of the case, because his case, as your Lordship has seen, has changed somewhat since his opening, at least it seems to us. Various matters have not been pursued which have figured rather prominently in the opening.

F My Lord, I would be happy with the timetable my learned friend has suggested, subject of course to your Lordship, so far as putting in written submissions is concerned. If I could have sight of my learned friend's written submissions before coming before your Lordship to make supplementary oral submissions, I would be happy simply to deal with those further submissions orally. I certainly do not anticipate that we would have with Counsel the sort of thing that we have had with experts with supplementary written submissions and so on. It is too burdensome, and it is much better to make those submissions orally.

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H So far as any interventions from your Lordship are concerned, I regard that as being entirely a matter for your Lordship. If your Lordship wants to query anything or put a point, then obviously we would welcome that, rather than your Lordship keeping it within your Lordship's bosom. On the other hand, it is entirely a matter for you.

DISCUSSION

A MR. JUSTICE FRENCH: Can I perhaps explore this means of approach: would it be regarded as too onerous for the written submissions to be prepared by say mid-day Thursday?

MR. ROKISON: Of next week?

MR. JUSTICE FRENCH: Of next week.

MR. HYTNER: Yes.

B MR. ROKISON: No, not from our point of view.

MR. JUSTICE FRENCH: If they were prepared by mid-day next Thursday, then that would give me an opportunity to provide for sitting on Friday for an oral hearing if I thought that appropriate and helpful, and that would leave us clear for the Monday, would it not?

C MR. ROKISON: I think what Mr. Hytner had in mind, my Lord, is that it is simply a question of coming back for a short period and then going away again and that it would perhaps be more convenient - and I do not have any strong views on it - if the medical evidence cannot take more than two days and if we are geared up to start epidemiology with Professor Evans on the Thursday, then that does mean that we could happily deal with our oral submissions on the Monday. That is why I think my learned friend was suggesting that your Lordship does not sit on this case next week at all. It simply avoids coming before your Lordship for a short period, then going away, then coming back again. We can simply start on the following Monday.

E MR. JUSTICE FRENCH: The epidemiology will be ready on the Thursday?

F MR. ROKISON: We do not know yet. I say that because - and this is no criticism whatever - we do not know what Professor Steven Evans is going to come up with. Although it was said that it is only a number-crunching exercise and should be done within a week, I think that was rather optimistic. I do not think my learned friend has yet seen what Professor Evans has come up with, let alone our seeing it. I think my learned friend is seeing Professor Evans tomorrow, so we are unlikely to see that until perhaps Monday. I simply do not know. We do not know what impact that will have on the epidemiological issues.

G It may be that the picture which will be painted will be completely different. Of course there are issues which will remain the same such as what support one gets from other studies both in the United Kingdom and abroad, and matters such as that, but in relation to the Gardner study and the re-working of the Gardner study, it may be that the picture will totally change. I did reserve our position in relation to that and have

H

A done so regularly, but the answer to your Lordship's question is that I simply do not know. We think that it will, but it depends what it comes up with.

MR. JUSTICE FRENCH: What is your best information to date?

MR. ROKISON: I have no information to date, my Lord, because I do not know what it is coming up with.

B MR. JUSTICE FRENCH: From those responsible for the number crunching?

C MR. ROKISON: We await what is the result of Professor Evans's re-working of Gardner. What he now comes up with, whether he attaches any significance to anything, we simply do not know. As your Lordship knows, as a result of the second re-working by Professor Evans which resulted from Dr. Dennis's figures which were not those that were agreed between Dr. Dennis and Dr. Strong, the result was that the six month dose which had appeared in the Gardner study to have some significance, appeared to have little or no significance, and my learned friend said "You are not going to hear very much about that, that is not going to figure large in the case". My Lord, we do not know what interpretation will be placed by Professor Evans on the numbers that come out of the number-crunching exercise. We have had no hint of that at all. Therefore, I have no knowledge as to what is going to come from the Plaintiffs and how we are going to react to it; so I cannot help your Lordship.

D
E The position is, as I have said to the court with respect on a large number of occasions, that this is a case which is driven by the epidemiology and we do not really know what the Plaintiffs' epidemiological case is. Whether or not other studies support or do not support Gardner depends on what the ultimate results of Gardner are.

MR. JUSTICE FRENCH: Re-worked Gardner.

F
G MR. ROKISON: Indeed, because everybody agrees that original Gardner should be re-worked because the figures that were used for the purpose of Gardner were in some cases wrong and in some cases incomplete. Everybody agrees with that. So I cannot help your Lordship. All I can say is that we will, of course, keep the court fully informed, and if it looks as though Thursday the 26th is a date which we cannot meet, then we will come and make an application to your Lordship as soon as we have that information.

MR. JUSTICE FRENCH: How soon, Mr. Hytner, do you

H MR. HYTNER: My Lord, we are seeing Professor Evans tomorrow. We hope that his figures will be ready then.

DISCUSSION

A I do not think it would be helpful if I were to respond in any way abrasively to Mr. Rokison. My Lord, I merely comment that presumably their side are also doing their exercise and they are not completely in the dark on this, so let us leave it amicably, my Lord, and see what happens next week.

MR. JUSTICE FRENCH: Yes.

B MR. ROKISON: My Lord, there is just one other point, if I may. I am sorry, your Lordship was going to say something?

MR. JUSTICE FRENCH: I was simply going to observe that Mr. Hytner is hopeful that tomorrow or very soon after you may have the wherewithal to work from.

C MR. ROKISON: Obviously if we could have it tomorrow, it would be a great advantage.

MR. JUSTICE FRENCH: It is a hope, not a promise.

MR. ROKISON: But some do work over the weekend, my Lord, I am afraid.

D MR. JUSTICE FRENCH: Some do.

E MR. ROKISON: Some have to! My Lord, the other matter that I thought I had just better make an observation on is that we would not be, I think, in any way against your Lordship giving a judgment on any aspects of dose on which your Lordship is able to give a judgment. Of course, your Lordship could not give a complete judgment on environmental dose because of course the issue of RBE alphas, in particular in relation to dose to embryo and foetus, is a matter which has been left over for genetics.

F MR. JUSTICE FRENCH: I think it unlikely that I would give a judgment, and I would receive submissions in whatever form purely on an interim basis, because matters may arise which would make either or both of you desirous of adding or altering the submission.

MR. ROKISON: Yes.

MR. JUSTICE FRENCH: Mr. Spencer, do you have something to say?

G H MR. SPENCER: My Lord, before we are tied to what has been described as a virtual undertaking in relation to the medical evidence, can I just make two points? The first point is that the tentative agreement that my learned friend referred to was only arrived at outside the door of the court and we have not had an opportunity to check the availability of the medical witnesses who will be giving evidence before your Lordship now on the Monday, so obviously we need to do that as a matter of

DISCUSSION

urgency and will do so. If there are any problems, then we will communicate accordingly with the court and the matter may need to be re-thought.

My Lord, the other point is this: our medical position in respect of Vivien Hope has not yet been finalised. My Lord, there is no secret about that. My learned friend knows precisely what our position is in relation to it. The final position may result in the medical evidence being more extensive than is presently thought, but it will not be much more extensive and I would hope that the two and a half days to which I am presently tied by virtual undertaking will still be an appropriate estimate. Again if there is likely to be any change in that, then obviously the court will be informed and I will be in contact with my learned friend at the first opportunity.

MR. JUSTICE FRENCH: Should difficulties arise, I would wish not only to be told of the difficulty but also of the nature of it, so that if necessary the matter can be canvassed in court.

MR. SPENCER: Absolutely, my Lord. That is not a problem and that will be done. My Lord, obviously one of our thoughts in arriving at this tentative arrangement was that it would be perhaps more helpful to the court and those who organise the lists that your Lordship should have the whole of next week free from this case, but I think we would rapidly know if any extra time is going to be needed in respect of medical issues and we would hope that if we communicated early enough with the court, we may be able to grab back part of next week so that the extra time could be made available in that way.

MR. JUSTICE FRENCH: Mr. Spencer, as you may perhaps guess, freedom from this case is a relative concept!

MR. SPENCER: Yes.

MR. JUSTICE FRENCH: The next thing I was going to seek your help about was a reading or re-reading list, as the case may be, for the next stage of the hearing.

MR. SPENCER: Does your Lordship mean the medical evidence? I can help your Lordship about that. On the medical evidence, my Lord, principally the two witnesses are Professor Greaves for the Plaintiffs and Professor Catovsky for the Defendants. Both of those witnesses, as well as describing the haemopoietics system and the development of it in the foetus and the differentiation of the various cells that constitute it, the lymph system and the like, and the different types of blood cancers, leukaemias, lymphomas and the like, also address the question of the aetiology of lymphomas and leukaemias. My learned friend and I are agreed that that part of their evidence really belongs to the genetics stage of the case,

DISCUSSION

A and we are going to confine the medical issues really to just the factual aspect of the blood system and its development and the types of cancers that these two Plaintiffs have?

MR. JUSTICE FRENCH: So it is Professor Greaves in effect, excluding genetics?

B MR. SPENCER: Excluding genetics, my Lord; excluding aetiology, I think is really the way it is put by both of them.

MR. JUSTICE FRENCH: Excluding aetiology; and Catovsky ditto?

MR. SPENCER: Catovsky ditto. You did hint at possible other evidence.

C MR. SPENCER: My Lord, the other evidence that I hinted at is not yet in written form or has not yet been finalised, if it is going to come at all. My Lord, that relates to the lymphoma in Vivien Hope, and it may be that even if further evidence is served in respect of that, it might be decided that it is more appropriate that that should be dealt with anyway at the genetics stage.

D MR. JUSTICE FRENCH: Yes. So that is diagnostics?

MR. SPENCER: My Lord, that is diagnostics. My Lord, can I just add this: there is one page, I think page 8 in Professor Greaves' second report, that also bears on the medical issue.

E MR. JUSTICE FRENCH: So it is Professor Greaves 1 and query page 8 of Greaves 2, is that right?

MR. SPENCER: Yes, my Lord. If I in my recollection have got that page wrong, I shall let your Lordship know.

F MR. JUSTICE FRENCH: It will be obvious, I think, on perusal.

MR. SPENCER: My Lord, I think it is obvious. It is one page that describes the type of lymphoma that Vivien Hope has and the type of leukaemia that Dorothy Reay had.

G MR. JUSTICE FRENCH: So that is the diagnostic evidence. Then could I have a check list of the epidemiological reports? I appreciate that there will be additions to it, in the light of what is proceeding now, but can you help me about that?

H MR. HYTNER: My Lord, before I deal with that, can I just complete the medical issue? It may not be quite as clear cut as all that. My Lord, there are overlaps in the medical evidence.

MR. JUSTICE FRENCH: I can see that, yes.

A MR. HYTNER: There is not only the diagnostic problem and the genetic aspect but there is also very mildly, but nevertheless it is there, one area of epidemiology which is touched on. My Lord, how that is going to be dealt with must in the end be decided as the questions are put. The issue is "Should the epidemiologists have lumped lymphomas and leukaemias together?"

B MR. JUSTICE FRENCH: Yes, that is clearly the issue.

C MR. HYTNER: Whether, when I ask that question, Mr. Spencer will feel that that should not be asked or whether it can be asked but he is not going to cross-examine on it at that time, is something that I think can be sensibly left to the actual evidence of the witness.

MR. JUSTICE FRENCH: Yes.

MR. HYTNER: My Lord, I will leave Mr. Langstaff to deal with the epidemiology.

D MR. JUSTICE FRENCH: Thank you.

MR. LANGSTAFF: My Lord, there is a tentative timetable which the Plaintiffs have prepared for the delivery of their epidemiological case. It is something which so far as I am aware has not yet been discussed with the Defendants.

E The first witness will, as your Lordship knows, be Professor Steven Evans. He will be followed, I anticipate, by the two American witnesses, Dr. Davis first, and then Dr. Kopecky. My Lord, that is likely to take us through the end of the week after Professor Evans begins his evidence and indeed probably a little bit into the week following that, the week beginning the 7th December.

F We would anticipate that at that stage, having heard from Dr. Davis and Dr Kopecky and their cross-examination, your Lordship might anticipate there will probably be a break of a day so that there is, as it were, a certain amount of slippage time in case it is needed, and on the other hand reading time for all of us in preparation for the next witness, who we anticipate will be Professor Alberman. We anticipate that Professor Alberman will take the 9th and 10th December, then Professor Savitz on the 11th.

G I am reminded by Mr. Hytner that it was tentatively suggested that we should not sit on Wednesdays during the delivery of the evidence. Your Lordship will appreciate that the timetable that I am sketching out to your
H

DISCUSSION

Lordship would give the break on the Tuesday rather than the Wednesday of that particular week, and although this means that there are three days in one chunk, as it were ---

MR. JUSTICE FRENCH: I think we have got to be flexible about this.

MR. LANGSTAFF: My Lord, that is what has been anticipated.

MR. ROKISON: It is absolutely impossible to say, for example, whether Dr. Scott Davis and Kopecky are going to take five days or six days - who knows? It may be Tuesday or it may be Wednesday, but I agree ---

MR. JUSTICE FRENCH: We have got to remain flexible.

MR. ROKISON: Indeed.

MR. LANGSTAFF: My Lord, that is why I put the timetable forward with the greatest of hesitation and knowing, as we do already, that witnesses have taken rather different lengths of time in the witness-box than had been anticipated. It is perhaps always the case.

My Lord, after Professor Savitz, we would intend to call Professor Thomas who, if I dare anticipate it, is perhaps likely to be one of the shorter epidemiological witnesses.

My Lord, that may or may not see us through until the end of term. If there is space before the end of term, we would then call Professor Day. It is likely, as we see it, that the Plaintiffs' evidence will be largely complete this term, with no space, unless circumstances insist that it should be the case, for the Defendants' witnesses this term. I suspect that the Defendants' cas will be early next term.

MR. JUSTICE FRENCH: Yes.

MR. LANGSTAFF: I have given your Lordship the provisional batting order, and I hope that that suffices for your Lordship's purposes.

MR. JUSTICE FRENCH: Yes, thank you. Mr. Rokison, are you in a position to give me a provisional batting order?

MR. ROKISON: No, I do not think I am, my Lord. I think it largely depends upon, as my learned friend says, how we progress through his batsmen. His rough estimate is about the same as ours. We roughly thought that we would probably get to or near to the end of the Plaintiffs' epidemiological evidence by the end of this term, so we are looking at our evidence being next term,

DISCUSSION

A and it must depend on the availability of the individual witnesses. I think it would be likely, subject to availability, that we would start with Dr. MacRae, but thereafter I think it is very difficult to say. We, like my learned friends, have epidemiological witnesses from abroad and it would be a question of their availability. Obviously I will be able, as this term progresses, to be able to give your Lordship an indication of our intended batting order and I will do that.

B MR. JUSTICE FRENCH: If you bear it in mind and let me have it.

MR. ROKISON: Certainly, but I cannot do that now.

C MR. JUSTICE FRENCH: No. Of course, it does sometimes happen that when a block of evidence has been heard, it shortens that which follows; it sometimes happens that it lengthens it.

MR. ROKISON: Sometimes.

MR. JUSTICE FRENCH: So again we have to wait and see.

D MR. ROKISON: As I say, the difficulty is that until we know what the re-working of the Gardner study looks like, we cannot really anticipate what further issues may arise or what issues which are presently raised as between the experts may actually disappear. We simply do not know.

MR. JUSTICE FRENCH: Yes, thank you.

E MR. LANGSTAFF: My Lord, the only thing I think it remains to add is that for the purposes of your Lordship's reading plainly some of the Defendants' reports touch upon the evidence that is likely to be given early by the Plaintiffs witnesses. Anticipating as best I can the points that may well be raised by the Defendants, your Lordship might find it convenient at least to glance at the reports of Dr. MacRae, Professor MacMahon and Professor Doll, at least so far as the first three of the Plaintiffs' witnesses are concerned.

F MR. JUSTICE FRENCH: Most of these I have with greater or lesser diligence read already, and it is very helpful to know the order in which I should give them further attention.

G MR. LANGSTAFF: Yes, my Lord.

H MR. JUSTICE FRENCH: Thank you. Now I have one matter for Mr. Hytner before we continue with Dr. Stather. I guess the answer is yes, but I just want to check. Would you please go to Dr. Stather's first report, Annex D1? You will see that he is setting out a list of incidents at Sellafield site given to the Black Advisory Group:

J. W. STATHER

"The incidents from the beginning of 1977 onwards are identified in accordance with the criteria introduced by the Secretary of State"

subject to certain reports. So 1977 onwards are identified, then we have the next sentence:

"Earlier incidents have been extracted from the list provided to the Windscale Inquiry in 1977".

Then we have got a little footnote 1 which we find on page 21 right at the bottom. I just want to confirm that the Plaintiffs have had the advantage of considering that document. One would expect it to be disclosed.

MR. HYTNER: Yes, my Lord, we have seen it.

MR. JUSTICE FRENCH: Fine, that is all I wanted to know. Mr. Nicholl-Gent has passed me a note which reads "When, if at all, would Dr. Stather be recalled?" Do you anticipate that he will be recalled?

MR. ROKISON: Probably yes, my Lord, but it will be in relation to the question of particularly RBEs and foetal dose, and therefore I would anticipate that that would be in the course of the genetics part of the case.

MR. JUSTICE FRENCH: Yes, thank you.

DR. JOHN WHARWICK STATHER - Recalled

Re-examined by MR. ROKISON:

Q. Dr. Stather, two apologies, first for bringing you back this morning and not being able to complete the re-examination yesterday afternoon, secondly for keeping you waiting this morning. I shall try to be as brief as I can. I have got perhaps ten or so short points that I want to ask you about arising out of your evidence. First, do you have a copy of the transcript of your evidence of yesterday?

A. Yes.

Q. I think it is probably easier to do it by reference to that document.

MR. JUSTICE FRENCH: That document will be retrieved.

Q. MR. ROKISON: May I first invite you to look at page 30 of the transcript please, where you were being asked by my learned friend Mr. Read about the raw data which you had which was provided to you for the purposes of the exercises which you have undertaken. You were specifically asked about the time when monitoring started in relation to certain radionuclides. If I can pick it up on page 30 at D, you were asked:

J. W. STATHER

"Q. And iodine-131 I think was 1964.

A MR. JUSTICE FRENCH: Caesium, constant monitoring as from 1961. (4) Iodine, constant monitoring? Is that right?

B MR. READ: My Lord, yes. They are set out in R171, and if I have derived the figures from there those figures will be right. I think yesterday Prof. Jones said that the monitoring for milk with iodine started in 1958, but what is in R171 sets out the correct position on monitoring:

Q. Is that right, Dr. Stather?

A. I believe so, yes."

C If one looks at R171 Addendum, which we have in the big bundle S - it is the common bundle S and it is divider 237 - if you turn to page 22 of that document, paragraph 386, you will find that there is a section entitled "Estimates of Iodine-131 Concentrations in Milk and Environmental Materials"?

Q. MR. JUSTICE FRENCH: What is the page?

D MR. ROKISON: I am sorry, page 22, my Lord:

Q. Can we just look at this, Dr. Stather? It says:

E "In R171 measurements of iodine-131 in milk collected in the Seascale area were used where these were available, and the estimated contribution from weapons fallout was subtracted. In the years when measurements were not available, milk concentrations were calculated using a scaling factor relating average annual measured concentrations in milk to the atmospheric discharges".

Can you just explain that please?

F A. There are some years when you have measured concentrations in milk and discharges, so that provides you with a relationship between discharges and concentrations, so for the years that you don't have that information you can scale from the discharge, so you have a relationship between the discharge of iodine and the concentration in milk which you can apply to years where you don't have the information.

G Q. MR. JUSTICE FRENCH: Where you do not have the information about discharges?

A. On milk levels.

Q. In the years when you can establish the relation between discharges and concentration, you do so?

A. Yes.

H

J. W. STATHER

Q. When you have not got information as to the discharges, you calculate it from what you see in the milk?

A. When you have not got information about the level in milk, you can use the discharge.

Q. So it is the other way round?

A. Yes.

Q. When you have not got information as to the level in milk, you calculate it from the discharges?

A. Yes.

Q. In respect of how many years was the latter exercised performed? Without tying you down to one or two, is it of the order of 50%?

A. Maybe 40% of the time. In some years measurements were made but the actual measurement was below the detectable level. It was not possible to measure the iodine because it was too low.

Q. In perhaps 40% of the cases where it was measurable ---

Q. MR. ROKISON: 40% of which years are you talking about?

A. It's a question of how many years do we have to ---

MR. JUSTICE FRENCH: Make the calculation rather than establish directly the relationship.

Q. MR. ROKISON: Exactly, and I am wondering over which years we are talking where there were no milk measurements or sufficient milk measurements?

A. I think I cannot give you a complete answer. I think I would have to go back to the data base.

Q. MR. JUSTICE FRENCH: Very well, I will alter the answer. "In some years there was no measurable activity". Was there always an attempt to measure?

A. I believe so, yes.

Q. "There was no measurable activity in milk. It was necessary therefore to calculate such activity as there may have been ...", is that right?

A. Yes. 1985 was the year ---

Q. Come in with that later, if you would. "As there may have been from the records of the discharges"?

A. Yes. There is a table that summarises the information, which you might find helpful.

Q. Where is that?

A. It is in Appendix H, page 14.

Q. That is an Appendix to R171 Addendum?

A. Yes.

Q. To what is it an Appendix?

A. Appendix H of my first report.

Q. Appendix H to Stather number 1?

A. Yes, page 14. Half way down the page, for Iodine-131, indicating what I indicated we did. We scaled to the Iodine discharge using average factor for 1970 to 1981, as we described in the earlier report. There were measurement data from about 1961.

MR. ROKISON: You refer there to R171, and I was referring - and a lot of this becomes clearer, my Lord, if one looks at the whole of the relevant paragraph to which I had referred Dr. Stather in R171 Addendum, which is in reference 237 at page 22:

Q. I had asked you about the second sentence and what you meant by scaling factor. It goes on:

"A more detailed analysis of the monthly measurements, from which the annual values were calculated, shows that many of these were below detection limits."

Now just pausing there, what do you derive from monthly measurements if they are below detection limits?

A. That there is a low level of activity in the milk.

Q. You go on:

"However, the minimum level of detectable activity was used for calculating average annual concentrations."

In other words, where it was below detection limits you took the limit of detection?

A. Yes. Effectively that would be a worst case.

Q. Exactly. As you explain as you go on:

"As a consequence, annual concentrations of iodine-131 in milk in the 1970s and early 1980s, which had been scaled from the discharge, were overestimated. The scaling factor was recalculated from the monthly concentrations of iodine-131 in milk which were above the detection limit, and the discharges in the corresponding months. As a result of applying the new scaling factor, estimated milk concentrations are an order of magnitude..."

Which I think means more than 10?

A. Yes.

Q. "...lower than those calculated previously. It should be noted that there is still considerable uncertainty associated with the scaling method, because of the short half-life of iodine-131 and the uncertainties in relating a discharge over a monthly period with a single milk measurement in that period. However, the majority of the monthly measurements are within a factor of five of the concentrations calculated using the scaling factor."

Then you say:

"Some measurements of iodine-131 in milk from the Seascale area exist for the late 1950s and 1960s, and these were used in R171."

It appears that your measurements were in the fifties and sixties?

A. Yes.

Q. Then you say:

"However, the relatively high level of iodine-131 in milk from weapons fallout in these years makes the contribution from Sellafield discharges difficult to determine with any accuracy..."

If there had been large discharges of iodine-131 would it have been picked up?

A. Yes.

Q. MR. JUSTICE FRENCH: Can I interpose a question? In view of the very short half-life of iodine, would you not expect that any from weapons fallout would have disappeared before it impinged on Sellafield or Seascale?

A. There would still be problems with weapons fallout. It is an eight day half-time, so there is time for it to get into the atmosphere.

Q. It has got to travel a long way, hasn't it, from Bikini to...

A. Yes. We have measured iodine in this country from weapons testing, as we did from Chernobyl.

Q. Yes, but there would not be a great deal left having regard to the total discharge?

A. No.

Q. MR. ROKISON: As I understand it, you are talking about small figures here, both from weapons fallout and from Sellafield?

A. Yes.

Q. I think you said that if there had been significant iodine discharges from Sellafield that would have been something which would have been picked up and would have been distinguishable from the weapons fallout contribution?

A. Yes.

Q. May I just ask this: how confident were you that so far as R171 Addendum was concerned, that you had adequately catered for iodine discharges in the method that you used?

A. I think it was an appropriate method to use to estimate the doses.

Q. Does that remain your view or have you changed that view?

A. That remains my view.

Q. Can I move on to another topic, my Lord? The next topic I want to ask you about is Argon-41. I would like you to go to page 34 of Day 8, where it was put to you that Argon-41 was one of the most important doses to the red bone marrow, certainly as far as R171 Addendum was concerned, and you say:

"A. Certainly. That is a point we make in the document.

Q. Yes, you say it in your report.

A. Up to the period at which the piles closed, of course.

Q. Yes.

A. Up to the end of October 1957."

You say it was one of the most important doses to red bone marrow up to the end of October 1957 when the piles closed down and we looked at the tables from which we can see the marked reduction thereafter?

A. That is right.

Q. Could that significant discharge of Argon-41 up to 1957 have any influence on the two cases which my Lord is considering so far as any dose to red bone marrow is concerned?

A. Hardly. No. I was also asked about the difference in the dose from stacks of different heights. There is a difference of about 50% in the dose from low level stacks compared with high level stacks - a somewhat higher dose from a low level stack - but the values given are really what I would expect.

Q. MR. JUSTICE FRENCH: What you are saying, for fairly obvious reasons, is that the Argon-41 dose under discussion is relevant to red bone marrow and not to gonads?

A. Well, it is a whole body dose, but of course it depends on when the individuals were born as to whether it would be an influence on their dose to bone marrow.

Q. This is...

A. Argon-41 would give more or less the same dose to every tissue of the body.

Q. Is the point and the reason why Mr. Rokison thought the answer might be obvious, that this is a bone marrow dose and not likely to affect F1 or F2?

A. It would affect parents' doses as well. It would be a dose to all the tissues of the body, but it would not affect the individuals.

MR. ROKISON: Can I clarify it?

J. W. STATHER

A Q. Insofar as my Lord is concerned with somatic doses to either Dorothy Reay or Vivien Hope, whether in embryo of foetus or after birth, and insofar as my Lord is concerned with the dose to red bone marrow which is primarily relevant to Dorothy Reay, can the discharges of Argon-41 up to the close of the piles in 1957 have any influence on that at all?

A. No.

B MR. JUSTICE FRENCH: Well, because of the sheer timescales.

MR. ROKISON: It is obvious because it has a short half-life of 1.8 hours. Sometimes one simply has to ask the obvious question.

C MR. JUSTICE FRENCH: Of course. Please don't fail to ask a question because you assume any knowledge on my part.

MR. ROKISON: Well, I did assume that and I was right.

D Q. Can I just move lower down the page where you were asked about the estimates of release of Argon-41 going up, as they did, from R171 to R171 Addendum by 70%, and you were asked:

"It was something that was entirely dependent upon the release information given to you by British Nuclear Fuels?"

You said:

E "It is a point we pursued on many occasions with BNFL to ascertain that the value they gave for Argon-41 release was appropriate."

Could you outline to my Lord the sort of checking you did in order to ascertain that it was...?

F A. It clearly was a significant increase in the discharge, so we wrote and I telephoned on a number of occasions to query the discharge, basically. I didn't, and nor did the Board, try to undertake any calculations of what the discharge might have been but we did ask BNFL on a number of occasions, and I have done over the past year, to confirm the discharge data.

G Q. I appreciate entirely that, as you explain later in your evidence, NRPB do not have the wherewithal to be able to calculate the discharges and you relied upon information supplied to you by BNFL?

A. Yes.

H Q. Can I ask this: did you satisfy yourself insofar as you could from inquiries that you had made, that the figures you had for Argon-41 were appropriate?

A. Yes.

- A Q. MR. JUSTICE FRENCH: From what means did you have to do that?
- A. In discussions with the individuals who had been involved in doing the calculations. Clearly the calculations depend on information about the plant characteristics, and they are the people in a position to know what the plant characteristics are, but the details of the calculations and what was involved I spent quite some time discussing.
- B Q. MR. ROKISON: Before we leave the question of discharges, may I just ask this: you were asked about a number of possible discharges and the extent to which they had been taken into account. In Annex D1 of your report, you had set out the specific incidents which you had taken into account which you provided to Black. In Annex D2 you refer to 19 further either incidents or periods in relation to various discharges which had been supplied to NRPB by BNFL since July, 1984. Now just clarify: is that that they were supplied after July 1984, or do they relate only to what happens after 1984?
- C A. They were supplied for the work we did on the Addendum.
- Q. Yes. Because one sees that in relation to many of these they go back right to the beginning of operations in 1951?
- D A. Yes. It was new information we were given during the preparation of the Addendum.
- Q. I next want to take you forward in your evidence yesterday to page 42. For these purposes if my Lord could have available Dr. Stather's first report? The point was raised, and you were asked about, the data which you had from the two farms, that is in relation to the strontium-90 measurement which is what you depicted on your diagram yesterday. Your evidence started at the bottom of page 42 at H. You were only looking at two farms and it was pointed out to you, and you agreed, that there was a nearly ten-fold difference.
- E A. It was actually a factor of 8.
- F Q. If one looks in your report at Appendix E on page 5 through to page 7, you deal with two aspects. One is the measurement of strontium-90 in milk on the farms?
- A. Yes.
- Q. You also deal there with the measurements of strontium-90 in soil at the two farms. Could you just explain to my Lord how they relate and the extent to which one provides any sort of cross check on the other?
- G A. Well, I think it comes back to this diagram. We have concentrations of strontium-90 from two farms, which differ by a factor of 8, so we take the average of these two concentrations which gives us a concentration of strontium-90 in milk in 1958. We use our food chain model to back-extrapolate, as I described, to give concentrations of strontium-90 in milk in earlier years. Assuming the release all occurred in mid-1954, that
- H

J. W. STATHER

corresponds to a deposition of strontium-90 on the ground of about 5,000 Bq per metre squared. It is the first complete paragraph on page 6, about eight lines down - 5.1 10-to-the-three Bq per metre squared.

MR. ROKISON: I am wondering one could just invite my Lord to read that paragraph and to see where that figure comes in in that paragraph and in particular in the context of that sentence?

MR. JUSTICE FRENCH: Yes.

THE WITNESS: So the inferred value was higher by rather more than a factor of 2 than the actual measured concentration in soil.

Q. MR. ROKISON: Just coming back to my question: to what extent did you regard that as being a cross check in relation to the approach which you had adopted from the measurements in milk?

A. To get a model prediction and a measurement to agree to within nearly a factor of 2 I think is very good, and I think it was a good cross check. Basically what we are doing is to use the cow to integrate the activity on the ground. It is obviously feeding over a wide area and it is the concentration of strontium-90 in milk from the cow that is grazing over the area, averaging the concentration that was being deposited.

Q. After taking account of those measurements in soil, as well as the measurements in milk, did the fact that there was an approximately eight-fold difference between the figures obtained from the two farms in relation to milk, cause you any concern?

A. Not particularly. We were within a factor of 2 of the highest value and maybe 4 times the lowest value, and the lowest value was in practice nearer to Seascale anyway, so we had no problem in taking that number. This value incidentally, is about comparable to the level of deposition from the weapons fallout through the fifties and sixties of strontium-90.

Q. On the following page, we now come to your cross-examination yesterday afternoon, and the questioning relates to whether or not you were, as you had told my Lord, making a cautious assumption in assuming that the release of all the uranium oxide occurred in mid-1954?

A. Yes.

Q. I don't know whether you can answer this because this was not a matter which was put to Prof. Jones who might have known, but you were asked at page 44F:

"Q. Would you be surprised, for example, to know that in August 1952 there were meetings minutes relating to cartridges being blown out of the back of a pile? Would that affect your assumption about

the release all occurring in mid-1954?

A. It would depend whether that resulted in any release to atmosphere."

A I don't know whether you can help on this at all, Dr. Stather, and if you cannot say so, but would you have any knowledge about the extent to which by August 1952 cartridges would have been irradiated?

A. No.

B Q. I will move on if you cannot assist on it. Just one small point, my learned friend Mr. Read kept trying to come back to a particular document, which was page 69 in the white bundle, bundle P1. Every time he came back to it he was interrupted either by me or by something else cropping up. Eventually at page 48 he came to be able to deal with it. The question arose in relation to that part of his cross-examination of you, Dr. Stather, as to when that document came into existence, it not being a dated document. Do you recall that?

C A. Yes.

Q. Could we just have a look at it? What I was going to ask you is to ask you whether there is anything in the document which gives you any guidance as to whether it came before or after R171 Addendum?

D A. Can you give me the page number again?

Q. It is page 69.

A. I just haven't seen the document.

E Q. You were referred to it and passages of it were read yesterday. It was a question of SEFs. I think I had objected at one point on the basis of the questions being put since it was not clear what date this document was because you were asked whether you would have expected to be told of matters when you were preparing R171 Addendum. If one looks, for example, on page 70 at paragraph 4, about half the way down...

F MR. JUSTICE FRENCH: Yes, "In recent years since 1978..." That gives some...

F MR. ROKISON: Also page 72, paragraph 8 - my learned friend says it is obvious from it and my learned friend indicates he agrees that it was post-R171 Addendum.

G Q. May I take you back - I am sorry to invite you to do that and also my Lord, particularly in view of the cumbersome nature of the document - to look at R171 Addendum again which is in "S" at 237. I want to ask you about the question of Ponsonby Tarn and the problem which arose in relation to Ponsonby Tarn because as you pointed out the core sample that you had from Ponsonby Tarn did not wholly tally with the assessments that had been made, and if you look on pages 55 to 56 you were asked a number of questions about those passages and you were asked about

H

J. W. STATHER

British Nuclear Fuels reaction to them, you will remember. You were particularly asked, in the white bundle, page 161, you were being asked about a letter which was sent by British Nuclear Fuels on 21st April, 1986, which was sent in response to their being sent a draft, or the second draft of NRPB R171. On page 159 they thank you for giving them the opportunity to comment on that document. Just pausing there, would you regard that as being anything unusual, that they should be given an opportunity of commenting on the document when it is in draft form?

A. No. The Department of Health were given copies of the first and the second draft.

Q. Is this a privilege that is somehow given specially to British Nuclear Fuels or is it generally given to interested parties?

A. It is generally the way the Board treats documents.

MR. HYTNER: My Lord, that has never been suggested, ever.

MR. ROKISON: I am not sure that it has never been suggested. I do not think it was actually put to this witness.

MR. JUSTICE FRENCH: Never mind whether it was suggested or not, it is not a privilege peculiar to BNF.

Q. In relation to the question of Ponsonby Tarn you see that what they say, after discussing on page 160 the measurement of radionuclides in lake sediment, where they say, and this was referred to yesterday, that they are somewhat unhappy about your treatment of the data relating to sediment cores from Ponsonby Tarn, and they think that caution should have been expressed more strongly. They end up on page 161 at the end of that paragraph by saying:

"I certainly agree with your final sentence in this section that the analysis of further sediment samples from Ponsonby Tarn would be useful."

If one goes back to your R171 Addendum one finds at the end of section 6, on page 57, just above the summary, they say two things:

"Too much emphasis should not be placed on this sediment core analysis"

- this is your report?

A. Yes.

Q. "... however, as it is based on only a single sample. The analysis of plutonium levels in further sediment samples from Ponsonby Tarn and measurements of the contribution from earlier deposits brought into the Tarn by run-off water should give more

complete information from which to estimate the pattern of plutonium releases from the Sellafield plant over the last 30 years."

Then the last paragraph of the section, in the next paragraph, you say:

"As the soil data for actinides at Seascale are very limited and somewhat disparate, a comprehensive sampling programme designed to measure total deposits of plutonium and americium at sites in the Seascale area would provide useful data for validating their discharges from the plant."

BNFL are effectively saying good idea, let's have more samples and since 171 has that been done?

- A. Yes, more samples have been taken and the Department of Health has done more samples from Ponsonby Tarn, or sponsored some further analysis at Ponsonby Tarn, so action was taken on those points.

- Q. Was it ever anything that BNFL wanted to discourage in any way, so far as you are aware?

A. No.

- Q. Have the results of further sampling been matters which you have taken into account for the purposes of your evidence in this case?

- A. They have been taken into account in that Prof. Jones has used the information to develop the database on discharges and we have used that database on discharges as part of what we have done for the dose assessment.

- Q. Yes. I think Prof. Jones specifically referred to Ponsonby Tarn and how the reassessment is more consistent with Ponsonby Tarn than the earlier assessment?

- A. Yes, specifically comparing his modelling with the profile in Ponsonby Tarn.

- Q. I can leave that. I now come to the question of validation, or verification as my learned friend, Mr. Read, referred to it. In relation to validation or verification, if you look at the transcript of evidence yesterday, what I wanted to ask you is this, at page 73 you were being asked about Dr. Popplewell's results, you remember?

- A. Yes.

- Q. It was put to you at 73C:

"Dr. Popplewell's results were published in 1985? I think it was in fact received in 1984, that report. Why was it that one has this large revision in the amount of dose coming from plutonium, from 10% to approximately 35%, from R171 Addendum to your present estimates, and yet this autopsy data didn't suggest there might be anything wrong with R171 Addendum?"

J. W. STATHER

A. Well, I have already said models tend to have caution built into them."

and this is a matter which you have developed on a number of occasions. It goes on:

"Q. At the end of the day it proves the point that this autopsy data, helpful as it may be, cannot really establish anything because it isn't big enough as a sample size? If it was a large enough sample size then something ought to have told you that something was wrong with R171 Addendum?"

You were asked two questions and I want to check your answers to them both separately. First of all, do you agree that the autopsy data cannot establish anything because it is not big enough as a sample size?

A. I believe six is a good sample size, given that the sample has a degree of homogeneity about it.

Q. The second point is, if it was a large enough sample size then effectively it is said it ought to have told you something was wrong with R171 Addendum. Do you agree with that?

A. I think it indicates we have probably over-estimated intakes of plutonium.

Q. MR. JUSTICE FRENCH: Would you say that again?

A. It would indicate we have over-estimated intakes of plutonium by people in Seascale.

Q. MR. ROKISON: Bearing in mind what you have said about models would that surprise you if you had over-estimated the plutonium?

A. No.

Q. Would it cause you concern?

A. No because I think there is a tendency to err on the side of caution and if you demonstrate that has happened it is not a thing that somebody would be concerned about. I think the concern would be if you felt you had under-estimated doses.

Q. Moving from 171 Addendum to your present assessment, does the autopsy data still provide you with a validation or verification of your assessment?

A. I believe it does, for the same reason.

Q. In relation to plutonium in particular what does it tell you about your assessment?

A. It tells me that we are likely to have over-estimated intakes of plutonium.

Q. My Lord asked you some questions at page 74 in relation to the autopsy results. You will recall where my Lord was making the point to you, with which you agreed, that it was essentially a measurement rather than an estimate, and that you agreed with my Lord that the doubt in it is

the extent to which you can effectively gross up the measurement that you have made. Is that something which is a standard procedure?

A. Definitely. You would take a large sample of tissue to minimise the problems in scaling up to the whole body, and you tend to look particularly at samples of skeleton to get representative samples of skeleton from different parts of the body, as well as a large sample of liver, and these, as I explained yesterday, are the two tissues that concentrate 90% of plutonium in the body.

Q. Is there empirical information which will give you guidance as to what conclusions you draw from ...?

A. There is information on complete distributions of plutonium in autopsy tissues from studies in North America so there is a lot of information to provide guidance on how to scale up the information to the whole body from tissue samples.

Q. So far as caesium is concerned, you were asked about that from page 75 onwards, 75B, where my learned friend Mr. Read said:

"So we turn to the final validation exercise, which is the caesium estimates - whole body monitoring?"

Again, is it accurate to refer to them as caesium estimates?

A. They are measurements of body content or estimates from the models.

Q. So that it is your measurements from body contents which are a validation of your estimates or assessments from your model?

A. Correct.

Q. You were asked about Dr. Rundo's reports, you remember?

A. Yes.

Q. With which you are familiar, I take it?

A. Yes.

Q. It was put to you that we do not know much about where the

A. That is Table 7.2 and they are all Seascale residents.

Q. How do you know they are all Seascale residents?

A. I recall that Dr. Chamberlain in his annex refers to the individuals involved and he knows the individuals who were measured, so although the published papers talk about Sellafield area

Q. I think what they say is "resident near Windscale"?

A. That is right.

Q. One can turn that up but

A. We can get detailed information on where these people lived, if it was necessary. They are Seascale residents.

J. W. STATHER

Q. MR. JUSTICE FRENCH: You say they all lived in Seascale?

A. Yes.

Q. MR. ROKISON: And that is in the statement of Chamberlain and I think my learned friends agreed that we need not call Dr. Chamberlain but his evidence could go in

A. It is Table 5.

Q. MR. JUSTICE FRENCH: Dr. Chamberlain, Table 5?

A. In Annex 1 of my second report.

Q. MR. ROKISON: That is annexed to your second report?

A. Yes.

Q. MR. JUSTICE FRENCH: So it is not Dr. Chamberlain, it is Stather 1.

A. But the annex was prepared by Dr. Chamberlain.

MR. JUSTICE FRENCH: Stather 1, Annex 5?

MR. ROKISON: My Lord, I am sorry, it is Table 5 in Annex 1 to Dr. Stather's Second Report.

Q. What Annex 1 is, is a statement of comment by Dr. Chamberlain?

A. These were people who lived in Seascale and were measured before and after the Windscale fire.

Q. They were identified individuals who were Sellafield workers, part of the workforce and if one looks - I do not want to take you to it - at the follow-up report which is Dr. Hess, their initials are actually given, not their full names, but they are identified. There is just one thing I want to ask you further in relation to page 78B, where it is put to you, and you agree, that the first validation you get for whole body monitoring is 1957?

A. Yes, that is right. These are Rondo's measurements of the Seascale cases.

Q. Yes, and as you say, as far as their whole body monitoring is concerned, the caesium only has a physical half-life within the body of about 110 days?

A. That is correct.

Q. But its half-life as a radionuclide is very much longer?

A. Thirty years.

Q. Can I ask you this: if there had been very much larger discharges of uranium oxide would the caesium resulting from that discharge have manifested itself in milk?

A. You would have expected to see it because cows would be grazing on ground that would have been contaminated with much higher levels of caesium and so it would be continually being transferred into the food chain, with

J. W. STATHER

the potential for people to take it up, so the answer is you would expect to see it later on if levels had been very much higher.

A

Q. Would that have been reflected even though in a sense not directly but indirectly in monitoring in 1957?

A. Yes.

B

Q. Page 79D, it was put to you that both your models had come up with wildly different predictions of the two peaks. One is talking about, as you know, the peak in relation to uranium oxide discharges, comparing your two reports and Prof. Jones, and the subsequent peak - was that the Windscale fire, the subsequent peak?

A. Yes, that is right.

C

Q. And it is said that both of your models had come up with wildly different predictions for the two peaks - you remember that being put to you?

A. And you said:

"Certainly different predictions."

D

and it is put to you that is a difference of a factor of 2, or you say that it is a difference of a factor of 2, that there are certainly differences. Do you regard those differences within the context of what you were doing as being wildly different?

A. No, certainly not.

E

Q. Do you regard them as being indicative that either you or Prof. Jones or both must have got it all wrong?

A. I think it is just an indication that we have made somewhat different assumptions in the models that we have used.

Q. At page 81 it was put to you:

"... we will never actually know the environmental doses of radiation"

F

First of all, so far as that is concerned, would you agree, I think you did agree, that one will never know exactly what they were?

A. Exactly, but we do have comprehensive information from the late fifties which does give us an indication of what the releases were in total.

G

Q. You said in answer to that:

"I am sure we will never know to within tens of percent."

but later on down that page you said:

H

"I think we are talking about estimates to within a factor of 2 or 3, that sort of order."

J. W. STATHER

Q. We will never know the environmental doses?

A. Yes, to better than a factor of maybe 2 or 3."

A

Just pausing there, so far as your assessment and your evidence in this case is concerned, I asked you and you told my Lord on Day 8 at page 25A, that you considered your assessment was, the word you used was "robust"?

A. Yes.

B

Q. You said that there cannot be any reason why you should have underestimated and in a number of places you had overestimated?

A. That is correct.

Q. So far as your assessment is concerned, again I ask you, how confident are you that your assessment does not give rise to an underestimate of dose?

C

A. As confident as I can be for this type of assessment. I think we put a tremendous amount of work into developing a database, looking at all aspects of the calculations, where there was some uncertainty then we have tended to err on the side of caution, and I think the net result of that is we are more likely to have over-estimated than to have underestimated the doses that we have calculated.

D

Q. The last matter I wanted to ask you about was this, and it relates to the document which is called the BNFL/NRPB relationship, which my learned friend Mr. Read started to ask you about but then stopped. I want to just ask you one thing about the part that he did ask you about, and that was in relation to your acceptance of data from BNFL. If I can ask you to look at page 84B where my learned friend said:

E

"Which is wrong because you are advisory? The fact of your relationship with British Nuclear Fuels led you to accept their data. Would you agree with that?

A. Yes.

F

Q. You did not investigate their data in great depth. It was not your duty to do that?

A. We are not in a position to investigate information on discharges.

G

Q. Such was the relationship, therefore, between you that, from time to time, you took on trust the information they gave you where, if the relationship had perhaps been more of a watchdog body, you may have been more interested in ensuring the accuracy of their data?

A. We are not an organisation that can validate information on discharges that would be given to us by an operator."

H

I just want to clarify this: was your acceptance of data given to you by British Nuclear Fuels in any way the result of any special relationship between NRPB and BNFL

or you as a individual and any individual at BNFL?

A. Definitely no.

Q. Has your work in relation to Sellafield either in relation to R171, R171 Addendum or the evidence which you have given to my Lord in this case been influenced in any way by any such special relationship?

A. No.

Q. Thank you, Dr. Stather.

MR. JUSTICE FRENCH: That means we can release Dr. Stather for the time being. Thank you very much. Can we go any further today?

MR. ROKISON: No, my Lord.

MR. JUSTICE FRENCH: So I think we meet again, God willing but otherwise come what may, on Monday week?

MR. ROKISON: And we will endeavour to provide your Lordship with our written submissions by mid-day on Thursday.

(Court was adjourned until Monday,
23rd November at 10.30 a.m.)
