Case number 4 BM 50028

IN THE HIGH COURT OF JUSTICE
QUEEN'S BENCH DIVISION
BIRMINGHAM DISTRICT REGISTRY

TECHNOLOGY AND CONSTRUCTION COURT

BIRMINGHAM CIVIL JUSTICE CENTRE
33 BULL STREET
BIRMINGHAM B4 6DS

Date of trial: 21, 22 and 23 February 2005
Date of draft judgment: 4 April 2005
Date of judgment: 9 May 2005

Before Her Honour Judge Frances Kirkham

(1) EIRIKUR MAR PETURSSON

(2) AGNES INGVARSDOTTIR

Claimants

and

(1) HUTCHISON 3G UK LIMITED

Defendant

Mr Stephen Eyre of Counsel (instructed by Harrison Clark) for the Claimants

Mr R W Humphreys of Counsel (instructed by Freshfields Bruckhaus Deringer) for the Defendant

JUDGMENT

1. Until last year, the claimants lived at 57 London Road, Worcester. The claimants claim pursuant to the Electronic Telecommunications Code contained in Schedule 2 to the Telecommunications Act 1984, as amended by the Communications Act 2003. They claim that the defendant's telecommunications apparatus has had substantial adverse effects on their physical well-being and on their enjoyment of their property. They seek an order for the removal or repositioning of the apparatus.

2. The apparatus, in simple terms, is a base station for mobile phone communications and arises following the installation in 2003 of the defendant's 'third generation' - ie 3G - telecommunications system. It comprises a mast with three antennas installed within a flagpole mounted on a pub called the Little Sauce Factory at 55 London Road and a base station which is contained in a cabinet at ground level at number 55. The mast is situated approximately 22 metres from the boundary of that property and approximately 28 metres from the nearest wall of the house. The claimants purchased 57 London Road in December 1999. They both lived at and operated their business from the premises. They moved the business to alternative premises in September 2003 and they themselves moved to a different house in February 2004. They sold the property in August 2004.

3. The claimants served notice under the Code of objection to the siting of the apparatus at the Little Sauce Factory. They require the apparatus to be removed. Their main contention is that there have been adverse effects on their well-being. They say that they, members of their family, their dog and visitors to the property suffered unpleasant symptoms and felt ill, and they attribute this to the effect of the emissions from the antennas. Their case is that their objection under the Code is well founded, the pre-conditions under the Code for the exercise of the court's discretion are made out and that discretion should be exercised so as to require the removal of the defendant's equipment.

4. Initially, the claimants claimed damages for personal injury and for diminution in the value of their property. Those claims for damages were abandoned before trial. Their claim now is solely for removal of the apparatus.

The Code

5. So far as relevant Paragraph 17 of the Code provides, as follows:

"17(2) At any time before the expiration of the period of three months beginning with the completion of the installation of the apparatus a person who is the occupier of or owns an interest in (a) ...

(b) any land the enjoyment of which, or any interest in which, is, because of the nearness of the land to the land on or over which the apparatus has been installed, capable of being prejudiced by the apparatus, may give the operator notice of objection in respect of that apparatus."

"17(5) ...the person who gave the notice may apply to the court to have the objection upheld".

"17(6) Subject to sub-paragraph 7 below, the court shall uphold the objection if the apparatus appears materially to prejudice the applicant's enjoyment of, or interest in, the land in right of which the objection is made and the court is not satisfied that the only possible alterations of the apparatus will:

(a) substantially increase the cost or diminish the quality of the service provided by the operator's network to persons who have or, may in future have, access to it or

(b) involve the operator in substantial additional expenditure (disregarding any expenditure occasioned solely by the fact that any proposed alteration was not adopted originally or as the case may be that the apparatus was unnecessarily installed) or

(c) give to any person a case at least as good as the applicant has to have an objection under this paragraph upheld."

(The provisions of paragraph 17(7) are not relevant here.)

"17(9) If it upholds an objection under this paragraph the court may, by order:

(a) "direct the alteration of the apparatus..."

(b) authorise the installation (instead of the apparatus to which the objection relates) in a manner and position specified in the order, of any apparatus so specified

(c) "direct that no objection may be made under this paragraph in respect of any apparatus the installation of which is authorised by the court".

6. It is common ground that the claimants took procedural steps within specified time limits and on 11 September 2003 gave effective notice under paragraph 17(2).

Background

7. The claimants purchased 57 London Road in December 1999. Mr Petursson is a ventilation engineer. He operates through a company called Aces Dust Control Ltd of which the claimants are directors. From February 2000 until September 2003 they ran that business from 57 London Road. The claimants employ one of their sons, Mr Niels Eiriksson, in their business. Mr Eiriksson did not live at 57 London Road but went there to work every day.

8. Mr Petursson began protesting about the proposed installation as soon as he learned of the defendant's plans. He organised a petition against the installation. The defendant made an application for planning permission for the apparatus. The claimants objected. Worcester City Council granted planning permission for the apparatus on 30 January 2003. Mr Petursson continued to raise concerns both with the local authority after planning permission had been granted, and with the defendant. He wrote to the defendant on 15 February 2003, referring to their successful application for planning permission, and stating that he regarded "your planned Radiation Generator as an intrusion upon my property and livelihood. And of course health, if that becomes affected."

9. The defendant wrote to Mr Petursson on 2 April 2003 seeking to allay his fears. They explained that they adhered to the ICNIRP [International Commission on Non-Ionizing Radiation] guidelines. They quoted from conclusions of the report published in May 2000 by the Independent Expert Group on Mobile Phones, led by Sir William Stewart, to the effect that "the balance of evidence indicates that there is no general risk to the health of people living near base stations on the basis that exposures are expected to be small fractions of guidelines". They offered to arrange for a representative of Bureau Veritas, a company which the defendant used to verify readings from their base stations, to visit the claimants' home and to take before and after non-ionising radiation readings. Mr Petursson rejected the suggestion that Bureau Veritas take measurements, on the ground that they were not independent of the defendant. (In fact, Bureau Veritas did subsequently visit the claimants' property and made measurements - I refer to this later).

10. The defendant completed physical installation of the apparatus on 6 August 2003. The apparatus was integrated into the network, ie became operational, on 7 August 2003.

11. The claimants sent the defendant an effective notice of objection pursuant to paragraph 17(2) of the Code dated 11 September 2003. They began proceedings in December 2003.

12. The claimants' evidence is that a pattern of symptoms emerged quickly after 7 August 2003. They experienced a sense of disorientation, difficulties in concentration and keeping the mind focussed. They also complained of mounting nausea and dizziness throughout the day, peaking in the afternoon when, they believed, the traffic from the antennas was at its heaviest. Mr Petursson's evidence is that, from the time when the apparatus became operational, he suffered dizziness, a heavy pressure on his head and nausea. Mrs Ingvarsdottir's evidence is that, until August 2003, she had been in excellent health with the exception of orthopaedic problems. From 7 August 2003, she began to experience headaches so violent that she lost concentration, had trouble with her eyesight and was sensitive to light. She became nauseous during the day; this became particularly bad during the afternoon. She experienced violent headaches, loss of appetite, nausea, sleeplessness, lack of concentration, bloodshot eyes, brown spots in her right eye (the side facing the apparatus whilst she sat at her office desk) and a prickling sensation on her skull which turned into a smarting sensation inside her head. She suffered badly from sleepless nights. Mrs Ingvarsdottir says that, now that she has left 57 London Road, her symptoms have largely disappeared.

13. The claimants believe that their cocker spaniel dog, Floppy, also suffered ill effects from the emissions. They say that he demonstrated changes in behaviour with loss of appetite, waking in the night and howling, going into hibernation mode and avoidance of some rooms in the property.

14. The claimants' case is that the apparatus has adversely affected their well-being and that of visitors to 57 London Road. The onset of their health problems coincided with the commissioning of the base station on 7 August 2003. Their evidence is that the symptoms they both experienced began on 7 August 2003. They did not know until later that that was the date on which emissions had begun. The defendant's case is that, by 20 June 2003 at the latest, the claimants believed (erroneously as it turned

out) that the base station had been commissioned and that emissions had thus begun. They began to complain of the symptoms which they attribute to the emissions before the emissions in fact began.

15. In mid June 2003 the claimants hired an Acousti-Com meter (a device to measure emissions from the apparatus) and purchased nickel-plated netting. They subsequently purchased an Acousti-Com meter. (Mrs Ingvarsdottir did not recollect accurately when this had been ordered by them.) After the Acousti Com meter had been delivered on 13 August 2003, Mr Petursson regularly noted readings he had taken using that meter.

16. Mr Petursson kept a log recording matters relevant to the base station. He wrote it in Danish. The defendant arranged a translation into English. That translation appears to have been given to the claimants in good time before trial. Mr Petursson made his own translation into English, but this was not made available to the defendant until the first day of trial. At trial Mr Petursson claimed that his translation was correct and that in some respects the defendant's translation was incorrect. It is unfortunate that the claimants raised that issue so late that differences could not be reconciled. At trial, we worked on Mr Petursson's translation. I reject Mrs Ingvarsdottir's suggestion, in relation to one entry, that the log was inaccurate. Mr Petursson said that he made entries during the day and it appears to me that it is a contemporaneous and accurate running record.

17. In their particulars of claim, the claimants contended that the installation of the apparatus had been completed by 20 June 2003. Mr Petursson sought to explain that he meant that the physical installation of equipment had been completed but that the apparatus had not by then become operational. In the answers they gave on 9 February 2004 to the defendant's request for further information, the claimants said that they first experienced symptoms on 7 August 2003 and that they had kept a log since that date. In fact, Mr Petursson had begun the log on 20 June 2003. The claimants initially disclosed only part of the log, from the entry dated 7 August 2003 onwards. It was only when the defendant pressed the claimants for disclosure of the hard disk of the computer on which Mr Petursson had written the log that it became apparent that he had begun the log earlier than 7 August, namely 20 June 2003, and those earlier entries were then disclosed.

18. The claimants' approach to the disclosure of the complete log does them no credit.

19. In the log, "Adda" and "Agnes" are references to Mrs Ingvarsdottir, "Eirik" is a reference to Mr Petursson and "Niels" is a reference to Mr Niels Eiriksson, their son. The entries between 20 June 2003 and 7 August 2003 are significant:

"20 June 2003	The mast has gone up and we'll see what happens
25 June 2003	Adda headache
	Eirik stressed
	Niels not in the office.
30 June 2003	Adda: headache
	It's peculiar that we are feeling ill. I don't think the equipment has started but may be there are test runs.
1 July 2	Adda: headache
003	Peter Yates [of Worcester City Council] sends an email that tells that the transmitter is not active. That is expected late July!
30 July 2003	I think there is periodic service or test runs on the mast. The electrics appear to be finalised but nobody wants to inform about anything.
7 August 2003	Adda has continuous headache, gets sick and vomits. They are working on the transmitter. Either it has started or it is just about to.
	Eirik feels dizzy and has a pressure on his head.
	The transmitter must have started.
	Niels is on vacation.
8 August 2003	Adda has a headache.
	Eirik confused."

20. Thereafter, Mr Petursson made regular log entries until August 2004.

21. As Mr Petursson's log entry for 1 July 2003 indicates, Mr Yates of Worcester City Council sent Mr Petursson an email on that date in which he informed Mr Petursson that he had understood from the defendant that the antennas were not yet active; the main equipment cabinet had yet to be installed; the defendant expected the installation to be completed by the end of July and had booked Bureau Veritas to come to do emissions testing at around that time. It is, in my judgment, significant that Mr Petursson wrote nothing in the log between that date and the end of July. On

the basis of the information given by Mr Yates, Mr Petursson was expecting nothing to happen during July 2003.

22. One of the complaints made by the claimants has been that they were not formally notified in person when transmissions began. They twice requested a copy of the commissioning notice, on the second occasion by letter dated 13 August 2003. The claimants started to use the Acousti Com on 13 August. No symptoms were noted for that day but Mr Petursson did note, specifically, that the measurement was (only) 2 volts per metre which, as Mr Petursson later described in an email to Mr Yates, "in any body's book would be considered safe".

23. It is common ground that, on 18 August 2003, the apparatus was switched off for a period of time. The claimants' case is that they detected, by their lack of symptoms and physical response to the switching off alone, that transmission had been interrupted. Accordingly, they say, they were able to detect by their physical response when the apparatus was and was not in use. If that were correct, it would constitute significant evidence. Mrs Ingvarsdottir's evidence is that, on 18 August, when she was working in her office, she suddenly felt as though something had happened. There had been what she describes as a terrible storm and then she felt as if she were in a quiet place. She says that she went to speak to her husband. That prompted him to make measurements. These indicated that the transmission had ceased. Mr Petursson said that he did not know until 18 August 2003, when transmission ceased for some two hours, that the mast had become operational some time previously. It was when his wife experienced a violent reaction on that day that they appreciated that the system had been live for a while. Mr Petursson's evidence was that on 18 August 2003 he and his wife could feel the difference between the periods when the antennas were emitting and the periods when there were no emissions. The only proof they had that the antennas had by then became operational was that they could feel the change in effect when the transmission stopped. Mr Petursson made that point in a letter to Mr Yates dated 5 September 2003. He referred to the symptoms of ill health suffered by himself, Mrs Ingvarsdottir and Mr Niels Eiriksson and behavioural changes of Floppy. Initially, he said, he had attributed their discomfort to the heat (it was the time of the heat wave): "I became certain it was the antennas the day they turned it off (18 August 2003) for a number of hours".

24. Mr Petursson's translation of the log entry for 18 August 2003 reads as follows:

"Approx 10.00 o'clock I measured there was no result. I observed there was a technician working in the control panel, which was why it was disconnected.

Approx 1100 -1130 hrs Agnes felt that the antennas got connected again.

She sat in front of her computer.

Agnes describes it like a pressure on the temple along with some confusion.

I checked, the beam is back, and the technician has left.

It is certain that the antennas is operational!

There is no visible announcement in a public place..."

25. I am not persuaded by the claimants' evidence as to the sequence of events on 18 August. As Mr Petursson accepted, if he had thought that the antennas was not transmitting on 18 August he would not have taken readings. It is clear from the log that Mr Petursson saw men working on the apparatus after he had taken Acousti Com readings that day. The log indicates that these events occurred before Mrs Ingvarsdottir experienced the relief from symptoms which she describes. In my judgment it is more likely that Mr Petursson saw the men working on the apparatus and communicated that to his wife who then experienced a change in physical sensations. I do not accept Mrs Ingvarsdottir's evidence that she had felt better that morning and asked her husband to make a measurement using the Acousti Com device. I believe that Mrs Ingvarsdottir experienced the dramatic change in symptoms which she describes after Mr Petursson had seen that men were working on the apparatus.

26. It is clear that Mr Petursson believed the apparatus had become operational in late June 2003, as his early log entries indicate. He then learned from Mr Yates on 1 July 2003 that the apparatus was not yet operational and was likely to become so at the end of that month. During July 2003, no symptoms are recorded in the log. Mr Petursson expected the apparatus to become operational at about the end of July. He saw men working on the apparatus on 6 August. In giving his evidence, Mr Petursson accepted that, as at 25 June 2003, he thought that the mast was probably operational. In giving her evidence, Mrs Ingvarsdottir accepted that she and her husband probably knew by 13 August 2003 that the apparatus had become operational by that date. I do not accept the claimants' case that it was Mrs Ingvarsdottir's startling reaction on 18 August 2003 that led them to conclude that the apparatus had become operational. They knew well before that time that the apparatus had been put into use. They knew from Mr Yates that the apparatus was

expected to be put into use at about the end of July. I believe that Mr Petursson, at least, had seen men working on the apparatus on 6 August 2003. In my judgment the claimants knew on 6 August that the apparatus was or was about to become operational. Any symptoms which the claimants experienced or believed they experienced after that date occurred after they had become certain that the apparatus had become operational.

27. My conclusion that the claimants probably knew as early as 7 August 2003 that the apparatus was operational is supported by the evidence of Mr Dobson (employed by the defendant as Regional Community Affairs Manager). On the afternoon of 21 January 2004, Mr Dobson and two representatives of Bureau Veritas visited the claimants' property to make readings. Mr Dobson made a file note recording matters relating to that visit. Mr Petursson's evidence is that Mr Dobson did not introduce himself as an employee of the defendant, but instead gave the impression that he was an employee of Bureau Veritas. On balance I prefer Mr Dobson's evidence as to events that afternoon and I accept that his file note records what Mr Petursson had said. Mr Dobson's recollection is supported by his file note. This records that Mr Petursson and Mr Dobson discussed Bureau Veritas' readings. It goes on to say that Mr Petursson "said to me that although [the defendant] had not told him when the site 'became operational' he saw a group of [the defendant's] people on site in August and that's when he knew".

28. It follows that the events of 18 August 2003 are not as significant as the claimants contend.

29. The claimants also rely on events on 1 September 2003. The log for that day records:

> "Control measurement 2.5 V/m
> Adda has a small headache and nausea
> Erik has pressure in his head
> Niels has got an upset stomach
> The mast was cut off at 1050 approx
> I did not get any measurement on the upper floor, no reaction
> Mast was put back on 1120 approx
> Measurement appeared to be back at the usual 2.5 V/m
> We did not have time to register a difference in the head, it was too short a duration."

30. However, as the log entry indicates, Mr Petursson used the Acousti Com device to discover whether the mast was operating.

31. The claimants' case is that Mrs Ingvarsdottir's reactions on 18 August and 1 September 2003 are of significance because these indicate the reality of a correlation between the operation of the base station and the suffering of symptoms by Mrs. Ingvarsdottir. On the evidence available to me, I do not accept that there is any such correlation. I have already dealt with the events on 18 August 2003. So far as the 1 September events are concerned, again, I am not persuaded that the cessation of Mrs Ingvarsdottir's symptoms alerted the claimants to the fact that transmission had ceased. In my judgment it is probable that, when Mr Petursson saw men working on the apparatus on 1 September, he drew the inference that the transmission may have stopped. His measurement confirmed this. Accordingly, it was not the case that the change in symptoms triggered the realisation; instead, the claimants experienced changes in symptoms after having seen men working on the site, and thus realising that the antennas may not be functioning, or after having measured emissions.

32. It follows that I do not accept that the incidents on 18 August or 1 September 2003 have the significance which the claimants suggest.

33. I heard evidence from the claimants' two sons, Mr Niels Eiriksson and Mr Henrik Eiriksson and from Mr Richard Waghorn, a friend of Mr Niels Eiriksson and a visitor to 57 London Road on 15 January 2004.

34. Mr Niels Eiriksson was with his parents for a family party at the property on 6 August 2003, then left for a holiday. A few days after he had left the UK he contacted his parents by telephone who told him that they were feeling sick and disoriented. After his holiday, Mr Niels Eiriksson returned to work at 57 London Road on 26 August 2003. He found his parents looking unwell and wearing silver foil hats. His evidence is that after a couple of hours he began to feel nausea and dizziness. After he left work and returned to his home, he began to feel better. He says that was the pattern of symptoms for the rest of that week. He then also began to get headaches and a feeling of pressure on his skull.

35. In early September 2003 the claimants asked Mr Niels Eiriksson to find alternative business premises. He did so. The business moved on 16 September 2003 to offices within Malvern District Council premises. In fact, there was a mast close to those

premises. Mr Eiriksson said he knew about that mast but did not mention that to his parents. In December 2003 the business moved again. After the claimants moved the business out of 57 London Road, in September 2003, they spent long hours at the new business premises and returned to 57 London Road only to sleep.

36. Mr Niels Eiriksson acknowledged that he and his parents had been concerned about the possible health consequences of the apparatus. As he said, at some point they thought they would all keel over and die of cancer if they stayed in the property. That was what he and his parents expected. He said that he had not expected to experience problems in the short term, nor had he expected the effects to be so drastic.

37. Mr Richard Waghorn is in his early forties. During the afternoon of 15 January 2004 he visited 57 London Road in order to take measurements of ambient audio levels to ascertain whether the apparatus was producing any predominant frequencies. (These do not assist in this case.) His evidence was that he had a dramatic experience: he began to feel nauseous, disoriented and dizzy. The feeling was so pronounced that he had to sit in his car for 20 minutes before he felt confident to drive. He had not experienced anything like it before. He had been really glad to get away from the house. Mr Waghorn suggested that he return with a calibrated analyser system to try to pinpoint the problem. He visited the house again during the afternoon of 18 March 2004, accompanied by two associates. Although they made many measurements, they were unable to pinpoint a problem. Once again he experienced feelings of nausea, but his symptoms on that occasion were not as dramatic as on his first visit.

38. Mr Waghorn came across as a robust man. I accept that he had been genuinely taken aback by his experience on 15 January 2004. Although he thought he was not prone to being suggestible, he very fairly accepted that it was possible that he had experienced the symptoms he described because of suggestion by the claimants.

39. The claimants' son, Mr Henrik Eiriksson, lives in Denmark. His evidence was that he visited his parents for Christmas 2003. He was shocked when he saw his parents: they looked worn out and as if they had aged 10 years over a span of a few months. He stayed with Mr Niels Eiriksson, but visited 57 London Road for four hours on 27 December 2003. While there, he conducted some sound recordings in the house. (These do not assist in this case). After about an hour he felt disoriented and dizzy. He found it difficult to concentrate. He felt increasing tension in his neck and shoulders and felt sick. Most of those symptoms had disappeared shortly after he left

57 London Road. By the time he visited 57 London Road on 27 December, he knew that his parents were not well and he acknowledged that he was very worried about them. Mr Henrik Eiriksson experienced no dizziness or sickness when at his home in Denmark. It was pointed out to him that he lives within 120m of the site of a 3G mast and of a second generation mast and within 120-190m of three other transmission masts.

40. Mr Petursson said that a neighbour, Simon of Sican Engineering, 50 London Road, had experienced symptoms but would not blame the mast for his illness. It was said that the claimants' cleaning lady experienced symptoms attributable to the apparatus, but she has not given evidence. No one else living near to the mast has given evidence that they had similar symptoms.

41. When the claimants' business was moved to Malvern in September 2003, it was located about 500 metres from a free-standing mast operated by four mobile telephone operators and radio and television broadcast services. Mr Niels Eiriksson did not inform his parents of the presence of that mast. It appears that the claimants and Mr Niels Eiriksson worked at those premises (and remained there for long hours) for about eight weeks with no reported symptoms, even though the level of emissions from that mast was greater than the emissions measured by Bureau Veritas in relation to the Little Sauce Factory mast.

42. Mr Dobson and Mr Navolio of the defendant both visited 57 London Road. Neither referred to feeling ill.

43. I believe that the claimants, Mr Niels Eiriksson, Mr Henrik Eiriksson and Mr Waghorn have all experienced the unpleasant symptoms each has described. There is no expert medical evidence available to me. Some of the claimants' medical records have been disclosed. There is no record of symptoms such as those which the claimants say they experienced while living and working at 57 London Road. The claimants did not seek medical help with the symptoms they describe. Both Mrs Ingvarsdottir and her son Niels said that they had no confidence that they would receive any effective medical help or treatment. I have no medical evidence to help me ascertain a cause of the symptoms described.

44. I accept that the claimants believe that the transmissions caused their symptoms. Mr Petursson had, from the beginning, protested about the proposed siting of the

apparatus. He was particularly concerned that emissions from the base station would adversely affect his health and that of his family. The claimants and Mr Niels Eiriksson had followed the public debate about possible adverse effects on health of telecommunications antennas and base stations. They expected to experience difficulties. They were anxious to move out of 57 London Road as quickly as they could. Mr Petursson took steps to try to protect the property by fitting metal netting to the walls of the house adjacent to the apparatus and by hanging nickel coated curtains, which he earthed. They hired then purchased measuring devices. Mr Petursson, his wife and son, Niels, wore foil hats when in the property. It is clear from their evidence that the claimants experienced a high level of anxiety. One can see how this may have been communicated between themselves and to others including their sons and Mr Waghorn.

45. It is clear that as soon as they knew that the defendant proposed to install apparatus, the claimants expected to suffer adverse effects. The claimants and Mr Niels Eiriksson had read about possible adverse health effects from emissions. The claimants were plainly very anxious about having apparatus so close to the house. It is also clear, as I have explained, that the claimants began to experience symptoms in June 2003 as soon as they believed that transmissions had begun, even though in fact the apparatus had not begun to operate. Mr Petursson accepts that, if - as is the case - the apparatus had not become operational by 20 June 2003, the symptoms he describes in his log for the period 20 June until 7 August cannot be said to have been caused by emissions and it was possible that the symptoms were psychosomatic. It seems to me that it is quite possible that the feelings experienced by the claimants, their sons and Mr Waghorn were psychosomatic.

Standing

46. The first question is whether the claimants are entitled to seek an order in circumstances where they disposed of their interest is 57 London Road before trial. They moved their business from 57 London Road in September 2003. On 6 February 2004 they completed the purchase of a house in Malvern, to which they moved. The sale of 57 London Road was completed in August 2004.

47. The claimants' case is that they are entitled to seek an order because they have fulfilled the pre-condition laid down by paragraph 17. The fact that they have disposed of the property since the commencement of the proceedings is immaterial.

They were entitled to give notice of objection under paragraph 17(2). At that time they were the owners and occupiers of 57 London Road and that was a property capable of being prejudiced by the defendant's apparatus because of its proximity to the land on which the apparatus was situated. Paragraph 17(5) provides for the application to the court to be made by the person who gave the notice under paragraph 17(2) – in this case, the claimants. That paragraph sets out the pre-conditions for bringing proceedings namely that the applicant owned or occupied the relevant land at the time of the notice of objection; that he gave a notice of objection; and that he makes the application within the time limit set out in paragraph 17. There is no indication that a claimant whose application is validly commenced does or can lose his rights because of a subsequent disposal of the property. The paragraph expressly requires the ownership or occupation of the property at the time of the giving of the notice of objection. This is the only stage at which a requirement of ownership or occupation is stated. There is no such express requirement at the time of the commencement of proceedings let alone at that of the hearing. The express pre-condition for the bringing of proceedings is that the applicant has served a valid notice of objection. There is no reference to continuing ownership. The Code does not, for example, contain a requirement that the person making the application must not only have served a valid notice of objection but must also own or occupy the relevant land at the time of making the application. To impose a requirement of ownership/occupation at the time of the commencement of proceedings would be to impose a requirement not laid down in the Code. If ownership/occupation is not required at the time of commencing proceedings then equally it is not necessary for a claimant to have retained ownership/occupation at the time of the hearing. If the proceedings are validly commenced, even though the claimants are no longer owner or occupier at the time of commencement, then the proceedings must be capable of leading to an order upholding the objection. It follows that the ending of ownership/occupation cannot be fatal to the claimants' entitlement.

48. The defendant's case is the claimants have no interest in continuing to seek an order that the apparatus be removed or moved now that they have ceased to occupy the property and sold their interest in it.

49. In my judgement, the claimants are no longer entitled to seek an order that the apparatus be moved or removed. Paragraph 17(6) permits the court to uphold an objection if the apparatus "*appears*_materially to prejudice the applicant's enjoyment of an interest in the land...". That is expressed in the present tense. Now that the land

has been sold the claimants cannot demonstrate that it appears materially to prejudice their enjoyment of the land. Further, having disposed of their interest in the land and no longer potentially being affected by it, the claimants can have no interest in continuing to seek an order that the apparatus be moved or removed. No such interest has been demonstrated here.

50. As Mr Humphreys for the defendant points out, paragraph 16 of the Code enables an objector, in the circumstances set out in that paragraph, to claim compensation in the Lands Tribunal for "injurious affection". Accordingly, an objector who moves from premises before his objection comes before the court nevertheless has the right to claim compensation. I accept Mr Humphreys' submission that the provisions of paragraph 16 are consistent with the defendant's case that, when occupation and ownership cease, a claim may be brought only, if at all, in respect of the diminution in value to the interest in land.

51. In my judgment the claimants' claim must fail because the claimants lack the standing to maintain the claim.

52. I nevertheless deal with the question whether the claimants have on balance of probabilities persuaded me that the apparatus appears materially to have prejudiced the claimants' enjoyment of 57 London Road.

Have the claimants demonstrated that the defendant's apparatus appears materially to have prejudiced their enjoyment of 57 London Road?

53. I consider, first, what is meant by appearing materially to prejudice enjoyment of land. The claimants believed that the emissions affected their health. I accept that, in that sense, the claimants' perception of the effects of the apparatus constituted material prejudice to their enjoyment of their property. They have a perception of material prejudice caused by the operation of the defendant's apparatus. That however in my judgment is not sufficient. The test set out in paragraph 17(6) of the Code is, in my judgment, objective not subjective. The claimants' subjective perception is insufficient. In my judgment, the claimants must demonstrate, on balance of probabilities, that the apparatus caused the ill effects of which they complain in order to prove the matters set out in paragraph 17(6) of the Code.

54. The claimants rely on their evidence in relation to what they say is the coincidence of timing and location between their symptoms and the operation of the base station on three occasions: on 7 August 2003 (commencement of operation of the base station, when Mrs. Ingvarsdottir said that she was more sick than she had previously been); on 18 August 2003 (alleged correlation between Mrs. Ingvarsdottir's reaction and the operation of the base station); and 1 September 2003 (when a similar reaction was experienced.) However, as I have set out earlier, I am not persuaded that there is any correlation which demonstrates that the claimants appreciated that the apparatus was operational by reason of their reactions. This point therefore does not assist the claimants.

55. The claimants rely on the evidence of Mr. Waghorn. Whilst I accept that Mr Waghorn experienced a marked reaction while inside 57 London Road, that should be considered in the light of the scientific evidence and of his acknowledgement that he might have been affected by knowledge of the claimants' feelings.

56. The claimants also rely on the coincidence of their worst symptoms with the conditions of lowest traffic at the base station. In his statement, Mr. Navolio describes the variations in power transmission as shown in recorded readings from the antennas. The claimants contend that these support the hypothesis of their expert, Dr. Hyland, that the claimants experience variations in the control channel transmissions. For reasons which I give in more detail later, I reject that hypothesis.

The Expert Evidence

57. I heard evidence from Dr Gerard Hyland for the claimants and Dr Philip Chadwick for the defendant. Dr Hyland holds a PhD in theoretical physics. He is an Executive Board member of the international Institute of Biophysics, based in Germany, and a Trustee of the EM Radiation Research Trust. During the past six years or so Dr Hyland has been concerned with potential health hazards associated with non-thermal influence of exposure to the low intensity microwave radiation used in the GSM (Global System for Mobile Communications) and TETRA (Terrestrial Trunked Radio Access or Trans European Trunked Radio) systems of telecommunications.

58. Dr Hyland gave evidence to the Ripon and Leeds Consistory Court in 2003. I am not bound by the findings in that case, and indeed have approached all the expert evidence anew and without reference to the findings of that court.

59. Dr Chadwick has a PhD in the interaction of electromagnetic fields with people. He has worked for fifteen years in the field of assessment of exposure of people to electromagnetic fields. He is currently technical director of a consultancy specialising in the interaction of electromagnetic fields with people. He is a member of a number of influential bodies including the International Commission on Non-Ionizing Radiation (ICNIRP) which was established in 1992 as an independent international scientific advisory body one of whose functions is to advance non-ionising radiation protection for the benefit of people and the environment and to develop international guidelines on limits of exposure to non-ionising radiation which are independent and scientifically based.

60. Reliable research into the health effects of radiofrequency electromagnetic fields (RF fields) began in the 1940s. There is now a substantial body of evidence upon which guidelines to restrict the exposure of people to RF fields are based. There are clearly established guidelines for the protection of the public from the RF fields emitted by base stations. These guidelines are based on the established thermal effects of exposure. The existence of possible non-thermal and biological effects has been considered by a number of authoritative independent expert groups.

61. There has been substantial, international research into and many papers have been published on the effects of human exposure to the electromagnetic fields emitted by mobile telecommunication base stations. I have been taken to a number of these, including:

> ICNIRP 1998: Guidelines on limiting exposure to time-varying electric, magnetic and electromagnetic fields
>
> Independent Expert Group on Mobile Phones (IEGMP) May 2000 (the Stewart report, referred to as Stewart 1).
>
> COST (European Co-operation in the field of Scientific and Technical research): paper November 2001
>
> National Radiological Protection Board (NRPB)'s Advisory Group on Non-ionising Radiation (AGNIR): report Vol 14 No 2 2003 "Health Effects from RF Electromagnetic Fields."
>
> Mobile Phone & Health 2004: Report by the Board of the NRPB Vol 15 No. 5 2004.

Santini: Survey Study of People Living in the Vicinity of Cellular Phone Base Stations, published by Santini et al, 2003

TNO Physics and Electronics Laboratory: Effects of Global Communication system RF fields on Well Being and Cognitive Functions of human subjects with and without subjective complaints, September 2003

Navarro: The Microwave Syndrome: A Preliminary Study in Spain, 2003

62. Stewart 1 concluded that "the balance of evidence indicates that there is no general risk to the health of people living near base stations on the basis that exposures are expected to be fractions of guidelines."

63. ICNIRP published its exposure guidelines in 1998. These recommend relevant exposure levels for the public at the frequency of operation of the defendant's base station at the Little Sauce Factory (2.10GHz) of 10 watts per square metre. Dr Hyland readily acknowledges that the defendant's apparatus is ICNIRP compliant.

64. In a joint statement, Dr Hyland and Dr Chadwick agreed that the base station complied with ICNIRP guidelines and that the conclusion of all international scientific review bodies (eg Stewart 1, AGNIR 2003, Zmirou et al 2001, and Nordic competent authorities) is that, at the levels to which the claimants were exposed, there is no general risk to health, on the basis that the exposure levels are small fractions of the guidelines.

65. They disagreed on (1) the question whether the electromagnetic fields (EMFs) from the base station are capable of causing or were responsible for the health effects experienced by the claimants at 57 London Road and (2) the adequacy of the ICNIRP guidelines and the overall scientific consensus related to possible health effects of EMFs from base stations.

66. In practice, Dr Hyland and Dr Chadwick do not disagree on the following propositions. (1) The scientific consensus, as reflected in UK and international expert review body reports, is, as stated in Stewart 1, that: "the balance of evidence indicates that there is no general risk to the health of people living near base stations on the basis that exposures are expected to be small fractions of guidelines". (2) The levels of exposure to radio frequency (RF) fields measured by Bureau Veritas at 57 London Road on 19 May 2004 are, at worst, approximately 80,000 times lower (rising to

437,724 times lower) than the ICNIRP guidelines (10 W/m^2) and also fall below even the more stringent guidelines issued in Italy and Switzerland.

67. Dr Hyland's opinion is that the current safety guidelines afford protection only against adverse health effects provoked by overheating. They leave those exposed vulnerable to adverse health impacts provoked by any other, non-thermal influences that the emissions might exert. He notes that this possibility was identified in Stewart 1 which stated "On its own, adoption of the ICNIRP exposure guidelines will not allow fully for current gaps in scientific knowledge, and particularly the possibility of, as yet, unrecognised thermal or non-thermal adverse effects at lower levels of exposure." Dr Hyland relies on a similar conclusion reached in a review of RF/microwave health literature conducted by the Institute of Social and Preventative Medicine in Basel on behalf of the Swiss Environmental Agency (BUWAL). That report concluded that there was a potential for health effects at levels below the ICNIRP guideline values.

68. Dr Hyland's opinion is that the ICNIRP guidelines protect only against what is not actually a hazard, as the intensity is far too low to entail any degree of heating. His criticism is that the guidelines "ignore the existence of sensitivities contingent upon aliveness – sensitivities that can be accessed by the non-thermal influences that the guidelines do not address. In the case of GSM, these sensitivities have been attributed to the presence of GSM signals of certain (bio-active) frequencies that can interfere with natural electrical bio-rhythms that the body supports when alive, and which are involved in biocommunication and in the control of biological processes essential to well-being."

69. Dr Hyland's theory is based on his proposition that there are a number of rhythmically regular underlying features in the transmitted power, characterised by the frequencies of 100Hz, 1,5Hz and 15kHz, associated with the four control channels which are always transmitted irrespective of the level of call/data traffic, and the primary and secondary synchronisation channels. Dr Hyland sought to explain how the transmissions can affect humans and he suggested that there is credible research based support for his contentions. Dr. Hyland claims that it is possible to identify a regular variation in the 3G signals at a frequency coinciding with endogenous body frequencies and so potentially capable of interfering with those frequencies. He maintains that there is, in the 3G signals, a punctuation or rhythmic variation with a repeated "on/off" variation. In support of this, he relies on the TNO report, the 3G

specification and the acceptance by Mr. Navolio of the defendant that there was a repeated on/off sequence.

70. The TNO report expressly addresses the question of emissions from 3G base stations. It identified symptoms similar to those suffered by the claimants. Those symptoms were not attributable to thermal effects. The TNO report was accepted by review bodies as being of high scientific quality. The Health Council of the Netherlands in 2003 stated " ...the Committee concluded that the TNO study was of good quality, both in terms of design and execution. The Committee had some comments, however, regarding the interpretation of the data....There is some debate concerning the validity of the questionnaire that was used to measure well-being." The TNO report's conclusions and findings were such as to justify further research, by way of follow up studies, as the Health Council of the Netherlands recognised in its report.

71. In relation to this case, Dr Hyland relies also on what he considered to be the significance of the events of 7 and 18 August and 1 September 2003. For reasons I have given, these do not have the significance contended for by the claimants.

72. Dr Chadwick's evidence is as follows. The current scientific consensus is that the existence of adverse health effects below guideline levels is unproven. Public exposure level to RF fields near base stations are, typically, thousands of times below the guidelines. The levels of exposure measured at 57 London Road are consistent with levels of exposure in homes that are not near base stations. The power per antenna is only 20 watts. The variation in power is from approximately 5W continuous (when there is no call traffic) to a maximum of 20 W (dependent upon the volume of call traffic). The difference between 5W and 20W is a factor of 4. This is less of a variation than occurs through refraction and reflection between the rooms of the property at 57 London Road as shown in the measurements made at the claimants' property by Bureau Veritas on 19 May 2004. The defendant's case is that these points are consistent with the scientific consensus that there is no general risk to the health of people living near base stations as such exposures are expected to be small fractions of guidelines.

73. Whilst the ICNIRP guidelines for the frequency with which this case is concerned (2.10 GHz) seek to protect from thermal radiation, (a) this is the case only because the scientific evidence for non-thermal biological (let alone non-thermal adverse biological) effects at this frequency did not, and does not, exist; and (b) in this case,

the base station's emissions do not only comply with ICNIRP but, rather, they are tiny fractions of those guidelines.

74. Dr Hyland lacked balance and impartiality in relation to his evidence in this case. He did not adopt the objective approach which a court expects from an expert witness. Dr Hyland claimed that all the expert bodies (apart from the SSI (Sweden) and Zmirou (France) reviews as to which he had no evidence) lacked honesty, independence and were economical with the truth. This is a bold and startling contention. It would, for example, cast doubt on the integrity of Sir William Stewart (who chaired the IEGMP, and who is now the Chairman of the National Radiological Protection Board) who referred in the foreword to the Stewart 1 report to "the fierce independence" of the group he chaired. I have no hesitation in rejecting Dr Hyland's statement with respect to these eminent and expert bodies. Dr Hyland produced no evidence in support of his contention. His unjustified criticism of national and international groups reflects poorly upon himself and must be viewed in the light of his own partiality in giving evidence in this case. In his reports to this court, Dr Hyland failed to draw attention to the COST 281 Statement. That paper, dated November 2001, is titled Scientific Comment on Individual Statements of Concern About Health Hazards of Weak EMF. It was prepared by an international committee of scientists in response to a submission which Dr Hyland made to the European Parliament. It contains the following: "It is postulated by Dr Hyland that GSM radiation affects the organism. This is supported by the argument GSM 'has rather well defined frequencies' which can interfere with 'a variety of oscillatory electrical biological activities, each characterised by a particular frequency, some of which happen to be close to those used in GSM' in particular 8.34Hz and 2Hz, which 'correspond to those found in the human EEG – especially in the ranges of the alpha and delta brain waves, respectively'. This is non-scientific argument by analogy." The paper sets out those matters, which it says Dr Hyland has ignored, and continues "Therefore postulating that weak GSM signals would affect brain activity just because there is a similarity in the frequency components ignores well-established knowledge.". It goes on to express strong criticism of Dr Hyland's approach eg "not based on generally accepted scientific rules. It is of dubious scientific nature and does not reflect the view of the majority of the accepted scientific experts in the field." This indicates strong condemnation by peers as to his own objectivity and scientific rigour.

75. In cross examination, Dr Hyland was asked about evidence he had given in a case heard by Ripon and Leeds Consistory Court in March 2003. He questioned whether he should have been asked about that evidence. His concern was rather odd. He had in fact referred to it in his own reports and, in any event, his opinion expressed to that court was plainly a matter which would be of relevance and assistance to this court.

76. I consider Dr Hyland's evidence in the light of those concerns.

77. I reject the claimants' submission that the evidence of Dr. Chadwick was flawed and unsatisfactory, on the basis that, as his expertise lies in dosimetry/measurement, then, other than in those fields, he cannot make an informed assessment of the validity of research nor of the views of the various review bodies. Dr Chadwick seemed to me to have a clear understanding of the scientific papers to which both he and Dr Hyland referred. Further, he was better able than Dr Hyland to understand and explain issues including, for example, the nature of the power output from the apparatus. He has a clear understanding of the effects of transmissions on the human body. Dr Hyland, on the other hand, is a theoretical physicist without a similar level of understanding of biological responses. I also reject the claimants' criticism of the conclusions drawn by Dr. Chadwick from the review papers as being over-simplistic. He gave most helpful evidence in relation to the extensive scientific research which has been undertaken and interpreting technical and epidemiological studies.

78. Dr Hyland misunderstood the power output from the defendant's apparatus. Once he had appreciated the true position, he took no further issue with matters arising from the power output. In fact, the variation in power is from approximately 5W continuous (when there is no call traffic) to a maximum of 20 watts (dependent upon the volume of call traffic). The difference between 5W and 20W is a factor of 4. This is less than the variation, of a factor of five, which was found to occur through refraction and reflection between the rooms of the property at 57 London Road. That variation was demonstrated by measurements taken inside 57 London Road by Bureau Veritas in May 2004. Dr Chadwick pointed out, and I accept, that that variation was greater than any variation in emissions from the base station which could possibly be attributed to changes in call traffic levels.

79. Dr Hyland's theory, (which was considered in Stewart 1) has depended upon there being pulsed radio waves, at frequencies within defined ranges of the human body's bioelectrical activities, and which are demodulated or decoded by a receptor in the body. Dr Hyland, under cross-examination, said that his theory does not now require

there to be a pulse or pulse modulation. Whilst this is a necessary concession given the facts concerning 3G base stations, it reveals an important flaw in his theory. Dr Hyland has previously relied on the need for pulsed radio waves which are demodulated or decoded by a receptor in the body. That was his position in 2000 when he gave a seminar on the physics and biology of mobile telephony. In an article published in the Lancet Volume 356 dated 25 November 2000 reporting this seminar, it was said that "the purpose of this review is to introduce clinicians to the physics of mobile telephony and to explain how low-intensity, pulsed microwaves can affect living organisms, both thermally and non-thermally". In addition, the judgment of the Ripon and Leeds Consistory Court states that Dr Hyland had "relied on the Freiburger Appeal, ...a statement made by a number of medical doctors.....which declared: 'we can see especially after carefully directed inquiry, a clear temporal and spacial correlation between the appearance of disease and exposure to pulsed high-frequency microwave radiation... such as ...installation of a mobile telephone sending station in the near vicinity...'".

80. I accept the evidence of both Dr Chadwick and Mr Navolio (the defendant's Head of Radio Emissions Compliance) that there is no pulse emitted from the antennas at the Little Sauce Factory. The power is continuous, at approximately 5W, even when there is no call traffic. The common pilot channel transmits at a constant 3W and the two synchronisation channels, which transmit simultaneously, at 1W each, are merely substituted by the broadcast channel which transmits at 2W. I am satisfied that Dr Hyland was in error in his assertion that power dropped to zero as channels were turned off and on. Reference was made to a graph in Dr Hyland's Reference Document 14. This shows that variations, or slight glitches, occur (because equipment is not perfect). I accept that such variations or glitches are of no more than a half watt, or 10% of the 5W output. This can usefully be contrasted with the power modulation that would be likely to occur with a GSM base station; the power drop would be from between 50-80W to nearly zero, which Dr Chadwick referred to as 'profound' modulation.

81. The claimants contend that Dr Chadwick's evidence as to the nature of 3G signals is unreliable. In describing the nature of the 3G signals, Dr Chadwick stated in his report that the Primary and Secondary Synchronisation Channels (P-SCH and S-SCH) were "not physical, time-modulated channels but rather they are merely pieces of information which form part of the overall 3G signal that is continually transmitted by the base station". However, the 3G specification identifies these channels as

physical channels, and both the specification and the evidence of Mr. Navolio show that there is variation. The claimants criticise Dr. Chadwick for having addressed solely the question of variations in power and failing to consider the rhythmic time-related variations in the message transmitted identified by Dr. Hyland. I reject those criticisms. I accept Dr Chadwick's explanation that the reference in his report to physical channels was simplistic. I also accept his explanation that the 3G specification should be read with an eye to the way in which such standards are written, and that is not layman's language. He carefully explained that the three channels do not have a physical existence. They are logical components of a data stream which is continuous. The physical data stream remains the same though it carries different information at different times. If the equipment were perfect, there would be no physical measurable change in the signal. It is not possible to identify, physically, or make a physical separation of the broadcast and data channels. The differences are logical not physical. It follows that when the different logical channels are switched on and off, there is no physical change at all to the physical signal.

82. The periodicity of the modulation which can occur in GSM base stations which, coupled with the profundity of the modulation, gives rise to the description "pulse-like modulation", should be contrasted with the random ("stochastic" was Dr Hyland's description) nature of the 3G power modulation as well as the 'shallowness' of the modulation.

83. I accept that it is clear that the frequency of the signal from the antennas remains the same, namely 2.1 GHz, whatever the power variation. Dr Hyland referred to frequencies of 100Hz, 1.5KHz and 15KHz which he thought also existed within the 'envelope' of the signal. Whilst he admitted that the significance of these frequencies was not apparent, they do not in any event exist within the signal. It appears that Dr Hyland has confused the frequency of the signal (which remains constant) with the rate at which the power or intensity of the signal varies. This variation in power intensity can obviously be measured but that measurement, in terms of the rate at which it occurs (Hz), has nothing whatsoever to do with, and has no bearing on, the frequency of the signal, which is also measured in Hz. Dr Chadwick suggested a helpful analogy of speech to illustrate the point: repetition of the same sentence, first loudly then softly, at the same rate, when the frequency remains the same but the power decreases ie varies.

84. The 3G signal (2.1 GHz) is well beyond the frequencies of the bioelectrical activities within the human body. I accept Dr Chadwick's evidence that the bioelectrical activities lie within a frequency range of 0.1Hz to approximately 1MHz. Their peak is at 20HZ which is a frequency that differs from the 3G signal (2.1GHz) by a factor of one hundred million. Further, their upper frequency limit is perhaps 2000 times lower than the frequency of the 3G signal. Because of this it is very unlikely indeed that the 3G signal would interfere with the human body's electrical systems directly. This is further demonstration of the flaws in Dr Hyland's theory.

85. Dr Hyland admitted that there is no known receptor within the human body that could demodulate the signal so as to affect the body's bioelectrical activities. Dr Chadwick's evidence that RF fields are transparent to the human body at 2.1GHz was not challenged.

86. In the Lancet article to which I have referred, Dr Hyland stated "It is important to stress that the existence even of established non-thermal effects does not make adverse health consequences inevitable". That remains his view. In his opinion, while some human beings will be adversely affected, others will not. In relation to this case, he sought to explain this by suggesting that there may be some genetic factor which made the claimants and their two sons susceptible. When asked about the improbability of alleged health effects being suffered by the Petursson family, Mr Waghorn and (possibly) a cleaning lady, but no one else, Dr Hyland appeared to try to explain the effects on the family as related to the "gene pool" but he accepted that the position would be different in relation to Mr Waghorn and the cleaning lady. Dr Hyland also acknowledged that hypersensitivity, or what he refers to as 'electro-hypersensitivity', is not currently a recognised syndrome or medical condition anywhere in the world except Sweden.

87. The claimants' case is that it has become apparent that the potential for effects from base station transmissions remains an area of scientific debate and investigation. They rely in particular on various research studies identified by Dr. Hyland, and in particular the TNO study, the Navarro and Santini reports and the reaction of the Netherlands Health Council, and on the repeated reviews of the evidence and consideration of the need for further reflection.

88. Dr Hyland advances his theory on the basis of the possibility, not the probability, of adverse health effects. So far as the TNO study is concerned, it was only under cross-examination that Dr Hyland revealed his belief that the GSM signal utilised in the

TNO study was not an accurate reflection of an actual GSM base station signal in commercial use. That does not go to his credit. Further, given that the GSM signal was not in his view an accurate reflection of an actual GSM base station, it must be possible that the 3G/UMTS signal used in the study was also flawed. I can have no confidence in the conclusions he seeks to draw from the TNO study. This is supported by the evidence which Dr Chadwick gave. Dr Chadwick was able to demonstrate convincingly that the levels of power attributed to the four channels, as set out in the table in the TNO report do not reflect the working of the 3G base station at the Little Sauce Factory where the power of the two synchronisation channels equals the power of the broadcast channel.

89. The Netherlands Health Council described the TNO study as being "of good quality both in terms of design and execution" and "an initial exploratory study". They raised legitimate concerns as to the validity of the questionnaire used in the TNO study. The council noted that "the results of the TNO study cannot be used to assess whether, and to what extent, there will be any effect on well-being in people's day to day environment". It considered that there were good reasons for replicating the study and stated: "..since the TNO study indicated that UMTS exposure might well produce health effects, the Committee considers it essential that research be carried out into the effects of UMTS signals." The report of the Health Council of the Netherlands did, however, state "The Committee takes the view that it is not possible, on the basis of the results of the TNO study, to determine the existence of a causal relationship between exposure to electromagnetic fields and decreased well-being or adverse health effects".

90. Professor Alan Preece (whose honesty and independence Dr Hyland respected) took the view that "on the face of [the TNO report], it seems incredibly unlikely" because the exposure levels are simply too low to expect an effect – "lots of us are exposed to this sort of level - we should already be seeing a massive effect".

91. Dr Hyland relies on the epidemiological evidence contained in the 2003 Santini and Navarro reports. The Santini report concerned a survey study using questionnaires which had been completed by some who lived in proximity to base stations and some who did not. The study group was self-selecting, in that a questionnaire was sent to those who expressed a wish to participate in the study. In December 2004 it was reported that a Swedish radiation protection agency, SSI, had appointed an international independent expert group for electromagnetic fields and health. The group's task was to evaluate the scientific development and advise SSI. That report

stated that, at that time, there had been only two studies on base station exposure and symptoms published, namely the Santini 2003 and Navarro reports. It pointed out that neither Santini nor Navarro had reported how participants had been selected. Participants had answered questions about various symptoms such as headaches, concentration difficulties, memory loss, fatigue and sleeping problems. They had been asked to estimate the distance to the nearer base station. The SSI report points out that self-reporting distances to a base station is "a questionable exposure assessment method". It concluded that the design limitations of the Santini and Navarro studies had made it impossible to assess whether their findings were results of bias or real effects.

92. It must be borne in mind that studies based on self-selecting groups and on questionnaires are susceptible to bias. Dr Chadwick reminded the court of the limitations of any experiment not conducted on a double-blind basis.

93. It is not surprising that Dr Chadwick was not prepared to accept a posited theoretical possibility that non-thermal effects might exist in relation to base stations (cf handsets, with their, comparatively, much higher levels of exposure). Given the data collected during 50 years of research concerning RF fields and the low levels of emissions from base stations, including the base station at the Little Sauce Factory, there was no reason at all, in his view, to expect such a possibility.

94. The reports to which I have been taken by both Dr Hyland and Dr Chadwick are extensive. They represent the conclusions of various groups of eminent scientists from around the world. Research is being undertaken in many countries. The reports are detailed and carefully argued. In Stewart 1 the independent expert group considered and discussed, amongst other matters, Dr Hyland's theories as to the biological effects from EMFs. At paragraph 6.35 Stewart 1 recommended that, "as a precautionary approach, the ICNIRP guidelines for public exposure be adopted for use in the UK....The balance of evidence to date suggests that exposures to RF radiation below NRPB and ICNIRP guidelines do not cause adverse health effects to the general population." Stewart 1 recommended, at paragraph 6.40, that "a precautionary approach to the use of mobile phone technologies be adopted until much more detailed and scientifically robust information on any health effects becomes available". At paragraph 6.41 it was said that "On its own, adoption of the ICNIRP guidelines will not allow fully for current gaps in scientific knowledge, and particularly the possibility of, as yet, unrecognised thermal or non-thermal effects at

lower levels of exposure." At paragraph 6.44 Stewart 1 referred to the current "uncertainties in scientific knowledge".

95. The NRPB in Mobile Phones and Health 2004 Vol 15 No. 5 2004 concluded: "The Board believes that the main conclusions reached in [Stewart 1] still apply today and that a precautionary approach to the use of mobile phone technologies should continue to be adopted" and "The possibility therefore remains open that there could be health effects from exposure to RF fields below guideline levels; hence continued research is needed".

96. In my judgment, the claimants have not demonstrated on balance that the emissions from the defendant's apparatus at the Little Sauce Factory are capable of causing or contributing to adverse health effects or the claimants' well-being, when viewed objectively. I am not persuaded by Dr Hyland's theory. His theory is in any event based only on a possibility, not a probability.

97. As Mr Eyre for the claimants put it, Stewart 1 was not the last word. It is clear that there is continuing scientific debate and continuing research work and there is widespread recognition that such on-going debate and research is desirable. Mr Eyre submits that, in that context, it is understandable that the test imposed in the Code was the appearance of material prejudice and not solely proof of its existence. The legislature was accepting that determinative proof of material prejudice might be difficult to obtain but was indicating that in a developing field of knowledge the appearance of material prejudice would suffice to bring the court's power into play. I accept that it is right to consider the test set out in the Code in the light of the current evidence and scientific uncertainty of the sort to which I have alluded. However, even in that context, in my judgment it cannot be said that in this case the claimants have demonstrated the appearance of material prejudice. There is no evidence to support the claimants' case except their own perception of harm, and that perception is in my judgment based on no objective evidence of harm but only on their subjective perception that they were harmed by emissions. I have no hesitation in concluding that the claimants have not proved on balance that there is any appearance of material prejudice to their enjoyment of 57 London Road. For those reasons, even if the claimants had the standing to bring their claim, I should have concluded that their claim case must fail.

98. Given my conclusions as to the merits of the claimants' case, it is not necessary for me to deal with the question whether the defendant had, on balance of probabilities

satisfied the court of one or more of the matters in paragraph 17(6) (a) - (c) of the Code. I decline to do so.

Human Rights

99. I have no submissions on any human rights issues and have not been invited to consider any Human Rights aspects.

Conclusion

100. The claimants' claim fails.