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HOUSE OF COMMONS

ORAL EVIDENCE

TAKEN BEFORE THE

ENVIRONMENTAL AUDIT COMMITTEE

INSECTS AND INSECTICIDES

WEDNESDAY 12 DECEMBER 2012

PROFESSOR COLIN BROWN, PROFESSOR PETER MATTHIESSEN, PROFESSOR RICHARD SHORE and DR BILL PARKER

LORD DE MAULEY, PROFESSOR IAN BOYD and DAVE BENCH

Evidence heard in Public Questions 258 - 371

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Oral Evidence

Taken before the Environmental Audit Committee

on Wednesday 12 December 2012

Members present:

Joan Walley (Chair)
Peter Aldous
Martin Caton
Zac Goldsmith
Mark Lazarowicz
Caroline Lucas
Caroline Nokes
Dr Matthew Offord
Mr Mark Spencer
Dr Alan Whitehead
Simon Wright

Examination of Witnesses

Witnesses: **Professor Colin Brown**, Member, Advisory Committee on Pesticides, **Professor Peter Matthiessen**, Member, Advisory Committee on Pesticides, **Professor Richard Shore**, Member, Advisory Committee on Pesticides, and **Dr Bill Parker**, Member, Advisory Committee on Pesticides, gave evidence.

Q258 Chair: I would like to welcome you to this afternoon's session of our Environmental Audit Select Committee inquiry. Before we commence our proceedings, on behalf of the whole Committee, I would like to express our condolences on the recent death—I think it was in the summer—of the Chair of the Advisory Committee, Professor Gabrielle Hawksworth. I would like to put that on the record.

I would like to get straight into the guts of the questioning we have on behalf of the Committee this afternoon, and ask each of you a series of questions about the independence of the ACP. Could each of you tell me whether, in your view, it is possible to develop sufficient expertise to advise the Government on pesticides, without having worked in or for the agrochemicals industry? I do not know who wants to begin.

Professor Shore: Perhaps if I start. Could I just confirm you are talking about the level of the individual rather than the expertise of the committee as a whole?

Chair: The individual members, yes.

Professor Shore: For many of us, the route into our expertise has been research. We have usually gone through a PhD level and then done post-doctoral work, and we may be working for universities or research centres or other such organisations. The emphasis for research, particularly, and the ever-growing emphasis now, is on carrying out research with impact: what does it really mean, rather than just being scientifically interesting? The members of the committee are all engaged in that kind of work, so they are working on real day scientific questions that have relevance. Obviously, with the expertise on the committee, those questions often tend to be around issues of environmental fate behaviour or impacts of pesticides or other similar kinds of chemicals.

Q259 Chair: Is it possible to do your role without having worked for the agrochemicals industry?

Professor Shore: I would say so, because what we are looking at is assessing the environmental fate and behaviour and the effects of these compounds on the environment, which is akin to the work we do as research.

Q260 Chair: Assessing the environmental behaviour is an important component?

Professor Shore: Of the ACP? Yes, absolutely, the fate and behaviour; the effects as well.

Chair: Does anyone else wish to comment, and could I ask you to speak up, please, because the acoustics are very bad in here?

Dr Parker: Yes. I have probably come via a slightly different route to my colleagues who are academics. I have come more from working in the applied research and consultancy area of agriculture and horticulture. I have spent most of my career working for an organisation that prided itself on its independence. Yes, we did work for the agrochemical industry, but we were largely used by them because we were known to be independent. So we have jealously guarded our independence in that regard.

Q261 Chair: Does anyone else wish to comment?

Professor Matthiessen: Like Richard, I come from a research background. I have been researching the effects of chemicals on wildlife since about 1970, working for a series of Government research organisations. Although I am now a consultant, I do not do consultancy work for pesticide companies so I consider that the experience I have gained—just like Richard—basically covers the ground.

Chair: Professor Brown?

Professor Brown: No, there is no reason why we cannot develop the expertise without working for the industry. That is not a pre-requisite.

Q262 Chair: I would like to ask each of you—and you have your current declarations of interest, they are in the public domain—very briefly, for the record, whether you have previously been employed by or connected with the agrochemicals industry. Professor Matthiessen?

Professor Matthiessen: I have done a few extremely brief reviews of data for the chemical industry over the years, not in the last five years, but, from time to time, I have been asked to look at a piece of data and give my opinion as to its scientific value.

Professor Brown: I have undertaken research on behalf of the agrochemical industry previously.

Q263 Chair: Which particular companies?

Professor Brown: There would be several. Syngenta would be one, Bayer, Dow, Monsanto, primarily in my previous role at Cranfield University.

Chair: Thank you. Professor Shore?

Professor Shore: My interests in that respect are to do with biocides rather than the agrochemical industry. I carry out some work and have declaration of interests in relation to a range of biocides, and some of that work is supported by industry.

Dr Parker: I have never worked as an employee of the agrochemical industry. Like the others, I have certainly done contract work on behalf of some of the agrochemical industry but not in my current role.

Q264 Chair: Thank you. I want to try and get a sense of the independence and the need to have expertise. I noted in the evidence that you made great play of the fact that one of your members left the room at a recent ACP meeting on neonicotinoids and bees, because they had an external interest in the topic. I presume that person was an expert on neonicotinoids. I wonder how you cope without that expertise and how important the whole area of expertise is in terms of the work that you do.

Professor Brown: That person's expertise is in consumer risk assessment, so it was not directly relevant to the discussion we were having. However, because she had worked with this class of compounds, and with the specific compound that we were discussing, she was asked to leave the room, but the expertise was not central to that discussion.

Chair: Thank you.

Q265 Simon Wright: Your written evidence states that the standard regulatory package defined at EU level for neonicotinoids "have proved to be acceptable"—your words. In the next sentence you point out though that, "The standard requirements do not include some of the specific sub-lethal effects suggested by recent academic studies". Do you accept that the sub-lethal effects identified—for example, in the Gill study—would have a significant impact on bees if they were replicated in the field?

Professor Matthiessen: I will take that one. Yes, they could indeed have significance if replicated in the field. In my opinion, clearly, there are shortcomings in the standard regulatory data set that we see. At the moment there is only an acute study. That means a measure of lethality with bees. Between that and field studies, at the moment we do not have anything. First, there seems to me to be a need—and this has been identified by the ACP—to develop a standardised international guideline for studying chronic toxicity in bees; this is lab studies as opposed to field studies. That will probably take a number of years to develop because it has to be agreed internationally, but there is a need for a chronic study. That is undoubtedly a gap.

Another gap, with the benefit of 20/20 hindsight, is that up until now we have focused solely on honeybees. That is a significant issue. It is not unreasonable—in our defence, I suppose—to say that it would be reasonable to extrapolate from honeybees to other bees but, in the light of some of the data that has been published relatively recently, that assumption may not be correct. We are not sure if it is or is not yet, but it would seem at least possible that we need to see data on bees other than honeybees in the future. That perception has been endorsed by the European Food Safety Authority, EFSA, which is the body responsible for co-ordinating the European hazard assessment of pesticides. They have developed new draft guidance on this very issue that recommends that, in the future, not only should there be testing on honeybees but also testing on solitary bees and bumblebees.

Q266 Simon Wright: Going back to the original question, failure to capture sub-lethal effects. That is not acceptable, is it?

Professor Matthiessen: I agree that there should be a test that looks at sub-lethal effects, but—and this is a very big but—most of the substances that are licensed for use on flowering crops, because of the potential risk to bees, are subjected to field trials. In fact all the big three neonicotinoids have been subjected to extensive field trials. Those field trials look at both lethality and sub-lethality, so they look at issues such as growth and behaviour of bees in the field. Once you get to the stage of field testing, if you do not see effects there you can be reasonably confident that you are not going to have problems. The problem that arises is, if you have an acute test that suggests that there is no further issue to investigate, and you do not go on to do a chronic test and do not do a field trial, you may miss something. That is why the new system will hopefully plug that gap. As I said, the three big neonicotinoids,

currently in use on oilseed rape in Britain, have all been subjected to extensive field trials that showed no biologically significant effects.

Q267 Simon Wright: You have mentioned one way in which the standard EU regulatory package might be considered too narrow, covering only honeybees. We have also heard from others giving evidence that it is narrow, in that it does not encompass pharmacology or neuroscience. How do you respond to those criticisms, and what cost implications might there be if we were to look at more pollinator species and other disciplines, such as neuroscience and pharmacology, as part of the approvals process?

Professor Matthiessen: Clearly, science being an open subject, you could potentially study anything at vast expense. I think we have to focus on the issues that we consider to be of greatest importance. Ultimately, with regard to bees, you are talking about the ability of that colony to reproduce itself, to grow, and to produce adequate amounts of honey. So providing those key, what we call, apical effects are covered. In my view, there is probably no need to go into certain areas such as nerve function. There are many things you could study but, in our view, it is the apical effects of pesticides that we need to know about. The bottom line is whether reproduction growth and honey production are affected or not.

The costs are considerable. Clearly, we cannot go out into the environment and test all species. That is impossible—impractical, too expensive etc—so the whole of ecotoxicology is founded on the ability to extrapolate from a relatively small data set of toxicity data to the whole environment. That is quite a big ask, but that is what is done.

Q268 Chair: Could I go back to what you were just saying about neuroscience? Surely that is important, given how neonicotinoids work. What weight is given to that?

Professor Matthiessen: Specific measurement of neural function could be done, yes, but the bottom line has to be: how does that feed through into these apical effects that really matter to the bees and really matter to us—things like growth and reproduction?

Professor Brown: Sorry, could I just clarify?

Chair: Of course you can.

Professor Brown: Is that a broader question, because obviously in the human toxicology assessment that would be very different? Is that a broad question or is it about—

Chair: No, we are just talking about bees.

Professor Brown: Thank you.

Professor Matthiessen: Yes. You could use things like neurotoxicity to give you a heads-up about sub-lethal effects long before any of these other apical effects occurred. You could do that. That is done in human beings, because in human beings what we are concerned about is protecting the individual, so you would want to use very sensitive biomarkers of that nature when you are dealing with the risks to human beings. However, when we are talking about the risks to wildlife, it is a different paradigm. What we are trying to do there is not protect the individual. Internationally, what we are doing is trying to protect the population effectively.

Chair: Thank you.

Q269 Peter Aldous: By way of introduction, I am a partner in an arable and livestock farm in Suffolk. In your advice to Ministers on the Gill study, you highlighted the need to establish, and I will quote, "Whether there have been any impacts on UK bee populations". Does the ACP think it needs to measure a damaging outcome before you are prepared to advise on action?

Professor Shore: One of the things we asked was whether there was any evidence of a link between bee population numbers and neonicotinoid use. That would be one of the strands

of evidence that we would look to examine, if those data were available. In fact, there was discussion at the ACP about how those kinds of data are quite difficult to gather and may not give you a very clear signal. When we talked about our approach to looking at the evidence currently with these compounds, we have three strands of evidence. We have been reviewing the new studies that have come out in 2012, which has given us new insights into how these compounds may affect bumblebees, rather than just honeybees, and also their mechanism of action by which they could have an effect on the whole colony level. That is telling us more about hazard.

The absolute crunch piece of evidence is whether the exposure of bees in the fields is at the same level as those effects we have seen in laboratory studies, where in those laboratory studies, the mechanism of exposure is not by the bees going out foraging normally in the fields. That is the key piece of evidence that we would put more weight on. If we also had evidence at a population level, that would be very significant indeed. That was not the main strand that we were looking at, but we would like to see if there is any evidence of such effects.

Q270 Peter Aldous: Your written evidence states that recent academic research, and I quote, "Has not established convincingly that the exposures employed experimentally are likely to occur in nature". Based on that, do you have a particular reason to think that the Gill, Henry and Whitehorn studies used unrealistic doses of neonicotinoids?

Professor Shore: This comes back to the point I was making previously: that the mechanism by which those bees are being exposed is not particularly realistic. They are exposed to an artificial system. They are not necessarily going out foraging across a range of crops, so the dosing that they may be getting may be more consistent than would occur normally in the field. This issue around the real level of exposure is the real critical piece of evidence, and that is what the ACP have asked to see evidence for. There is a study going on at the moment. We have asked the reporting of that to come as early as possible, and we are expecting that in January. That will give us better scientific evidence to benchmark what is happening in a field exposure against the studies that Gill, Whitehorn and the others have done.

Professor Matthiessen: It should be added that, make no mistake, we consider those three studies to have been well conducted. They represent good science.

Q271 Chair: Sorry, which field studies?

Professor Matthiessen: The study by Gill et al, by Whitehorn et al and by Henry et al. Those three studies published this year we consider to be sound science. The only question in our minds is whether the dosing levels were completely realistic and that has been followed up, as Richard said, in the Defra-funded field study that is now in progress.

Q272 Peter Aldous: You would agree then that such peer reviewed studies, which are repeatable in laboratories, are a building block of scientific method, and a sound basis for action in this case?

Professor Matthiessen: They certainly justify the field research that is currently being generated, yes. As you say, they are a building block and they are part of the weight of evidence that will eventually be used to make a firm decision about this group of substances.

Professor Brown: Could I add to the questions we have about the dosing? In each case the dosing occurred via sucrose solution. The bees feeding off the sucrose solution dosed at a certain level, and in each case that is an artificial construct to get a dose to the bee, which is absolutely fine from a scientific perspective. The question is how that relates to the field, and there are specific questions. For example, in the Whitehorn study—was it Whitehorn or

Henry?—the dosing occurred over an hour and they tried to give a daily dose. One dose was too short. They gave a high dose over a short period, and you can imagine drinking a bottle of wine in an hour versus a day would give you different effects on your state of being. The others have tended to use doses that are at the top end of the field measurements. So again, we have questions about how those relate to field behaviour where the bees will forage off a number of different sources. That is what we see as the key uncertainty, but we absolutely agree that the fundamental science raises serious concerns.

Professor Shore: That is why those studies are brought back to ACP. As they appear, they come back and generate discussion. The questions around those discussions: does that change the advice or the recommendations we might want to make? Does that change our understanding of what the real risk is? That is a continual process. As new evidence comes out, those studies are brought to ACP.

Q273 Caroline Lucas: How do you consider how much uncertainty is required before you might invoke a precautionary approach, and perhaps in that case have said, "Let us have a moratorium until we are clear about this"?

Professor Shore: Again, it comes back to where we ended up with our discussion. This is quite a good example to draw. These new studies moved us to a better understanding. As Colin said, they showed the mechanisms at levels probably at the top end of the field rates, potentially, but also how those effects could occur and the mechanisms by which they then affected the whole colony and productivity. It gave us a much clearer understanding that these colony effects could occur.

The issue then was is there evidence that they are likely to occur in the field? What do we know about that? What is the real exposure happening in the field? That is the data gap: the regulatory package that had field studies that gave no indication of these effects or these real field studies where the foraging is natural. So we have a gap. We can see this evidence from the laboratory or semi-laboratory studies. The field studies did not give us that indication and the key question is: what is the real exposure? Can we get better data on that, and can we do that in a short period of time? That is what we are requesting and that is the key piece of evidence.

Professor Brown: I wonder if it would be helpful to draw an analogy of a previous instance for the ACP, which was in 2007 when we considered isoproturon. Isoproturon is a herbicide. It was the most used compound in the UK at the time, and we recommended to Ministers that it be withdrawn from the market. That was based on strong evidence for the safe levels, in terms of exposure that would cause environmental issues, plus field measurements that demonstrated that those exposures were happening in reality. We did not need to see evidence of degradations from an aquatic issue at the time; we did not need to see evidence of degradation of the aquatic environment. The fact that we measured concentrations that we considered to be unsafe, from an ecological perspective, those were the two pieces of evidence that we needed.

Professor Matthiessen: The clincher was that we also did see some field data that showed that plants in the aquatic environment were in fact being damaged. Those three areas were the final clinching argument; the final weight of evidence that there was enough evidence available to withdraw the substance from the market.

Q274 Zac Goldsmith: Very simply speaking, given that there is a gap between the results of the field studies and the results of the laboratory studies, what can and does the ACP do specifically to ensure that that gap is closed as quickly as possible? What actions will the committee take?

Professor Matthiessen: As I mentioned earlier, we have certainly made recommendations that there is a need for a chronic bee study. As a committee, we cannot generate such a study. That is the province of the OECD in Paris. They are responsible for developing test guidelines.

Q275 Zac Goldsmith: What has been the reaction to your recommendation?
Professor Matthiessen: I do not know.

Q276 Chair: Whose job would it be to follow that up to find out what their response was?
Professor Matthiessen: That would be CRD in York's responsibility.
Professor Brown: There are responses on two levels. One response is very specifically to the data that we had in July, which was the Whitehorn and Henry papers, and that response was that we needed to generate information. We think the gap is that the field studies do not assess disorientation very well. To get a high level of exposure to the bees, they place the hives very close to the treated crop. That means that the bees do not have to travel a long distance to forage. If a bee is foraging over longer distances and is disorientated, the field studies would not pick that up. We recommended—and Defra had already picked this up and instigated the work by the time we discussed it—a field study to look at that. That is the data that we are waiting for.
Zac Goldsmith: That is now happening?
Professor Brown: That is happening, and it is just being analysed. We expect that at the start of January and then we will reconvene to discuss that.

Q277 Zac Goldsmith: That is work that is being conducted and funded by Defra?
Professor Matthiessen: It is, yes.

Q278 Zac Goldsmith: Going back to my original question, your recommendation was that there were other questions that needed to be asked and answered. That has been delegated to the CRD. It will be for them to respond?
Professor Matthiessen: My response was a general response about the effects in bees in general, whereas Colin has dealt with the specific one about neonicotinoids.

Q279 Zac Goldsmith: You do not know what the CRD response has been yet to your recommendation?
Professor Matthiessen: I do not know, no.
Professor Brown: We do, sorry—I only got half of my answer in. The second part is to look at the risk assessment, which is a slower process. This study was put in more or less as an emergency requirement and rushed through the system. So that is happening and will report. There is then a slower process of assimilating new scientific information, which re-evaluates the risk assessment and considers whether we are collecting sufficient data. That has to go through the European Food Safety Authority, and that has already happened. They have recommended where that should go, and that has been out for consultation.

Q280 Caroline Lucas: I would love to know if, in your deliberations around that, there was any discussion by any member of the ACP about whether a moratorium would have been an appropriate measure at that point, given that the gap between field trials and laboratory trials sounds like quite an important gap and given that countries like France had already gone ahead and implemented some kind of moratorium. Did anybody raise that at your ACP meeting?

Professor Brown: Of course it was discussed. The scientific advice that came out of the scientific analysis in France and the UK was almost identical.

Q281 Caroline Lucas: Why was there a different judgment?

Professor Brown: There was a political decision in France that led to the moratorium. At the time we considered it in July, the advice we had was that the seed for sowing in that autumn was already in the system and that you would not be able to sow areas of oilseed rape if we withdrew. Given the doubt that we had, because remember there was a huge stack of evidence from well conducted field studies that looked at non-lethal end points that demonstrates that there are not these problems occurring.

Chair: We must move on.

Caroline Lucas: Sorry, this seems to be really crucial.

Chair: Go on then.

Q282 Caroline Lucas: In a sense, you are almost saying that, because the seed was ready to be planted, that was the reason that the political decision here was different from the one in France.

Professor Brown: No. It was not. Our understanding is that we will have what we consider to be on a scientific basis, the critical piece of information will be available in January.

Q283 Caroline Lucas: You did regard it as an emergency, which is why you fast-tracked it in order to get this extra bit of information.

Professor Brown: Absolutely. We take this very seriously.

Q284 Caroline Lucas: Therefore, given that it was such an emergency, I want to understand why there was a different political decision about whether to go for a moratorium here from that in France, when you said the evidence that you were looking at was much the same.

Professor Brown: I do not think I can answer that. That would be for the politicians.

Q285 Chair: Who was it referred to specifically?

Professor Brown: We made recommendations to the Minister.

Chair: The Minister of?

Professor Brown: Environment, Food and Rural Affairs.

Chair: Defra. Okay.

Q286 Mr Spencer: Can I draw Members' attention to my declaration of interest, particularly, that I am a farmer in Nottinghamshire?

We have heard that the suspension of neonicotinoids might lead to farmers using different chemicals, which could be more lethal to pollinators on a more regular basis. Is that the sort of advice you might give to Defra Ministers when discussing whether to approve these chemicals or not?

Dr Parker: I think that is heading my way. If I could preface by putting into context what the major areas of neonicotinoid uses are in the UK. If you look at the usage data, over 90% of the usage is seed treatments on cereals and on oilseed rape. It is about 50/50 between the two. Nothing is being sprayed on to crops. These are treatments that are applied to the seed, the seed is then planted. One of the principal routes of exposure then may be bees on the crop when it comes into flower the following year. You need to bear in mind that the major usage of neonics is seed treatments. It is not crops being sprayed with insecticides. When it

comes to thinking about alternatives, because of the multitude of uses there are for neonicotinoids—not just on cereals and oilseed rape but on a range of minor crops—you have to consider what is proportionate, and you have to look at it on a case-by-case basis.

If you ask the bald question on, for example, cereals: are there alternatives? The simple answer is: there are, but—and there is quite a large but here—there are a number of complex interactions going on, and perhaps an example would help to illustrate. One of the major uses of neonics on cereals is to control aphids in autumn, greenfly, which transmit barley yellow dwarf virus. For many years, the mainstay of barley yellow dwarf virus control has been the use of pyrethroid insecticides, applied as sprays in the autumn to the cereal crop, and they have proved to be very effective.

There is now—and this has only happened in the last two years—a developing problem with insecticide resistance to one of the two main aphid vectors of this particular virus. The most effective alternative is a neonicotinoid seed treatment. If you remove that neonicotinoid seed treatment, you do not have a particularly good alternative for controlling this particular virus. Is there a non-chemical alternative to control this particular virus? There is, but it involves sowing the crop late in the autumn so that it misses the aphid migration period. In an autumn like this, you are not going to get the crop in the ground basically. You get into these sorts of complex multi-level interactions when you start to think about whether there are alternatives or not.

Q287 Mr Spencer: Do you take that into account when you are giving Defra Ministers advice? Do you look at a neonicotinoid chemical, and say, "Minister, if you remove this, these are the implications"?

Dr Parker: We are bound to give that sort of level of detail, yes. I think we have to.

Q288 Mr Spencer: In your opinion, would it be worse to remove other chemicals that are available to us? Are they going to have a greater or a lesser impact on those pollinators?

Dr Parker: Again, it depends exactly which case you are looking at. If you take possibly a worst case scenario, which would be the removal of seed treatments from oilseed rape, the particular neonicotinoid treatments are again targeted at controlling pests in the autumn, but the potential impact on bees is due to bees feeding on the crop when it is flowering the following year. There are a whole series of oilseed rape pests that potentially need to be controlled during or around the flowering period. Again, there are alternatives, and again, some of those pests have pesticide resistance issues associated with them. Up to now the major alternatives have been pyrethroid insecticides, which are by far the biggest single group of insecticides used in the UK. They are acutely toxic to bees, but the way they have been used over the years indicates that if they are used correctly then the risk to bees, in terms of acute problems, is relatively low, otherwise they would never have been approved. We are in a swings and roundabouts situation. As I said, you do have to look at this on a case-by-case basis. It is not possible to take a blanket approach, because it does not give you the definition you need on particular problems.

Professor Matthiessen: You would also consider the wildlife implications of the alternatives. For example, synthetic pyrethroids are extremely toxic to aquatic life. Therefore, we would need to ensure that there were sufficient buffer zones, for example, around treated fields, so that spray drift did not carry into surface waters. We would have to look at the whole issue.

Chair: Thank you.

Q289 Caroline Lucas: We are interested in a specific example of imidacloprid, which as you know was re-approved for use in the EU in 2008, and we were hoping that we might have the benefit of your expert advice. I know that the Committee in advance of this meeting has sent to you pages 637 to 640 of Annex B8 of the 2006 Draft Assessment Report. Looking at those pages, do you think that it was reasonable for the regulatory authority in the member state—which was Germany—to conclude from those trials, as they did, that imidacloprid has no potential for accumulation in soil?

Professor Brown: It is not that it does not have any potential for accumulation in soil. It is a persistent compound. There are two distinct sets of evidence. There are laboratory experiments into persistence in soil, there are field experiments into persistence, and then there are accumulation trials. If we stick to the German accumulation trials, laboratory and field data all suggest that—are you okay with the word "half-life"?

Caroline Lucas: Yes.

Professor Brown: Okay. The half-life is somewhere between 100 and 300 days.

Q290 Caroline Lucas: What I want you to look at, though, is the table that we sent you that looks at the concentrations in Bury St Edmunds and in Wellesbourne.

Professor Brown: Yes. If you want me to specifically, first of all—

Q291 Caroline Lucas: What I want you to do is look at those two tables and tell me if you think that the conclusion, which the German authorities drew that there was no accumulation in the soil, is or is not correct. That is a fairly simple question.

Professor Brown: That is fine, but I need to go back to the first bit. Their conclusion is based on the other parts and assumes and concludes that levels will accumulate, but only to a minor extent. Clearly, something very different is happening in the UK. So there they derive half-lives that are just over 1,000 days, which is completely outside the current data set. I have not looked at the raw data. The ACP is allowed to look at raw data but I have not had to evaluate that information so far.

Q292 Caroline Lucas: Who at the ACP would be looking at that raw data?

Professor Brown: We would not do that. That was done by EFSA, so it would have been done by the rapporteur member state, which I think was Germany.

Q293 Caroline Lucas: It was Germany. But what I want to know is, from your expert advice looking at these graphs, those bar charts in figure B8.1, do they or do they not show that there is accumulation in the soil?

Professor Brown: What I think—

Caroline Lucas: I just want you to say "Yes" or "No".

Professor Brown: It is not a "Yes" or "No" answer. I can give you a "Yes" or "No" if you want, but it is slightly more complex than that, so I would rather give you what I think—

Q294 Caroline Lucas: The German authorities themselves said very clearly, they did not worry about subtlety, they said, "No potential for accumulation in soil". They were very, very clear and I am asking you—

Professor Brown: That is clearly an oversimplification for the UK. What is happening in the UK is that the compound is being taken up into the plants and the plants are being reincorporated. My intuition—and I do not have data for it—is that the residue then stays bound to plant material, and that breaks down very slowly, so what you do see is an accumulation in soil bound to plant material.

Q295 Caroline Lucas: Do you think that the graphs in that figure show evidence of plateauing? If you look at what you see there, would you call that plateauing?

Professor Brown: No, and that is the conclusion from EFSA as well, that they have not plateaued yet. They are getting close to plateauing but they have not plateaued yet.

Q296 Martin Caton: You have indicated in your written evidence that you think the European regulatory regime, as it applies to the Annex, is acceptable. But if we look at what happened in this case, as you have said, it was EFSA's job to look at it. What they said at the time, looking at the Draft Assessment Report for 2006, "At the two UK study sites accumulation occurred over the full six year duration of the studies and the experts considered that a plateau was not reached". They then concluded that, "Plateau not reached at the end of the study. Data gap identified". They then said, "The risk assessment to soil dwelling organisms cannot be finalised because the assessment of soil accumulation is not finalised". That was then referred to the EC Standing Committee on the Food Chain and Animal Health, which completely failed to pick up on that. Then it went to the Commission, which again failed to pick up on it. This is a gross failure, is it not? A gross failure of the system that you have told us is acceptable.

Professor Brown: I think the specific statement that you are giving us back referred to the bee risk assessment. We have not been asked to look at this piece of data; it has not been referred to the ACP. We can give you our scientific opinion, based on what we see now.

Q297 Martin Caton: I completely accept that this is not a failure at your level, but it is a failure of a system that you thought was working well. Does that give you cause to rethink?

Professor Brown: I would anticipate that you would need to go back and determine what was causing that behaviour at those two sites, yes.

Q298 Caroline Lucas: My question is on the same subject because I think what we are seeing here is a pattern, whereby the EU regulatory system is not working as well as it should. In the documents that we sent you, did you notice anything strange? The reason I ask is because this document, when it was first sent to us, had figures that simply do not match. When you look at the bar chart that we have been focusing on so far, figure B8.1-9, those figures are not the same figures that then appeared in the table. A simple schoolboy error was made of adding two columns together instead of averaging them. It seems very odd to us that you can still get this document in the public domain now with no addendum to it, nothing in this document saying that those figures are wrong. Originally, it looked like the amount of concentration and accumulation was even worse, and it is worrying that those figures are out there and no one seems to be correcting them. Then we found a second document that put the right figures, but even then, the scientific advice that we have received from some people suggests that that level of accumulation could be lethal. I wonder what your view is then if you focus on the bar chart rather than on the figures, because the bar chart is correct and the figures were wrong.

Professor Brown: I think there is a difference between the presence of a chemical and its bioavailability. What I would expect to happen out of that study is to understand where those residues are residing. My suspicion—without looking at the raw data and doing further work—is that the chemical is bound up with the plant material. That limits its availability for degradation, which is why it persists for so long. It also limits its availability for uptake into organisms for leaching into soil and so on. That would be my expectation, but you would need to do further work to determine that.

Q299 Caroline Lucas: Bayer CropScience told the Committee that imidacloprid had a half-life of between 16 and 200 days. What is your understanding of the half-life?

Professor Brown: From everything, apart from those two studies, I would put it higher than that. Somewhere in the range 100 to 300 looks like the data set that you can see, apart from those two studies.

Q300 Caroline Lucas: Because you know that EFSA is talking about looking at those two studies—

Professor Brown: Yes, the difference in that study is that it is a seed treatment. The compound is taken up into the plants and the plants are reincorporated and that difference causes greater persistence.

Q301 Caroline Lucas: The British trials also involved annual soil sampling, which took place just a number of days before the next year's seeds were drilled. Is that kind of timing normal?

Professor Brown: Yes. What they are looking for there is to understand how much has dissipated before the next addition of chemical into the soil, so that would be a standard part of the protocol and then you would take another sample immediately after the sowing.

Q302 Caroline Lucas: It has been put to us that other trials use average readings, which are taken during the course of the year, and if you have your trial just before the next planting, in a sense, you have chosen the time when it was most likely to yield the lowest possible figure.

Professor Brown: That is true, yes. I would normally expect that you would also take samples after the sowing, yes. It is not unusual to have a sampling just before.

Q303 Caroline Lucas: In conclusion, would you say that the European Draft Assessment Report that we have been talking about of these field trials, provides a sound foundation for the UK's approvals regime?

Professor Brown: Scientifically, I would say that they are open questions and if it came to the panel we would expect to look into those questions. Politically, we are not a political panel. We are a scientific advisory panel, so I cannot give you a political answer to that question, but we would certainly ask questions if those data came to us.

Q304 Dr Whitehead: Could I try and clarify the issue that you raised concerning the reincorporation of residues by plant turnover in the soil? The suggestion from that is, conceivably, that practices in the UK, therefore, in terms of turning plants over in the soil, are different from those, say, in Germany, which you might then hold to be the explanation for the long persistence in the UK trials and apparently relatively shorter observed persistence elsewhere. Is there any evidence that there are different practices in different parts of Europe for returning plants to soil, or is it the same practice?

Professor Brown: You already have an artificial system in the Bury St Edmunds and Wellesbourne trials so, rather than removing the straw and reincorporating just the stubble, they have left the whole of the straw, chopped it and reincorporated it into the soil. It is not a real agronomic situation. In practice, that straw would not be reincorporated, so it creates an addition of residues that would not happen in practice.

Q305 Dr Whitehead: Never?

Dr Parker: Probably not never, but it is not common practice.

Q306 Zac Goldsmith: Just going back a couple of questions. Very simply, you have repeatedly emphasised that the difference between the policies here and in France are based on more or less the same evidence, the same data. You have repeatedly said that it is a political decision; that we need to ask the politicians. Are you subtly telling us that you think the political decision that has been taken in one of those countries is wrong, or do you remain neutral? I cannot work out whether you are telling us the French have it wrong politically or whether we did, but it would be useful to know what your view is.

Professor Brown: It is useful to clarify, because the advice in both cases stopped short of suggesting a moratorium. It expressed great concern, and some serious doubts, about whether these effects would occur in the field, and my understanding of the precautionary principle is that it asks for a proportionate response. The proportionate response that has been taken in the UK is to undertake some field work over a very short period that will come back and answer a very specific question. That is due back in January. That seems to me like an appropriate response. Obviously I cannot comment on French political decisions, or even UK political decisions, so I do not have an opinion on it.

Q307 Zac Goldsmith: Is there any research that we should be looking at with a view to having a genuinely informed and correct decision on this that we are not doing? Will the answers in January satisfy your curiosity as a board?

Professor Brown: Perhaps I might ask if Professor Matthiessen could talk about the epidemiology work.

Professor Matthiessen: Yes. One of the pieces of work that is in progress is being done by FERA up in York, which have been asked by CRD to look at the available data on bee populations—numbers of hives, etc.—and also see if they can correlate that with usage of neonicotinoids to see if there is any relationship between the two. It is an extremely difficult issue because of all the various confounding factors out there. Weather, bee disease and a number of other things, can confound the data, and the numbers of beekeepers, for example. All those considerations have to be taken into account when they are doing this. At the end of the day, we are not expecting to get absolutely crisp unequivocal information from that, but we hope it will tell us a bit more than we know now.

As far as we know at present, we have not seen any clear evidence of a relationship between neonicotinoid use and damage to bees in the field. For example, the Wildlife Incident Investigation Scheme, which regularly looks at bee kill incidents, analyses the bees for neonicotinoids and has never found any. There is some data already that suggests that perhaps there is not a link to neonicotinoids. But we anticipate getting better data in January, and that is one of the pieces of data that will be put into the weight of evidence to make the decision. But basically, yes, we believe all the studies in progress will be sufficient to help us make this decision in January.

Q308 Chair: Can I ask, what you just said, that you have possible reasons but none of it has really being checked out. Whose responsibility would it be to check out the basis on which the re-approval is then approved?

Professor Matthiessen: Sorry, I do not quite understand. Do you mean the epidemiology data?

Q309 Chair: Yes. What you said to us just now was that you have suppositions that are not based on the evidence. Who checks out the evidence, which was the basis for which there was then a re-approval on the database that was given?

Professor Brown: The ACP did. When the Whitehorn and Henry papers were referred to us, we did go back to the raw data regarding thiamethoxam and look at the field studies,

because there was clearly a conflict between some field studies that look at sub-lethal end points and showed no effects of this compound, and then these data appearing in the literature. So we did go back to the raw data at that point, and that became a—

Q310 Chair: I am talking about the reassessment of imidacloprid.

Professor Brown: We have not gone back specifically. We have looked at the bee risk assessment for imidacloprid. We have not gone back—that would not mean we would go back and check the whole risk assessment.

Professor Matthiessen: After the Buglife report, we did look at some of the imidacloprid data.

Professor Brown: For bees, yes.

Q311 Mark Lazarowicz: A point of clarification about the data. You said you will get the data in January, does that mean making an assessment of the data in January, so we will know what the thinking is? When we know the thinking, will there be a period of assessment after that?

Professor Matthiessen: There will be an assessment in January. We hope very much that this will produce conclusive evidence one way or the other. If the conclusion is that the neonicotinoids are causing a problem, that information will come in before the autumn sowing season for oilseed rape. It will be too late to affect the spring sowing, but it would kick in with the autumn sowing.

Q312 Mark Lazarowicz: Just to be clear, when do you expect to make this decision—January, February, March?

Professor Matthiessen: I would anticipate that at the January meeting of the ACP—if all these data come together as we expect—we will be in a position to make a fairly clear decision.

Q313 Mark Lazarowicz: Will that decision be published at that stage, and indeed will the data be published?

Professor Matthiessen: Yes. All our proceedings are published.

Q314 Caroline Lucas: Two quick things. In terms of making a decision, does it come to a vote? I am sorry, I should know this but when you discuss, for example, a moratorium, would there be a vote of the members of the ACP?

Professor Matthiessen: In all my experience of the ACP, which is six years now, we have never, ever had to take a vote. It would not be like that. There would just be a minority and a majority view, I guess, but it has never happened.

Q315 Caroline Lucas: Going back to my question about the moratorium earlier, was there a minority view in favour of a moratorium?

Professor Matthiessen: No.

Professor Brown: No, it was a unanimous view.

Q316 Caroline Lucas: My last question, again going back to the Draft Assessment Report. It said that they thought that 50 parts per billion in the soil of imidacloprid was a rather low residue level. Would you agree with that, that 50 parts per billion was a rather low residue level?

Professor Brown: It is worth pointing out that that residue level is lower than the accumulation from soil applications in the German field studies. The German field study, with

the shorter half-life, accumulates to 70/80 micrograms per kilogram. The UK, even with that very long half-life, accumulates to a lower level because the rates of application are so much lower with seed treatments. We would need to look at ecotoxicology in order to understand whether that was a safe level or not of soil dwelling organisms.

Q317 Martin Caton: On the question of the half-life, you have talked about the Bury St Edmunds and Wellesbourne research, but there is some international advice that seems to think that, in fact, even that is on the low side. The Canadian Pest Management Regulatory Agency, in a note said the dissipation time for imidacloprid is in the order of one to two years. German research, Hellpointner in 1994, talked about—this was in potatoes—a half-life of approximately two years. The US Environmental Protection Agency talks about a half-life of 7,000 days. There is a body of thought and evidence that suggests that perhaps the UK research was not way off the mark.

Professor Brown: It does very much depend. We could offer to come back with an opinion on that. It depends on the system. People will look, for example, at low temperature systems, anaerobic systems that have no micro-organisms in them, and all sorts of things. Without knowing the details of those studies, it is impossible to give an opinion.

Dr Parker: Just very quickly, if I may?

Chair: It must be very quick because we have our next set of witnesses waiting to come in.

Dr Parker: This is a very, very practical point, and that is that the use of imidacloprid in the UK is declining very rapidly indeed. It is being replaced by another neonic, clothianidin.

Chair: There we must leave it. Can I thank all four of you very much indeed? Thank you.

Examination of Witnesses

Witnesses: **Lord de Mauley**, Parliamentary Under-Secretary of State, Defra, **Professor Ian Boyd**, Chief Scientific Adviser, Defra, and **Dave Bench**, Director with responsibility for the Chemicals Regulation Directorate and Chief Scientist, Health and Safety Executive, gave evidence.

Q318 Chair: Minister, and the other two witnesses, I welcome you—I think for the first time—to our Environmental Audit Select Committee. I think you were here for some of the previous session, and I apologise for the slight delay in getting started. I am sure you understand this is an important inquiry for us. We are very pleased that you are here this afternoon.

We have been talking about the European regulatory regime, and we have all kinds of questions about whether it is fit-for-purpose and if we might have reassessments on a database that goes back to a regime that appears—to us at least—to have certain question marks about it. I wonder about the extent to which you and your scientific advisers think it is fit-for-purpose.

Lord de Mauley: Perhaps before I start, can I say that I am rapidly going to get out of my depth, in terms of technical things, so I hope you will be happy if I perhaps make an initial comment on some of your questions and then turn to my right or left for more detail?

Q319 Chair: I am happy to do that, but I think that you were here when our previous witnesses said that issues were put before the Defra Minister and perhaps there had not been any resolution, so I do not think we want to let you off the hook entirely.

Lord de Mauley: No. I am not asking for that, of course.
Chair: Thank you, but by all means please do.
Lord de Mauley: Can you ask me the specific question again, please?

Q320 Chair: Given that there seems to us to be important questions about how fit-for-purpose the European regulatory regime is, in terms of how imidacloprid was taken through its assessments and its reassessments, and the further work that is now being done by the Advisory Committee, my question to the Defra Minister is how fit-for-purpose is the European regime? Have you looked at that? Are you aware of issues? We want your view on how fit-for-purpose it is.

Lord de Mauley: Yes. We are constantly looking at it, and certainly any particular concerns we have we follow up. At the moment I am satisfied that the system is working adequately. Can I ask the Chief Scientific Adviser if he would like to add to that?

Q321 Chair: By all means, if the Chief Scientific Adviser would like to add, please do, Professor Boyd.

Professor Boyd: I think that we are always testing any regulatory regime for its fitness-for-purpose. From a scientific perspective, when one has to make scientific decisions, science is continually moving on, and in a cyclical process new information is being continually fed back into the regulatory regime. As a result of that, we always have to look again at whether the regulatory regime is doing the job, considering the science that is available. With regard to your specific question about the European regulatory regime, the situation is no different and so we also do that in the UK. The science is moving on. I think you have already heard a lot about the science of neonicotinoids, and we are gaining an immense amount of information all the time. We would like to see the regulatory regime adapt itself to that new scientific evidence. Science is always uncertain and, as we gain more certainty, we want to make sure the regulation is aligned to that certainty.

Q322 Chair: In terms of the previous questions that we have just been asking the Advisory authority, I think we shared with you certain questions that have been raised with us about the accumulation in the field studies, the extent of the half-life etc. We are interested in whether you have had a chance to look at that, and to comment to our Committee on whether, in the light of that, you do or you do not have concerns about the European regulatory regime.

Professor Boyd: I always have an open mind, and I know Defra always has an open mind about these sorts of things. So, yes, we do by definition.

Q323 Chair: But have you already?

Professor Boyd: Already had concerns? We continually have concerns about the regime. Given the evidence that you have already heard, we are continually making representations in Europe to move the regime on in a constructive way. We are continually faced with new kinds of evidence, and we have to be able to have a regime that takes that into account.

Q324 Chair: Does not what we have raised give you concern that the European system has failed to get a proper decision in terms of the regulatory regime?

Professor Boyd: I think "failed" is not the right word. The regime is continually reconsidering the evidence base, and this has to be evidence-based. Then a weight of evidence approach has to be taken, thereafter, as to what to do about it. If one person's opinion is that one should have taken a certain action, and another person's opinion is that there is another action to be taken, that depends on their view of how the evidence is weighted. That is what

the Advisory Committee on Pesticides is there to do for us, it is there to advise us on that weight of evidence that exists out there, and it takes the European Regulatory Regime and the new evidence into account in doing that.

Q325 Chair: But the limits were exceeded, were they not?
Professor Boyd: The limits?
Chair: The decision was based on a set of limits that were exceeded.
Professor Boyd: Which decision specifically are you referring to?
Chair: The decision on imidacloprid.
Professor Boyd: In the European regime?
Chair: Yes.
Professor Boyd: I cannot comment specifically about the decisions of the European regime. What we are doing is making decisions here based on our regime, and trying to base those on evidence particularly.

Q326 Chair: My point is that, if the European regime is not fit-for-purpose, where does that leave UK decision-making?
Professor Boyd: Perhaps Dave could say something on that.
Dave Bench: Yes. Perhaps I should say that the decision on imidacloprid, and any other active substance, will be on the basis of the whole data package, so all the data, not just the ones that we have been talking about this afternoon. There will have been a consideration during that process, both by my experts in CRD, by the Advisory Committee on Pesticides—the membership in place at that particular point in time for imidacloprid—that will have preceded all the members that you have been talking to today because of the time at which it was done, so they will not have first-hand memory of those discussions.

I am talking on the basis of an active substance that would come through us and be considered by us as a rapporteur member state. If we dealt with that, we would consider all those issues in the round. If it is an active substance, where another member state is the rapporteur, we will get the chance to be involved at the point at which EFSA do their peer review process. So they look at it, they do their peer review and our experts get involved at that stage. The whole of the evidence base, at the point at which an active substance is considered, is taken into account and the respective end points—in this respect, the ecotoxicology will be of particular concern—those will be taken into effect at that point in time.

As Ian has said, regulatory science is always developing and we are consistently looking in the European process to see whether any of those requirements need to change. You have already heard about the way in which the bee risk assessment is in the process of being updated and revised. Indeed, there was a meeting in EFSA last week, which our experts attended, attempting to move that forward and gain some conclusions.

I would say that the process, as a whole, works on the basis of considering each active substance to the standards that are in place at the point in time that that consideration is done. Then we have a whole system of continuous review so that, over a 10-year period, each active substance will then come around again and be reconsidered in the light of any developments in the regulatory science at that point in time. So every single active substance on the market in the European Union has been reviewed, since the point at which a pan-European process was put in place in the early 1990s.

Q327 Caroline Lucas: It is precisely that process of review that I think we are pointing to some concerns about, because it is not as simple as saying, "There are a couple of people out there, and they do not agree and, therefore, we cannot quite decide what the issue

is". We have the situation where EFSA itself had looked at the German review, the Draft Assessment Report in 2006, and said, "We cannot sign off this German report because it says very clearly that, contrary to what the German report said, the experts at EFSA consider that a plateau was not reached". In other words, soil accumulation was happening and, again, it says very clearly, "The risk assessment to soil dwelling organisms cannot be finalised because the assessment of soil accumulation is not finalised." So you have real concerns being expressed by EFSA and yet, when it comes to the European Commission, they are somehow able to sign it off simply saying, "There are no unacceptable effects on the environment", so there does not seem to be any consistency between what EFSA is saying, in other words, raising really big concerns here, and then the fact that it gets the green light and comes into force by the Commission.

Dave Bench: Essentially, at that part of the process, what you are looking at is the kind of distinction in the European process between EFSA taking a risk assessment view, and then the Commission taking a risk management view and asking whether it is possible to include the active substance on a positive list, and then handing it over to member states to consider individual product registrations. That is essentially the process that occurs. When they make that decision they then say, "Are there any issues?" and, in the case of most active substances, they will say something about whether there are any issues that member states should particularly take into account. For a number of these compounds, they have particularly mentioned that we should consider issues in relation to movement to ground water, for example, and that then is taken up as we do the product re-registration process on a national level.

Q328 Martin Caton: There is no evidence that the Commission ever had sight of or were aware of EFSA's recommendations about the inadequacy of the research. It was not a matter of them deciding, "We are not going to take a risk assessment approach. We will take a risk management approach". They just did not know that the research was incomplete and that more work needed to be done. You have said that, at the peer review stage with EFSA, that you get sight of the Draft Assessment Report. Were you aware of the inadequacy?

Chair: Minister?

Lord de Mauley: No. I am going to have to turn to Mr Bench here.

Dave Bench: I cannot say at that point in time because that goes back to 2005, so I would have to check out what was going on at that point. I cannot answer that here.

Q329 Chair: It is important for the record that we know whether anyone—either ACP or CRD—raised it with Defra, and that there were issues that needed to be looked at before the whole thing then was the basis on which future decision-making is made.

Caroline Lucas: Did they notice, as well, that the graphs on which they were making the decision were completely wrong, because the two columns had been added up instead of averaged? It does not give one confidence in the robustness of the regime when so many errors appear to be happening.

Lord de Mauley: Can I ask, in that this was a while ago, whether we can look into it? I think it would be helpful, perhaps, if we wrote to you on that particular one.

Q330 Chair: Yes. We would be very pleased to receive a written response. Professor Boyd, do you want to come in?

Professor Boyd: Yes. Could I make a general point about the use of evidence? You have zeroed in on a particular item of evidence here. In making these sorts of decisions, quite rightly, a very broad range of evidence is used. In the particular circumstance you are talking about here, it is very possible for different regimes to make different decisions, based upon

that evidence, because of different circumstances that they have to take into consideration. Different evidence can be weighted differently under those different regimes, and different items of evidence can be used under those different regimes. So to pull out one item of evidence and say, "The decision is wrong", based on that one item, is probably misrepresenting how the process works in weighing up evidence.

Q331 Chair: But presumably you would have concerns if one of the limits has been breached, particularly in relation to the half-life that was considered appropriate in environmental terms?

Professor Boyd: Absolutely. We have lots of concerns about neonicotinoids and that would just be one of them.

Q332 Dr Whitehead: I want to draw attention to the EU regulation that came out, after imidacloprid had initially been approved as an active substance within the EU under the directive. That regulation did a number of things, but two things are perhaps worthy of underlining. Firstly, the regulation specified that "any plant protection substance approved for use in the EU must have a half-life in soil of less than 120 days". Secondly, that regulation gave member states a power to reassess previously approved active substances if information of concern came the way of that member state, after the initial approval had taken place. Could you tell me generally, on the basis of that regulation, how many times Defra Ministers have exercised that power?

Professor Boyd: I cannot tell you.

Q333 Dr Whitehead: Do you know whether they ever have?

Professor Boyd: We need to come back to you on that.

Lord de Mauley: I am so new to the job that I do not know the answer, but we had better include that in our letter.

Dr Whitehead: Could you possibly write us a note about that?

Lord de Mauley: Of course.

Q334 Dr Whitehead: That would be excellent. I appreciate what is being said about homing in on particular aspects of wider issues, but in the light of the existence of that regulation, and the apparently enormously varying results in the UK of soil tests, i.e. a half-life of 10 times what is in the specification that the regulation had, would you consider, if that is information of concern, Minister, that that would be something that the UK ought, under the regulation, to bring in and reassess in the way that the regulation works?

Lord de Mauley: Clearly, that sort of thing should be and would be considered very carefully, yes. I do not know whether you have anything to add to that?

Professor Boyd: Like Lord de Mauley, I am fairly new to the job but one of the earliest things I did in my job was to ask the question about the soil half-life of neonicotinoids. I got a response along the lines of that, yes, there was some evidence indicating that soil half-life was rather longer than would be considered ideal, but that there is other evidence that suggests that some of the experiments that were done were not entirely applicable in the circumstances in which neonicotinoids are used. For example, the reincorporation of straw in the experiments into the soil in some cases, but also that it depended very much on environmental conditions.

As a result of that I was concerned, and I continue to be concerned, about the potential soil build-up of neonicotinoids because, if one was continually cropping a location, you could potentially continue to accumulate neonicotinoids in the soil. However, the evidence suggests that that does not happen, so at the end of the day what is important is what happens in reality,

not what happens in theory. One could say that about some of the tests that have been done on bumblebees, for example, which are laboratory-based tests and, in a sense, are then projected theoretically into the field. It is the same with the soil accumulation issue. It is what really happens in those circumstances that is important.

Q335 Dr Whitehead: Yes, but I think you would accept that in these trials, these things actually happened under field trial circumstances. Once one had the data sorted out, the relationship of the data to the charts, and an assessment of whether the charts that were pasted over—the original research—were accurate, appeared to suggest that there was a continuing accumulation that was not plateauing in soil under real, non-laboratory conditions as far as the tests were concerned.

Professor Boyd: That is correct, but those studies were carried out under certain specific conditions that again do not replicate the reality of the field situation in normal circumstances in agriculture. Going back to the basic science, the science requires one to ask a question in a consistent way and, in this particular case and also in the case I mentioned about the effects on bumblebees, the question is not quite the right question. The question is: what are the soil concentrations in real fields in real circumstances?

Q336 Dr Whitehead: Bearing in mind that the only way you can enact exactly real circumstances is just to undertake life and not experiment on it, what is the point at which something becomes real enough to count as reality, as far as field trials are concerned?

Professor Boyd: What has to happen is that it provides an indication that there is an issue, and then you have to go and conduct studies in real situations that incorporate all the kind of variables that sit there, and get results back from that and make a judgment based on those results.

Q337 Dr Whitehead: I am sorry to dwell on this, but I think, for example, we heard earlier that the possibility, under apparently real circumstances, of the concentration under these two particular field trials related to the reincorporation of plant matter into the soil, which is fairly standard farming practice, whether it is stubble or a full plant. Because there is not stubble burning going on, the plants are reincorporated into the soil, are they not?

Professor Boyd: Stubble is reincorporated very regularly, but my understanding is that straw is not normally reincorporated.

Q338 Dr Whitehead: Yes, but it is the case that plants are reincorporated into the soil in the way that would suggest accumulation?

Professor Boyd: That is possible. Also, in some of these studies, what happened was that, for example, barley was grown year-on-year. Normally, you would have a rotation where you would have several years in between, so again it is not replicating a real situation on a farm, and what we need to do is be able to see it in those real situations.

Q339 Chair: Before we move on from this initial questioning, can I go back to when we were discussing with the Advisory Committee on Pesticides in relation to bio-crop science, where the actual rapporteur was Germany? I want to check whether you think it is appropriate for this assessment to be done by the European member state in which the business is based.

Lord de Mauley: I am so sorry could you be more specific about the question?

Chair: Yes. The case that we were discussing previously with the Advisory Committee on Pesticides related to bio-crop science, and the fact that the assessment, the DAR, was done by Germany, and Bayer, of course, is based in Germany. I wonder whether,

as a general principle, Defra thinks it is right that these draft assessments should be done as part of the regulatory regime by the state in which the business resides.

Lord de Mauley: Yes. The studies that companies submit have to be conducted to internationally recognised guidelines. They must also carry out verified good laboratory practice and quality assurance certification, and there is also now a requirement for companies to include recent scientific peer-reviewed open literature in their dossiers. The dossiers are constructed around a pre-determined set of requirements. I think the principle, that those being regulated should carry the burden of generating the appropriate information needed for regulatory decision-making, is widely accepted and employed in regulatory systems around the world.

Q340 Chair: You do not think there is any conflict of interest in the rapporteur country's being the country in which the business is located?

Lord de Mauley: Do you want to comment on that?

Professor Boyd: Yes. As long as the process is one similar to the one we have here—and I have no reason to think it is not—in the sense that there is independence of the advisory process, and, as long as it is evidence-based, I cannot see a conflict in those circumstances.

Q341 Zac Goldsmith: We have already heard from the previous panel, the ACP, that there is an element of politics when it comes to decision-making. We have the example that we have already heard in relation to France, where the same set of data with the same results have led to two political decisions. Do you not think it is possible that there would be political contamination of the decision-making process, in the circumstances that have just been outlined by the Chair? There must be a risk.

Lord de Mauley: If there is, it would err on the side of caution. We have taken a decision, based on the advice from the ACP and the CRD, and we are absolutely confident in that decision.

Chair: We are about to move on to the precautionary principle.

Q342 Zac Goldsmith: Before we do that, I want to go back to a point you made earlier, Professor Boyd. You stressed that the Government has made representations to EFSA, and made all kinds of recommendations and suggestions as to how the system can generally be improved. You implied that the Government has been critical of the workings of EFSA. Can you give us a couple of examples of where there are particular problems with EFSA's approach that you have sought to improve?

Professor Boyd: Can I pass this one to Dave?

Dave Bench: I am not sure I would give you specific examples in relation to substances, but certainly the generality of the approach that EFSA takes is quite technocratic, and the way in which we interact with EFSA can sometimes be difficult to move the process forward and have some of the discussions that we think, perhaps, we would like to have at all times. We need to recognise that, in the way in which the system is set up, member states have a responsibility, when they are acting as rapporteur to do the initial assessment. In relation to the previous question, I would say that certainly I, and my teams in CRD, would offer no favour to any particular applicant, everybody would be treated equally and everything would be done on the basis of the evidence provided to us. When we get into the European process and we give our assessment to EFSA, and then that is opened up for peer assessment across all member states, it would be unrealistic for a rapporteur member state to take a position that was in favour of a particular applicant. That would simply be picked apart in the peer review process when other member states were involved.

In relation to the specific question about difficulties with EFSA, one of the areas where we have had some issues over a number of years is in the development of guidance. We have the legislative base that sets the framework for how we work, but in actual fact there is an enormous amount of guidance in many specific areas that describe how regulatory authorities should deal with particular types of data. We think that the ways in which some of that guidance has been developed have essentially taken a technical focus in many areas, without thinking how you are going to answer the regulatory question. That, to me fundamentally in all areas, is: what is the level of protection to human health or the environment that we are trying to achieve, and how do we develop a position where we can be sure that we are achieving that level of protection?

Zac Goldsmith: Can I—

Chair: I am very conscious of time. Can we move on to the next set of questions, and if we have time we will come back at the end.

Zac Goldsmith: All right.

Q343 Martin Caton: The Defra document *Neonicotinoid insecticides and bees: The state of science and the regulatory response*, which you published in September, does not mention the words "precaution" or "precautionary" anywhere, whereas your evidence to this inquiry includes several paragraphs under that heading. What is Defra's position on the precautionary principle and has it changed?

Lord de Mauley: Let me be very clear that Defra fully accepts that the precautionary principle applies to decisions on the regulation of pesticides. In making decisions about neonicotinoids, it must be accepted that these are insecticides and carry a risk to non-target insects. The regulatory regime requires that authorised insecticides have no unacceptable effects on the environment, including impacts on non-target species. Neonicotinoids meet the current regulatory requirements. The expert advice Defra has received is that the current evidence does not indicate that unacceptable effects should be expected in field conditions. However, we have some important work going on. Can I ask the Chief Scientific Adviser if he would like to comment?

Professor Boyd: Certainly. Thank you, Minister. Clearly, with respect to the precautionary principle, we have to come up with decisions that are proportionate, non-discriminatory and consistent, and we do that through the advice that we get from the Advisory Committee on Pesticides and the CRD. From a scientific perspective, I have already mentioned the weight of evidence approach. I think that is central to how one plays through the precautionary principle.

We have a very large weight of evidence with respect to neonicotinoids, which has been submitted as a result of the regulatory process. What we are seeing now is some new evidence coming to light—mainly from academic studies, some funded by Defra, within the context of a specific funding stream that we put in place recently on pollinators. We are beginning to assimilate that evidence into the weight of evidence approach that is being applied under the auspices of the precautionary principle.

It is beginning to tip the balance, and that is why we are looking at it very, very closely. That is why, as soon as the Gill paper came out in *Nature* recently, we went straight to the Advisory Committee on Pesticides and said, "What do you think about this? What is your advice about it?" I think they have already said that they are concerned, and we share that concern. As a result of that and as a result of the previous studies, we have commissioned a number of studies to try to get to the bottom of the problem. It comes back to what I said earlier about addressing the real question at hand. The real question is: what is the impact of these chemicals on pollinator populations in the field? That is a very difficult question to answer. It is one that is only partially answered by all the evidence that we have in front of us

at the moment, including the dossiers that have been submitted by companies who are looking to license the pesticides but also including the recent studies. What we want to do is get closer to answering that question, if at all possible.

The studies that are being carried out at the moment are, specifically, one on the effects of neonicotinoids on bumblebees in real field conditions. That is partly experimental, but it is getting as close as we can in an experimental paradigm to real field conditions. We are also looking at the presence of toxic chemicals on bees that are returned in a scheme that we have whereby wildlife is sent in. We look for toxic chemicals on the animals that are sent in, and that includes bees. We are also carrying out a long-term study on the survival of honeybee colonies over winter and a correlation study, which is an epidemiological study looking at the interaction between the use of neonicotinoids in the countryside and the survival of honeybee colonies. Honeybees are a very useful species to use in this because obviously they are farmed. They are present in clearly-defined hives and can be studied quite easily over longish periods of time.

So there are a number of studies in place to respond to this need for more evidence, and more evidence that is targeted at the very specific questions we need to answer, in order to be able to make sure that we are coming to a proper conclusion on this weight of evidence approach.

Q344 Martin Caton: In September, Defra justified its decision not to suspend neonicotinoid licences, in response to the Henry and Whitehorn studies, by referring to the lack of unequivocal evidence that sub-lethal effects with serious implications for colonies are likely to arise from current uses of neonics. Do you believe that there is unequivocal evidence that sub-lethal effects of neonics do not have serious implications?

Lord de Mauley: I fully accept that the use of the word "unequivocal" was inappropriate. We are not seeking unequivocal evidence, and recognise that scientific studies can never meet such a test. The reality is that we do consider the weight of evidence and, at present, the evidence suggests that the effects do not occur in the field.

Q345 Martin Caton: Professor Boyd, you just listed some further research that you commissioned. Can you give an idea of when each piece of that will be published?

Professor Boyd: The key piece of research is the bumblebee study in as realistic field conditions as possible. In science there are different stages of publication, but we hope the results will be made available sometime in January, so that the Advisory Committee on Pesticides can adjudicate over those results. The results are now in and they are being analysed. I have commissioned some additional work around that, which will take a bit longer to come through. But hopefully the basic results will be with us in January.

Q346 Martin Caton: That will be in the public domain then?

Professor Boyd: I guess it will be, yes. There is a recognised process for publication in science, which involves peer review. We would like to be able to get through a peer review process before publishing that. We can accelerate that peer review process, but normally we would send the results out to a scientific journal, which would do an independent peer review on the study. That would give assurance that the study is done to an appropriate standard. That takes time, but we know that we do not have time on our hands so we will try and find an accelerated process to make sure that it is in the public domain as quickly as possible.

Q347 Mark Lazarowicz: What does that mean in terms of an accelerated process, how long?

Professor Boyd: We would see the Advisory Committee on Pesticides, for example, as being essentially like a peer review body. We have no influence on what they say or anything like that, so we will probably give the whole study to the Advisory Committee on Pesticides, and ask them to adjudicate on it and to provide their view on not just the methodology that was used—which they are already aware of—but certainly the results and how the results have been interpreted. That is probably the most rapid way of doing it. I may ask the Advisory Committee on Pesticides to independently send it for peer review to other individuals as well, but that would take a bit longer because we have to give people a few weeks to be able to review these studies appropriately.

Q348 Caroline Lucas: We heard earlier from the ACP that the decision on whether to call for a moratorium, at a moment of lack of sufficient evidence, is a political decision. It is obviously a decision that was taken differently in France. Would you think that the French are just more risk averse, or what difference would there have been or what could you do direct us to that would give us a different result?

Lord de Mauley: It would be inappropriate for me to comment on decision-making elsewhere. What I can say is that our decision-making is based entirely on the advice of the ACP and the CRD.

Q349 Caroline Lucas: In a sense, they are coming to you saying that the evidence is not clear and then you have a political decision—as we have heard—about whether to go for a moratorium, or to leave things as they are but to find more evidence. The worry I have is that it can take a long time to get sufficient evidence to act. I want to understand a bit more about the political decision-making that goes on to say, "This is enough".

Lord de Mauley: I absolutely understand the question but, as I have said earlier, the advice has been, and remains, that there are no unacceptable effects. However, we have this extra work going on, which we are accelerating the conclusions on, and if that gives rise to a change of the advice we will take it.

Q350 Dr Offord: Many people in the agricultural industry have been awaiting the publication of the UK's action plan on the sustainable use of pesticides. Could you please advise us when it will be published and why there has been a delay, because we were expecting it at the end of November?

Lord de Mauley: Yes, absolutely. It was due to be submitted to the Commission on 26 November. It is almost finalised, following a public consultation. We are finalising our consideration of the responses to the consultation and the UK plan will be published shortly. It may be worth saying that we understand that only seven member states met the 26 November submission date but, as I say, it will be published shortly.

Q351 Dr Offord: Would you be able to elaborate on why it has been delayed?

Lord de Mauley: It is purely the process of giving due consideration to the responses to the consultation.

Q352 Dr Offord: That concerns me slightly because it feels as though there is not a great priority—not only in Defra, but you also mentioned other member states—for the sustainable use of pesticides. Would you say it is a priority for your Department?

Lord de Mauley: Yes.

Q353 Dr Offord: Even though we have not gone through the consultation document and submitted it on time?

Lord de Mauley: We are working hard on it and it will be out shortly.
Chair: But it was due on 26 November, was it not?
Lord de Mauley: Yes.

Q354 Dr Offord: I will move on from that then. The draft action plan did not include any binding targets or timetables. Could you confirm whether the plan will feature those when it is published?

Lord de Mauley: I cannot give you an answer to that.

Dave Bench: For quite some time now, the UK Government has preferred not to set binding targets of the kind that you are talking about, because they have the potential to skew behaviour in unintended ways. There is a whole raft of initiatives, both regulatory and non-regulatory, that are described in the national action plan. In essence, much of what is in the national action plan is an extension and an explanation of what has been going on in the UK for quite some time. In relation to the sustainable use directive of pesticides and transposing national legislation, in effect, the UK has already had in place most of the things required for quite some time. In effect, the national action plan is an updating of national strategies in relation to the sustainable use of pesticides that we have had in place for many years.

Q355 Dr Offord: I have been trying to get an answer to a question from Defra, and I will ask it in a roundabout way, which is: as a matter of policy, would you be prepared to trade off certain sectors of the agricultural economy to conserve the contribution of pollinators to UK agriculture? I ask that is because I have been trying to determine what the economic worth of bees to UK agriculture, and I have not been able to find that out.

Dave Bench: Perhaps you are asking something of a political question there, which I suggest I probably should not answer.

Chair: Then we will invite the Minister to answer that.

Dave Bench: In terms of the regulatory regime, it does not take economic benefit into account. It sets a high level of protection as an absolute level, regardless of the usage.

Q356 Dr Offord: Would the Minister like to comment on that?

Lord de Mauley: I would like to ask the Chief Scientific Adviser before I accept.

Professor Boyd: It is a very interesting question. As you are probably aware, we carried out something called the National Ecosystem Assessment. That has a methodology within it that allows the assessment of the financial worth of different parts of what we call our natural capital. You could include pollinators as part of our natural capital. There are a number of estimates of what pollinators are worth, something like £0.5 billion, in very round terms, is kind of the number that comes out. Do we do a cost-benefit trade-off? Yes, I think we do. We perhaps do not do it explicitly at the moment, but I think that is something that is a perfectly valid thing to do. Although I would say that any effect of any pesticide on pollinators is something we want to avoid at almost any cost, even small effects may be sustainable, because the advantages that the pesticide use brings, in terms of increased yields, for example, are much greater than the disadvantages that you would get from reducing the numbers of pollinators, assessed along the lines of the national ecosystem assessment in financial terms. That is the whole point of doing these types of assessments.

My suspicion is that we do have an effect on pollinators but we cannot measure it at the moment. It may be impossible to measure it because it is small, relative to a lot of the other things that affect pollinators, like changing weather conditions, changing forms of land use, changing food supply, these sorts of things. I would be very surprised if neonicotinoids did not have an effect but it is a small effect, relative to all those others, and it is a small financial effect. The other thing is that these are what we called non-linear processes. If we

were to remove, let us say, 5% of the pollinators it might not reduce the value of pollinators by 5%. It might reduce it by a much smaller amount than that. Explicitly, we do not use it, but implicitly we do use these cost-benefit trade-offs.

Q357 Chair: Minister, with all the discussion that there is about natural capital and having a joined-up approach across Government through the Cabinet Office, how does all this tie in with the decision of where the weight is finally given on the value of pollinators as opposed to other considerations?

Lord de Mauley: We think pollinators are extremely important. They have a clear economic value, but they are also important to our diversity. I hope that what is coming out of this discussion is that we take them extremely seriously and the use of insecticides—which, of course, are designed to kill insects—are subject to very rigorous procedures, specifically on non-target species, and their impact on the environment generally. It is an extremely important subject and we take it very seriously.

Q358 Dr Offord: My final question is: have you considered suspending the use of neonicotinoids?

Lord de Mauley: Of course, we would not go through all this process unless it was an option at our disposal. There are lesser options, such as restrictions on use, which must also be considered. I have already said it, but as yet the evidence suggests very clearly that there are no unacceptable effects but, as soon as that changes, we have those tools at our disposal, yes.

Q359 Dr Offord: You say "restrictions on use". What I was particularly thinking of is that I am aware that people have to be licensed in the agricultural commercial side. I am talking about people going down to their local garden centre and using them. If we suspended their use there, it would enable an opportunity for some research to be conducted, between urban and rural pollinators, to see the likely effects of the public using it. Have you considered it from that point of view?

Lord de Mauley: It is an interesting suggestion but I think it might be a bit hasty to make a sudden distinction between urban and rural.

Dr Offord: It is a very crude measurement.

Lord de Mauley: It is slightly crude. The products for use in gardens have very clear instructions for use. No product is approved for garden use if the correct use would require either training or protective clothing. The levels of toxicity for products that are approved for garden use are generally considerably lower than for professional use. So we think that the level of control is appropriate. Dave, you were keen to come in.

Dave Bench: I would add the point that, as part of the ACP discussions throughout the course of this year in relation to neonicotinoids, they have addressed the issue of home garden products and whether they should be treated in a different way. To this point, they have said there is no reason why they should be, but that is something that they will return to whenever they have another discussion. The next one will be at their meeting on 29 January.

Q360 Mark Lazarowicz: A couple of questions, which I think are mainly for Mr Bench, on the chemicals regulation directorate. Generally, do you operate on the basis that any product or any active substance, which is approved at EU level, has achieved a risk assessment? Is that your normal approach?

Dave Bench: Clearly, the risk assessment is done through that European process, and then there is the inclusion on a positive list of the active substance and, of course, we accept that, being part of the EU.

Mark Lazarowicz: So you accept what comes through?

Dave Bench: It is then for us to deal with individual product authorisations on a national basis.

Q361 Mark Lazarowicz: The risk assessment is always done on an EU basis—that is something you would take as a given?

Dave Bench: No, we do not take it as a given, because we are involved in the peer review process if we are not the rapporteur member state, so we are engaged and involved at the point the risk assessment is conducted.

Q362 Mark Lazarowicz: If you had concerns, they would be fed in through the peer review process?

Dave Bench: If we are not the rapporteur member state to start with then, yes, we would feed in at the peer review process. Of course, there is also the process in the commission at the standing committee, which deals with the risk management process, and as part of any inclusion decision will consider whether there are any conditions related to that inclusion, and we can be involved at that point too.

Q363 Mark Lazarowicz: How far is the CRD's own funding dependent on the turnover of pesticide companies, because presumably the pesticides that are approved also are another way in which you get some of your funding? Is that not the case?

Dave Bench: Yes, it is. We apply fees and charges, so that all the application work is funded by the applicant companies. Those companies that hold authorisations are also charged on the basis of their turnover each annum. That contributes to the broader cost of some aspects of the regulatory system like, for example, the monitoring schemes that there is a benefit derived from.

Q364 Mark Lazarowicz: You have a fast-track approval scheme within the directorate. What is the basis on which a product is placed on the fast track?

Dave Bench: At the moment, if a company has a particular application that they would like to be fast tracked, they are allowed to nominate that, so it is completely at their nomination, and we allow one per year per company at the moment.

Q365 Mark Lazarowicz: Is that a frequent occurrence?

Dave Bench: Some companies take advantage of that, yes.

Q366 Mark Lazarowicz: Does the fast-track procedure have any difference in terms of the assessment procedure?

Dave Bench: Absolutely not.

Mark Lazarowicz: Why do you have to have a fast-track procedure and the others go through a slow-track one?

Dave Bench: The assessment procedure is absolutely the same. It is simply allowing them to target some applications where they may have a pressure, in terms of wanting to hit a particular growing season for the marketing of that product, and it allows that acceleration. We cannot do that for all applications, of course, because then you are going through the process at the same pace. It is essentially paced through the process. It is not about the way the assessment is conducted or the number of hours of assessment time that is taken to do that assessment.

Q367 Mark Lazarowicz: You have a number of targets for the consideration process—the approval process. What are the targets that apply to how you deal with applications? Is there a target on the number of days it takes to complete the approval?

Dave Bench: There are, although we are going through a process of reconsidering targets. Different targets apply for different streams, depending on whether there is data applied or you have a lot of data. The new European legislation, regulation 1107/2009, applies some legislative targets, and, in the most part, those targets in the legislation are in excess of what we have typically delivered. We are going through a process of considering how we should adapt to that. What we do not think is a good idea is to extend the time dramatically just because the legislation says that we can.

Q368 Chair: Before we conclude, can I just go back, Minister, to what you were saying about the national action plan and the fact that it has been delayed? Can I ask you what you hope that it will be? Do you envisage it as being an action plan with specific actions in it, or is it going to be a more descriptive summary of the state of affairs?

Lord de Mauley: It will address the requirements of the sustainable use directive, of course. Priorities for action will include protection of water, encouraging best practice among amenity users and the development and encouragement of integrated approaches to pest, weed, and disease management. I do not know who is the best person to ask.

Professor Boyd: I could probably give a little bit more but not an awful lot, I think, because at the moment it is still being put together. It will include something called SCEPTRE, which is the Sustainable Crop and Environment Protection Project that is co-funded by industry partners, so industry will be involved in it. As the Minister mentioned, there is the integrated pest management system that we would like to put in place, and that is a requirement that has to be in place by the beginning of 2014. I think that presents huge opportunities for looking anew at how we develop more intelligent pest management procedures. There is a sense that perhaps pesticides are used more often than perhaps they should be. Through appropriate research and advice coming from that research to farmers, we have an opportunity for opening up a dialogue, especially trying to get the industry itself to appreciate that a lot of the solutions are going to come from industry, and industry then has to pass those solutions on to other members of industry. Through that early adopters process and then the learners within the industry taking up new ideas, we have the potential to develop probably quite imaginative new systems for integrated pest management that, at the end of the day, might use a lot less pesticide than we use at the moment. We can probably achieve that without banning pesticides as well, but just—

Q369 Chair: Will it be linked and integrated into the discussions that are going on about the reform of the common agricultural policy as well?

Lord de Mauley: Yes, there is reference in the national action plan to that.

Q370 Dr Offord: Just very quickly, when will the plan actually be published?

Lord de Mauley: I said shortly; I cannot go further than that.

Chair: Before Christmas?

Professor Boyd: We will need to come back to you on that. I do not know the answer to that.

Q371 Dr Offord: Because you will be in breach of the European directive if it is not published by the end of the year.

Lord de Mauley: We will try and get you a letter before the document.

Dr Offord: Thank you.

Chair: You have been generous with your time, all three of you. Obviously you will appreciate that a large number of people are very interested in our inquiry. Thank you very much indeed for your evidence this afternoon, and for offering to come back with more information.