BARRELL
TREECARE

Report on behalf of Claimant relating to the Arboricultural issues relevant to the case of Mr G Poll and Viscount Asquith of Morley

Prepared by

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Appendices

1 INTRODUCTION

1.1 **Formal details:** My name is Jeremy Barrell and I am the Managing Director of Barrell Treecare Ltd, an arboricultural consultancy practice based at Bridge House, Pullman Way Business Park, Ringwood, Hants, BH24 1EX. I have over 20 years experience in tree contracting but have spent the last 10 years solely as an arboricultural consultant providing advice on a range of tree problems. A summary of my qualifications and experience is included as Appendix 1.

1.2 **Instruction:** I am instructed by Lyons Davidson Solicitors who are acting on behalf of the Claimant, Mr G Poll, to review the tree issues relating to his accident on 11 July 2001, which involved a fallen tree and his motorcycle on the road outside Clavey's Farm, Mells, Somerset.

1.3 **Documents I have seen:** I have seen the following documents:-

1. Report of Dr DP O'Callaghan dated 30 January 2003, including its appendices (only photos 1–3 in appendix 3.1 and photos 1–2 in appendix 3.3)
2. Witness Statement of Mr C Rowe dated 18 January 2003
3. Weymouth District Land Registry letter dated 24 August 2001 with an attached 1:2500 plan, Title No ST171650

1.4 **Synopsis of case:** On 11 July 2001, Mr G Poll, the Claimant, was riding a motorcycle along the road from Leigh-on-Mendip to Mells Green, when he sustained serious injuries after hitting a tree that had fallen into the road. The tree fell from land on the Mells Estate (Defendant) about 0.7km southwest of Clavey's Farm. I was instructed to prepare a report on the tree issues on behalf of the Claimant. I attended the site on 26 March 2004 and 15 July 2005.

1.5 **Disclosure of interests and Expert Witness Statement:** I have no connections with any of the parties, witnesses or advisors that might be thought to influence the opinions expressed in this report. I have dealt with Dr O'Callaghan before, and know him on a personal and professional basis. However, I do not believe my past contact with him will in any way prejudice my opinions in this case. As a Member of the Expert Witness Institute, I observe their *Code of Conduct for Expert Witnesses* and include a signed declaration to this effect in Appendix 2.

2 SITE VISITS, OBSERVATIONS AND RELEVANT REFERENCES

2.1 **Site visits:** I first visited the site on 26 March 2004 to inspect the subject tree. The weather at the time of inspection was heavily overcast, with very poor visibility. I took photographs during this visit but they are of poor quality because of the weather. I carried out a second visit on 15 July 2005 to view the locality around the subject tree and take further photographs to illustrate various points in this report. The weather at the time of this inspection was bright, still and dry, with good visibility. During both visits, all my observations were from ground level without detailed investigations and I estimated all dimensions unless otherwise indicated.

2.2 **Location of subject tree and other relevant features:** From my first site visit, it was obvious that the precise locations of the subject tree and other relevant features nearby were difficult to identify from the provided plans because of the rural nature of the area. Consequently, during my second site visit, I used the Land Registry plan to more accurately locate them by pacing up and down the road from the subject tree and recording the distances. Whilst not as precise as using a tape, I believe this was sufficiently accurate for the purposes of identifying the relevant features I refer to in this report. In this simple survey, I noted field entrances and trees that I considered relevant to my evidence. Some trees have been identified on site by an aluminium numbered tag stapled to their trunks; I have referred to them by this number where appropriate. I have marked the approximate locations of these features with their distances from the subject tree in brackets on an extract of the Land Registry plan included as Appendix 3. I have set out the description of the trees I noted in 2.3 below. Photos 1 and 2 show the setting of the subject tree from the road and adjacent field.

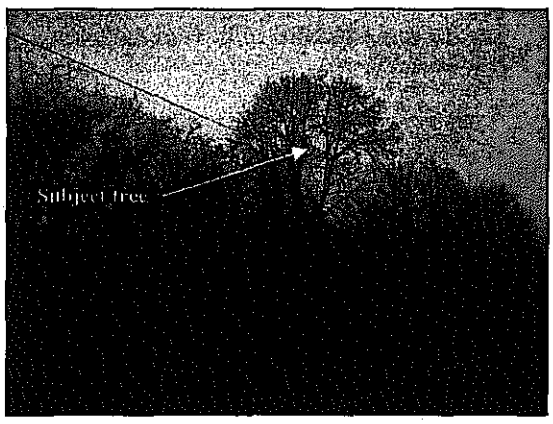

Photo 1 (15/07/05): The subject tree from the road looking towards the northeast

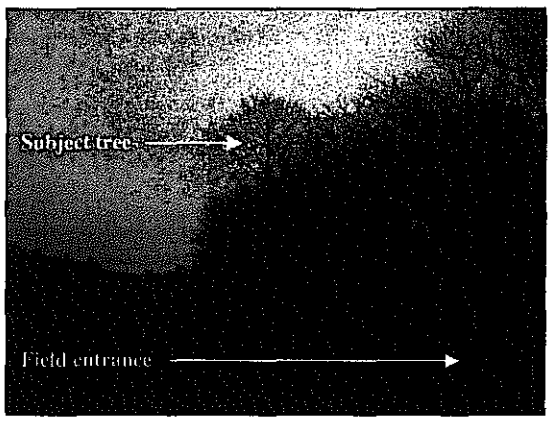

Photo 2 (26/03/04): The subject tree from the field entrance looking towards the northeast showing the unobstructed access to the tree

2.3 **Description of relevant trees:** During my visits, I inspected the subject tree and other trees that I considered relevant to my evidence. Their approximate locations are shown on the plan in Appendix 3 and I set out their relevant details below:-

- **Subject tree:** I agree with the description of the tree set out in the OCA report (see 3.2, bullet point 1 below) but add that one of the stems was dead at the time of both my visits, indicated by the yellow arrow in photographs 3 and 4.

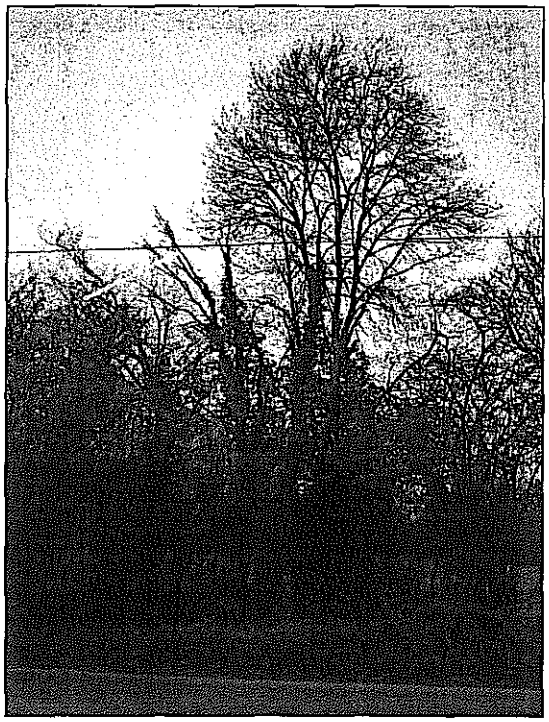

Photo 3 (26/03/04): The subject tree from the road in winter showing the dead stem with the yellow arrow

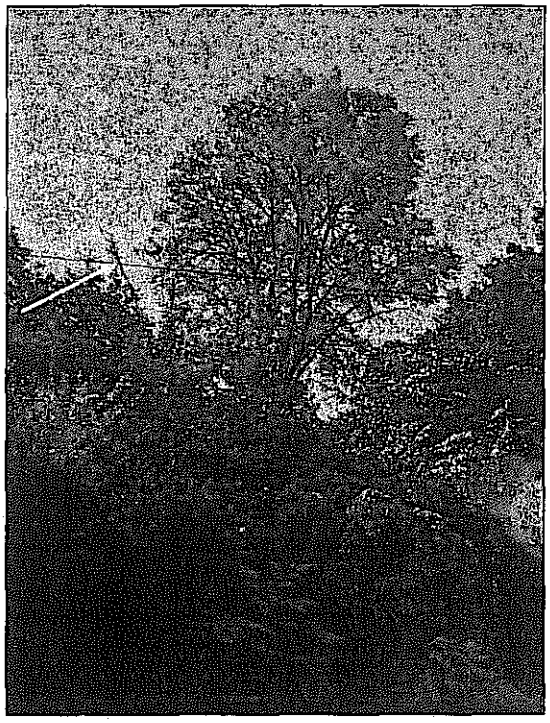

Photo 4 (15/07/05): The subject tree from the road in summer showing the dead stem with the yellow arrow

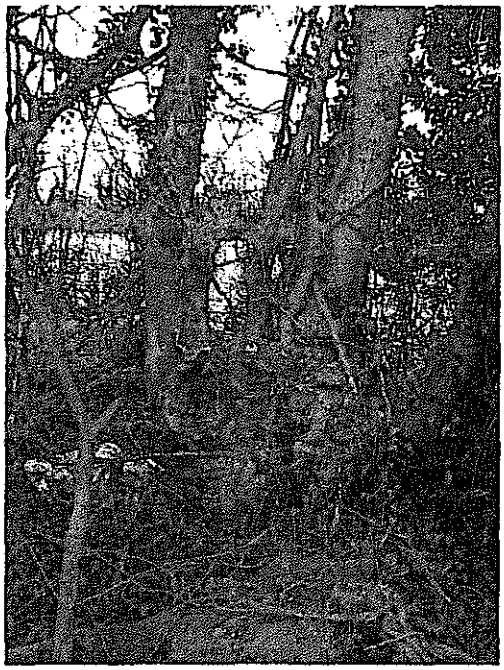

Photo 5 (26/03/04): View of the failed union from the road in winter

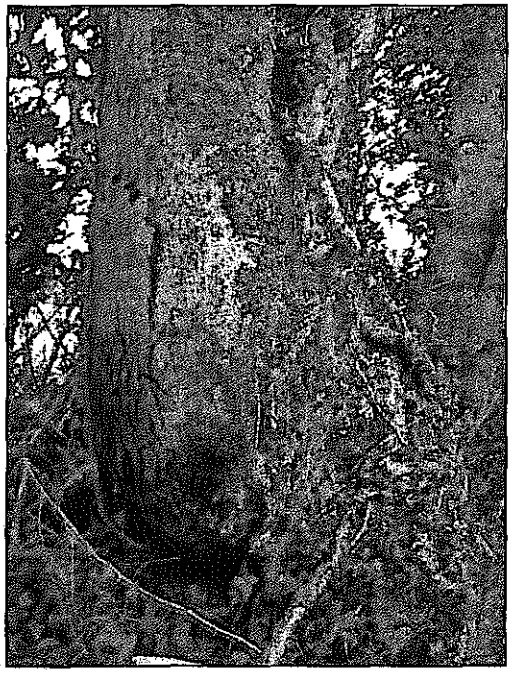

Photo 6 (26/03/04): View of the failed union from the along the ditch

- **Ash (tag 16):** This a maturing ash about 79m northeast of the subject tree. It is in good health and has multiple stems that can be seen from the roadside (photo 7). From close up, it has three stems and all have included bark defects at their bases (yellow arrows in photo 8).

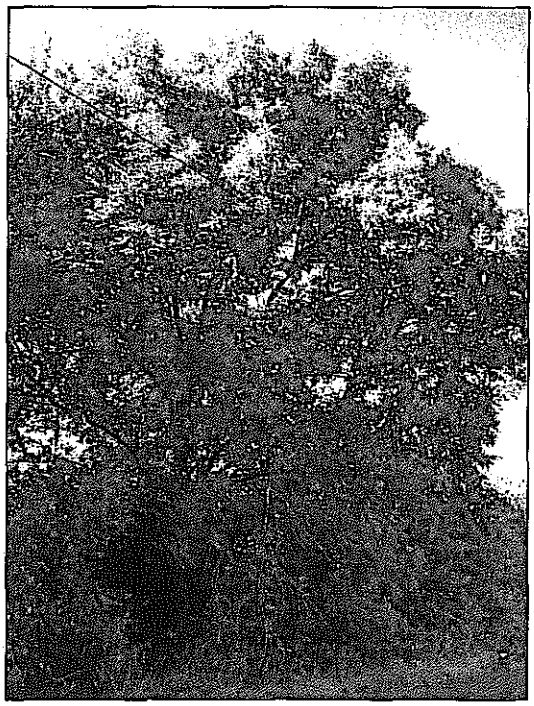

Photo 7 (15/07/05): Tree 16 viewed from the roadside showing multiple stems

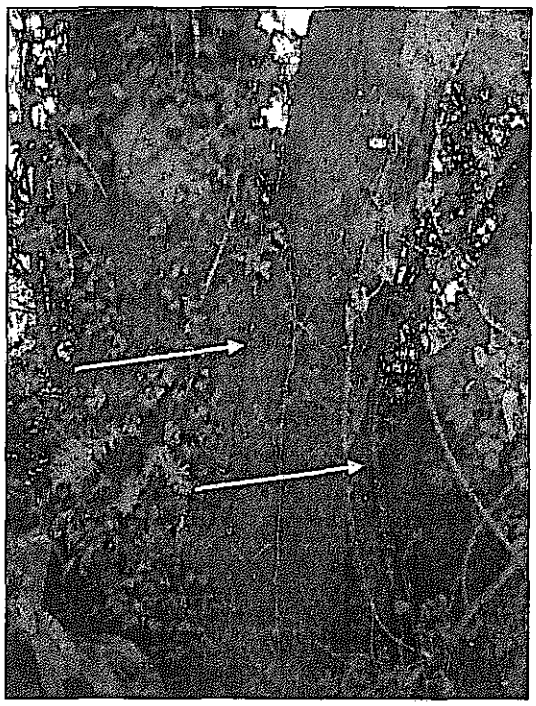

Photo 8 (15/07/05): Stems of tree 16 showing two unions with included bark

- **Holly (tag 19):** This a mature holly about 128m southwest of the subject tree. It has multiple stems that can be seen from the roadside (photos 9 and 10) and is in declining health, which can be seen from the very thin foliage on the severely unbalanced stem over the road. A closer inspection of the base revealed a vertical crack between the largest stem unbalanced over the road and the main stump (photos 11 and 12), which was large enough to push my hand into. The wood inside this crack was soft and obviously in an advanced state of decay.

Photo 9 (15/07/05): Tree 19 viewed from the road looking towards the southwest showing the multiple stems and the ivy covered declining stem leaning out over the road

Photo 10 (15/07/05): Tree 19 viewed from the road looking towards the northeast showing the same features from the other direction

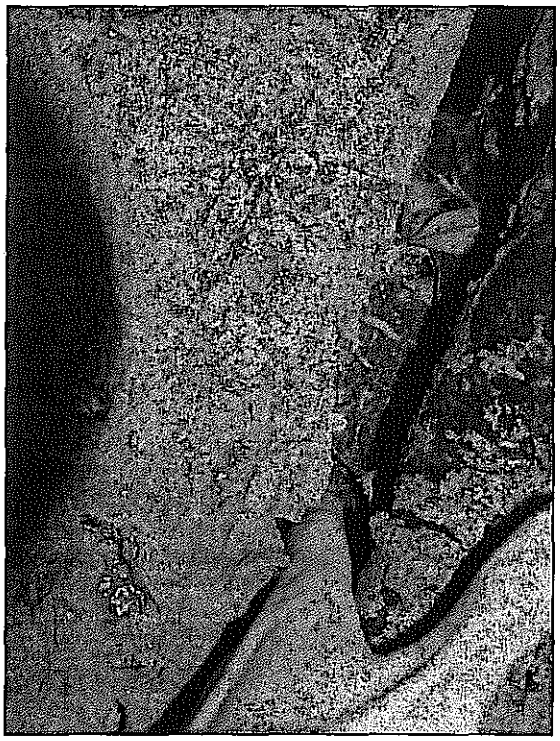

Photo 11 (15/07/05): Tree 19 showing the depth of the split between the severely leaning stem over the road and the main stump and the internal decay

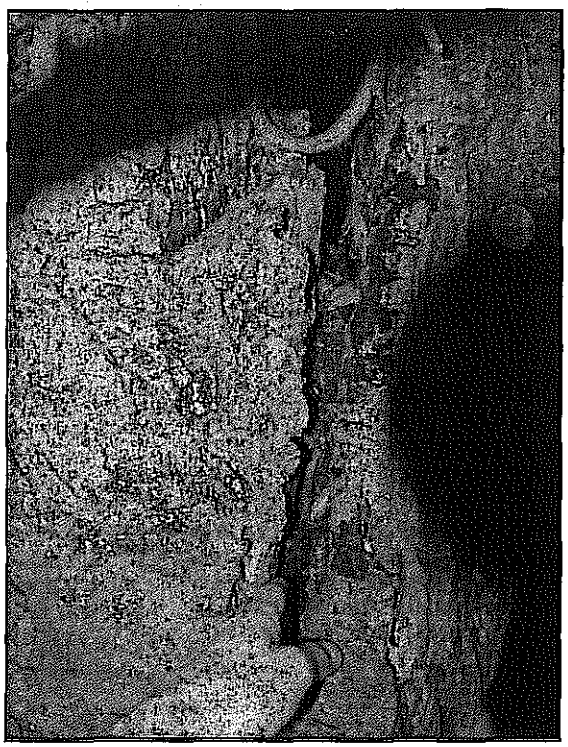

Photo 12 (15/07/05): Tree 19 showing the same split widening to where it completely separates from the trunk

- **Sycamore (tag 21):** This a maturing sycamore about 189m northeast of the subject tree. It is in good health and has multiple stems that can be seen from the

roadside (photos 13 and 14). From close up, it has three stems and all have included bark defects at their bases (yellow arrows in photos 15 and 16).

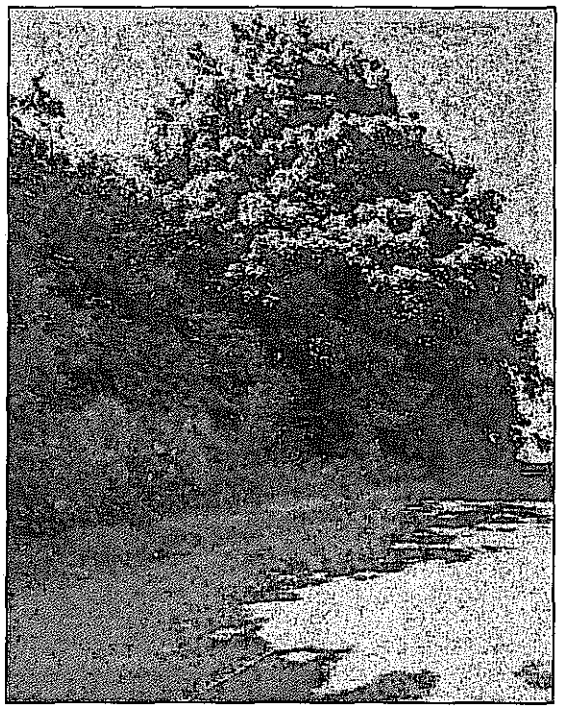

Photo 13 (15/07/05): Tree 21 viewed from the road looking towards the northeast

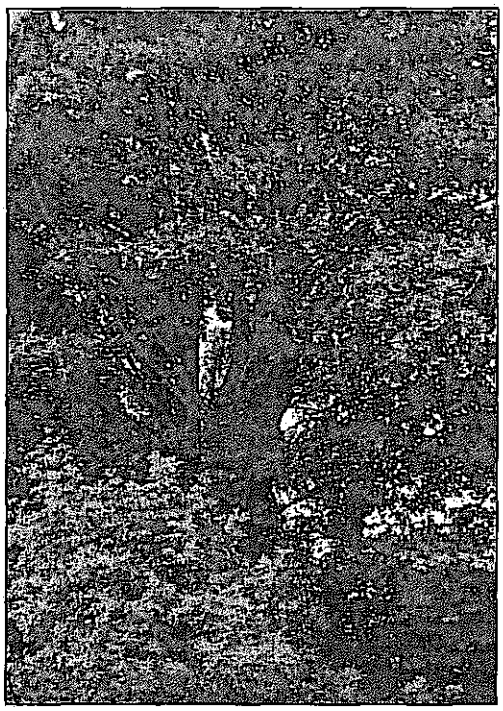

Photo 14 (15/07/05): Tree 21 viewed from the road showing the multiple stems

Photo 15 (15/07/05): Tree 21 showing the multiple stems viewed from the ditch

Photo 16 (15/07/05): Tree 21 showing the multiple stems viewed from the ditch

- **Elms (group 1):** These dead elms are about 72m northeast of the subject tree on the other side of the road (photos 17 and 18). They are about 8m in height and 3m from the road edge. They were dead during both my visits.

Photo 17 (26/03/04): Dead elms in group 1

Photo 18 (15/07/05): Dead elms in group 1

- **Elms (groups 2, 3 and 4):** I noted other groups of dead elms during my first visit but did not take photographs because of the poor light. I took photographs during my second visit and describe them as follows. Group 2 are about 46–57m southwest of the subject tree on the other side of the road (photo 19). They are about 8m in height and 3m from the road edge. Group 3 are about 94m southwest of the subject tree on the other side of the road (photo 20). They are about 10m in height and 3m from the road edge. Group 4 are about 108m southwest of the subject tree on the other side of the road (photo 21). They are about 10m in height and 3m from the road edge.

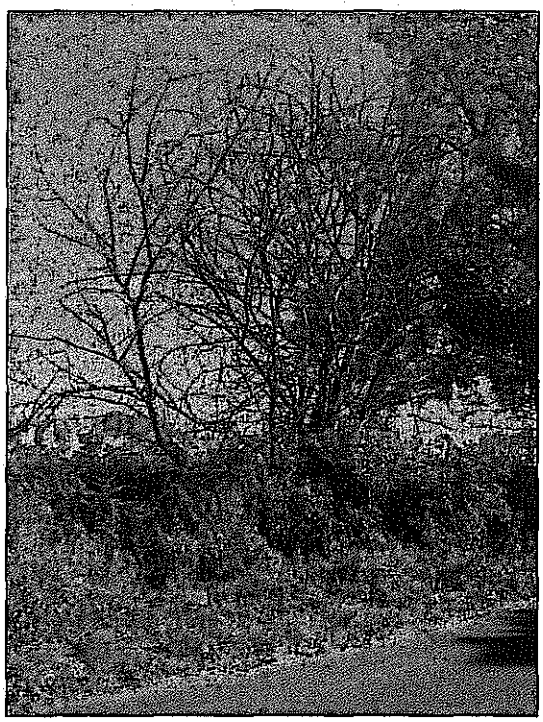

Photo 19 (15/07/05): Dead elms in group 2

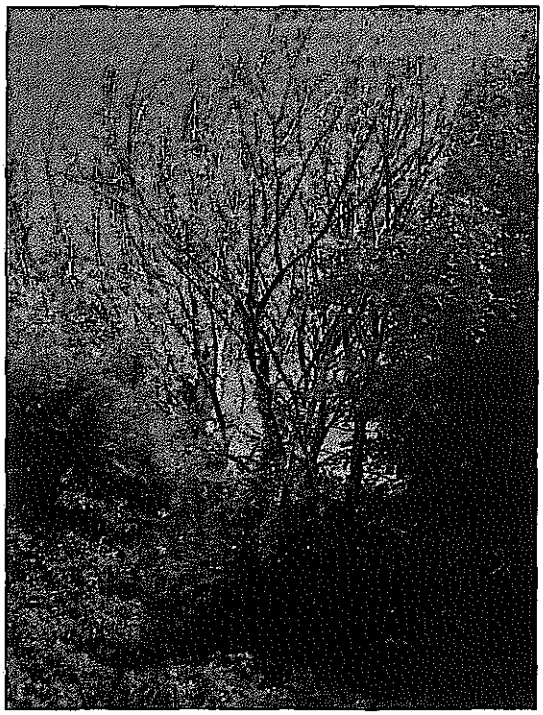

Photo 20 (15/07/05): Dead elms in group 3

Photo 21 (15/07/05): Dead elms in group 4

2.4 **Relevant references:** In my analysis of the issues in section 3, I refer to the following technical references:-

- One of the most authoritative and current publications relating the law surrounding hazard trees is *The Law of Trees, Forests and Hedgerows* by Charles Mynors. I enclose sections 5.5 *The nature and location of the tree* and 5.7 *Inspection and risk assessment* that list and analyses relevant case law in Appendix 4.
- Current good practice for inspecting trees for ill-health is set out in *Diagnosis of ill-health in trees* by RG Strouts and TG Winter (Pages 8–9 in Appendix 5).
- Current good practice for inspecting trees for structural defects is set out in *The body language of trees* by Claus Mattheck and Helge Breloer (Pages 118–119 in Appendix 6).
- Current good practice for identifying and managing tree hazards is set out in *Principles of Tree Hazard Assessment and Management* by David Lonsdale (Pages 145–149 in Appendix 7).

3 MY OPINION

3.1 **Summary of my opinion:** I have carefully considered all the information I have seen and looked in detail at the subject tree and its surroundings. I have interpreted what I have seen in the context of my experience and summarise my analysis as follows. The base of the subject tree had been cut in the past, which resulted in multiple stems from the original stump. One of these stems had a severe included bark defect, which, in conjunction with a fungal infection, became so weak that it was not able to support the stem in strong winds. The large size of the stem and the severity of the defect made this a high hazard tree. The closeness of the adjacent road, with regular and fast moving traffic, made this a high risk situation. This stem subsequently failed and fell across the road, causing the accident. The included bark defect would certainly have been visible and the fungal infection is likely to have been detected in a detailed inspection. The defect and fungal infection would not have been directly visible from a roadside inspection because of heavy undergrowth. However, one very common characteristic of trees with included bark defects between stems is that they have multiple stems rather than one single stem. Multiple stems are normally visible from a distant visual inspection and should trigger a more detailed inspection, which would then identify any defects. The subject tree was inspected from the roadside during a drive by inspection by a forestry contractor. The multiple stems of this tree, which were easily visible from the roadside, did not trigger a more detailed inspection. If they had done, a closer inspection would have identified the defect and the decay, prompting remedial action that would have reduced the high risk to an acceptable level. It would be common knowledge to any trained and experienced tree inspector that trees with multiple stems in hedgerows with a history of cutting are more prone to having included bark defects than single stemmed trees. These can be easily seen from a distance and should then be more closely inspected. Being aware of the issues relating to multiple stems is good practice for anyone carrying out tree hazard inspections and an essential element of any competent inspection regime. The multiple stems of the subject tree and its location in a hedgerow means it would have been obvious and predictable that it was defective, and so the failure was reasonably foreseeable. Both the landowner and the highway authority have a duty of care to identify hazard trees and take reasonable actions to reduce risks to acceptable levels. Both the landowner and the highway authority failed to do this for this tree. I set out

the detailed reasoning behind these conclusions in the following subsections, which are organised around the points made in the OCA report that I disagree with.

3.2 **Areas of agreement with the OCA report:** This case is unusual in that I have had the benefit of seeing the report prepared by the Defendant's expert, Dr O'Callaghan from OCA Ltd, before writing my own. In this context, I am able to agree with a number of points in the OCA report and see no benefit in exploring them in any detail in my report. However, for completeness, I set those points out as follows:-

1. I agree with the description of the tree set out in 3.2.4, 3.2.5 and 3.2.6.
2. I accept as presented the findings on fungal infection in 3.2.7 and weather conditions in 3.2.8 and 3.2.9.
3. I agree with the discussions set out in 4.3, 4.4, 4.5 and 4.6 relating to included bark defects.
4. I agree with the discussions set out in 4.8 and 4.9 relating to the nature of the fungal infection.
5. I agree with the discussions set out in 4.11, 4.12 and 4.13 relating to the weather conditions and reasons for failure.
6. I agree with the discussions set out in 4.17 that conclude "it is unlikely that any symptoms would have been evident in the stem before it failed." specifically referring to crown symptoms.
7. I agree with the analysis of the responsibility of Highway Authorities to tree inspections set out in 4.22.
8. I agree with conclusions in 5.1, 5.2, 5.4 and 5.6

This leaves a number of areas where I do not agree, which I deal with in more detail in the following subsection.

3.3 **Areas of disagreement with the OCA report**

3.3.01 **OCA 4.7 – identification of the included bark union from a routine visual inspection:** Whilst I agree that the defect would not have been visible from a roadside visual inspection, the multiple stemmed structure of the tree would have been. Indeed, photo 1 in OCA Appendix 3.2 and my photos 1 and 2 clearly show this; the multiple stems are easily visible, both when the tree has leaves and when it has none. It would

be obvious to any competent inspector, and especially to one who was familiar with the estate, that this was a hedgerow tree and many of the field hedgerows had been cut in the past. This knowledge would alert the inspector that trees with multiple stems are likely to originate from single stumps, which are well known for being prone to included bark unions. More specifically, my inspection showed three obvious examples of other multiple stemmed trees in the same hedgerow that have a similar form to the subject tree. Tree 16 (photos 7 and 8) about 79m from the subject tree is an ash with three stems that can be clearly seen from the roadside. All the stems have potentially weak unions with included bark. Tree 19 (photos 9, 10, 11 and 12) about 128m from the subject tree is a holly with many stems. One heavy stem is clearly dying from the thin foliage and is severely leaning out over the road. This has an opening split between the stem and the trunk at the base with advanced internal decay. Tree 21 (photos 13, 14, 15 and 16) about 189m from the subject tree is a sycamore with many, closely packed stems originating from one stump. Again, this has potentially weak included bark stem unions at its base. All these multiple stemmed trees are large and have defects, so they are potentially a high hazard. Their multiple stemmed form is an obvious indication that there may be included bark defects, which should immediately trigger a more detailed inspection. Multiple stems are a common tell-tale sign that there may be a defect and should be one of the first features that a competent inspector looks for. Photographs 3 and 4 show the multiple stems of the subject tree would have been easily visible from a routine visual inspection. A competent inspector would have recognised this sign and initiated a more detailed inspection. Indeed, this point is confirmed in OCA 4.15, "However, I am of the opinion that a multi-stemmed Ash resulting from a previously cut stool is likely to have an included union(s) and this type of tree adjacent to the highway would normally be singled out for detailed investigation by an experienced inspector.". Such an inspection would not have been difficult because of the easy and unobstructed access through the nearby field entrance to the open field leading up to the base of the tree (photo 2).

3.3.02 **OCA 4.10 – identification of the fungal bracket:** It is standard practice when carrying out a detailed tree inspection to carefully look at the base of the tree because this is where fungal brackets and defects are most often found. It is well documented in the most relevant references on tree inspection that defects can be covered by vegetation (Appendices 5, 6 and 7) and any competent inspector would be aware of

this. In this instance, although it was difficult to see the base of the tree from the road, it was possible to get up to the trunk through the vegetation on the roadside or from the easy and open access on the field side (photo 2). Negotiating such obstacles would be standard practice for any tree inspector and not out of the ordinary. Once at the base of the tree, it is relatively easy to pull away vegetation; doing so is essential for the detailed inspection of the trunk required to assess the extent of any included bark defects. For these reasons, I do not believe that the presence of the fungal bracket at the base of the tree would have been missed by an experienced inspector.

3.3.03 **OCA 4.14 – effects of regular strong winds:** Whilst I agree with the conclusion of this paragraph in the last sentence, I do not accept the reasoning that the regular strong winds resulted in the subject tree being less likely to fail in such conditions. I believe the defect in the tree was so severe, it would become increasingly liable to failure as it increased in height, irrespective of the nature of the wind it was used to. I accept that wind induced adaptation is likely to happen in a tree without decay and defects, but the subject tree was far from normal and the reasoning cannot be reasonably applied in the same way.

3.3.04 **OCA 4.15 – external signs of the included bark union:** As I set out in 3.3.01 above, I believe there are two external signs of the included bark union that could have alerted a competent inspector to the fact that the tree could fail. The most obvious is the actual union, which, from my photos 5 and 6, it is clear that it would have been visible from a close up inspection of the base of the tree. Equally as important, in the context of the historic hedge treatment, would be the multiple stems from a more distant inspection (photos 1–4). My opinion is that a competent inspection would have identified the multiple stemmed form and that would have triggered a more detailed inspection, which would have detected the included bark defect. Furthermore, I believe a competent inspection would have detected the weak union, irrespective of whether it was done in winter or summer.

3.3.05 **OCA 4.16 – fungal infection:** As I set out in 3.3.02 above, I believe a competent inspection would have detected the fungal bracket.

3.3.06 **OCA 4.18 – included bark defect:** As I set out in 3.3.01 above, I believe a competent routine inspection would have detected the included bark defect.

3.3.07 **OCA 4.21 – inspection regime by the landowner:** I believe this estate is similar to those of other large landowners that have the responsibility for managing tree hazard. Limited resources are a common problem and it is often not realistically feasible to inspect every single tree in detail every year. In such circumstances, a responsible and reasonable management approach is to analyse the extent of inspections required and prioritise the allocation of the available resources. Typically, the areas of highest risk, i.e. areas where large trees are near people and property (targets) such as busy road or buildings, should be given the highest priority for resources. Areas more distant from targets, such as woodlands with limited access, would be given a lower priority. In my experience, this simplistic but effective management strategy is regularly applied to this type of situation by responsible councils and estate managers. On this estate, Mr Rowe was already employed to inspect the trees, albeit in a rather random and unorganised manner from the evidence I have seen. I believe it would take very little extra effort or resources to focus those inspections on the areas of highest risk and organise them in a systematic way. In his Statement, Mr Rowe advises he is on the estate three or four days a week and he surveys the trees on a regular basis by driving by. My experience is that it is possible to easily visually inspect from the roadside an average of 1km of hedgerow per hour by walking. It would have taken about one hour to walk the 1km along the road from Clavey's Farm to the end of the field where the subject tree was located. In the context of the amount of time that Mr Rowe was employed on the estate, I do not believe it would require a significant increase in the allocation of resources to carry out a proper visual inspection of the roadside trees where the accident happened.

3.3.08 **OCA 4.23 – inspection regime by the highway authority:** The admission by Somerset County Council that they do not regularly or systematically inspect highway trees is contrary to the government guidance set out in DoE Circular ROADS NO52/75 and is a cause for concern. I believe it is too simplistic to state that the length of roads and volume of trees beside them would make detailed inspections on a regular basis almost impossible. As I set out in 3.3.07 above, if there are resource limitations, then a strategy or prioritisation allows the highest risk situations to be dealt with most urgently. The first practical step in such a strategy would be to drive along all the roads and identify the areas of high risk from visual indicators. This would then focus the more resource hungry detailed inspections to where they will be most

effective. This is a common solution to a common problem. I believe it is misleading to imply that it is such a big task that it cannot be done.

3.3.09 **OCA 4.24 – Suitability to carry out tree hazard inspections:** I believe it is misleading to state the majority of tree inspections for landowners in Britain are undertaken by tree work contractors. If anything, my experience is that tree consultants carry out the majority. Mr Rowe is a forestry contractor, which is completely different from a tree work contractor or consultant. Unless he had specific training to identify the structural defects that make trees hazardous, then he would not be able to identify the tell-tale multiple stem indicator of a potential defect. My opinion is that a forestry contractor that has not been trained to identify these defects and is not aware of their significance is not competent to carry out tree hazard inspections.

3.3.10 **OCA 5.3 – Detection of the weak union:** My opinion is that the potential for a weak union could have been detected by observing the multiple stems from a distance.

3.3.11 **OCA 5.5 – Wind adaptation:** My opinion is that the defect was so severe that it had not become optimised to withstand the wind. The defect and the decay made it inevitable that the stem would fail irrespective of the nature of previous winds.

3.3.12 **OCA 5.7 – Detection of the weak union:** My opinion is that the potential for a weak union could have been detected by observing the multiple stems from a distance so it is likely that the defect could have been recorded from a roadside inspection.

3.3.13 **OCA 5.8 – Foreseeability:** My opinion is that multiple stems are a know pre-requisite for included bark unions and the potential for hazard can be detected without a full and detailed structural assessment of the tree. The failure of the subject tree was foreseeable because it was large, it was close to the road and there was a visual indicator of a potential defect. Visual roadside inspections are not difficult to plan or implement, even if there are large number of trees and resources are limited. It is good practice and quite reasonable to expect councils and landowners to have strategies in place for managing tree hazard inspections.

3.3.14 **OCA 5.9 – Symptoms of hazard:** My opinion is that multiple stems are an obvious and well known indicator of structural defects. Observing this characteristic in a hedgerow tree would warrant closer examination.

3.4 **Other relevant issues not fully dealt with in the above analysis**

3.4.1 **Competence of Mr Rowe to carry out tree hazard inspections:** A tree hazard is any tree part that could cause harm and the risk is the likelihood of that harm occurring. The magnitude of the hazard is directly related to the size of the tree part that may fail. The level of risk is directly related to the size of the hazard and the number of targets it could harm. In most instances, tree failure is predictable through the two primary visual indicators of poor health or structural defects, which can be identified through competent inspection. Tree hazard inspection is a complex matter that can only be undertaken competently by a person who has been properly trained for the task and has experience in tree management. In this case, Mr Rowe carried out the tree hazard inspection for the subject tree and has made a statement that covers his credentials; he has 15 years experience in forestry work but no formal qualifications. In four places (paragraphs 9, 12, 14 and 16), he specifically refers to the health of trees but no mention anywhere is made to structural defects. Indeed, in paragraph 16 he states "Certainly this tree would not have caused me concern as it still appears to be a healthy tree.". All these comments suggest that Mr Rowe was looking for tree health as the indicator for high risk, with no emphasis on structural defects if the tree is healthy. Furthermore, as set out in 4.24 of the OCA report, he is a forestry contractor and not an arboricultural contractor and as such, could not be expected to have the experience or training to notice anything other than a hedgerow tree in the absence of crown symptoms. From the evidence and analysis I have seen, I do not believe that Mr Rowe was sufficiently competent to carry out the tree hazard inspections he was asked to do.

3.4.2 **Adequacy of the inspection method for the subject tree:** In Mr Rowe's statement, he refers to the inspection method as follows, "We survey the property on a regular basis. To do this I normally drive by and look at the condition of the trees. I have an authority that if any tree is in a dying or diseased or dangerous condition then it should be felled immediately.". From this, I understand that Mr Rowe looks at the trees whilst he is driving alone. My opinion is this is not a reliable or effective way of

inspecting roadside trees because it is difficult to properly concentrate on multiple complex tasks, namely driving safely, visually inspecting the trees and recording the findings. Drive by surveys would be an acceptable preliminary approach if there was a driver and an inspector working together. Furthermore, if this is the method still used and dying or diseased trees are felled immediately, photographs 3 and 4 prove this is not actually the case. In these photographs, there is clearly a dead stem from the subject tree visible in both visits from the road. It is dead and has been there for at least a year so it has not been removed immediately. I noted other dead trees along he same hedgerow during my most recent visit, which adds further weight that these trees are not being removed immediately.

3.4.3 **Observations of the highway authority's roadside tree inspection regime:** Mynors' set out an analysis of the law regarding duty of care relating to highway authorities and the issues around reasonable inspection (Appendix 4). In this location, on both of my visits I noted many dead elms along the roadside within a 400m stretch of highway adjacent to the subject tree but on the opposite side of the road. Photographs 17 and 18 show the same trees all dead at the time of my first visit and still there now over a year later. Photographs 19, 20 and 21 show other, similar trees that have been dead for years. They are all large enough to be a high hazard and within 3m of the highway verge, so represent a high risk. From my observations and the evidence in the OCA report at section 3.2.2, Somerset County Council did not have and still does not have an effective inspection regime for the highway trees in this vicinity.

3.4.4 **Observations of the landowner's roadside tree inspection regime:** Mynors' set out an analysis of the law regarding duty of care relating to landowners and the issues around reasonable inspection (Appendix 4). On the same side of the road as the subject tree, on land owned by the Defendant, tree 19 (photos 9, 10, 11 and 12) is obviously declining and severely leaning over the road. A close inspection revealed severe trunk decay at the base of the leaning stem, which I believe has been present for many years. Despite the multiple stem indicator of potential weak unions and its obvious declining health, this high hazard and high risk tree has not had any management to reduce the risk. From my observations, the Mells Estate did not have and still do not have an effective inspection regime for the highway trees in this vicinity.

3.5 **Conclusions:** In the context of all the above discussions, I summarise my conclusions as follows:-

1. The tree failed because of the included bark union that was further weakened by a fungal infection.
2. The multiple stemmed form of the tree in the context of the hedgerow would have alerted a competent tree inspector of the potential for the included bark union.
3. Mr Rowe's tree hazard inspection was not competent because it was based on tree health indicators and was not carried out in reliable or effective manner.
4. The multiple stemmed form of the tree should have triggered a more detailed inspection that would have easily identified both the included bark union and the fungal infection.
5. Appropriate remedial works would have prevented the accident.
6. The failure of the tree was reasonably foreseeable because it was large, it was close to the road and there was an obvious visual indicator of a potential defect.
7. This accident would not have happened if the Mells Estate and Somerset County Council had competent tree hazard inspection procedures in place.

PP

Jeremy Barrell **BSc FArborA CBiol MIBiol DipArb FICFor**

17 July 2005

Appendix 1

Qualifications and experience of
Jeremy Barrell **BSc FArborA DipArb CBiol MIBiol FICFor**

1 **Formal qualifications:** I hold the Degree of Bachelor of Science with Honours in Environmental Forestry. I am a Fellow of the Institute of Chartered Foresters and a Arboricultural Association (AA). I was an AA Approved Contractor from 1984–1995. I am also a Chartered Biologist. I hold the Royal Forestry Society's Professional Diploma in Arboriculture, which is the premier qualification within the Arboricultural Profession. I am a Law Society 'Checked' expert witness and a founding member of the Institute of Expert Witnesses. I was honoured with the 2001 AA Award in recognition for services to Arboriculture.

2 **Background and experience in the tree industry:** I was brought up in the New Forest and have been closely associated with trees all my life. In 1978, I joined the Forestry Commission as a Field Surveyor and in 1980, I began my tree contracting business. Since then, I have been providing a comprehensive tree consultancy and contracting service dealing with all aspects of tree and woodland management. This involved working for 15 years on a daily basis felling and pruning trees along with my employees. In 1993, I obtained the NPTC FTC Units 20, 21 and 22 for using a chainsaw on the ground and in a tree. In 1995, I sold my contracting business and concentrated solely on consultancy, forming my present Practice, the Barrell Tree Consultancy. Additionally, since 1990, I have been growing Christmas trees in France on a commercial scale, which has kept me in touch with the practicalities of managing trees.

3 **Professional experience:** I have been dealing with the assessment of tree hazard and managing trees close to occupied areas throughout my career. Between 1993 and 1996, I was one of eight DoE tree preservation order appeal inspectors subcontracted to carry out site inspections and report to the Secretary of State. This involved impartially assessing a whole range of tree safety issues. During my career, I have been involved in many legal cases as an expert witness, from Magistrates Courts to the High Court. More recently, specific projects I have worked on include advising on insurance claims at Disneyland Paris, tree retention on a 550 luxury mansion development in Vichy and street tree management issues for the City of Plantation in Florida. All these involved tree inspections and the management of hazard. Additionally, our company regularly advise large landowners including councils and private estates in the UK on tree hazard inspections. I regularly act as an expert witness in personal injury cases because of my extensive practical background within the tree industry and profession.

4 **Continuing professional development:** Most of my time is now spent as an arboricultural consultant. I regularly lecture all over the world and have written numerous papers on tree care. I am internationally recognised as a leading authority on managing trees on development sites and authored both the SULE and TreeAZ methods of assessing trees. Additionally, in conjunction with the AA, I conceived, wrote and presented the first ever course on report writing for arboriculturists and foresters. I am an occasional examiner for the RFS Professional Diploma and an assessor for the ICF chartered entrance test. This year I will be speaking at the International Society of Arboriculture's conference in Nashville and presenting two report writing workshops in New Zealand. A summary of papers I have written, events I have attended and presentations that I have given are listed in the tables below:-

Appendix 1

Qualifications and experience of
Jeremy Barrell **BSc FArborA DipArb CBiol MIBiol FICFor**

Table 1: Presentations given at conferences, seminars and workshops

Date	Event	Paper content
9/11/05	Report Writing Workshop, New Zealand (Booked)	Report writing
7/11/05	Report Writing Workshop, New Zealand (Booked)	Report writing
8/08/05	ISA International Conference, Tennessee (Booked)	The psychology of writing
17/05/05	AA Report Writing Workshop	Report writing
5/11/04	New Zealand National Conference, Queenstown	The psychology of writing
3/11/04	Trees on development sites workshop in New Zealand	Development sites
22/04/04	AA Report Writing Workshop	Report writing
29/11/03	New Zealand National Conference, Tauranga	TreeAZ
5/08/03	ISA International Conference, Montreal	TreeAZ
21/05/03	AA Midland Branch Seminar	Tree issues
14/11/02	AA Report Writing Workshop	Report writing
6/11/02	Merrist Wood College PDA Course	TreeAZ
9/10/02	Midland Tree Officers Association	TreeAZ
17/09/02	AA Conference at Cambridge	TreeAZ
18/04/02	AA Strategic Tree management Seminar	BS5837 Update TPOs & SULE
12/03/02	AA Report Writing Workshop	Report writing
19–20/04/01	NAAA Conference in Sydney	Report writing SULE SULE practical workshops
18/09/00	AA Conference at Exeter	Report writing
17/11/99	AA Report Writing Workshop	Report writing
22/10/99	Gaydon AA Seminar on Risk Management	Risk Management
29/09/99	Canterbury AA Seminar on Subsidence	Report writing for subsidence reporting
30/04/99	AA Report Writing Workshop	Report writing
25/03/99	AA Report Writing Workshop	Report writing
8/01/99	AA Report Writing Workshop	Report writing
27/01/98	AMIUG seminar on report writing	Report writing for mortgage reporting
2–21/04/98	Study Tour of NZ and Australia to present two workshops, one on report writing and one on climbing techniques in each country	Report writing & climbing techniques and participating in skills competitions
16/06/98	AA Seminar on Tree Assessment	SULE
20/11/98	AA Report Writing Workshop	Report writing
16/10/97	ISA AGM speaking on report writing	Report writing
09/96	ISA Hilton Head Conference (USA)	SULE
31/05/96	Morton Arboretum Conference (USA)	SULE
9/07/96	Presenting at OCA SPG Course in Reading	Managing trees on development sites
26/09/95	2nd European Congress in Versailles (France)	Diagnosis of tree defects
17/05/95	Surveyors talk at Romsey	Trees and subsidence
7/02/95	SULE talk at Bury St Edmunds	SULE
11/02/94	Talk on trees to residents association in Poole	Tree management
13/07/93	LTOA SULE talk	SULE
6/07/93	SULE talk at S. Wales AA Branch	SULE
23/06/93	ISVA/RICS Southampton	Trees and subsidence
10/06/93	RTPI Chorley	Managing trees on development sites
05/93	1st European Congress in Llanstein (Germany)	Tree management in the UK

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Qualifications and experience of

Jeremy Barrell **BSc FArborA DipArb CBiol MIBiol FICFor**

Table 2: Technical papers either published or awaiting publication

Date	Paper
2005	*A vision for Arboriculture* Article in essentialARB Issue 15
2004	*The British Sub-Standard 5837: is it too late?* Article in NATO Newsletter
2004	*The British Sub-Standard 5837: where did it all go wrong?* Article in essentialARB Issue 13
2004	*Fastigiate trees: fools gold or a winning strategy?* Article in essentialARB Issue 13
2004	*Trees and light; Arboriculture emerging from the shadows!* Article in essentialARB Issue 12.
2004	*Keeping trees on development sites: is it possible?* Article in essentialARB Issue 11.
2003	*TreeAZ: An international framework for tree assessment.* Article in essentialARB Issue 10.
2003	*Planning ahead.* Article in essentialARB Issue 9.
2003	*Tree assessment on development sites: The future of the Profession in the balance.* Article in essentialARB Issue 8.
2002	*Axeman to expert witness - is it possible?* Article in essentialARB Issue 6.
2002	*Taking the Profession forward.* Article in essentialARB Issue 5.
2001	*SULE: Its use and status into the New Millennium.* Paper presented to the NAAA Conference in Sydney in April 2001 awaiting publication.
2000	*Streamlining tree related subsidence claims management: the tree perspective.* The Loss Adjuster, Manfield House, 1 Southampton Street, London WC2R 0LR.
2000	Awaiting publication after peer review: *Quality Control in Report Writing and its Implications for the Arboricultural Profession.*
1998	*Increase profits; take trees seriously.* Construction South magazine
1998	*Writing professional reports; a workshop manual.* Workshop Manual supporting the report writing workshop.
1996	*Pre-development tree assessment.* Proceedings of the International Conference on Trees & Building Sites in Chicago, 143–155. International Society of Arboriculture, Champaign, IL.
1995	*The Methodology employed to assess the condition of three trees within the grounds of the Palace of Versailles.* Presented jointly by Dr David Lonsdale, John Dolwin and Jeremy Barrell and published in the Proceedings of the second European ISA Conference in Versailles, France. International Society of Arboriculture, Champaign, IL.
1994	*Innovations in practical arboriculture.* Proceedings of the Swansea AA Conference. AA, Ampfield House, Romsey, Hants.
1993	*Arboriculture in the UK.* Proceedings of the First European ISA Conference in Llanstein, Germany. International Society of Arboriculture, Champaign, IL.
1993	*Pre-planning Tree Surveys: SULE is the Natural Progression.* Arboricultural Journal 17, 33–46

Table 3: Seminars, courses and workshops attended

Date	Event summary
12/05/05	Basic tree climbing and aerial rescue update training
2/03/05	RICS Expert witness course in Birmingham
28/02/05	ICF/RICS merger meeting at FC, Alice Holt
9–11/07/04	Tree hazard assessment
20/04/04	BRE training day on daylight issues
28/11/03	The Expert Witness Conference 2003
29–31/10/03	New Zealand National Conference, Tauranga
17–18/10/03	Successful Expert Practice by Society of Expert Witnesses
15–17/09/03	AA Conference at Northampton
4–6/08/03	ISA Conference, Montreal
14/04/03	CTLA seminar on tree valuation by Scott Cullen in York
14/01/03	Sun Alliance TreeRAT seminar in London
16–18/09/02	AA Conference at Cambridge
29/08/02	Kew Gardens visit to inspect mycorrhizae treatments

Appendix 1

Qualifications and experience of

Jeremy Barrell **BSc FArborA DipArb CBiol MIBiol FICFor**

Date	Event summary
3/07/02	Cooper-Clarke special surfacing
23/04/02	BRE training day on daylight issues
9/10/01	RICS Expert Witness Course in London
19/09/01	TRA shading and daylight seminar in London
10–12/09/01	AA Conference at Lancaster
9/05/01	Arboriculture in planning: a tree centred approach workshop
29/03/01	Amenity valuation of trees workshop by Rodney Helliwell
14/03/01	NATO special surfaces: Installation of hard surfaces under trees workshop
18–20/09/00	AA Conference at Exeter
10/05/00	NATO subsidence seminar in Chester
24/05/00	BCTGA meeting in Oxford
12/02/00	PHC Seminar Ruislip
14/05/99	BCTGA meeting in Torbay
26/05/99	Kew Seminar on mycorrhizae
24/06/99	Visit to Alba Trees in Scotland
19/07/99	Christmas tree pest and diseases meeting in France
6–8/09/99	AA Conference
29/09/99	Attending Canterbury AA Seminar on Subsidence and presenting paper
22/10/99	Attending Gaydon AA Seminar on Risk Management and presenting paper
27/10/99	ICF meeting at Bath
8/01/98	ISA Conference meeting
2–21/04/98	Study Tour of NZ and Australia to take in Kauri and Eucalyptus Forests and present two workshops, one on report writing and one on climbing techniques in each country
11/05/98	Subsidence seminar in London
5/06/98	EWI Course of Basic Law
16/06/98	AA Seminar on Tree Assessment and presenting paper on SULE
1–4/08/98	ISA Conference in Birmingham and ISA World Tree Climbing Championships
23/10/98	BPRO How to be a Confident Trainer Seminar
24/02/97	Report writing seminar in London with Academy of Experts
29/04/97	LTOA meeting in London
15/05/97	BCTGA meeting in Worcester
29/05/97	AA Midlands Branch subsidence seminar
3/07/97	Pryor Seminars Business Writing Course in Guildford
1–6/07/97	ISA World Tree Climbing Championships and Conference in USA
20/08/97	BPRO seminar on Confident Presenting
8–10/09/97	AA Conference at Exeter
16/10/97	ISA AGM speaking on report writing
22/10/97	Report Caveat seminar in Leicester by Tree Life
7/11/97	EWI Conference
20/11/97	British Geological Survey course by Tree Life
21/11/97	BPRO workshop on Business Grammar
28/02/96	AA Commercial Committee meeting
21/05/96	OCA Mortgage report writing course
23/05/96	DoE meeting to review David Lonsdale's book
29/05/96	Wrote comments on David Lonsdale's book
13/06/96	BCTGA meeting in Kent
9/07/96	Presenting at OCA SPG Course in Reading
6/08/96	LTOA meeting on mortgage reports at Kensington
10–12/09/96	AA Conference at Exeter and Skills Competition
2/10/96	ISA expert witness seminar at Birmingham
8/11/96	EWI Conference in London
18/11/96	Shigo talk in Birmingham
20/11/96	Shigo talk in Birmingham
22/11/96	Shigo talk in Birmingham
25/01/95	AA Merrist Wood evening talk on BS 3998 Revision
7/02/95	SULE talk at Bury St Edmunds + attending rest of meeting

Appendix 1

Qualifications and experience of

Jeremy Barrell **BSc FArborA DipArb CBiol MIBiol FICFor**

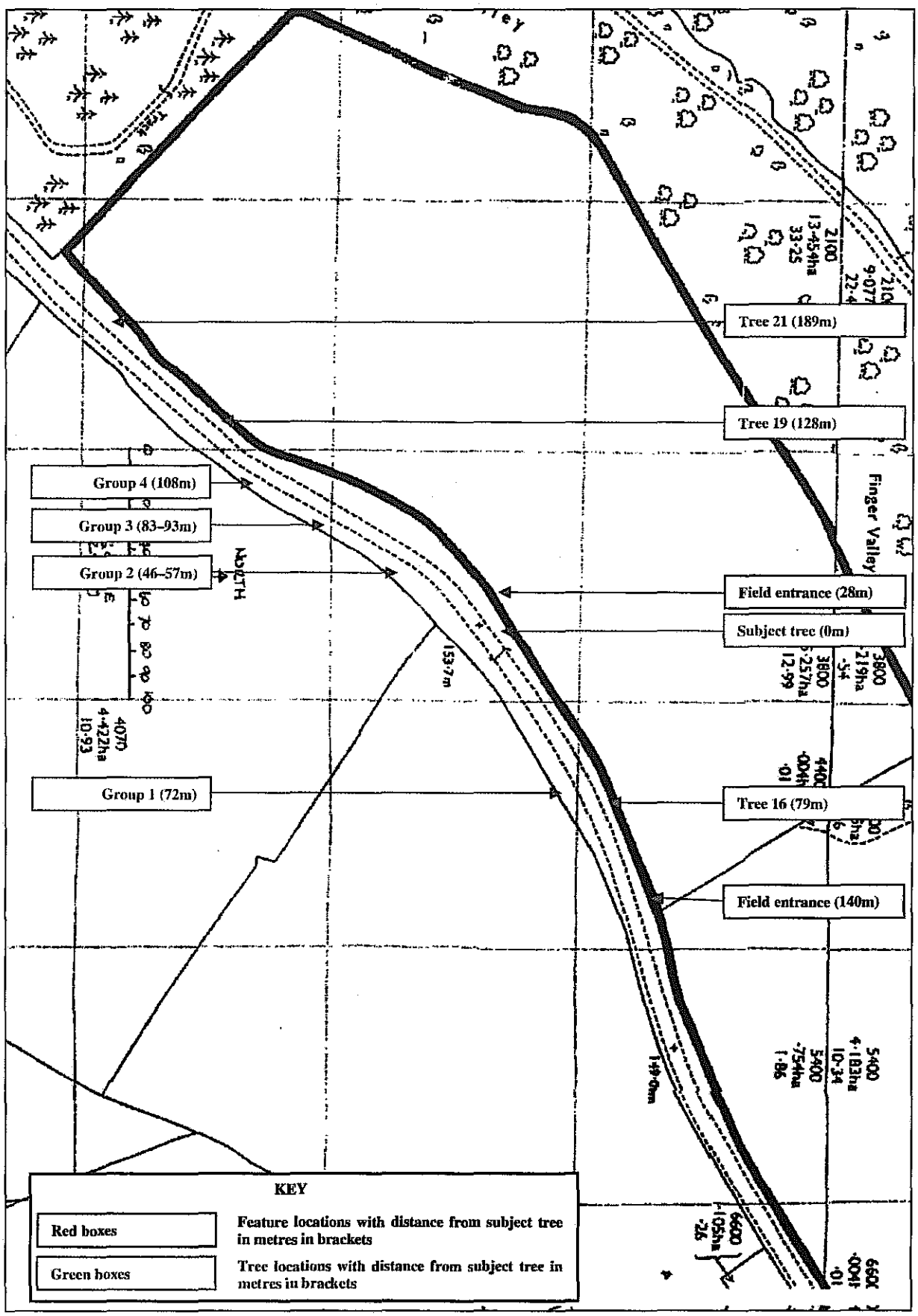
Date	Event summary
19/05/95	BPRO Proof Reading Course in London
27/05–4/06/95	Attending 3 day Conference on tree roots and Buildings at the Morton Arboretum, Chicago
12/06/95	Versailles carrying out field investigations for talk in September
10–19/8	Attending 3 day ISA Conference
31/05	Giving talk at Conference and preparation before to submit paper
4–7/09/95	AA Conference at Lancaster including meetings
27–30/09/95	Attending 3 day ISA European Conference
19/01/94	AA Review Group meeting
21/01/94	FASTCo meeting at Merrist Wood
2/02/94	AA SE Branch discussion panel at Merrist Wood
11/02/94	Talk on trees to residents association in Poole including preparation
24/02/94	AA Planning Seminar at BIC
16/04/94	ISA AGM and technical seminar on certification
9/05/94	ISA Mattheck workshop at Hillier Arboretum
27/05/94	French technical seminar at Montpellier
28/05/94	Shigo presentation and technical discussions at Montpellier
6–8/09/94	AA Conference
25/06/93	BCTGA Meeting at Yattendon
7–9/09/93	AA Conference
30/09/93	DoE training day for writing reports
8/10/93	ISA Tree Hazard Evaluation Workshop at Southampton
15–17/11/93	Chainsaw certification
19/11/92	Helliwell Amenity Valuation Workshop

Appendix 2
Expert Declaration

1 I understand that my overriding duty is to the court, both in preparing reports and in giving oral evidence.
2 I have set out in my report what I understand from those instructing me to be the questions in respect of which my opinions as an expert are required.
3 I have done my best to be accurate and complete in preparing this report. I have mentioned all matters that I regard as relevant to the opinions I have expressed.
4 I have drawn to the attention of the court all matters of which I am aware that might adversely affect my opinion.
5 Wherever I have no personal knowledge, I have indicated the source of factual information.
6 I have not included anything in this report that has been suggested to me by anyone, including the lawyers instructing me, without forming my own independent view on the matter.
7 Where, in my view, there is a range of reasonable opinion, I have indicated the extent of that range in the report.
8 At the time of signing the report I consider it to be complete and accurate. I will notify those instructing me if, for any reason, I subsequently consider that the report requires any correction or qualification.
9 I understand that this report will be the evidence that I will give under oath, subject to any correction or qualification I may make before swearing to its veracity.
10 I have included in this report a summary of my instructions. I believe that the facts I have stated in this report are true and that the opinions I have expressed are correct.

Jeremy Barrell
17 July 2005

Appendix 3
OS plan extract showing approximate location of features



has voluntarily accepted the risk.[27] It would, after all, be absurd if a landowner, either a business, a public authority or a private person, could, for example, simply erect a notice on the boundary of his property stating that members of the public walking or driving on the adjacent highway did so entirely at their own risk.

Notices are also considered further below, in the context of possible remedial action.[28]

5.5 The nature and location of the tree

5.5.1 The nature of the tree

The nature of the tree itself is clearly relevant to any consideration of whether reasonable care has been taken to ensure that it does not lead to the land on which it is growing being unreasonably dangerous. Some trees, that is, are clearly more dangerous than others. The problem is that defects in trees are not always readily discoverable: they are the result of "a secret and unobservable operation of nature".[29]

The first consideration will be whether all or some of the tree is likely to fall. This will depend on its age and species, but more importantly on its condition. A tree that is apparently free from serious defects may suddenly shed a branch, or blow over altogether in a severe storm,[30] but that is a risk that cannot reasonably be predicted, and any harm thereby caused will, by definition, be unforeseeable, and thus will not render its owner liable in negligence. What is required is to consider the risks that are apparent, or which could become apparent with reasonable care; and these will largely relate to discernible defects such as fungal infection and malformation. Thus trees may develop defects for a wide variety of reasons. This may be as a result of pruning (considered in more detail below). But it may be due to natural causes, such as branches breaking in storms and leading to decay; or unbalanced crowns; weak forks; or through disease or pests.

There have, for example, been a number of cases in which the courts have decided that the failure of the tree in question was caused by a defect of some kind, which would have been discoverable on a proper inspection: a hole in the elm tree in *Kent v Marquis of Bristol*,[31] the decay in the branch of the chestnut which fell onto the road in *Lane v Tredegar Estate Trustees*,[32] the decay causing die-back and thinness of foliage which caused a large section of a beech tree to fall across a road in *Quinn v Scott*,[33] and the decay which caused an elm to shed a branch onto a parked car in *Thomas v Miller*.[34]

Trees that are dying or dead, as opposed to merely diseased or otherwise defective, may also be dangerous – as with the old and partly dead horse-chestnut

[27] 1977 Act, s. 2(3).
[28] See 5.8.2.
[29] *Noble v Harrison* [1926] 2 K.B. 332 per Wright J. at p. 341; *cf. Wringe v Cohen* [1940] 1 K.B. 229, CA, per Atkinson J. at p. 233.
[30] *Bruce v Caulfield* (1918) 34 T.L.R. 204, CA.
[31] (1940), unreported, noted in the *Quarterly Journal of Forestry*, January 1947; see 5.3.2.
[32] (1954) E.G., 27 November, 1954.
[33] [1964] 1 W.L.R. 1004.

tree in *Brown v Harrison*,[35] and the beech tree in *Shirvell v Hackwood Estates*[36] that was dead from 5 metres above the ground to its top.

And of course each tree must be considered individually. It is no use saying that old trees, or trees of a particular species, are statistically more likely to be defective; that may well be true as a generality, and may suggest that inspections should be carried out more frequently, but what matters is the particular tree in question. Conversely a young tree of a species that is generally problem-free may be seriously defective, perhaps because of an earlier pruning wound,[37] or a blow by a vehicle.

It may incidentally be noted that judges, particularly in the past, were prone to make unsupported statements about trees, which may or may not have been justified. So, for example, the comment of Lord Goddard C.J.[38] that "elms are notoriously treacherous trees" appears not to have been based on any evidence; and the statement by MacKinnon L.J.[39] that "the fear of branches falling from a beech is nothing like as great as that of their falling from an elm" was based on his knowledge "as one who lives in the country".

Once a fall has occurred, that may suggest that the tree had been defective, and thus dangerous, before it fell; but that does not of itself prove that reasonable care had not been taken to see that visitors were safe, since the defect may have been invisible. A tree may thus be apparently safe from all outward evidence, but actually defective inside, so that even a slight breath of wind will cause it to fall – it is therefore dangerous before it falls, even though no one could tell that until after the fall has occurred.

Thus in *Noble v Harrison*, which concerned a beech tree, it was found that the branch that fell had at some time developed a crack at the place about 4.5 m from the trunk where it broke off, but that the defect would not have been observable by any reasonably careful inspection.[40] In *Cunliffe v Bankes*,[41] the cause of the elm tree falling was honey fungus at the base of the trunk, which would probably not have been detected by inspection; in *White v Carruthers*,[42] it was elm heart rot – also undetectable.

In *Caminer v Northern & London Investment Trust*,[43] the situation was slightly more complex, in that it was subsequently discovered that the roots of the tree that had fallen were badly affected by elm butt rot, but it was held both at first instance and in the House of Lords that there was nothing in the appearance of the tree to indicate that it was in any way diseased; nor would an expert have discovered it. That case therefore turned on what was described as a "broader and more general" issue:

> "In the case of an apparently healthy elm tree, which was of obviously mature age although by no means old, ought its owners either to have had it lopped and topped or should they at any rate have called in an expert to advise them as to its treatment, and was this course the more imperative in the case of a tree standing near a public and well-used road? The answer

[35] (1947) E.G., June 28, 1947, CA.
[36] [1938] 2 All E.R. 1, CA, see 5.7.2.
[37] See 5.5.2.
[38] In *Caminer v Northern and London Investment Trust* [1949] 2 K.B. 66 (at first instance).
[39] In *Shirvell v Hackwood Estates* [1938] 2 All E.R. 1, CA, at p. 9.
[40] [1926] 2 K.B. 332 at p. 339.
[41] [1945] 1 All E.R. 459.
[42] (1958) 172 E.G. 229.

in this particular case is somewhat complicated by the controversy as to whether the crown was a very large one or not."[44]

That is, the problem was not the disease which in fact existed, but which was unknown and unknowable, but simply the size and age of the apparently healthy tree. Lord Normand summarised the matter as follows:

"The Court of Appeal applied . . . the proper test – the conduct to be expected of a prudent and reasonable landowner – and held on the evidence that the [owner] had satisfied this test because there was nothing dangerous in the appearance of the tree, no sign of disease, advanced age, disproportion of crown to stem, or rising roots."[45]

That provides a useful checklist, although it may not be complete. Particular species may be prone to particular problems which will suggest that other features should be looked for. The expert retained by the Council in *Chapman v Barking and Dagenham LBC*,[46] for example, suggested that a more thorough inspection of an elm would be justified in the event of features such as fruiting bodies, decay, weak forks, or crossed or broken branches.

The same position occurred in *Knight v Hext*,[47] in that after the beech tree had fallen, it was discovered that it had been subject to butt rot; but, as in *Caminer*, that could not have been discovered by external inspection, and the question was again whether the top heavy crown would or should have led an expert to recommend that the tree be either topped or felled.

The matters mentioned above largely relate to abnormal growth, or disease, decay or death of the tree. The remaining factors under this heading are simply evidence of a tree behaving in a way that is entirely normal, but which could in certain circumstances be dangerous to people – such as having poisonous fruit, or thorns at eye level, or dropping branches, twigs, cones, leaves and berries.

All of these features – abnormal (such as disease) or normal (such as dropping berries) – do not necessarily in themselves make a tree, and thus the land on which it stands, "dangerous"; but all are potential sources of danger if the tree is in certain locations.[48] They are therefore all matters that should be considered carefully by occupiers. For further information, see texts such as *Principles of Tree Hazard Assessment and Management* by David Lonsdale.[49]

5.5.2 Danger due to works carried out in the past

One particular source of problems is the effect of work having being carried out at some stage in the past. Where a tree is pruned so that a wound is caused which leads to decay, this may some while later lead to a branch falling onto the ground. Or a building may be constructed in such a way as to harm the root system of a tree so that it is much less stable; it may then fall in a subsequent storm.

[44] Per Lord Porter at p. 94.
[45] At p. 99.
[46] [1997] 2 EGLR 141 at p. 145E
[47] [1980] 1 EGLR 111, CA.
[48] See 5.5.3.
[49] 2nd ed., 2001, Stationery Office; part of the Research for Amenity Trees series published by DTLR

The same result may follow from alterations being made to the ground surrounding the base of the tree, as in *Mackie v Dumbartonshire County Council*,[50] where about a year before the accident[51] the Council had widened the road, in the process removing a great deal of the soil which had supported an elm tree growing on a very steep bank at the side of the road. The House of Lords held that the Council was liable "either for the negligence which did not disclose the obvious danger or for the negligence which did not in fact deal with the obvious danger after it had been disclosed".[52]

This type of scenario will not necessarily lead to the tree owner being liable for any consequent damage or harm, provided that he or she was reasonable in entrusting the earlier work to the contractor concerned, and took all reasonable steps to check that the contractor was competent and that the work had been done properly[53] – although the contractor may be liable in negligence.[54] It is thus not appropriate to rely on a tree pruning exercise that was done at some stage in the past by a general contractor with no special expertise.

And it may be that it is not known who did the earlier work, as in *Lambourn v London Brick Co*,[55] where the judge noted that the roots of the tree had been severed, and that this had undoubtedly contributed to its fall; but he also held that this was not an obvious feature of the tree, and there was no evidence as to who had done the work or when.

Or it may be that a trespasser or a vandal harmed the tree in such a way as to leave it unsafe. Once the owner is – or should be – aware of the potential hazard, it should be dealt with. That was the situation in *Sedleigh-Denfield v O'Callaghan*,[56] albeit that that was a claim based on liability in nuisance rather than negligence.

However, there is an important difference between works to trees and those to buildings. Where a building has been constructed or altered, any defect arising from faulty workmanship will not (usually) become any worse with the passage of time; and it may thus be entirely reasonable to justify the fact that a building has collapsed by pointing to faulty workmanship of many years earlier which could not have become apparent on intermediate inspection. Trees, by contrast, grow and decay; the effect of faulty work will therefore change, and possibly increase, with time. Indeed, work carried out perfectly competently may have the effect that some while later the tree develops a structural weakness or other defect.

The law recognises this by, in effect, requiring occupiers to continue to inspect their trees from time to time (how often depends on the circumstances) – and to pay particular attention where past works may have subsequently caused defects. Thus in *Chapman v Barking and Dagenham LBC*,[57] the Court of Appeal confirmed that where works are carried out to a tree such that it is no longer in its natural state there is a special duty to inspect the result. Even if, as claimed by the Council, the earlier pruning works had been carried out in accordance with the relevant British Standard that was applicable at the time, that did not absolve the Council from its duty to continue to inspect the tree. And in the earlier case of

[50] (1927) 91 JP 158; see also *Sheen v Arden* (1945), unreported, noted in the *Journal of the Land Agents' Society*, January, 1946.
[51] See 5.3.2.
[52] Per Viscount Dunedin at p. 159.
[53] Occupiers' Liability Act 1957, s. 2(4)(b).
[54] See 9.5.1.
[55] (1950) E.G., July 28, 1950.
[56] [1940] A.C. 880

Caminer v Northern & London Investment Trust, it was noted that evidence had been given to the effect that lopping a tree may be appropriate, but that it would make it more dangerous in the end, so that it should be inspected "every five or seven years" after the works.[58]

5.5.3 The location of the tree

It has already been noted that none of the features considered above necessarily in themselves make a tree "dangerous". The location is also crucial. A tree that has a decaying branch, or poisonous berries, is not dangerous if it is in the middle of a dense forest to which the public have no access; but an identical tree may be potentially lethal if it is immediately adjacent to the main entrance to a large primary school. The location is not of itself a source of danger – there must be an inherent hazard in the tree – but it is the location that might turn a diseased branch from a low risk of harm into a high risk.

Further, there are features of trees (notably roots, and fallen leaves and berries) which are of themselves not dangerous at all, but which can lead to harm or danger in certain situations. Roots can disrupt the surface of a path, creating a trip hazard; fallen leaves and berries can make playgrounds slippery; either can be a danger to those affected. But there must be a path, or a playground, in a location such that it will be affected.

Amongst the factors that will need to be considered, the number of people likely to frequent the vicinity of the tree will be crucial. The level of care that is required in connection with a tree on a remote mountainside is clearly much less than with one in a public park. There may also be seasonal discrepancies; a part of a park that is normally almost deserted may be used twice each summer for concerts attended by thousands. And as well as people, there may be property involved – notably vehicles (either moving or stationary).

So, for example, trees on or adjacent to land that is used for any public or semi-public purpose (such as roads, schools, parks, railways and cemeteries) need to be the subject of particular care. It is thus no surprise that many of the reported cases relating to the duty laid upon tree owners relate to trees causing harm to users of the highway.[59] This is partly because there are many trees adjacent to highways and because claims involving vehicles are funded by insurers. But it also reflects the fact that there are more people on highways likely to be affected by the failure of a tree; they usually are not aware of its existence, let alone its condition, until after it has failed, and any accident involving a moving vehicle is likely to be serious.

This view was expressed by Lynskey J. in *Lane v Tredegar Estate Trustees*[60]:

"If a bough of a tree was overhanging a highway, there might be an extra degree of care required as compared with the case of a tree in a park to which there was no public access and where, if a bough fell, it might not cause any particular damage."

But not all roads are equally well used. Lord Radcliffe pondered this question in *Caminer*:

[58] [1951] A.C. 88 at p. 108.
[59] See, in particular, 5.3.2.

"It would be conceded, I believe, that there is somehow a difference between the legal responsibilities of the owner of a mature forest tree, in a built-up area, immediately adjacent to a busy street, and the responsibilities of the owner of a stand of timber bordering a country lane. But is the difference only this, that the latter is entitled to take more chances at the expense of his neighbours than the former? I am not certain of the logic, for a tree or its branch only falls once; and it must be poor consolation to an injured passer-by in the country lane to be assured that the chances were all against his being at the place of the accident at the moment when it occurred. The accepted test that liability only begins when there is apparent in the tree a sign of danger has the advantage that it seems to ignore, or to a large extent to ignore, the distinction between a spot that is much, and the spot that is little frequented."[61]

There is also the problem that an accident on a very minor road in the remote countryside, particularly if at night, is likely to remain undiscovered for longer than one on a busy road, and it will take longer for the victims to obtain medical assistance.[62] Any injuries in such a case are likely to be aggravated.

And not all cases involve roads. The other things that are likely to be hit by trees are parked vehicles and buildings – since they cannot see the danger or get out of the way. A residential caravan was thus hit by an elm tree in *White v Carruthers*,[63] and a parked car by a branch of another elm in *Thomas v Miller*[64] – the two cases, by coincidence, were decided twelve years apart in the same county court by the same judge.

Buildings near trees are also high-risk targets in some circumstances. Thus a neighbour's stable was damaged in *Bruce v Caulfield*[65] – as had been predicted by the plaintiff's wife. And in *Knight v Hext*,[66] the plaintiff pointed out to his neighbour that his barn was directly beneath her beech tree, which was leaning in that direction - and which indeed fell in that direction a few days later.[67] The lesson is that it is prudent to ensure that trees are carefully inspected where there is a building, particularly one that is occupied, that would be within range if it were to fall.

5.6 The nature of the potential victims

5.6.1 General principles

The nature of those frequenting the area will require consideration. It has already been noted that the Occupiers' Liability Act 1957 specifically states that amongst the circumstances that must be borne in mind are the degree of care, and of want of care, which would ordinarily be looked for in those who are likely to be visitors to the land on which the tree is growing.[68] And there would seem to be no reason why the same approach should not be adopted in relation to trees affecting those on neighbouring land. So, for example, are they likely to be elderly, adults, older

[61] [1951] A.C. 88 at p. 111.
[62] See, for example, *Cunliffe v Bankes* [1945] 1 All E.R. 459.
[63] (1958) 172 E.G. 229.
[64] (1970), unreported, noted in the *Western Morning News*, February 3, 1970.
[65] (1918) 34 T.L.R. 204, CA.
[66] [1980] 1 EGLR 111, CA.
[67] See 5.7.3.

(c) the risk is one against which, in all the circumstances of the case, he may reasonably be expected to offer the other some protection".[91]

In other words, the occupier is required to offer those other than visitors protection against risks that are known or suspected, but not against those which could only be discovered as a result of unreasonable effort. Once a hazard has been discovered, the occupier's duty is, once again, to take "such care as is reasonable in all the circumstances of the case" to ensure that the potential victim does not suffer injury.[92] The distinction between the two Acts lies thus not in the extent of the duty, but in the circumstances in which it is owed.

The significance of this distinction will not be great in most instances – if a tree is in a location, such as overhanging the path to the front door, where its fall is liable to cause harm to lawful visitors, it must be maintained accordingly (see above); the fact that this may incidentally protect trespassers and others walking up the path is an added bonus. But there may be more remote parts of larger plots of land which would only rarely if ever be frequented by lawful visitors, but which may be occasionally used by trespassers, even if only as a short cut to reach other land. If there is a defective tree in such a location, and it causes harm, any trespasser injured as a result would not be able to claim damages from the occupier of the land unless it could be shown that the occupier knew of the danger.

It follows that trees in locations that are not frequented by "visitors" (within the meaning of the 1957 Act) will require a lower standard of maintenance, except in the case of those which are in fact known (by the occupier) to be dangerous.

5.6.5 Those visiting national parks and the open countryside

The Occupiers' Liability Act 1984[93] applies also in the case of land in national parks which is subject to access agreements enabling the public to wander at will – so that the owner of the land is only required to provide protection against hazards of which he or she is aware.

The 1984 Act does not apply, however, in relation to members of the public exercising a right to roam under the Countryside and Rights of Way Act 2000. Instead, occupiers of "access land" under that Act are explicitly relieved of any duty in respect of any risk arising from the existence of "any natural feature of the landscape"[94] – which is explicitly defined to include "any plant, shrub or tree, of whatever origin".[95]

5.7 Inspection and risk assessment

5.7.1 Introduction

Given that neither the common law nor statute requires an occupier to make his or her land *completely* safe, and given that it is not practical to inspect every tree on the land every day, what then is the occupier to do?

[91] 1984 Act, s. 1(3).
[92] s. 1(4).
[93] See 5.6.4.
[94] 1984 Act, s. 1(6A), inserted by Countryside and Rights of Way Act 2000, s. 13(2).
[95] 1984 Act, s. 1(6B), inserted by 2000 Act, following an amendment introduced in the Lords.

It should be remembered that the duty is (only) "to take reasonable care" or, as it is elaborated in the Occupiers' Liability Acts 1957 and 1984, "such care as in all the circumstances of the case is reasonable . . .".[96] This reflects the classic definition of negligence just over a century earlier in *Blyth v Birmingham Waterworks*[97]:

"[Negligence is] the omission to do something which a reasonable man, guided upon those considerations which ordinarily regulate the conduct of human affairs, would do, or doing something which a prudent and reasonable man would not do."

As to what is reasonable, this will obviously vary with circumstances:

Even if an occupier has no special expertise in matters relating to trees, he or she will still be expected to act as a "reasonable and prudent landowner".[98] That will mean that, in the case of potential dangers such as poisonous berries, thorns, fallen leaves, moss caused by shade, and so on, an occupier should be generally aware of the state of his or her property, and immediately adjacent land, and particularly of those parts most frequented by visitors (such as roads, paths, driveways and patios), and promptly remove any hazard. That is, either the problem branches should be cut back, or the fallen leaves removed, or whatever else is appropriate.

More substantial measures may be required in some cases, including completely felling the tree where there is no alternative, but this will rarely be necessary.

The first step is, in the light of the above considerations, to assess the risk of injury or harm being caused by the tree in question or by any part of it.[99] Where it is justified, an inspection must then be carried out by someone with sufficient knowledge and experience – which may be the owner himself or herself, or an appropriate expert.[1] Once the problem has been properly assessed, it will then be possible to decide whether further action is required.[2]

5.7.2 Assessment of risk

In the light of all the above considerations - the nature of the tree, its location and those likely to be affected by it – it should be possible for the owner to begin to make some assessment of the potential risk presented. It has thus already been noted that not all trees are equally dangerous; some, for example, are more liable to shed branches than others. Perhaps more importantly, hazards arising from trees are more likely to cause harm and danger in locations more frequented by people than elsewhere.

This problem was considered briefly by the House of Lords in *Caminer v Northern & London Investment Trust*, particularly in the thoughtful speech of Lord Radcliffe, quoted above.[3] He was clearly troubled by the whole issue of risk, however, because he revisited the matter later in the same year in his speech in

[96] 1957 Act, s. 2(2); 1984 Act, s. 1(4) is virtually identical.
[97] (1856) 11 Ex. 781, per Alderson B. at p. 784.
[98] *Caminer v Northern & London Investment Trust* [1951] A.C. 88, per Lord Normand at p. 99 (following the Court of Appeal).
[99] See 5.7.2.
[1] See 5.7.3, 5.7.4.
[2] See 5.8.
[3] [1951] A.C. 88 at p. 111; see 5.5.3.

Bolton v Stone[4] – albeit in the context of cricket balls landing on the highway rather than trees (or parts of them) landing on surrounding land. His speech in that case is worth quoting at length:

"If the test whether there has been a breach of duty were to depend merely on the answer to the question whether this accident was a reasonably foreseeable risk, I think that there would have been a breach of duty, for that such an accident might take place some time or other might very reasonably have been present to the minds of the appellants. It was quite foreseeable, and there would have been nothing unreasonable in allowing the imagination to dwell on the possibility of its occurring. But there was only a remote, perhaps I ought to say only very remote, chance of the accident taking place at any particular time, for, if it was to happen, not only had a ball to clear the fence round the ground but it had also to coincide in its arrival with the presence of some person on what does not look like a crowded thoroughfare and actually to strike that person in some way that would cause sensible injury.

"Those being the facts, a breach of duty has taken place if they show the appellants guilty of a failure to take reasonable care to prevent the accident. One may phrase it as 'reasonable care' or 'ordinary care' or 'proper care' – all these phrases are to be found in decisions of authority – but the fact remains that, unless there has been something which a reasonable man would blame as falling beneath the standard of conduct that he would set for himself and require of his neighbour, there has been no breach of legal duty. And here, I think, the respondent's case breaks down. It seems to me that a reasonable man, taking account of the chances against an accident happening, would not have felt himself called upon either to abandon the use of the ground for cricket or to increase the height of his surrounding fences. He would have done what the appellants did: in other words, he would have done nothing. Whether, if the unlikely event of an accident did occur and his play turned to another's hurt, he would have thought it equally proper to offer no more consolation to his victim than the reflection that a social being is not immune from social risks, I do not say, for I do not think that is a consideration which is relevant to legal liability."[5]

Some years later, the House of Lords revisited its earlier decision. Lord Reid (who had been a member of the Judicial Committee in both *Caminer* and *Bolton*) said this:

"The House of Lords [in *Bolton v Stone*] held that the risk was so small that in the circumstances a reasonable man would have been justified in disregarding it and taking no steps to eliminate it.

"But it does not follow that, no matter what the circumstances may be, it is justifiable to neglect a risk of such a small magnitude. A reasonable man would only neglect such a risk if he had some valid reason for doing so, e.g. that it would involve considerable expense to eliminate the risk. He would weigh the risk against the difficulty of eliminating it."[6]

The question is thus not "was the harm foreseeable?" but "was the conduct unreasonable?"

That is clearly relevant to questions of how much care should be taken to avoid harm being caused by trees; and suggests that action need not be taken where the risk is very small. And just as the cricket accident required both the abnormal shot (to provide the missile) and the person passing by at the relevant moment (to provide the target), so the chance of a person being hit by a tree (or by part of it)

[4] [1951] A.C. 850.
[5] Per Lord Radcliffe at p. 868.
[6] *The Wagon Mound (No. 2)* [1967] 1 A.C. 617, per Lord Reid at p. 642E.

may be extremely remote if the tree is unlikely to fall or shed a branch and the number of people passing by is very small – so remote indeed as to not require any precautions to be taken. But that will be a matter for consideration on the facts of each case.

This issue had earlier been considered by the Court of Appeal in *Shirvell v Hackwood Estates*, in which Lord Camrose took possession on February 10 of an estate on which were some 56,000 trees (excluding young plantations), and among them were thousands of dead and dying trees. Mackinnon L.J. considered what landowners exercising reasonable care would do in those circumstances:

"I think that they would resort to expert advice as to how to deal with these neglected woods, and that, perhaps without waiting for that, they would put on men to cut down the most obviously dead and dangerous trees. The latter would obviously be properly done where such trees were near thoroughfares or footpaths."[7]

As ill luck would have it, the tree that actually caused the death of the workman (on May 30) fell onto an arable field, where there was no footpath, and it was one of the last places where anyone might expect to be working; the deceased and his colleague were probably "the only beings who had been within range of the tree for a year". The court accordingly held that the Estate was not negligent in failing to get round to dealing with that tree before it fell.

Of course this level of analysis is not appropriate in every instance; in some cases it is patently obvious that people are at risk from a tree. This may occur because of the normal state of affairs – such as a bush that has thorns at head height – or as the result of an abnormal event – where, for example, large quantities of leaves have fallen over a weekend onto a much-used path, or a storm has left a branch only loosely attached to the remainder of a tree, overhanging a car park. In each case, the risk is clear; and in the last two, at least, so is the remedy.

Equally, in other cases, it may be wholly unnecessary to take any action, because the risk is so small – as where claims were brought by a gas fitter who had injured his knee on a needle hidden in a carpet,[8] and by a child who fell over a banister at a school[9]; in each case the court considered that the risk had been insignificant, and dismissed the claim. So too with trees that have very recently been inspected, or that are in very remote locations; in either case, there could be a theoretical risk of harm occurring, but the risk is insignificant and does not justify action of any kind.

But in other cases, it will be necessary to consider a range of possible remedies.

5.7.3 The need for an inspection

The first duty of the owner of trees is clearly to inspect them at appropriate intervals. Indeed, it is probably prudent to inspect trees on first acquiring a new property, and to ascertain at that stage how frequently and how thoroughly they should be inspected thereafter.

But there are limits on what must be done immediately. In *Knight v Hext*,[10] the defendant had bought a property, and had moved in on December 12. Her

[7] [1938] 2 All E.R. 1, CA, at p. 9H
[8] *Fryer v Pearson, The Times*, April 4, 2000, CA.
[9] *Gough v Upshire Primary School*, February 2, 2000, Q.B.D., unreported.
[10] [1980] 1 EGLR 111, CA.

husband went into hospital on December 14. She was warned by a neighbour of the dangerous state of one of her trees, overhanging his barn, on Saturday December 16. There were then five working days before Christmas; but she had not arranged for the tree to be inspected by the time it fell, on December 27. The Court of Appeal, reversing the decision of the judge at first instance, held that all that was required of her was that, within a reasonable time, she should go and make an inspection; and, in all the circumstances, a failure to do so before Christmas was not unreasonable. See also the analysis by the Court of Appeal in the earlier case of *Shirvell v Hackwood Estates*.[11]

A failure to inspect at all will usually be a powerful indication of negligence. In *Brown v Harrison*, for instance, the owner had failed to notice a partly dead horse chestnut tree in a spinney. The Court of Appeal approved the formulation of the test by the judge at first instance:

"Having regard in each particular case to the circumstances of the particular case, if there is a danger which is apparent not only to the expert but to the ordinary layman, which the ordinary layman can see with his own eyes, if he chooses to use them, and he fails to do so, with the result that injury is inflicted . . ., the owner is responsible because, in the management of his property he has not acted as a normal, reasonable man should act." [12]

And in *Chapman v Barking & Dagenham LBC*, there was a clear failure to inspect:

"I am satisfied that, despite all encouragement and advice both from external sources and to some extent from their own officers, the defendant council did not at any relevant time appreciate the distinction between making lists of trees and routine maintenance, as opposed to systematic expert inspection as often as would reasonably be required. I find that no such inspections were ever made, that it was a clear duty on the defendants to make them, and that they have failed in that duty."[13]

In that case, the court also found that an inspection, if it had been made, would have discovered the defect that caused a branch to fall; the failure to inspect was accordingly fatal.

On the other hand, it may be that a tree is suffering from a defect that will not be revealed by inspection. In *Caminer v Northern & London Investment Trust*, the House of Lords considered that the question was whether the owners of the tree in question performed the duty of inspection that a prudent and reasonable owner of such a tree – bearing in mind both its size and age and its proximity to a highway – would have performed. "Plainly they did not." But, continued Lord Normand, "it is no less plain that, if they had, it would have made no difference. The tree was just such a tree as [the expert witness] says the owner might consider safe."[14] In other words, the failure to inspect was negligent, but that negligence had not caused the harm.

The limitations of inspection are highlighted by the fact that, in several of the cases, the tree in question had been inspected, but that inspection had failed to disclose the problem that led to the failure of the tree or part of it shortly

[11] [1938] 2 All E.R. 1, CA; see 5.7.2.
[12] (1947) E.G., June 28, 1947, CA.
[13] [1997] 2 EGLR 141, per Judge Viscount Colville of Culross QC, at p. 145G; upheld in the Court of Appeal (1998) unreported.
[14] [1951] A.C. 88 at p. 103.

afterwards.[15] Thus in *Noble v Harrison*, which concerned a beech tree, it was found that the branch that fell had at some time developed a crack at the place about 4.5 m from the trunk where it broke off, that the tree had actually been the subject of inspection "not long previously", but that the defect would not have been observable by any reasonably careful inspection.[16] And in *Cunliffe v Bankes* the defective tree was on a large estate of some 2,000 hectares, where the agent inspected all the trees every summer, and marked those with signs of disease or decay. In this case, too, the court decided that there was nothing like certainty that any examination in the previous summer would have disclosed that this tree was affected by honey fungus:

"The onus is upon the plaintiff . . . of showing that there was something wrong with the tree of such a kind that the occupier or his agent either knew it or ought to have known it."[17]

Nevertheless, an inspection should be carried out if in any doubt, particularly if the tree in question is close to a highway or other high-risk target. The passing comment of Finnemore J. in *Lambourn v London Brick Co*,[18] that "it was neither the duty nor the practice of an ordinary prudent landowner to make a meticulous examination of individual trees" may be correct as to the normal practice of typical landowners; but it is very doubtful as a statement of the duty in law of the hypothetical "prudent and reasonable landowner". The comment may have arisen from that which immediately followed, to the effect that "there was nothing at all to indicate that the trees were dangerous. They appeared to be sound, of good quality and of comparatively young growth".

The need to carry out a proper inspection is highlighted by the fact that there have been a number of cases in which the courts have decided that the defect that led to the failure of the tree in question would have been discoverable on a proper inspection. In *Brown v Harrison*,[19] the Court of Appeal upheld a decision that a landowner was responsible for the fall of a tree since it was partly dead; the judge at first instance had decided that the evidence showed that the tree was so old that it had become a danger and that that danger should have been apparent to its owners. Proper inspection would also have revealed a hole in the elm tree in *Kent v Marquis of Bristol*,[20] the decay in the branch of the chestnut which fell onto the road in *Lane v Tredegar Estate Trustees*,[21] the decay causing die-back and thinness of foliage that caused a large section of a beech tree to fall across a road in *Quinn v Scott*,[22] and the decay that caused an elm to shed a branch onto a parked car in *Thomas v Miller*.[23]

Useful advice on the inspection of highway trees is given in the Department of the Environment Circulars 52/75 and 90/73.[24]

[15] See 5.5.1.
[16] [1926] 2 K.B. 332 at p. 339.
[17] [1945] 1 All E.R. 459 at p. 464H.
[18] (1950) E.G., July 28, 1950.
[19] (1947) E.G., June 28, 1947, CA.
[20] (1940), unreported, noted in the *Quarterly Journal of Forestry*, January 1947; see 5.3.2.
[21] (1954) E.G., November 27, 1954.
[22] [1964] 1 W.L.R. 1004.
[23] (1970), unreported, noted in the *Western Morning News*, February 3, 1970.
[24] And see Chapter 6.

5.7.4 The nature of an inspection

Of course, it is no good having a tree inspected if the inspection is inadequate or incompetent. But what is "adequate" in this context? Where a Council was aware that land in its ownership was unstable, through no fault of its own, it was held to be liable only to take care to avoid harm that it ought to have seen without further geological investigation.[25] The same would seem to apply to liability for defective trees. A landowner is thus liable for harm caused by a defect in his land that is patent and not merely latent. It is no answer for him to say that he had not observed the defect if a responsible servant had seen it, or should have seen it.

The first consideration, therefore, is to make sure that any investigation is indeed carried out properly. So, for example, it is not enough to rely solely on the advice of a forester who has been in practice for 53 years, who makes no detailed examination of a tree, but who passes under it two or three times a week on his bicycle – as was the case in *Lane v Tredegar Estate Trustees*,[26] where the forester unfortunately failed to spot the decay that caused a branch of the roadside horse-chestnut tree to fall. As the judge put it:

"I think that the condition of those two branches, with their degree of decay, ought to have put the defendants on inquiry. I do not suggest for one moment that they would be called upon to make a branch to branch examination of that tree; but I do think that when one has a tree with heavy branches like that overhanging a highway, if one finds evidence which ought to make one suspicious, then one ought to make a branch to branch examination of those branches which overhang a highway."

In that case, the decay in the branch that actually fell would probably only have been visible from above, on inspection by climbing a ladder. But the same decay also affected a neighbouring branch, in such a way as to be visible from the ground; and that should have put the owner on notice to get a proper examination.

The first key question facing the owner of trees is whether, and if so how often, to call in an expert. After all, in practice most owners of trees, rightly or wrongly, decide themselves whether works should be done, and merely engage the services of an "expert" to carry them out. This was considered by the House of Lords in *Caminer*. Lord Reid phrased the question thus:

"Would a reasonable and careful owner, without expert knowledge but accustomed to dealing with his trees and having a countryman's general knowledge about them, think it necessary to call in an expert to advise him or would he think it sufficient to act at least in the first instance on his own knowledge and judgment?"[27]

Fifty years later, it is not perhaps immediately obvious what would have been the extent of "a countryman's general knowledge of trees" at the time of the Second World War.

But an owner who is not confident as to his or her own expertise should, if in any doubt, find someone at least a bit more knowledgeable (and, just as important, experienced), for advice – partly as to whether to obtain an opinion from a genuine expert. Lord Reid again:

[25] *Holbeck Hall Hotel Ltd v Scarborough BC* [2000] E.G.C.S. 29, CA.
[26] (1954) E.G., November 27, 1954.
[27] *Caminer* [1951] A.C. 88, H.L., at p. 108.

"I think the question is whether a person with general knowledge and experience of trees would or should have advised the respondents that this elm tree, notwithstanding its normal healthy appearance, ought to be lopped or at least that there was such doubt that expert advice should be sought if it was desired to keep the tree untouched."

Note the reference to the need for expert advice, particularly if the intention of the owner is to do nothing – after all, if something is to be done, the person doing the work will at least probably give some advice.

The Court of Appeal had summarised the proper approach as being that of "a reasonable landowner" or "a reasonably careful man".[27a] By the time the case reaches the House of Lords, Lord Normand misquoted this as "a reasonable and prudent landowner". However, he continued:

"The test of the conduct to be expected from a reasonable and prudent landlord sounds more simple than it really is. For it postulates some degree of knowledge on the part of landlords which must necessarily fall short of the knowledge possessed by scientific arboriculturists but which must surely be greater than the ordinary urban observer of trees or even of the countryman not practically concerned with their care."[28]

Clearly not all countrymen, even then, had a general knowledge of trees.

Lord Radcliffe, in the same case, propounded a slightly different test:

"The accepted test that liability only begins when there is apparent in the tree a sign of danger . . . does end by making the standard of the expert the test of liability. Anyone can own a tree: there is no qualifying examination; but to how many people in this country can be credited as much general knowledge as will warn them that a tree's top is unusually large or that it is in fact diseased, dangerously or otherwise?"[29]

On reflection, this seems to be the most logical, although the most onerous, test – litigation of this kind will almost always occur following an "accident" of some kind; and the tree owner must be confident that he or she will then be able to justify fully the works that were done (or not done). The only way to be certain is to employ the services of an expert: if the expert turns out to be incompetent, anyone affected can sue him or her for negligence, but at least the owner is covered.

And even an expert must be looking for the right things. In *Quinn v Scott*,[30] the beech tree in question was owned by the National Trust, who employed a land agent, a forester and seven woodmen. The tree was the subject of a limited inspection; but unfortunately no one looked up and noticed the thinness and die-back of the foliage, which would have caused a reasonable landowner to have the tree cut down at once.

In a relatively recent case, *Chapman v Barking and Dagenham LBC*,[31] there was a dispute between the two expert witnesses as to the level of the inspection required. The expert appearing for the Council (the owner of the tree) had stated that there were no abnormal features justifying such inspection; the tree was not any more of a risk than thousands of other trees. But the judge accepted the view

[27a] [1949] K.B. 64, CA, *per* Tucker L.J. at p. 70 and Singleton L.J. at p. 76.
[28] [1951] A.C. 88, H.L., at pp. 99–100. The references to "landlords" should presumably have been to "landowners".
[29] At p. 111.
[30] [1964] 1 W.L.R. 1004.
[31] [1997] 2 EGLR 141, upheld in CA (1998) unreported.

that the tree would have exhibited features that would have warranted a climbing inspection; and considered that it was unnecessary, as well as impossible, for him to decide whether, and if so how many, other trees in the road would also have deserved such attention. This would seem to place a high duty on those with trees in high-risk locations.

As to what should be covered in any specialist inspection, appropriate technical literature should be consulted. See, in particular, the three manuals published by the Department of the Environment and the Forestry Commission in the series *Research for Amenity Trees*:

- *Diagnosis of Ill-Health in Trees*, by R G Strouts and T G Winter[32];
- *The Body Language of Trees: a Handbook of Failure Analysis*, by C Mattheck and H Breloer[33]; and
- *Principles of Tree Hazard Assessment and Management*, by D Lonsdale.[34]

In all cases, however, it should be borne in mind that professional opinion is by no means unanimous as to the causes of particular types of failure, nor as to the results of particular types of remedial works. Technical evidence should be written and read accordingly, and terms such as "undoubtedly" and "inevitably" viewed with caution.

A tree owner may thus obtain a report by an appropriately qualified and experienced expert stating that inspection indicates that no works need to be carried out to a tree. If the tree in fact falls shortly afterwards, another expert may appear on behalf of the victim stating that he now considers, not least with the benefit of hindsight, that it must have been clear at the time of the owner's inspection that the tree should have been felled. That does not mean that the owner was negligent, since all that a prudent and reasonable landowner can be expected to do is to obtain an expert opinion – not a range of opinions.[35] It may, of course, suggest that the original expert can now be shown to have been negligent, but that is a different issue.[36]

Further, professional knowledge is constantly improving, so that when reading older decisions of the courts, it should be borne in mind that the professional evidence on which the analysis of the court was based may now be discredited in detail – it is the underlying principles that must be discovered, not (necessarily) the practical outworking of those principles.

5.8 Possible remedial measures

5.8.1 Removing the target

Having considered the risk posed by a tree and, if appropriate, had the tree inspected, the next step for the owner is to consider what (if any) remedial action is required.

[32] HMSO, London, second edn, 2000 TSO.
[33] HMSO, London, first edn, 1995.
[34] The Stationery Office, London, second edn, 2001.
[35] *Caminer* [1951] A.C. 88, per Lord Oaksey at p. 104; and see *Quinn v Scott* [1964] 1004 per Glyn-Jones J. at p. 1009C.
[36] See 8.2.1.

If a tree constitutes a hazard, that will usually be in the context of a particular "target". That is, it will be above or next to a road, building, picnic area or whatever. The tree may have grown in that location for many decades, and may have many more ahead; to replace it with a new sapling, either in the same location or elsewhere, will be normally be no kind of substitute.

The first possible remedy, therefore, since it will be impossible to move the tree, may be to move the target.

This will obviously not often be possible, but should be considered in the case of, for example, a greenhouse, a path, or a seating area that might be hit by a tree if it were to fall. Or, in the case of a veteran tree standing in open parkland, it may be possible to allow the grass underneath it to be left alone, thus making the immediate vicinity of the tree less suitable for picnics.

And in some cases it may be possible to prevent (or limit) access to the target zone, through the use of suitable fencing – either a simple rope barrier or a secure fence, depending on the circumstances. This may need to be supplemented with an appropriate notice (see below).

5.8.2 Warning of danger

Another simple (and cheap) way in which to lessen danger is to give warning of it. It is accordingly provided in the Occupiers' Liability Act 1957 that the occupier may be able to rely on the fact that he or she had warned visitors of potential dangers to escape liability, but only where "in all the circumstances [the warning] was enough to enable the visitor to be reasonably safe".[37]

This is not unreasonable; the existence of a warning notice ("Beware: poisonous berries"; or "Warning: these are old trees, and may occasionally shed branches"), or an oral warning on a specific occasion, may be sufficient to enable a visitor to take appropriate avoiding action. Apart from anything else, it may enable the occupier to justify a defence on the basis that the visitor, after receiving the warning, had voluntarily assumed the risk, so that the occupier was no longer liable.[38]

But the fact that a warning has been given is not necessarily sufficient for the occupier to discharge his or her duty of care; someone who keeps a tiger in his garden needs to do more than put up a notice pointing out the danger. Thus no warning was given of the poisonous berries in *Glasgow v Taylor*[39]; but it is arguable that a warning notice would have made no difference. There is similarly no point in erecting a sign to point out that a tree overhanging a path is dangerous, if no alternative route is provided.

On the other hand, a warning may not always be necessary, if the danger is self-evident; a Council in Derbyshire was thus not required to put up a sign warning people not to fall off a cliff[40]; and, perhaps more relevantly, another Council was held not liable for failing to warn people about the danger of slipping on algae at the Cobb at Lyme Regis in Dorset.[41] It is thus presumably not necessary to warn people that holly has sharp leaves, or to highlight the danger of slipping on autumn leaves or fallen fruit; but whether the dangers of climbing on or walking

[37] 1957 Act, s. 1(4)(a).
[38] 1957 Act, s. 2(5); see above.
[39] [1922] A.C. 44, H.L.
[40] *Cotton v Derbyshire Dales DC, The Times*, June 20, 1994
[41] *Staples v West Dorset DC, The Times* (1995) 93 L.G.R. 536.

EXAMINING THE SEAT OF DAMAGE
(see also p.269, Inspecting Trees for Signs of Decay)

Once the probable seat of damage has been deduced from symptoms, that part of the tree must be examined for dead, dying, missing, discoloured or deformed tissues. If these are found, (confirming that this is indeed the probable seat of damage), their character and distribution should be noted, and note made also of any associated features (see Table II, 3 The Problem, (p.13)). If you are unsure what healthy tissue should look like, examine an evidently healthy part of the same tree or a healthy tree of the same species.

Roots and Root Collar

Roots are the most difficult part of the tree to examine and so are often ignored or given cursory attention. However, a systematic examination with a minimum of digging often proves fruitful and, in all cases where symptoms admit of a root problem, should be undertaken.

(i) Start by examining the stem at soil level closely for fungal fruit bodies. These may be small and inconspicuous or very close to the ground and concealed by vegetation; the presence of a known pathogenic species will add much weight to or may suffice to confirm a tentative diagnosis of root disease.

(ii) Especially if no fruit bodies are found, examine the stem base again for dead bark, starting at any exudate or between root buttresses (where dead bark extending up from roots often first appears). It is very often impossible to distinguish dead from live bark from a superficial examination; therefore, at regular intervals around the tree, prise up or cut out with a chisel or knife small pieces of outer bark to check the condition of the inner bark adjacent to the wood (on thin-barked trees, tiny cuts may suffice).

(iii) If dead bark is found, cut further to check for fungal mycelium in and under the bark or in the wood; check the wood for decay; ascertain the extent and configuration of the dead bark.

If no dead bark is found:

(iv) Examine the stem base again, this time a few inches below ground level; include the major visible roots in the examination.

If still no dead bark is found:

(v) Attempt to examine deeper roots. Select four points equally spaced around the stem and a few feet from it. Dig a narrow hole as deep as practicable at each place, working between any sizeable roots and checking the condition of all roots encountered. Note also features of the soil's texture, odour or colour which might indicate an inhospitable rooting environment, such as a raised soil level, chemical contamination or waterlogging.

If no explanation for the damage has been found by now but a root problem still seems to be worth pursuing:

(vi) Further digging may be revealing. Start against the stem, between root buttresses. A stout trowel is usually the most satisfactory implement for this purpose. Then repeat step (v) but a little further away from the stem.

How much more digging can be done depends on the soil type and condition, the number and type of roots and on the time and patience available. At best only a tiny proportion of the root system of a large tree can be examined in this

way so failure to find dead, dying or decayed roots does not rule out the possibility that they are present but inaccessible.

Bark and Cambium of Stem, Branches and Twigs.

(i) Examine the bark proximal to (i.e. below) the wilted or dead parts: it may be missing, roughened, sunken, swollen or cankered. If so, note any exudations or other associated features. Dead bark that has lifted away from the wood beneath will yield and sound hollow if tapped with a mallet.
If the bark appears to be normal:

(ii) Starting just proximal to the affected part, gently prise up or cut out small pieces of outer bark to check the condition of the inner bark. Check the extent and configuration of any dead bark and of any stain in the underlying cambium; check for decay and stain in the wood; note any associated features.
If only healthy bark is found:

(iii) Repeat the process at short intervals up and down the member, starting in the vicinity of the affected part. If still only healthy bark is found, proceed as in the next paragraph.

Water-conducting Wood

Beginning at the distal end of the affected branch and working back towards the tree stem, cut into the wood at intervals of 6 or 12 inches and examine it for stains of the kind described under Verticillium wilt or Dutch elm disease (p.241 and p.113). The stain which is characteristic of such vascular wilt diseases may be present only at the very base of wilted branches, or even only in the stem. If permissible, such examinations are best carried out by cutting the branch back piece by piece with secateurs or saw. The cut ends often need trimming with a clean, sharp knife before examination. Check the cambial area by paring the bark away.

Foliage

Examine shoots, buds (cut through some), stipules, petioles and both sides of leaves for discoloured or necrotic areas; note their character and distribution and any associated features.

SHORT CUTS TO A DIAGNOSIS

Early on in the Diagnostic Flow Chart on p.17, the investigator's attention is drawn to a list of problems characteristic of certain tree species (Table IV, p.18); many steps in the diagnostic process can sometimes be circumvented by comparing the symptoms exhibited with the symptoms described in Section 3 for these characteristic problems. Such short cuts must be used circumspectly as it is easy to jump to wrong conclusions if due consideration is not given to all the circumstances of the case.

IF THE INVESTIGATION FAILS

Do not be surprised if, after all your efforts, you cannot explain the damage. Failure may be because insufficient information is available (often an investigation begins so long after the initial damage that the cause and evidence for it has vanished); or it may be due to the investigator's inexperience or lack of knowledge; or the disorder may not be described in the books to hand; or, rarely, the problem may

8.4 PROCEDURE FOR MECHANICAL TREE ASSESSMENT USING THE VTA METHOD

The evaluation procedure is presented as a flow chart in Fig. 74 and also a field guide in Chapter 14.1 where it forms a recipe that includes all the VTA diagrams needed for defect evaluation. The fundamental first step is the visual assessment, which involves not only mechanical criteria, but also a judgement of the tree's biological state of health, taking into account features such as foliation, bark condition and the presence of any fungal fruit bodies. While the tree is being evaluated for soundness, it is particularly important to look out for possible symptoms of mechanical defects, that is those structural repairs that have been described in earlier examples.

If a reparative symptom is found, the only assumption that can be made in the first instance is that the tree has a defect which it is attempting to counter by means of adaptive growth. *On no account must every tree bearing symptoms be immediately felled!* In the human sphere this would mean dispensing with all medical treatment and the immediate liquidation not only of all who are ill, but also of all those who are recovering. Both are inconceivable.

After identifying a symptom visually, – which the practised defect hunter can in fact occasionally do even from a moving car – the defect can now be evaluated in detail with more refined methods such as sounding with or without electronic aids. In a simple hammer test, decayed areas sound dull, while undamaged areas sound brighter. Cracks or zones of kinked fibres can barely be detected acoustically.

If, for example, a decay cavity has been located by recognising symptoms and/or sounding methods, it is now necessary to determine the thickness of the residual load-bearing wall's cross-section. An initial indication of this can be obtained with minimal injury to the tree by examining the shavings from a narrow drill bit, or with the *'Resistograph'*, which provides information about the mechanical properties of the wood over the stem cross-section. If the results indicate that the thickness of the effective wall is close to the minimum value, it becomes necessary to take increment cores so that the wood strength over the cross-section can be directly measured with the *'Fractometer'*. Although the cutting of increment cores might increase the risk of the extension of decay, it is morally justified in such cases, and is indeed essential to provide information which may help to avoid the unnecessary felling of the tree. To the best of the authors'

Fig 74. Schematic representation of the procedure for evaluating a tree with the VTA system.

between the buttresses or on the surface of exposed dead wood. Before the mature fruit bodies form, asexual fruiting structures, consisting of flat, very thin disc-like structures, up to 5 cm in diameter, can be found, often together with fruit bodies that have matured previously. These are at first bluish-grey with a whitish margin, and later become yellowish-grey and powdery. The mature fruit bodies can persist for several years.

• *Decay*

This fungus can cause a white-rot in the more advanced stages of decay, but recent research has shown that it can persists in a soft-rot mode within much of the decayed zone. By preferentially destroying cellulose, while failing to degrade the most heavily lignified parts of the wood cell walls until a very late stage, *U. deusta* induces a brittle ceramic-like fracture [146]. This can occur in main stems and root systems, since the fungus is exceptional amongst ascomycetes in being able to grow in the central wood of very large trees. Fracture often occurs before an advanced white-rot has developed, so that the fracture surface can be quite hard. The decayed areas have a pale straw or greyish colour, and usually contain irregular fine, black 'zone lines'. As with other fungi that form 'zone lines', the lines are really sheets in three dimensions, and these sheets can be found lining the cavities which form in very advanced regions of decay. A wider irregular reaction zone, unlike the fine internal zone-lines, often marks the boundary between the decayed and sound wood.

The seat of the decay within the tree is usually at the stem base, where in some cases the fungus appears to have entered through a wound. In such cases, it can extend 4 m or more up the stem, as well as into the roots. It can also enter via the roots, eventually causing windthrow.

• *Significance*

This is a particularly dangerous decay fungus, partly because its fruit bodies are often overlooked, also because of its very common occurrence and wide host range, and finally because of the type of decay that it causes. The brittle fracture associated with this decay often occurs with no warning of incipient failure, and without the compensatory thickening of the stem that can occur with fungi which cause selective delignification (e.g. *Ganoderma* spp.). Except in very advanced cases, this decay cannot be detected with a stress-wave timer and may also escape detection by certain kinds of mechanical probe [153].

Chapter 5 Tree inspection procedures and reporting

5.1 A strategy for assessing hazards and risks

Site occupiers or managers need to be aware of their legal liability for damage or personal injury caused by trees under their control. The risk of such damage or injury occurring as a result of tree failure is dependent on the nature and intensity of site usage. To take an obvious example, a tree failure next to a busy highway is much more likely to cause injury than a similar event in a woodland, far away from any roads or paths [e.g. 183, 186]. It is necessary to try to quantify the risk by considering the factors which relate to the potential severity of harm and the probability of its occurrence, as outlined in Chapter 1. (For convenience, people and property at risk are called 'targets' although, strictly speaking, a target is something at which deliberate aim is taken.)

The damage caused to a target in the event of failure in a tree can be total or partial, depending both on the nature of the target and the size and height of the tree or part of tree concerned. On this basis, the potential severity of harm can be predicted within broad categories and must be considered when the overall hazard potential of the tree is assessed. Small twigs are very unlikely to cause harm, whereas an entire tree or a large branch could maim or kill a person or crush a car. Nevertheless, a larger target such as a house would probably sustain only partial damage even from a major impact. Indeed, if a tree falls on to a house it is quite likely to penetrate the roof while causing little if any damage to the walls. The example shown in Plate 126 represents an unusually severe impact.

The probability that a target will be struck as a result of mechanical failure can range from almost nil to very high, depending on the length of time that the target is present within falling range. Stationary targets, such as buildings or parked vehicles, are generally more likely to be struck than moving ones, unless the density of traffic is very great. The quantification of risk is still a matter of some debate, and it is necessary to keep abreast of current thinking. Recent contributions to the debate have been made by Helliwell [71, 72] and Ellison [49].

Unless the risk to targets is negligible, there is a need to identify any tree defects or site conditions that could contribute to major failures. This means that trees must be inspected regularly by persons who are competent in the recognition and evaluation of defects and can identify trees that require

specialised assessment, perhaps using diagnostic devices. The frequency of the inspections is a matter for local decision, according to the characteristics of the tree population and its surroundings. The size, age, past treatment and species of the trees can all affect the time interval over which serious hazards are likely to develop. A high density of people or other 'high-value targets' on a site may also be a factor in deciding to carry out relatively frequent inspections. When there are large old trees on such a site, it is usually considered advisable to inspect them annually and as soon as possible after very severe storms [97].

Some defects can be evaluated on the basis of a visual inspection, whereas others sometimes need more detailed assessment. A reasonable principle is that trees do not generally need to be subjected to detailed assessment unless they are found to require it during the course of visual inspection. Provision for identifying such trees should be stated within the written terms of the visual inspection (see Section 5.4). Another principle which is worth adopting is that a proper assessment of trees and of any associated risks is the correct basis for deciding whether to carry out remedial action. Such action should not be carried out as a substitute for proper assessment.

It should be noted that all the procedures and techniques outlined in this chapter are relevant not only to risk assessment but also to investigations following injury or damage caused by tree failure. In such cases, additional information - for example, evidence of the cause of any fracture of the wood - is likely also to be needed. All parts of the tree and surrounding objects which might provide relevant evidence should be retained until they can be recorded or preserved for future examination, even when a fallen tree has to be cleared away from a highway.

Evidence recorded 'after the event' can also be extremely useful in building up a library of information about the causes of failure in trees. Such information has often been lost or poorly recorded in the past, and there is a need for a systematic approach. Such an approach was adopted in 1987 in California under the California Tree Failure Report Program, and could provide a model for similar schemes elsewhere.

5.1.1 Visual inspection

Most types of hazard can be detected by regular inspection of the tree population for external signs of decay, physical damage, growth-related defects and adverse site conditions. This approach provides a mainstay for hazard management, as it has proven to be a cost-effective means of placing trees into categories for further action. Three main categories can be recognised: (a) trees that currently appear to present no significant hazard, (b) trees showing immediately diagnosable hazards which may require remedial action and (c) trees with suspected defects which require more detailed assessment.

General inspections for visual signs of hazard can be carried out by persons with a general grounding in arboriculture and basic training in hazard

recognition. Trees that they identify as requiring more detailed investigation may require the services of a specialist practitioner. In some cases, however, it is not appropriate to distinguish between general inspection and detailed assessment as separate operations. For example, a specialist practitioner is sometimes called in to look at a specific defect that is suspected by a site owner, and which requires investigation to whatever degree of detail may be appropriate. Equally, the owner or manager might decide to delegate all aspects of a hazard evaluation to the practitioner, rather than to conduct a general inspection beforehand.

Some defects, especially certain forms of decay, do not give rise to external signs and therefore tend to escape detection in a purely visual survey. Basal cavities sometimes escape attention for this reason, and also because of materials piled around the foot of the tree but they can sometimes be detected by means of a sounding mallet during the primary visual inspection. This might be advisable in cases where such cavities have previously been found within a tree population. If there is no such reason for suspecting a hidden defect to occur within a particular part of the tree, there is no reasonable basis for carrying out a detailed internal assessment. Although in theory, an unsuspected defect might be detectable by the use of specialised diagnostic devices, this would be impracticable in the absence of some external sign to indicate the place which should be probed. Also, internal examination without good reason is undesirable, as it usually causes injury to the tree and is unreasonably time-consuming and costly.

Although most types of hazard can in theory be detected through visual inspection from the ground, reasonable care should be taken to examine parts of the tree that may be hard to see due to their height or to obscuring features such as a covering of ivy. Despite the possibility of overlooking defects that cannot be seen from the ground, it is usually considered sufficient to examine high parts of the tree with binoculars, rather to inspect them by climbing or from a hoist. Such measures can generally be justified only if defects requiring close examination are first observed from the ground.

Signs of defect are distinguishable only with reference to the normal appearance of the types of tree concerned, and mistakes may be made by persons who are unfamiliar with those trees. For example, some species such as Douglas fir *(Pseudotsuga menziesii)* develop thick plates of bark in maturity which could be mistaken for signs of bark loosening due to the deformation of the stem. Also, a particular type of defect may be of much less consequence in some species than in others, and it is therefore valuable to be aware of all available information on the 'track record' of failure for the type of tree concerned, including any experience which is relevant to local climate or soil conditions.

Unfortunately, information on the incidence of different modes of failure among various types of tree has not been well documented, and has not yet been shared widely enough. As a preliminary step towards remedying this

situation, Appendix 2 of this book contains a summary of experiences that a small sample of arboriculturists have gained with a range of tree genera.

5.1.2 Detailed assessments

A routine visual inspection is often sufficient for the evaluation of hazards, but it may identify some trees with suspected defects which can be properly evaluated only by means of a more detailed assessment. Such assessments usually involve the use of diagnostic tools and need to be done by persons who have special knowledge and experience. The specialist assessor needs to be familiar not only with all the external signs of defect, but also to have some understanding of the underlying biology and biomechanics. Another important requirement is adequate **professional indemnity insurance.**

A detailed assessment is a **focused and stepwise** procedure which helps to avoid the use of lengthy or invasive tests unless they are necessary. As in the primary visual inspection, the assessor may occasionally need to climb the tree or to use a hoist; the latter may be needed if cumbersome devices have to be used. Also as in the primary inspection, a checklist of possible defects and of other factors contributing to potential hazards helps to ensure that nothing of importance will be missed. Such a list can be incorporated into a recording form of the type designed by Matheny and Clark [101], and reproduced here in Appendix 3. Such a form could be adapted for use on a portable data-logger for computer input. The completed form can help to demonstrate subsequently that the assessment has been carried out systematically, but is not a substitute for more detailed notes that may be needed for the recording of specific defects.

The overall stepwise approach to hazard tree assessment is shown in Fig. 5.1 and the specific procedure for detecting and mapping decay is shown as a more detailed flow-chart in Fig. 5.2.

5.1.3 Systems for quantifying hazard and risk

The setting of arboricultural management priorities can be simplified by using a numerical system to help quantify hazards and the associated risks to persons and property. Quantified risk assessment is a valuable approach, but the use of numerical scores should not be allowed to lend an exaggerated air of objectivity to a procedure that is inherently subjective in many respects. The assessment form mentioned above [101] makes provision for assigning scores to the following factors:

- the severity of each defect (incorporating site factors such as wind exposure)
- the size of the part of the tree that might fail due to the defect
- the nature and intensity of site occupancy by persons or property.

By adding these scores, an overall hazard rating is calculated for each tree. In effect, this rating includes both the hazard presented by the tree and the degree of risk, represented by the probability of damage to one or more 'targets'. A computer-based version of this system (Tree Risk Assessment and Management System) has been developed and is currently being evaluated in Britain. Also, a modification of this approach, for more accurate assessments under British conditions and incorporating a 'ready reckoner' for on-site calculation, has been proposed by Ellison (in press; see Appendix 3).

Figure 5.1 Tree assessment strategy