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Judgment: approved by the Court for handing down | *Delivered:* **15/9/2011**

*(subject to editorial corrections)**

IN THE CROWN COURT IN NORTHERN IRELAND

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BELFAST CROWN COURT

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THE QUEEN

-v-

KAREN WALSH (DNA evidence)

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HART J

[1] Mr Irvine (who appears for the defendant with Mr Johnston) has applied to the court for a ruling under Article 76(1) of the Police and Criminal Evidence (Northern Ireland) Order 1989 that part of the evidence to be given by Miss Woodruff in relation to DNA should be excluded because to admit the evidence would have such an adverse affect on the fairness of the proceedings that the evidence should not be admitted.

[2] The application was made before the case was opened to the jury, and in order to decide this issue I was invited to conduct a voir dire during which I heard the evidence of Miss Woodroffe for the prosecution and the evidence of Professor Dan Krane by way of a live link from the United States for the defence. The application was opposed by Mr McCollum QC (who appears on behalf of the prosecution with Mr McGaughey).

[3] Mr Irvine's application is that because Miss Woodroffe is unable to provide either a match probability, or a subjective evaluation of the statistical probability of her findings, the evidence in relation to the disputed DNA is inconclusive and unreliable, and to admit the evidence would lead the jury into the area of speculation, and would be to invite them to draw conclusions in an area where they had no statistical yardstick to guide them.

[4] No criticism has been made of Miss Woodroffe's analysis or interpretation of the results of the examination of the DNA profiles prepared in Northern Ireland and then submitted to her employers for further examination, the defence objection being to the evidential significance of her findings. It is therefore unnecessary for me to

describe the process of DNA examination in technical detail and I shall attempt to describe the technical nature of her evidence in as simple and non-technical fashion as possible.

[5] Each person has a number of distinct components in their DNA which upon analysis may be capable of identification. Of the defendant's 22 components 2 relate to her gender, but as Mrs Rankin was also female the same components are found in her DNA and so have to be left out of account when comparing their respective DNA.

[6] In addition the defendant's DNA contains a double dose of components inherited from her mother and from her father and these have to be left out of account as well, thereby reducing the number of components that may be compared with those making up Mrs Rankin's DNA to 18. Because Mrs Rankin and the defendant shared a further 7 components these also have to be left out of account. As a result of these characteristics there are only 11 components of the defendant's DNA which are different to those of Mrs Rankin, and so any comparison between the defendant's DNA and that of Mrs Rankin has to be confined to seeing whether some or all of the 11 different components in the defendant's DNA can be identified in any of the DNA samples relied upon in this case, because the presence of the others may be accounted for by their originating from Mrs Rankin and not from the defendant.

[7] I will have occasion to refer to the interpretation of the DNA tests which are not sought to be excluded later. The interpretation of those that are sought to be excluded are as follows:-

(1) Sample 1. Swabs taken from the inner and right left thighs of Mrs Rankin. These were found to contain 5 out of 11 components which could have been contributed by the defendant.

(2) Sample 2. Swabs taken from the left breast of Mrs Rankin. These were found to contain 9 of the 11 components which could have been contributed by the defendant.

(3) Sample 3. Swabs taken from Mrs Rankin's right breast. These were found to contain 10 of the 11 components which could have been contributed by the defendant.

(4) Sample 4. Swabs taken from the back of Mrs Rankin's left hand. Only 2 of the 11 components could have been contributed by the defendant.

(5) Sample 5. Swabs taken from the back of Mrs Rankin's right hand and right arm contained only 1 of the 11 components which could have been contributed by the defendant.

(6) Sample A. The cellular material recovered from a long the hair shafts of hairs the DNA of which matches the profile of Mrs Rankin. 5 of the 11 components from the cellular material could have been contributed by the defendant.

(7) Sample B. Swabs taken from the bottom of the crucifix. These were found to contain 10 of the 11 components which could have been contributed by the defendant.

[8] Miss Woodroffe was careful to explain that in each of the above 7 instances she could only say that the components were identified as components "which could have been contributed" by the defendant. She explained how the samples from which the DNA had been extracted in each of these instances, whilst sufficient to enable the analysis to be carried out, was nevertheless insufficient in quantity to permit any statistical calculation to be carried out that would enable a statistical evaluation to be arrived at such as that she was able to perform in relation to another sample not yet referred to where there is no application to exclude the evidence. This was described as Sample 6 and consisted of swabs taken from Mrs Rankin's chin where all of the defendant's DNA components were detected, and Miss Woodroffe calculated that the probability that this originated from another person unrelated to the defendant is less than 1 in 1,000 million i.e. less than 1 in 1 billion. She went on to explain that in this instance this figure enabled her to express the opinion that this result provides extremely strong scientific support for the proposition that a portion of the DNA tested in relation to the chin swab originated from the defendant rather than another person unrelated to her. She also explained that whilst some were able to provide statistical evaluations of this type from such small samples as were considered in the 7 disputed samples referred to, this was not regarded by her company as providing a sufficient basis for this type of statistical evaluation, which is why her opinion is confined to saying that the components were identified as components "which could have been contributed" by the defendant.

[9] Professor Krane on behalf of the defendant did not take issue with any of the analyses carried out by Miss Woodroffe, but said that in his opinion if it was not possible to proceed to the stage of attributing a statistical evaluation to the results of the analysis then, as he put it in his report:

> "When a proponent of DNA evidence says that they cannot compute such a statistical weight they are effectively saying we cannot tell in an objective, systematic way which profiles are excluded and which are not."

In his evidence he said that if such a statistical weight or fraction as it referred to cannot be arrived at he would regard the result as inconclusive. When Mr McCollum put to him in relation to the swabs taken from the bottom of the crucifix that the defendant could have contributed to that sample of DNA Professor Krane replied:

> "I agree that Mrs Walsh cannot be excluded as a possible contributor to that sample."

I consider that the difference between Miss Woodroffe and Professor Krane as to the evidential significance to be attributed to the results of the DNA tests is one of emphasis and degree.

[10] I now turn to the authorities to which counsel referred. In R v. Bates [2006] EWCA Crim 1395 the submission made on behalf of the appellant at paragraph 27 echoes that made by Mr Irvine in the present case:

> "The primary ground of appeal in this case rests as did the application before the judge on the impossibility of ascribing any statistical value to the potential exculpatory effect of the voids in a partial profile. In the hands of Mr Miskin this ultimately found expression two submissions –
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> (a) That the effect of the decision of this court in Doheny and Adams is that only statistical evidence can properly be placed before the jury in relation to DNA analysis and that in the case of a partial profile the inability to take account of the potential exculpatory effect of voids invalidates any match probability.
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> (b) That to invite the jury to assess for themselves the evidential value of a partial profile having explained to them the potential significance of the voids is to invite them to embark on an exercise which they are ill equipped to undertake because it requires them to weigh up something which is inherently unquantifiable.
>
> He submitted that whether or not the test put forward by the judge in paragraph 14 of his ruling was correct in relation to other kinds of scientific evidence it was not the correct test to apply in the case of DNA analysis"

[11] That submission was rejected by the trial judge and his ruling was upheld by the Court of Appeal as can be seen from paragraph 30 where Lord Justice Moore-Bick said:

> "We consider that the judge's approach to the question was entirely correct. We can see no reason why a partial profile DNA evidence should not be admissible provided that the jury are made aware of its inherent limitations and are given a sufficient explanation to enable them to evaluate it. There may be cases where the match probability in relation to all the samples tested is so great that the judge would consider its probative value to be minimal and decide to exclude the evidence in the exercise of his discretion but this gives rise to no new question of principle and can be left for a decision on a case by case basis. However the fact that there exists in the case of all partial profile evidence the possibility that a missing allele might exculpate the accused altogether does not provide sufficient grounds for rejecting such evidence. In many cases there is a possibility at least in theory that evidence exists which would assist the accused and perhaps even exculpate altogether but that does not provide grounds for excluding relevant evidence that is available and otherwise admissible though it does make it important to ensure that the jury are given sufficient information to enable them to evaluate that evidence properly. Moreover as the court observed in Doheny and Adams at page 373(d) the significance of DNA evidence depends to a large extent upon the other evidence in the case. By itself such evidence, particularly based on a partial profile, may not take the matter far but in conjunction with other evidence it may be of considerable significance."

[12] In R v. T [2010] EWCA Crim 2439 at paragraphs 92 to 94 Lord Justice Thomas confirmed that the fact that there is no reliable statistical basis does not mean that a court cannot admit an evaluative opinion, and pointed out that any such evidence needs to be approached with caution and that cross examination will play an essential role quoting the remarks of Lord Justice Hughes in Atkins and Atkins v. R [2009] EWCA Crim at paragraph 29. Whilst R v. T concerned footwear marks and Atkins and Atkins v. R concerned facial mapping the approach to be adopted as a matter of principle is equally applicable to cases such as the present case. That is clear from the discussion of the relevant principles by Lord Justice Thomas in R v. Reid and Another, R v. Garmston [2009] EWCA Crim 2698 at paragraphs 111 to 113. For present purposes it is only necessary to quote two passages from paragraph 111:

> "It is important to distinguish the issue of the admissibility of expert evidence from the assessment of that evidence by the jury."

And

> "If the reliability of the scientific basis for the evidence is challenged the court would consider whether there is a sufficiently reliable scientific basis for that evidence to be admitted but if satisfied that there is a sufficiently reliable scientific basis for the evidence to be admitted then it will leave the opposing views to be tested in the trial."

[13] From the authorities it is clear that, provided the scientific basis for the expression of an opinion is sufficiently reliable to permit the opinion to be admitted, the absence of a statistical calculation to demonstrate the implications of that opinion of itself does not justify the exclusion of evidence which is otherwise admissible. That is subject to the discretion of the court to exclude evidence which the court considers to have minimal probative value. Provided that the discretion to exclude evidence is not exercised, then it is for the jury to consider the weight of the evidence in the light of all the relevant circumstances which may have been expressed during cross examination and in the light of appropriate directions by the trial judge. It has to be remembered that in many cases the DNA evidence in question may only be a part of a circumstantial case made by the prosecution, and that whilst the DNA evidence by itself may not take the matter far when viewed in conjunction with other evidence it may be of considerable significance.

[14] In the present case there is no issue as to scientific basis of the tests to which Miss Woodroffe referred, nor to the accuracy of the results of the tests. The area of disagreement relates to the interpretation of those results, and as I have earlier stated I consider that area of disagreement to be one of emphasis and degree and to be one which is perfectly capable of being placed before the jury subject to the exercise of my discretion to exclude any part of the proposed evidence which I consider to be of minimal probative value. The DNA evidence in this case is not all in dispute and the jury will be able to evaluate the disputed evidence by contrasting it with the undisputed evidence. In addition, as Mr McCollum pointed out, there are other aspects of the evidence upon which the prosecution seek to rely as part of its circumstantial case.

1. The defendant's admission that she was in Mrs Rankin's house on Christmas Eve.

2. That the defendant gave inconsistent accounts as to when she left Mrs Rankin's house.

3. Evidence suggesting that the defendant made phone calls from Mrs Rankin's house to a Dublin number.

4. That she was seen sitting on a wall outside Mrs Rankin's house.

5. Other DNA evidence which is not disputed such as the evidence relating to the DNA of the defendant on Mrs Rankin's chin.

[15] Taking all of these considerations into account I am satisfied that Miss Woodroffe's evidence is admissible subject to the exercise of my discretion to exclude parts of it. I admit the evidenced relating to –

1. Sample 1 – left breast.

2. Sample 3 – right breast.

3. Sample 3 – from the crucifix

[16] These show 9 and 10 out of 11 components to be present, and notwithstanding the absence of statistical evidence due to the small size of the samples tested I consider that they are of sufficient probative value to be considered by the jury. I exclude the evidence relating to –

4. Sample 5 – back of the right hand and arm.

5. Sample 4 – the back of the left hand.

[17] As only 1 and 2 components respectively were found out of 11 I consider this to fall far short of constituting evidence of sufficient probative value to be considered by the jury, and to admit it would be to create an unacceptable risk that the jury would attach significance to the evidence which it cannot sustain.

[18] So far as –

6. Sample 1 – the inner thighs.

7. Sample A – from the hair shafts.

are concerned each has only 5 components out of a possible 11 components.

[19] On balance I consider that these fall on the wrong side of the line and should also be excluded. If there had been sufficiently large samples or traces to enable statistical evaluations of the significance of these results to be carried out it might have been necessary to consider where the line should be drawn in terms of admissibility, but as that is not the position it is unnecessary to consider that aspect any further.