

## CHAPTER 42

### KEY FINDINGS AND KEY RECOMMENDATIONS

#### Key Findings

I made numerous findings in the course of the Inquiry, which are described in the text throughout this Report. The following statements are those which I consider my key findings.

1. There is no evidence other than the mark Y7 to suggest that Ms McKie at any time entered Miss Ross's house beyond the area of the porch.
2. The mark Y7 on the door-frame of the bathroom in Miss Ross's house was misidentified as the fingerprint of Ms McKie.
3. Ms McKie did not make the mark Y7.
4. There was no conspiracy against Ms McKie in Strathclyde Police and all reasonable steps were taken by that force to seek from SCRO confirmation of the identification of Y7.
5. The mark Q12 Ross was misidentified as the fingerprint of Miss Ross.
6. There was no impropriety on the part of any of the SCRO fingerprint examiners who misidentified the mark Y7 as having been made by Ms McKie or the mark Q12 Ross as having been made by Miss Ross. These were opinions genuinely held by them.
7. The marks Y7 and Q12 Ross were both misidentified by SCRO fingerprint examiners due to human error and there is nothing sinister about the fact that these two errors occurred in the same case.
8. The misidentifications of Y7 and Q12 Ross expose weaknesses in the methodology of fingerprint comparison and in particular where it involves complex marks.
9. Fingerprint examiners are presently ill-equipped to reason their conclusions as they are accustomed to regarding their conclusions as a matter of certainty and seldom challenged.
10. There is no reason to suggest that fingerprint comparison in general is an inherently unreliable form of evidence but practitioners and fact-finders alike require to give due consideration to the limits of the discipline.

## Key Recommendations

In all I have indicated 86 recommendations for future action as a result of the Inquiry, which are described in the chapters comprising Part 7 and in full in chapter 43. There are ten which I consider to be key recommendations.

1. Fingerprint evidence should be recognised as opinion evidence, not fact, and those involved in the criminal justice system need to assess it as such on its merits.
2. Examiners should discontinue reporting conclusions on identification or exclusion with a claim to 100% certainty or on any other basis suggesting that fingerprint evidence is infallible.
3. Examiners should receive training which emphasises that their findings are based on personal opinion; and that this opinion is influenced by the quality of the materials that are examined, their ability to observe detail in mark and print reliably, the subjective interpretation of observed characteristics, the cogency of explanations for any differences and the subjective view of 'sufficiency'.
4. Differences of opinion between examiners should not be referred to as 'disputes'.
5. The SPSA's Standard Operating Procedures should set out in detail the ACE-V process that is to be followed.
6. Features on which examiners rely should be demonstrable to a lay person with normal eyesight as observable in the mark.
7. Explanations for any differences between a mark and a print require to be cogent if a finding of identification is to be made.
8. A finding of identification should not be made if there is an unexplained difference between a mark and a print.
9. The SPSA should develop a process to ensure that complex marks (such as Y7 and QI2 Ross) are treated differently. The examination should be undertaken by three suitably qualified examiners who reach their conclusions independently and make notes at each stage of their examination. The substantive basis for the examiners' conclusions should be reviewed. The reasons why they have reached their respective conclusions should be explored and recorded, even where they agree that an identification can be made.
10. An emphasis needs to be placed on the importance not only of learning and practising the methodology of fingerprint work, but also of engaging with members of the academic community working in the field.

## CHAPTER 43

### RECOMMENDATIONS

#### The subjective nature of fingerprint evidence

**Recommendation 1****(Para 35.132)**

Fingerprint evidence should be recognised as opinion evidence, not fact, and those involved in the criminal justice system need to assess it as such on its merits.

**Recommendation 2****(Para 35.133)**

Examiners should receive training which emphasises that their findings are based on their personal opinion; and that this opinion is influenced by the quality of the materials that are examined, their ability to observe detail in mark and print reliably, the subjective interpretation of observed characteristics, the cogency of explanations for any differences and the subjective view of 'sufficiency'.

**Recommendation 3****(Para 38.77)**

Examiners should discontinue reporting conclusions on identification or exclusion with a claim to 100% certainty or on any other basis suggesting that fingerprint evidence is infallible.

**Recommendation 4****(Para 38.72)**

Differences of opinion between examiners should not be referred to as disputes.

**Recommendation 5****(Para 38.79)**

In order to allow the court to assess the strength of their evidence, fingerprint examiners should highlight the variables relevant to their assessment and how they have formed their conclusions in the light of those variables. The conclusion should state if it has been reached through training and personal experience or on any other basis such as statistical analysis.

#### Fingerprint methodology

**Recommendation 6****(Para 35.137)**

The SPSA should review its procedures to reduce the risk of contextual bias.

**Recommendation 7****(Para 35.138)**

The SPSA should ensure that examiners are trained to be conscious of the risk of contextual bias.

**Recommendation 8****(Para 35.139)**

The SPSA should consider what limited information is required from the police or other sources for fingerprint examiners to carry out their work, only such information should be provided to examiners, and the information provided should be recorded.

**Recommendation 9****(Para 35.140)**

Features on which examiners rely should be demonstrable to a lay person with normal eye sight as observable in the mark.

**Recommendation 10**

(Para 35.141)

In comparing a mark and print fingerprint practitioners should pay close attention to the precise type of the characteristics and carefully evaluate differences in the type of characteristic.

**Recommendation 11**

(Para 35.143)

Explanations for any differences between mark and print require to be cogent if a finding of identification is to be made.

**Recommendation 12**

(Para 35.144)

A finding of identification should not be made if there is an unexplained difference between mark and print.

**Recommendation 13**

(Para 35.145)

Examiners should consider whether the clarity of the mark is sufficient to support a confident conclusion of identity or exclusion.

**Recommendation 14**

(Para 35.146)

Care should be taken when relying on third level detail in arriving at a finding and practitioners should pay close attention to research on the reproducibility of such detail.

**Recommendation 15**

(Para 35.147)

Where third level detail is relied upon in making a comparison this should be included in any note of the examination.

**Engaging with the academic community**

**Recommendation 16**

(Para 35.135)

An emphasis needs to be placed on the importance not only of learning and practising the methodology of fingerprint work, but also of engaging with members of the academic community working in the field.

**Recommendation 17**

(Para 35.136)

Fingerprint examiners need to be provided with training to enable them to articulate their reasoning. The SPSA, in conjunction with members of the academic community as appropriate, should determine how best to explain the process of reasoning in arriving at a non-numeric conclusion.

**Recommendation 18**

(Para 35.142)

The SPSA, in conjunction with members of the academic community as appropriate, should design a practical system for examiners to assess and evaluate (a) tolerances and (b) any reverse reasoning.

**Standard Operating Procedures**

**Recommendation 19**

(Para 36.104)

The SPSA should revise Standard Operating Procedures to take into account the recommendations from chapter 35 (recommendations 1, 2, 6-18 and 82(part)).

**Recommendation 20****(Para 36.105)**

The SPISA's Standard Operating Procedures should set out in detail the ACE-V process to be followed.

**ACE-V****Exceptions to strict application of ACE-V****Recommendation 21****(Para 36.106)**

Steps should be taken to reduce the risk of over-familiarity with prints where an examiner has prior knowledge of the print before conducting an analysis of the mark:

- (i) Examiners should be made aware of the risks arising from over-familiarity with prints, by way of written guidance and training.
- (ii) As wide a range of examiners as possible should be involved in the work when this risk is present. As an example, when an identification is made in such circumstances at least one verifier should be an examiner who has not previously seen the prints in question.

**Recommendation 22****(Para 36.107)**

If a 'sift' phase is employed, the examiner who has carried out the 'sift' should not participate further and a different examiner should carry out the full analysis and comparison.

**Analysis****Recommendation 23****(Para 36.108)**

At the analysis stage an examiner should assess the quality of the mark. If the examiner considers it to be complex this should be recorded and the separate process for complex marks recommended in recommendation 42 should be followed.

**Recommendation 24****(Para 36.109)**

As thorough analysis is an important safeguard against reverse reasoning, before comparison commences the whole mark should be analysed. The approach whereby only a target area is analysed for all levels of detail should be discontinued.

**Recommendation 25****(Para 36.110)**

Fingerprint examiners should assess tolerances during the analysis stage so that when they come to evaluate whether the mark and print match they are conscious of the risk of applying excessive tolerances.

**Comparison****Recommendation 26****(Para 36.111)**

Characteristics first found at the comparison stage should be included in any note of the examination. Less weight should be attached to such characteristics.

## Evaluation

### Recommendation 27

(Para 36.112)

Although evaluation may be taking place throughout the analysis/comparison part of the ACE-V process, emphasis should be placed on the need for a separate E - evaluation - stage.

### Recommendation 28

(Para 36.113)

SPSA guidance to fingerprint examiners should emphasise the need at the evaluation stage to reflect on: tolerances, the quality of similarities, the nature of differences, any explanations for differences, the extent to which reverse reasoning may have been employed and the sufficiency of matching characteristics.

## Verification

### Recommendation 29

(Para 36.114)

All verifiers should be experienced examiners who have been given special training for this task, stressing the need for independence.

### Recommendation 30

(Para 36.115)

A verifier should not be told of the preceding examiner's reasoning before completing A-C-E. It follows that the verifier should not be shown, for example, a photograph or comparator screen marked up to show points of similarity.

### Recommendation 31

(Para 36.116)

A verifier should not be someone who has been consulted for advice on the mark by the original examiner in the course of his or her examination.

### Recommendation 32

(Para 36.117)

No discussions should take place between verifiers and preceding examiners until they have completed their work and reached their conclusions.

## Differences of opinion during the ACE-V process

### Recommendation 33

(Para 36.118)

Practitioners should conduct their individual ACE comparisons conscious of the fact that they are working in a field where there is no certainty and where there is scope for differences of opinion. When it comes to verification, examiners should be encouraged to be open and to adopt a challenging attitude to the opinions of other examiners, irrespective of seniority. Standard Operating Procedures should emphasise that the fact that one examiner reaches the opposite conclusion from another, or entertains any doubt, does not necessarily cast any aspersion on the competence of either examiner.

### Recommendation 34

(Para 36.119)

The SPSA should review its Standard Operating Procedures relative to handling differences of opinion and provision should be made not only for cases of disagreement between examiners but also for instances where an examiner has some doubt about the finding which is being verified.

**Recommendation 35****(Para 36.120)**

Where an examiner has doubts, the comparison should be processed in accordance with the complex marks procedure recommended in recommendation 42.

**Recommendation 36****(Para 36.121)**

The SPSA should amend its procedures to include a review panel to consider any disagreement between examiners:

- (i) Where there is a disagreement between examiners the further investigation should be conducted by a panel the members of which should have had no prior involvement with the mark in question but need not come from outside SPSA.
- (ii) The members of the panel should each examine the mark independently without any background information about the case or knowledge of the conclusions of the other panel members.
- (iii) Once the panel members have reached their own conclusions, they should, as a panel, look at the reasoning of the earlier examiners.
- (iv) A result of the review should be that examiners understand why they came to different views.
- (v) If the panel members are unanimous, then the result can be reported.

**Images****Recommendation 37****(Para 37.103)**

The training and use of specialist fingerprint photographers should be considered by SPSA.

**Recommendation 38****(Para 37.104)**

Fingerprint photographers should provide an examiner with a selection of images of a mark.

**Recommendation 39****(Para 37.105)**

In relation to digital images:

- (i) the digital original should be stored separately;
- (ii) any digital image processing should be carried out only on accurate replicas of the digital original;
- (iii) any adjustments made to the digital image should be recorded as part of the audit trail.

**Recommendation 40****(Para 37.106)**

Any adjustments made to a photographic print should be recorded as part of the audit trail.

**Viewing of original object on which mark is found****Recommendation 41****(Para 37.107)**

Consideration requires to be given to the need for examiners to examine the object on which the mark was found

## Complex marks

### Recommendation 42

(Para 39.24)

The SPSA should develop a process to ensure that complex marks such as Y7 and Q12 Ross are treated differently. Such a process should include the following principal elements:

- (i) Examination should be by three suitably qualified examiners.
- (ii) Notes should be taken at each stage of ACE-V by every examiner involved in the process. Those notes should record the information specified in recommendation 52.
- (iii) No examiner should disclose his or her conclusion to another examiner until all three examiners have reached their independent conclusions.
- (iv) After all three examiners have completed their individual comparisons they should meet and review the substantive basis of their conclusions. The reasons each has for their respective conclusions should be explored, even when they agree that an identification can be made. Any differences of opinion among them should be discussed in order to determine whether the conclusion is reliable. A note should be kept of the matters discussed at the technical review meeting.

## Questioned marks

### Recommendation 43

(Para 39.25)

Where the police or COPFS require a fingerprint comparison to be reconsidered by SPSA for any reason the matter should be referred to the review panel to be addressed in accordance with the procedures recommended in recommendation 36.

## Record-keeping and note-taking

### Audit trail

### Recommendation 44

(Para 37.108)

The method used by scene of crime examiners to detect and record a mark should be recorded as part of the audit trail for that mark.

### Recommendation 45

(Para 37.109)

The selection of images provided to the examiner, the image chosen for comparison work and the photographic negatives, if any, should all be recorded as part of the audit trail.

### Recommendation 46

(Para 37.110)

Any image(s) studied by the examiner in making an identification should be provided to the Crown on request together with the remainder of the selection of images.

### Recommendation 47

(Para 37.111)

A record should be kept for each mark which

- (i) shows whether or not it has been regarded as suitable for comparison;
- (ii) lists all prints with which it has been compared.

**Recommendation 48****(Para 37.112)**

Any discussions between examiners (including any consultation with an examiner not directly involved in the comparison of the mark in question) at any stage of ACE-V should be recorded.

**Recommendation 49****(Para 37.113)**

The audit trail for a mark should be available to the Crown if requested.

**Note-taking****Recommendation 50****(Para 37.114)**

Examiners should always take notes when they are examining marks that they consider to be complex.

**Recommendation 51****(Para 37.115)**

Notes should be taken in any case in which a fresh comparison is made in response to a request from the Crown for a report.

**Recommendation 52****(Para 37.116)**

Where notes are required as a result of the preceding recommendations, the notes should be taken at each stage of ACE-V by every examiner involved in the process at that stage and should cover the following matters:

- (i) the assessment of the quality of the mark at the analysis stage and any sign of distortion;
- (ii) the characteristics identified at analysis including their type and the sequence of them;
- (iii) the characteristics taken into account at the comparison stage including their types and sequence in mark and print;
- (iv) any revision to the initial analysis made at the comparison stage;
- (v) any differences observed at the comparison stage;
- (vi) the explanation for any differences;
- (vii) any third level detail relied upon in arriving at the conclusion;
- (viii) the reasons for the conclusion at the evaluation stage; and
- (ix) any consultation with any other examiner during the ACE-V process.

**Recommendation 53****(Para 37.117)**

Subject to any requirement under ISO 17025 and recommendations 50 and 51, note-taking as to the detail found on analysis and the process of comparison, though not mandatory, should become the general practice for all fingerprint comparison work.

**Provision of information to the Crown by the SPSA****Recommendation 54****(Para 37.118)**

The omission of the SPSA from the statutory scheme of disclosure under sections 117 to 120 inclusive of the Criminal Justice and Licensing (Scotland) Act 2010 should be reviewed. The

SPSA should be regarded as having the same duties as regards provision of information to COPFS as investigating agencies under those provisions.

**Recommendation 55**

**(Para 37.119)**

SPSA and COPFS should agree and implement, as a matter of urgency, a process for the provision of information by SPSA to COPFS. COPFS should provide SPSA with information and advice as to the Crown's duty of disclosure with a view to informing SPSA's understanding of the nature and extent of the information that SPSA will require to provide to COPFS.

**Recommendation 56**

**(Para 37.120)**

The following information should always be provided to the Crown:

- (i) a list of names of all examiners who have examined the mark at SPSA and their opinions as to the mark and the comparison;
- (ii) whether the complex marks process has been invoked;
- (iii) any discussions between examiners relating to the formulation of conclusions about a mark;
- (iv) any differences of opinion between examiners;
- (v) whether the mark has been subject to facilitated discussion or panel review.

**Reports under sections 280 and 281 of the Criminal Procedure (Scotland) Act 1995**

**Recommendation 57**

**(Para 37.121)**

Each examiner should provide a separate written opinion and prepare his or her own material before any attempt is made to produce a joint report.

**Recommendation 58**

**(Para 37.122)**

The joint report prepared should be supported by the production of the individual opinions. It should be a matter for the Crown and defence to determine whether the joint report would suffice in a given case, or whether examiners should be called to give oral evidence.

**Recommendation 59**

**(Para 37.123)**

Each examiner's separate opinion should cover:

- (i) the images of the mark and also the specific print used in the comparison;
- (ii) the examiner's opinion about the quality of the mark;
- (iii) if the examiner considers the mark to be complex;
- (iv) whether third level detail is relied upon and the fact that such detail still requires to be supported by further research that has been validated;
- (v) identifying any differences between mark and print;
- (vi) a summary of the reasons why any differences between mark and print have been discounted and whether the examiner relies on objective studies and evidence to account for such differences or on common sense and experience;

- (vii) the characteristics relied on in making the identification, the number of such characteristics, and the classification of such characteristics, (e.g. ridge ending, bifurcation);
- (viii) a marked up image of the mark and print with a legend specifying the type of the ridge detail (including any third level detail) relied upon and the associated ridge counts;
- (ix) the opinion of the examiner;
- (x) any consultation with another examiner during the ACE-V process, including any facilitated discussion or panel review; and
- (xi) the fact that any novel method such as probabilistic analysis has been used or relied on.

## Consideration of material by defence experts

### Recommendation 60

(Para 37.124)

Fingerprint examiners engaged by the defence should be afforded access to the same material as that used by SPSA, in appropriate examination or laboratory conditions.

### Recommendation 61

(Para 37.125)

Fingerprint examiners engaged by the defence should be afforded access to any other images of the mark or fingerprint forms as are available to SPSA and COPFS. If negatives are available, arrangements should be made on request to provide the defence examiner with any print reasonably required. If the image is in digital format the defence examiner should be given sight of the digital original and should be provided with a copy of the same.

### Recommendation 62

(Para 37.126)

As a matter of good practice, defence examiners should examine the unmarked mark and print and reach their own conclusions on that material before examining any marked images produced by SPSA.

### Recommendation 63

(Para 37.127)

In the event of a challenge to an identification the defence should disclose the full reasons why it believes that the SPSA examiners' opinions are incorrect. This may require the disclosure of marked up images of mark and print with a legend specifying the type of characteristic and associated ridge counts. Such disclosure should take place at a reasonable time before the trial in question. It should take place where appropriate in the context of the provision of defence statements in accordance with section 124 of the Criminal Justice and Licensing (Scotland) Act 2010.

## Presentation of fingerprint evidence in court

### Recommendation 64

(Para 37.128)

COPFS should pay particular attention to ensuring that fingerprint evidence is presented to the court in such manner as to be readily understood by the judge and jury.

### Recommendation 65

(Para 37.129)

The use of technology to assist fingerprint examiners in demonstrating to the court aspects of their evidence should be explored.

**‘Unable to exclude’****Recommendation 66****(Para 38.84)**

Before a finding of ‘unable to exclude’ is led in evidence, careful consideration will require to be given to (a) the types of mark for which such a finding is meaningful and (b) the proper interpretation of the finding. An examiner led in evidence to support such a finding will require to give a careful explanation of its limitations.

**Erroneous identifications or exclusions****Recommendation 67****(Para 38.73)**

The SPSA should investigate all ‘erroneous’ fingerprint identifications or exclusions.

**Recommendation 68****(Para 38.74)**

Cases where there is scope for a difference of opinion should not be classified as ‘erroneous’. The cases that merit investigation are where there may have been a mistaken fingerprint analysis or a breach of accepted procedures.

**Recommendation 69****(Para 38.75)**

The SPSA should consider whether their procedures require to be revised in the light of the findings of an investigation of an erroneous fingerprint identification or exclusion.

**Training and performance management****SPSA****Recommendation 70****(Para 40.114)**

The SPSA should introduce a requirement that fingerprint examiners have training and development in core fingerprint examiner skills each year.

**Recommendation 71****(Para 38.81)**

All fingerprint examiners at SPSA should receive court skills training at suitable intervals. The training should emphasise the role of the expert witness.

**Recommendation 72****(Para 38.82)**

Examiners should be discouraged from using stock phrases or responses to questions.

**Recommendation 73****(Para 40.115)**

The discussions about the possibility of having a national dip sampling regime should be pursued, as this would introduce an element of external validation. The proposal whereby some dip sampling will be carried out by SPSA personnel from other bureaux should be implemented in the interim.

**Recommendation 74****(Para 40.116)**

The SPSA should develop a procedure for the provision of information to COPFS where issues have been raised about the performance of an examiner who may be required to report or give evidence. COPFS should provide SPSA with guidance as to the nature and

extent of the information that should be provided in order to enable COPFS to comply with its duties of disclosure to the defence.

## COPFS

### Recommendation 75

(Para 38.83)

COPFS should ensure that appropriate written guidance as to fingerprint evidence is available to its staff. COPFS should also ensure that a sufficient number of lawyers fully conversant with fingerprint evidence are available to deal with any issues that may arise.

## Accreditation and authorisation of examiners

### Recommendation 76

(Para 40.117)

The system for authorisation under section 280 of the Criminal Procedure (Scotland) Act 1995, so far as relating to fingerprint examiners, requires review.

### Recommendation 77

(Para 40.118)

A system should be devised whereby any authorisation of fingerprint examiners under section 280 would be confined to the authorisation of individuals who are employed by an institution which has achieved appropriate accreditation. It would be for the Scottish Government to satisfy itself in the course of the review referred to in recommendation 76 as to what constitutes appropriate accreditation, and by whom that accreditation should be carried out.

### Recommendation 78

(Para 40.119)

The system of registration on the National Register of Fingerprint Experts should be reviewed. If it continues in use it should be revised to ensure that the criteria for registration and the records are kept up to date and that the records indicate competence. Should SPSA for any reason decide that an examiner is no longer competent to practise, it should notify the NPIA so that the examiner's name is removed from the register and also the Scottish Government so that authorisation under section 280 is withdrawn.

### Recommendation 79

(Para 40.120)

Absence of authorisation under the Act should not be taken as disqualifying a witness from being treated as an expert in relation to fingerprint evidence. The witness should be prepared to demonstrate his or her expert status on ordinary common law principles.

## Accreditation of bureaux in Scotland

### Recommendation 80

(Para 40.113)

The SPSA should continue to seek to obtain and retain the ISO 17025 external accreditation and such other accreditation as may become relevant in the field of fingerprint identification.

## Research and development

### Recommendation 81

(Para 41.41)

Requirements for research and development should be identified and collated and an appropriate scheme of research and development prepared by SPSA. Appropriate

arrangements and funding (when available) should then be provided to enable research and development to take place on a UK basis and where appropriate through co-operation on an international basis.

**Recommendation 82**

(Paras 35.134, 39.23, 41.42)

Specific matters to be included in the scheme of research and development include:

- (i) the frequency of particular characteristics or combinations of characteristics in fingerprints;
- (ii) the use of data as to the frequency of particular characteristics or combinations of characteristics as a means of assisting examiners in their work;
- (iii) the weight to be given to third level detail, and as to its reliability;
- (iv) distortion and the effect of movement;
- (v) which marks ought to be assessed as complex;
- (vi) the specific factors that may cause variations among examiners; and
- (vii) contextual bias.

**Recommendation 83**

(Para 41.43)

The use of probabilistic analysis should continue to be developed.

**Recommendation 84**

(Para 41.44)

The SPSA should keep its practices under review in the light of developments in research.

**Familiarity with developments and disputes in fingerprint law and practice**

**Recommendation 85**

(Para 41.45)

The SPSA should task identified staff with:

- (i) maintaining up-to-date knowledge of cases, at least in anglophone jurisdictions, in which fingerprint evidence has been disputed; and
- (ii) monitoring cases in which courts, inquiries or other investigating bodies have made significant criticism of existing fingerprint practice and of considering whether those criticisms should be taken into account in developing and improving fingerprint practice in Scotland.

Such staff should be tasked also with advising an identified contact in COPFS as to these matters.

**Recommendation 86**

(Para 41.46)

COPFS should task identified staff with maintaining up-to-date knowledge of cases, at least in anglophone jurisdictions, in which fingerprint evidence has been disputed, and with liaising with an identified contact in SPSA in relation to any implications that the findings of such courts may have for fingerprint evidence in Scotland.