

**Scottish Parliament
Justice 1 Committee**

Answers to questions and matters raised during the hearing of 7th June 2006.

Arie Zeelenberg

Upon the closure of the meeting the Convener asked me to come back upon the presentation of Mr. Swann and in particular to references during his presentation that I "misidentified the print." (col 3428 13.45)

In this submission I will therefore address the presentation and the matters raised by Mr. Swann and other matters that require clarification. In this I will try to be as factual as possible and draw conclusions or give an opinion with regard to possible causes of the mistake based on my analyses all with the aim to suggest avenue's for solutions.

Although it is my understanding that the Committee works from the notion that the identification of Y7 is a mistake I think it is in the interest of the Committee and the public to understand the nature and to give further analyses of the arguments from those who still uphold an identification.

Latent Y 7

The argument put forward to justify identification circles around one main theme; the discrepancies in the top area are no discrepancies because they can be found in the outer right area of the print as demonstrated and marked in the print from the Daily Mail and in fact they support identification. The reverse of this argument is that if this can be demonstrated to be incorrect than the logical conclusion must be that it contradicts the hypotheses of identification.

In this discussion I will concentrate on the top part of the print and its relation to the bottom part.

Did does not mean that the bottom part can be identified on itself. I have demonstrated during my presentation that there are numerous discrepancies on second level detail and there is total absence of confirmation of third level detail.

The 66 degree theory.

In order to discuss and to visualize this subject I have created an overlay of the upper part of the Daily Mail print used by Mr. Swann. I have connected this overlay to the overlay of the plain impression of the comparison print of Shirley McKie as used during my presentation. In annex A the overlay of the latent is placed next to it. The characteristic referred to by Mr. Swann as "Rosetta characteristic" (our number 20) is marked in the latent and in the comparison print were it should be if in sequence with the similar cluster in the bottom part. This similar cluster decides orientation. In this cluster I have indicated a common reference point.

The location were the Rosetta characteristic is replaced to by Mr. Swann is also indicated.

In Annex B I have added the minutiae as precise as possible as charted in the C chartings marked "court".

I did not copy the numbers 1, 2, 3 and 6 in the latent because I don't regard them as genuine events that can be established in the latent in an analyses phase.

In fact point number 1 is placed at the outskirts of the contour of the latent which is questionable at least. The location is off as well because it should be further to the inside of the latent in relation to point 4. (See Annex B)

I suggest that conviction was the driving force to put 8 points in using the supposed original as a guide.

In order to check whether the minutiae are in the same sequence both within the upper cluster and separately the upper and low cluster as a whole in relation to each other, I have calculated the ridge counts.

Ridge counts have to be accurate, this is a vital requirement for identification because this is the most important element for the establishment of the relations.

See attachment 1 report IEEGFI II paragraph 8.3.2 and 8.33.

If a position of an ending ridge is ambiguous because it could be on either side of an adjacent ridge the counts have to be checked from all sides given the assumed position.

In annex C the ridge counts are given both for the minutiae in the latent and in the comparison print in the assumed, new, position.

We note that the ridge count from the reference point A to the Rosetta in the latent is 7 whilst in the comparison print the count from the reference point to the alternative location is 10. Apparently the cluster has "jumped" to its new position. The proposition that pressure could create extra lines and change the whole lay out of the sequence of the ridges is beyond theory and practice of fingerprint identification.

This difference in ridge count also excludes the theory of a single placement of the left thumb from Shirley McKie definitively.

The relations within the upper cluster are also off in a distinct manner, 6 out of 8 ridge counts differ at least 1 line.(marked in red)

Two points in the comparison print that are in the "replaced" area are marked blue. In the latent these points fail. (marked blue/yellow)

Since the minutiae 5 and 8 in the latent were plotted ambiguously I placed them at the exact location in the latent and checked the ridge counts again. See Annex D.

Only the ridge counts that are redone are presented. Of those again 4 are different, the total the number of different ridge counts stays the same; 6 out of 8.

Thus not only are the upper and the lower cluster out of sync within the upper cluster we see two new points that fail and the relations of the assumed similarities differ so much that the left thumb print of Shirley McKie is again excluded as the possible source.

The non discrepancy rule has been brought up and debated as well in attachment 1 to this document I have provided relevant citations upon this subject from The Scientific Working Group on Fingerprint Analyses Study and Technology (SWGFAST)

and the final reports from the Interpol European Expert Group on Fingerprint Identification I and II.

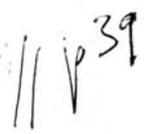
In E I have indicated the assumed area of distortion and I have replaced the top of the latent (in black lines) such that the Rosetta point is matching and that the cluster of minutia is in the suggested location. To achieve this I had to rotate the tip about 45 degree's.

If a print during deposition is twisted say 45 degrees the print would show as a coherent print (if not obliterated by distortion) and reveal signs of the twist. In particular one would expect to see slippage at the contours of the latent. The overlay gives an indication of the amount of twist that would be required according to the hypotheses. The suggested twist is very particular because it proposes that the bottom part of the print is in "normal" position and the top part separately rotated 66 degree's. If this would be anatomically feasible this would always show bending of the ridges and/or slipping from the skin in the area of twist. See attachment E In the suggested area of twist however there are no signs of this distortion. Furthermore this type of assumed rotation pressure is in conflict with the real distortion demonstrated as being from the tip downwards. A double setting as a hypothetical alternative for distortion would show the lines to cross and create numerous disconnections in the mark, therefore this option is also excluded.

The hypotheses of Mr. Swann is therefore wrong on all counts and supplies additional evidence of exclusion of Shirley McKies left thumb print.

The questions from Mr. Swann put to me in his report;

QUOTE p 38

1. Can Mr Zeelenberg explain why point 19 on the crime scene mark, Y7, is indicating a continuous ridge which ends further to the right at where he has marked point 20 and how these can be related to points 19 & 20 on Shirley McKie's Left Thumb impression which is a totally different area of ridge structure and pointing in the opposite direction. 
2. Can Mr Zeelenberg explain why point 20 on the crime scene mark, Y7, is marked as point 23 on the Left Thumb impression of Shirley McKie. 
3. Can Mr Zeelenberg explain why his points 23 & 24 on the crime scene mark, Y7, which are indicating non-existent characteristics and simply continuous ridge structure be related to his points 23 & 24 on the Left Thumb impression of Shirley McKie. As I have referred at '2', point 20 on Y7 is point 23 on her Left Thumb.
4. Can Mr Zeelenberg explain why on both the crime scene mark, Y7, and Shirley McKie's Left Thumb, his point 25 on both, is pointing not to any characteristic but simply to a continuous ridge. What is the significance of a continuous ridge in any identification process.

And.

In our Tulliallan report Torger Rudrud and I have presented a chart Mr. Swann is referring to. In this report we have stated that quote;

Paragraph 8.1, Page 6

“- In declination of the steps of the normal method we will incorporate in this presentation the charting and conclusions of SCRO and discuss them at the same time. This is to serve the reader because it enables direct comparison of differences between the findings of SCRO and us.

- This is a verification report rather than a report of identification, as a result the phases we have carefully separated during our investigation are twined together in our presentation and discussion.”

Page 13;

10.2 The comparison

“In order to enable discussion we have numbered dactyloscopic points and other (possible) characteristics. To make the discussion more transparent, and the comparison with the SCRO easier, we have maintained their numbers and only added to them. The charted lines and numbers are aids to the discussion of certain area's and events, and are not meant to indicate similar points intrinsically.”

End of quotations.

In comparing fingerprints from different origin one may expect to find discrepancies of this nature and we have pointed those out. See Annex K. We marked the real points in red and the failing characteristics on the corresponding location in the other print in white.

With his questions Mr. Swann confirms the discrepancies numbered 19, 20, 23, 24 and 25. Since we could not explain those, and other discrepancies, we arrived to the only conclusion possible; not identical.

With regard to question 2. We have marked point 20 in the latent as location 20 in the comparison print were it should be if in sequence with the rest. It is the proposition of Mr. Swann that point 20 should be moved to location 23 not ours. This is demonstrating how confusing comparing non identical fingerprints can be.

Another comment in the production of Mr. Swann is;

This chart appears to me to be an exercise to illustrate that the two marks are not identical as opposed to any attempt at a verification of an existing identification. To this end, no account of the basic principles of fingerprint identification are adhered to, but instead, strict positioning of ridge characteristic detail is being applied with no account being taken of distortion. This can only lead to a flawed conclusion, as indeed, it has.

The statement above is remarkable in itself. It is a demonstration of reasoning based upon a mind set. It is a shape of circular reasoning that is worrying for a forensic practitioner to say the least. It may serve in future as a classic example of conviction leading to evidence instead of evidence leading to conviction.

The chartings of John Berry.

In the productions of Mr. Swann chartings are incorporated of Mr. Berry.

Mr. Berry has used the latent from Pat Wertheim retrieved from the site ONIN.com of Ed German twice.(internet print). For the comparison prints he used the print from the Daily mail once, from the second chart the source of the comparison print is not mentioned.

In my analyses of the print and the proposed twist I concluded that, taking some margins into account, the rotation should be about 45 degree's, this is a significant difference with the proposed 66 degree's.

The fact that Mr. Swan and Mr. Berry both propose an exact rotation of 66 degree's suggests that their findings were not reached independently.

Mr. Berry is marking 10 points of similarity in his first charting (not dated) at least three of those are in the brush mark area. In his second charting dated 7th of July 2003 he marks 16 points and again has no problem with marking of at least 5 in the brush mark area. Than in the same area he marks point A as a missing point in the latent print which he attributes to the damage by the brush mark obliterating this vital point. In both chartings the comparison print is rotated anti clockwise. The effect is that the area of latent is not fully covered by the comparison print. This is apparent if one looks at points 1 and 2 in both prints. Compared in these positions Mr. Berry should have shown the whole relevant part of the comparison prints as he sees them. In the second charting part of the tip is chopped of as well. In this manner he brings a lot of differences in the tip out of sight.

The quality of the printed charts is substandard and provides the independent (lay) viewer no opportunity to verify the charted similarities.

Dissimilarities are ignored, virtual similarities are put in, one must assume using the supposed original as a guide.

Brush mark as an explanation of different views ?

It is suggested that the opposing views could have its origin in the use of different material i.e. the images from Pat Wertheim (with the brush mark) versus the SCRO/Sandridge images. It was even suggested that the brush mark was made intentionally to create those differences. From a technical point of view this suggestion is bizarre. In Annex "I" I have copied all the relevant images available to me. These are two digital copies from the Pat Wertheim images, a high resolution scan of a 1:1 SCRO photo, a scan of a large SCRO photo from Pat Wertheim and a scan from a large photo from the images of Terry Kent (SRDB).

To assume that some one intentionally or unintentionally has changed the ridge flow such that more than 10 similarities are removed and over 20 differences put in is beyond imagination and beyond reality.

Apart from this we must keep in mind that the experts from SCRO and John Berry have used the image from Pat Wertheim with the brush mark to deliver proof of identification. Secondly one should take into account that the majority of differences lie outside the brush mark.

In annex J the area of the brush marks are given separately for inspection. Although there are differences in contrast and detail, signs of changes of the ridge flow and alterations of detail fail.

The differences of opinion can therefore not be contributed to the use of different images.

Print QD2

Discussion was raised during the hearing with regard to mark QD2 . During their survey on request of HMIC in 2000 the Danish experts had reported that QD2 did not originate from David Asbury. Report 7th August 2000, Rasmussen en Rokjaer.

In January 2006 we had a meeting in preparation for the court case from Shirley McKie versus the Scottish Executive with Q.C. A.Smith He showed me a photograph representing the mark QD2. See annex G. It was a large photograph of about 17 x 23 cm size of the right side of a right slanted loop pattern. In examination of the mark I compared it with a copy of the fingerprints from David Asbury and found it to be a solid identification.

Since this conclusion confirmed the identification of SCRO and was in conflict with the findings of the Danish experts I liaised with Mr. Rokjaer, being one of the experts involved, by telephone and E-mail.

He did send me the copies of the material showed to them during their investigation, see annex F production number 98 page 1. This is a copy of the same production showed to us by QC A.Smith. The Danish experts stated to me that to them is not shown any other material relevant to mark QD2 than this production.

The photograph of the mark QD2 (annex G) is from a fluorescent fingerprint, this can be derived from the bright emission in the centre of the mark and a sharp drop of to a dark surrounding. Also the glowing effect and the little unsharpness indicate a mark photographed with fluorescent light. Much later we learned that the "Q" in QD2 stands for "Quasar" this is confirming our assumptions.

The most common used detection technique for fingerprints on banknotes is treatment with DFO and than to examine the treated notes with a light source emitting around 490 nanometers and examining it with filters between 530-570 nanometer. The DFO will cause the wavelength to shift to the 530-570 domain and become visible. The light beams generally have a small field of view in order to concentrate the light and improve fluorescence.

The Danes had not seen the large photo from the latent presented to us by Mr. Smith as mentioned before. The photo has no markings up in the image itself indicating that it is QD2. When we presented the images to them they confirmed identification as to a print of the right little finger of David Asbury.

Immediately after they found out the Danish fingerprint service have written a letter to the Scottish executive revealing the new findings and explaining the situation.

The photo's from the banknote including the sticker with the marking up show an overview of part of a 10 pound banknote. It is noticeable that the area were the QD2 mark should appear, i.e. the area with the ornament, the mark is not showing as on the large photo.

After my visit to Scotland our laboratory could do a small scale reconstruction with an actual ten pound note. From that we learned that the overview photo was also taken with a fluorescent light source. This in contradiction with our first assumption that it was taken with ordinary lighting. The shift of color showing vertical bands is generated by the light source.

With the overview photo it is obvious that the centre of the spot light is in the middle of the image, the mark QD2 is not showing as in the large photo presumably because

of the diminished intensity of the light source and the drop of from the intensity of light and as a consequence also from the fluorescence towards the edges. It is also noticeable that the marking up is not directly adjacent to mark QD2.

We have reconstructed the events as follows; The Danish experts first looked at the actual banknote and found no impression. They suggested that the print might have been evaporated as may happen after the use of ninhydrin as a developer. After that the experts investigated one photo marked QD2 this has to be the overall photo from the banknote. (Note that the large photo of QD2 does not show this marking up.)

Since the good mark is not showing on this photo (see annex H) they have most likely picked up a small fragment between the actual mark and the marking up. This would be in the centre of the bundle of the quasar.

In their report they mentioned a mark with at least 4 minutiae that could not be found on one of the right little finger nor on the other fingers of Asbury and they reported like wise. This is another indication that this is not the same latent as the one from the photographic enlargement because this mark shows very clearly more than double this amount of minutiae.

If the Danish experts were shown this enlargements they would have identified it quite easily as they did after receiving it and as we did.

The cause is quite simple, you cannot identify what you don't see and what is not presented to you.

The remarks made during the hearing about the lack of competence of the Danish is not supported by these events.

The future

The "McKie case" and related incidents can learn us a number of things;

First of all that mind set can lead to contradicting and false conclusions both alleged identifications and misidentifications being proven wrong.

Not all cases have the same nature and impact. The Danish experts not able to confirm an identification because the wrong material was shown to them can not be accused of making a wrong call. The claims about a recent misidentification of a palm print are revoked and experts have either reversed themselves on second thought or after consultation of peers which in itself is not only courageous but also a hopeful sign of awareness of fallibility and hopefully a better culture.

Scotland could lead the way if this example is embraced and evolved rather than used as fuel to an existing fire.

The McKie case stands out for its longstanding and persistent denial by the experts involved and the bad management.

The denial became a self enforcing mechanism after so many years of pressure and rising stakes, the difficulty of reversal is understandable.

A greater concern is the fact that mindset can rob even experienced experts from the most basic abilities such as perception and rational. The ability to objectively reexamine material, to reconsider and if necessary reverse himself is a key quality for an expert. (see paragraph 14 from the code of conduct CRFP attachment 2)

The McKie case and its aftermath tell the seriousness of the problem and underline that more attention has to be paid to this competence. The inability to recognize a huge mistake on the doorstep is incompatible with a professional organization that wants to be transparent, accountable and reliable.

To promote the required attitude of openness and accountability between individual experts and within an organization requires attention to culture, methodical and impartial thinking, good training and the application of careful application of procedures and methodology such as ACE-V. If a good analyses of the print at hand was made before starting the comparison process this mistake would not have occurred because in my judgment it is impossible to mark up the latent the way it is done without using the comparison print as a guide. If with difficult marks the results of an analyses phase are discussed, the type of characteristics marked up in the latent, as done in this case, would not survive the scrutiny of fellow experts.

It is my opinion that using the comparison print as a guide to the mark is served by a bad quality print and bad images. A good print would contradict the marking up of non existing points immediately whilst on the other hand it seems that bad prints allow experts to call upon their skill of explaining away differences which task they apparently regard as a challenge and a token of their expertise.

The complaints from SCRO about the charting PC and the substandard quality of prints generated with it may have been a (partial) cause of the mistake as well as it has supplied a means of masking the differences.

I suggest therefore that attention is given to up to date tools to mark up prints in a screen with which in particular the analyses phase of poor quality latents can be executed in an accurate and professional manner. This should include the annotation of observations such as; Galton points, distortions, third level detail, peculiarities etc. Of the shelf, state of the art equipment is available for that.

The managing

The management of the case by all levels involved is very poor to say the least. Simply said this case should never have taken 9 years to resolve. It is up to the Committee to investigate the causes but it is my opinion that all that were involved in the managing when confronted with the case have all acted almost instinctively, reactive and defensive with an eye on self interest and short term damage control. Justice and the truth were second to that.

It is worrying that the system in place was unable or unwilling to solve the matter and only did after continuing pressure from outside from media and the fingerprint world. It is up to the parliament and within the scope of the "Action Plan" to develop and implement mechanisms within the system to prevent that from happening again. Scotland is certainly not alone in this, throughout the world police organizations and experts struggle with the same phenomena and are looking for solutions. (See the latest May/June 2006 IAI journal for the handling of the Mayfield case in the USA.) In the Netherlands a recent discovered miscarriage of Justice (referred to as the "Schiedammer Parkmoord) has lead to indepth investigation published as the "Rapport Posthumus" and to a massive overhaul of the whole of the investigative process. It is recognised that mindset, "tunnel vision" and absence of "tegenspraak", best translated as "counter-argumentation", were the main causes.

Since the problems in the fingerprint profession are, in my opinion, embedded in culture the problem is certainly not easy to address and requires vision, patience and perseverance.

One particular aspect, common throughout the world, is that civilians who become victims of forensic errors, in particular with fingerprints, have no one to turn to.

The police monopolizes fingerprints and is reluctant to open up and to be transparent and accountable. Fellow police organizations turn their head the other way and will only react if asked officially. The questioned material is not released, free debate in the forensic community is blocked and we see police chiefs explain matters about fingerprints only exposing themselves as laymen. As an analogy one would wonder if police chiefs would also explain DNA disputes.

In the McKie case there are signs that experts are persuaded to silence and not to go beyond the system. No matter what argument is used, valid or not the effect is that the victim stands alone. Some independent experts noting that the "system" is incapable of resolve from within and who are in a position to detach themselves from their organization may consider to intervene in the interest of justice, the truth and the profession. This creates a dilemma between following their conscious or the mores of their organization. In these situations the specific position of a forensic practitioner in a police organization trying to serve two masters adds to the problem.

In the code of practice and the code of conduct from the CFRP serving Justice is second to none and justification can be found to go outside the organization if a miscarriage of justice is observed.

Experts that go around the standing organization take a great personal risk. They have nothing to gain, they will get "the treatment" or are not taken serious. A side effect of the McKie case might be that independent experts will rethink twice before coming out again. By the actions of the police, the administration and the politicians those experts are discouraged through negligence, discreditation, personal attacks and slander.

The Committee could revitalize them paying attention to it and by giving credit to the part they played in the given situation that has led to the inquiry which is the first attempt to real resolve.

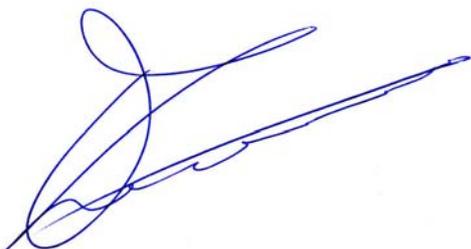
Of course it is preferable that the organization puts mechanisms in place that these situations do not occur and that differences of opinion and mistakes are taken care of by preset procedures in an open transparent and accountable manner within the organization.

The detachment either physical or by greater independence from the police organization could be considered with this respect.

Higher self esteem and more emphasis on forensic evidence rather than upon investigative results could also underline independence.

Scotland could also take the lead in the set up of an International Forensic Arbitrary Panel that could take up cases like this and were individuals that are confronted with questionable forensic conclusions could have access to in particular cases and situations to be defined.

Some good might finally come from the McKie case then.

A handwritten signature in blue ink, consisting of several loops and a long horizontal stroke extending to the right.

A.J.Zeelenberg, 23 June 2006

Journal of Forensic Identification
358 / 54 (3), 2004
and SWGFAST website public domain;
<http://www.swgfast.org/>

SWGFAST (Scientific Working Group on Friction ridge Analyses Study and Technology)

Standards for Conclusions

1. Individualization (Identification):

The standard for individualization is agreement of sufficient friction ridge details in sequence.

1.1 Conditions that shall be satisfied:

1.1.1 Determined by a competent¹ examiner, and

1.1.2 Applied to a common area in both impressions,
and

1.1.3 Based on quantity and quality of the friction
ridge details, and

1.1.4 Absent any discrepancy, and

1.1.5 Reproducible conclusion.

Interpol European Expert Group on Fingerprint Identification I (first report)

Website Interpol public domain;

<http://www.interpol.int/Public/Forensic/fingerprints/WorkingParties/default.asp>

Detailing of methods and procedures

7. Evaluation or balance phase

In this phase, all facts are known and can be evaluated and validated. From all details, the similarity is validated, characteristic value and clarity are taken into account. The significance of the corresponding detail is validated. Differences are studied and are weighed whether they fit in the margins of tolerances normally found between prints coming from the same donor. Explanations for the differences are checked.

A minutia of which the location and direction are apparent in the latent and absent in the comparison print (or vice versa) in principle forbids the drawing of any positive conclusion on identity.

Interpol European Expert Group on Fingerprint Identification II (second report)

8.3.2 When points are assigned to be valid (demonstrable and significant) their position is related to all other points. This is a very important part of the analysis and comparison of fingerprints since the formation of the relations determines uniqueness. The relations are established by following lines, counting ridges and determining relative positions towards neighboring points taking direction, angles, height and length into account.

8.3.3 In the comparison phase all those relations are meticulously checked and compared. Relations have to be the same in prints from the same source; in particular ridge counts between points have to be exact. Through pressure and the flexibility of the skin the constellation of points may be stretched or compressed like a spiders web but the relative positions and the ridge counts stay the same. The first report read in paragraph 9.6:

'Every single detail is checked as to whether location aspects and relations are similar with the detail in the corresponding locations of the comparison print. Differences should be detected, checked and noted. Any explanation of differences found should preferably be related to observations done in the information phase. All details are related to each other. Parts of a print that are distorted or damaged and show differences as a result of this distortion may be ignored if the distortion is consistent and demonstrable.'

8.5 Dissimilarities and dactyloscopic points of difference

8.5.1 Compared prints will never look exactly the same so there will always be dissimilarities between prints from the same donor. If there is only one different dactyloscopic point between prints identification is excluded. The first report read (paragraph 10.5):

'Identifications require sufficient coinciding information between two prints, if features are present in one print and absent in the other and there is no rational explanation based on findings and facts, a statement of identification should not be given in principle.

8.5.2 How does one discriminate between dissimilarities and different dactyloscopic points?

A different dactyloscopic point is of second level nature; the location, the direction or (one of) the relations differ. The basis for identification is the hypothesis that dactyloscopic points keep there properties even under adverse conditions. One has to be very prudent to leave this position if one bumps into a dissimilarity that it is not in agreement with the supposed original because this affects our principles.

One may explain differences if they can be contributed to distortion formulating the following guidelines and rules:

- One explains differences because one can, not because one must.
- our profession is not the art of explaining 'unwanted' differences.
- the explanation of a dissimilarity must be based on facts and circumstances that are demonstrable.
- one has noted the distortion in the information phase.
- the comparison print should not be leading.
- explained dissimilarities do not become similarities.

- after 'reconstruction' (see 8.6) the whole constellation should be redefined and checked. for its relations.

Note also the citations in paragraph 8.3.3 and 8.10.

If a difference of second level nature cannot be explained one has to regard this 'unexplained difference' as a different dactyloscopic point. Identification of the compared prints is prohibited.

8.3.2 When points are assigned to be valid (demonstrable and significant) their position is related to all other points. This is a very important part of the analysis and comparison of fingerprints since the formation of the relations determines uniqueness. The relations are established by following lines, counting ridges and determining relative positions towards neighboring points taking direction, angles, height and length into account.

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8.10 Tolerances

The statements in the first report in paragraph 10.12 require no further elaboration:

With identifications proven to be mistaken it became clear that the involved experts have ignored the differences. Evaluation of those comparisons often contain a long list of excuses why the print does not look like how it should, disguised as demonstration of the skill and experience of the expert.'

'A difference in appearance between compared fingerprints (or details of them) that is contributed to normal variations with printing can be tolerated.

Tolerances should be applied consistently and honestly. Experts should be aware of the paradox that one may be inclined to accept more differences in bad prints under the umbrella of distortion than one would accept in better quality prints. Distortion not only limits the perception of the similar but also from the dissimilar.

The rule is therefore that; Tolerances should not vary dependent on the quality of the impression.'

Simply put the paradox is 'the worse the print the larger the tolerances'. Mistaken identifications can often be contributed to this effect. One starts to assume similarity because one is unable to check it.

Council for the Registration of Forensic Practitioners

Code of practise

CRFP is a company limited by guarantee. The members of the Governing Council are the trustees of the company. The company's Memorandum and Articles of Association specify the members' legal obligations.

In addition to those obligations, CRFP service carries responsibilities for defining and securing high standards of forensic practice in the interests of justice, the public and the forensic professions. To command the confidence of everyone who has an interest in that process, members voluntarily undertake:

- to put the public good, and the interests of justice, before all other considerations, acting without favour towards any individual or organisation
- to serve without seeking personal gain or preferment
- to avoid placing themselves under any obligation which might affect their ability to carry out their CRFP duties impartially and objectively

Code of conduct CRFP

As a registered forensic practitioner you must:

1. Recognise that your overriding duty is to the court and to the administration of justice: it is your duty to present your findings and evidence, whether written or oral, in a fair and impartial manner.
2. Act with honesty, integrity, objectivity and impartiality
3. Not discriminate on grounds of race, beliefs, gender, language, sexual orientation, social status, age, lifestyle or political persuasion.
4. Comply with the code of conduct of any professional body of which you are a member.
5. Provide expert advice and evidence only within the limits of your professional competence and only when fit to do so.
6. Inform a suitable person or authority, in confidence where appropriate, if you have good grounds for believing there is a situation which may result in a miscarriage of justice.
14. Reconsider and, if necessary, be prepared to change your conclusions, opinions or advice and to reinterpret your findings in the light of new information or new developments in the relevant field; and take the initiative in informing your client or employer promptly of any such change.