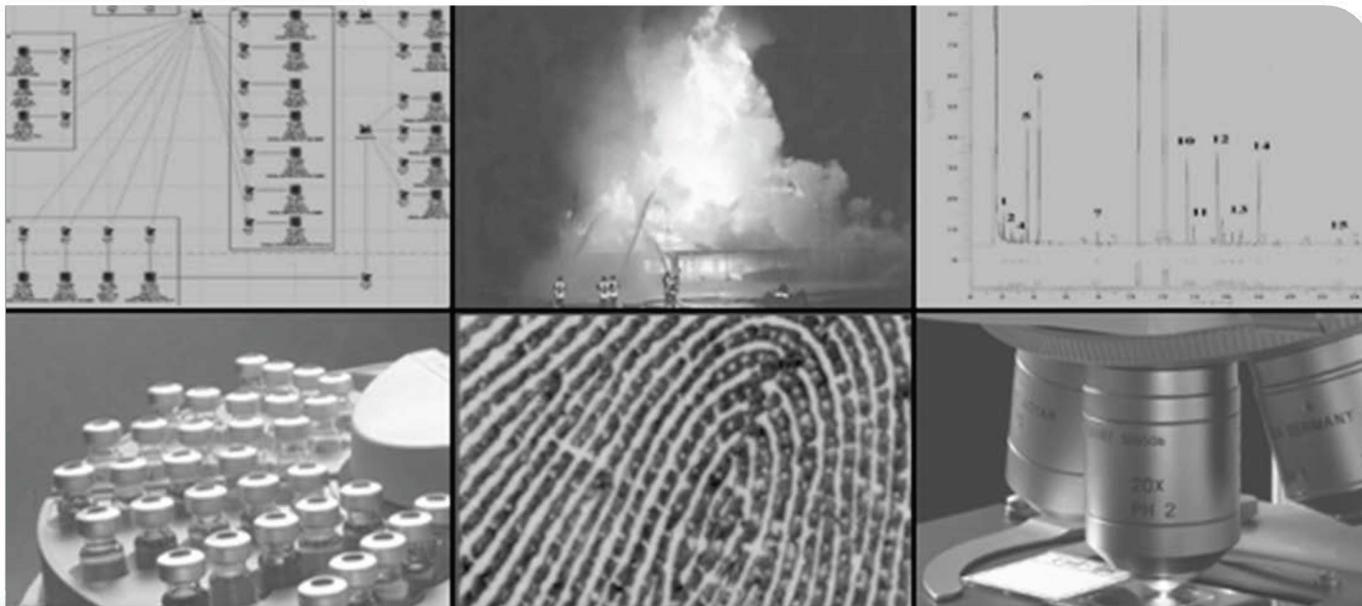


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## Prof. Christophe Champod

Faculty of Law, Criminal Justice and public administration  
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# Reliable experts in pattern evidence

January 9, 2017

| le savoir vivant |

National Commission on Forensic Science  
Washington DC

# Three questions

- Do we let experts decide on an “identification” ?
- Do we allow experts to formulate informed judgments ?
- How will experts report in the future ?

**Do we let experts decide on an  
identification ?**

**Table 1. Proportion of correct detections (sensitivity scores: number of Hits / [Hits + Misses]) and False Alarms (specificity scores: number of CR / [CR + FA]) throughout the 10 periods of continuous training.**

Periods	Scores of sensitivity $\pm$ S.E.M. (Hit / Hit + Miss) $\times$ 100	Scores of specificity $\pm$ S.E.M. (CR / CR + FA) $\times$ 100
1 <sup>st</sup>	70.41 $\pm$ 2.56	100
2 <sup>nd</sup>	73.46 $\pm$ 2.68	98.43 $\pm$ 1.22
3 <sup>rd</sup>	75.50 $\pm$ 2.79	99.12 $\pm$ 0.88
4 <sup>th</sup>	76.73 $\pm$ 2.92	100
5 <sup>th</sup>	80.14 $\pm$ 3.72	99.00 $\pm$ 1.00
6 <sup>th</sup>	82.62 $\pm$ 3.14	99.23 $\pm$ 0.77
7 <sup>th</sup>	82.41 $\pm$ 4.19	100
8 <sup>th</sup>	84.93 $\pm$ 2.69	100
9 <sup>th</sup>	83.80 $\pm$ 4.99	100
10 <sup>th</sup>	84.76 $\pm$ 3.83	100

doi:10.1371/journal.pone.0146963.t001

About 200 trials per period for each expert

*Only [experts] that gave no False Alarms over 200 trials during step 5 (corresponding to the last 24 sessions or 4 to 5 weeks of training) entered the judicial case program.*

# Match (ID) / non-Match (not ID) paradigm

A. Biedermann, S. Bozza, F. Taroni, Decision Theoretic Properties of Forensic Identification: Underlying Logic and Argumentative Implications, *Forensic Sci. Int.*, 177 (2008) 120-132.

A. Biedermann, S. Bozza, F. Taroni, The decisionalization of individualization, *Forensic Sci. Int.*, 266 (2016) 29-38.

ID

not ID



COMMENTARY ON  
THE NEED FOR A RESEARCH CULTURE  
IN THE FORENSIC SCIENCES

Pierre Margot<sup>\*</sup>

*UCLA Law Review*, 58 (2011) 795-801

*Most practitioners involved in the analysis of fingerprints, toolmarks, and firearms marks are not scientists and have little, if any, training in science. (p.798)*

*I contend that there is a solution [...]... forensic science education built on a forensic science culture. (p.799)*

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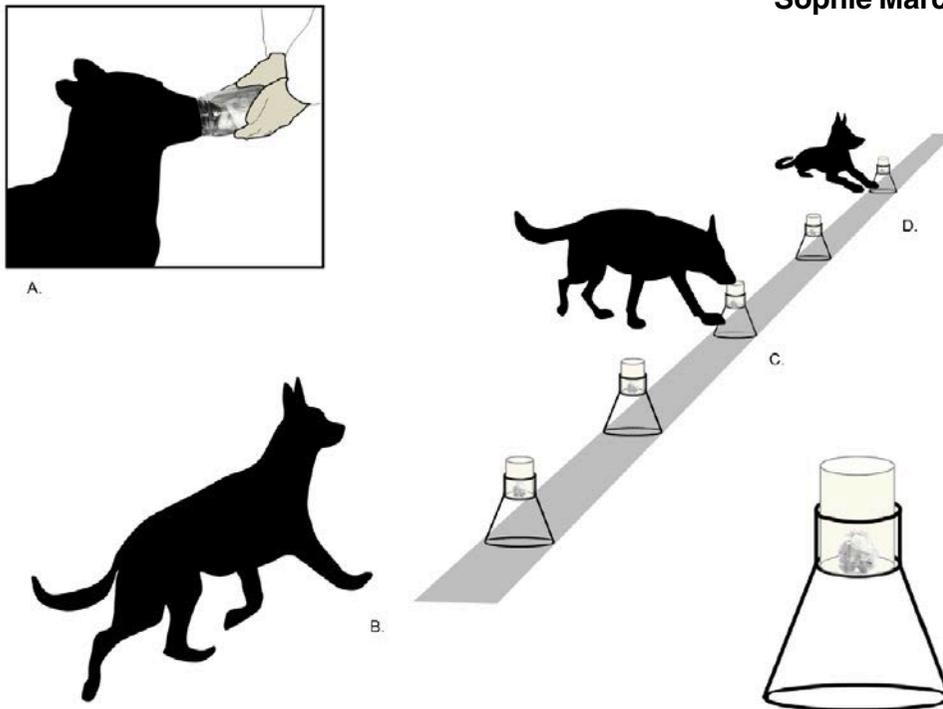
 OPEN ACCESS

**Citation:** Marchal S, Bregeras O, Puaux D, Gervais R, Ferry B (2016) Rigorous Training of Dogs Leads to High Accuracy in Human Scent Matching-To-Sample Performance. PLoS ONE 11(2): e0146963. doi:10.1371/journal.pone.0146963

RESEARCH ARTICLE

# Rigorous Training of Dogs Leads to High Accuracy in Human Scent Matching-To-Sample Performance

Sophie Marchal<sup>1</sup>, Olivier Bregeras<sup>1</sup>, Didier Puaux<sup>1</sup>, Rémi Gervais<sup>2</sup>, Barbara Ferry<sup>2\*</sup>



# Match (ID) / non-Match (not ID) paradigm

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ID

not ID



[http://enfsi.eu/sites/default/files/documents/external\\_publications/m1\\_guideline.pdf](http://enfsi.eu/sites/default/files/documents/external_publications/m1_guideline.pdf)

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Justice Weekly

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criminallawandjustice.co.uk

# ENFSI Guideline for Evaluative Reporting in Forensic Science

Christophe Champod, Alex Biedermann, Joëlle Vuille, Sheila Willis and Jan De Kinder write on a primer for legal practitioners

## ENFSI GUIDELINE FOR EVALUATIVE REPORTING IN FORENSIC SCIENCE

**Strengthening the Evaluation of Forensic  
Results across Europe (STEOFRAE)**

European Network of  
Forensic Science Institutes



With the financial support of the Prevention of and Fight against Crime Programme of the European Union European Commission - Directorate - General Justice, Freedom and Security

A project funded by the EU ISEC 2010  
Agreement Number: HOME/2010/ISEC/MO/4000001759

**Do we allow experts to  
formulate informed judgments ?**

## Data:

Data can take, for example, the structured form of **scientific publications**, **databases** or internal reports or, in addition to or in the absence of the above, be part of the expert knowledge built upon experiments conducted under controlled conditions (including case-specific experiments), **training** and **experience**.

## Likelihood ratio:

[...] shall be assigned on the basis of published data (see data as defined in this glossary) or a body of data that can be made available for peer review. Additionally, and in the absence of such data, experience or knowledge may be used. **All bases used should be disclosed.**

## Guidance Note 3:

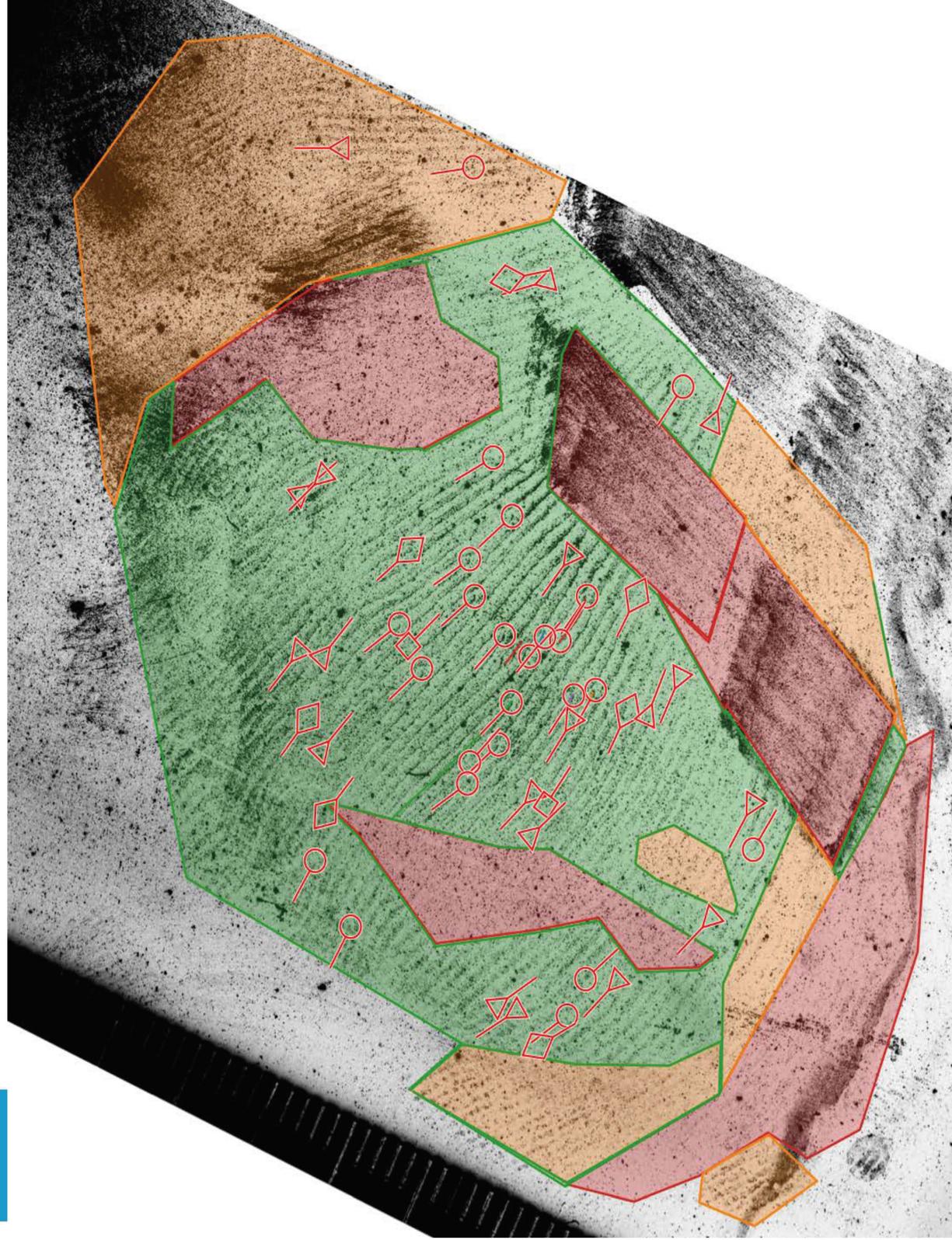
[...] The basis for these assignments shall be **documented on the case file**. Relevant and appropriate published data will be used wherever possible. If appropriate published data are not available then data from unpublished sources may be used. Regardless of the existence of sources (published or not) of numerical data, personal data such as experience in similar cases and peer consultations may be used, **provided that the forensic practitioner can justify the use of such data.**

# Transparency

# The mark



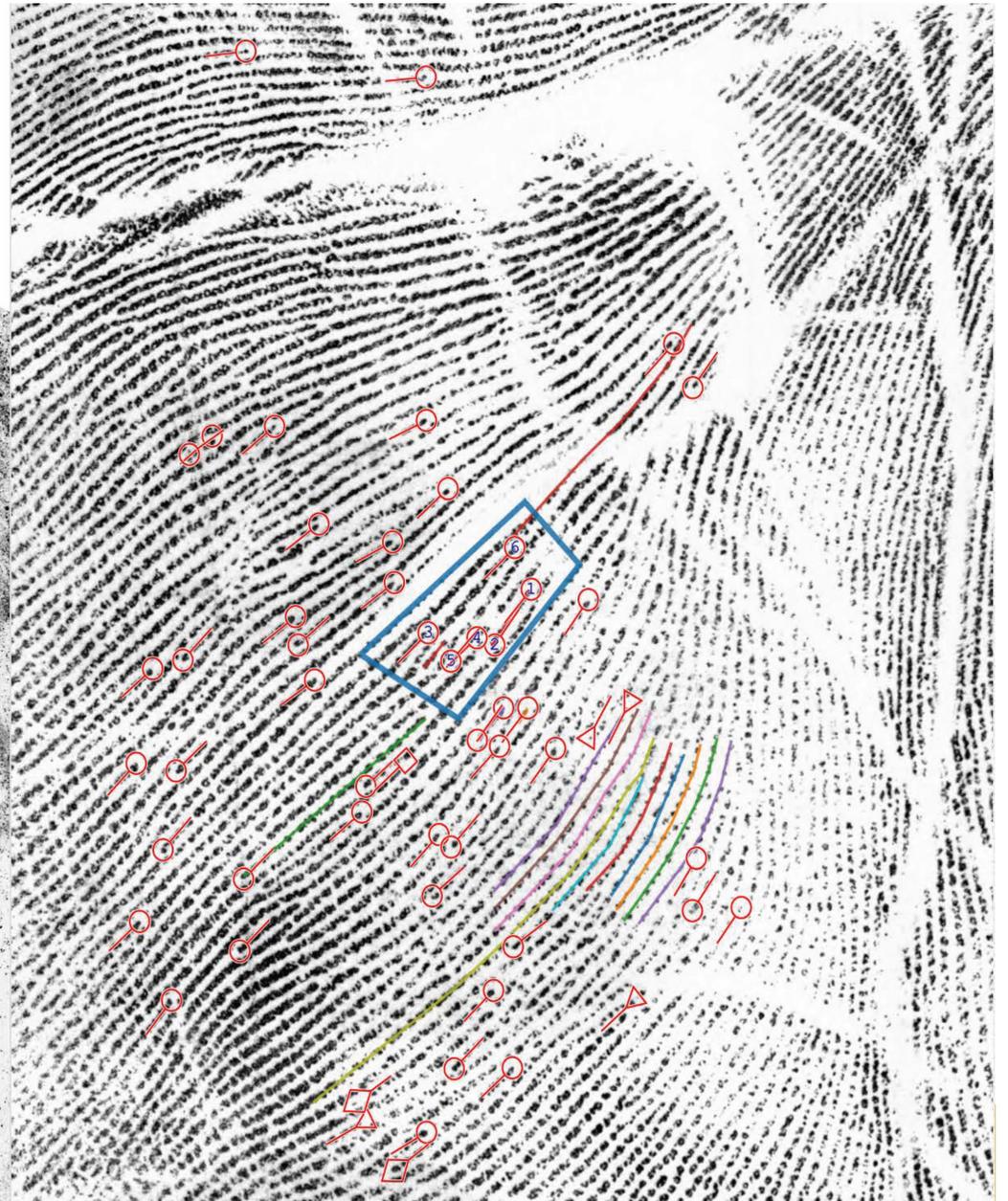
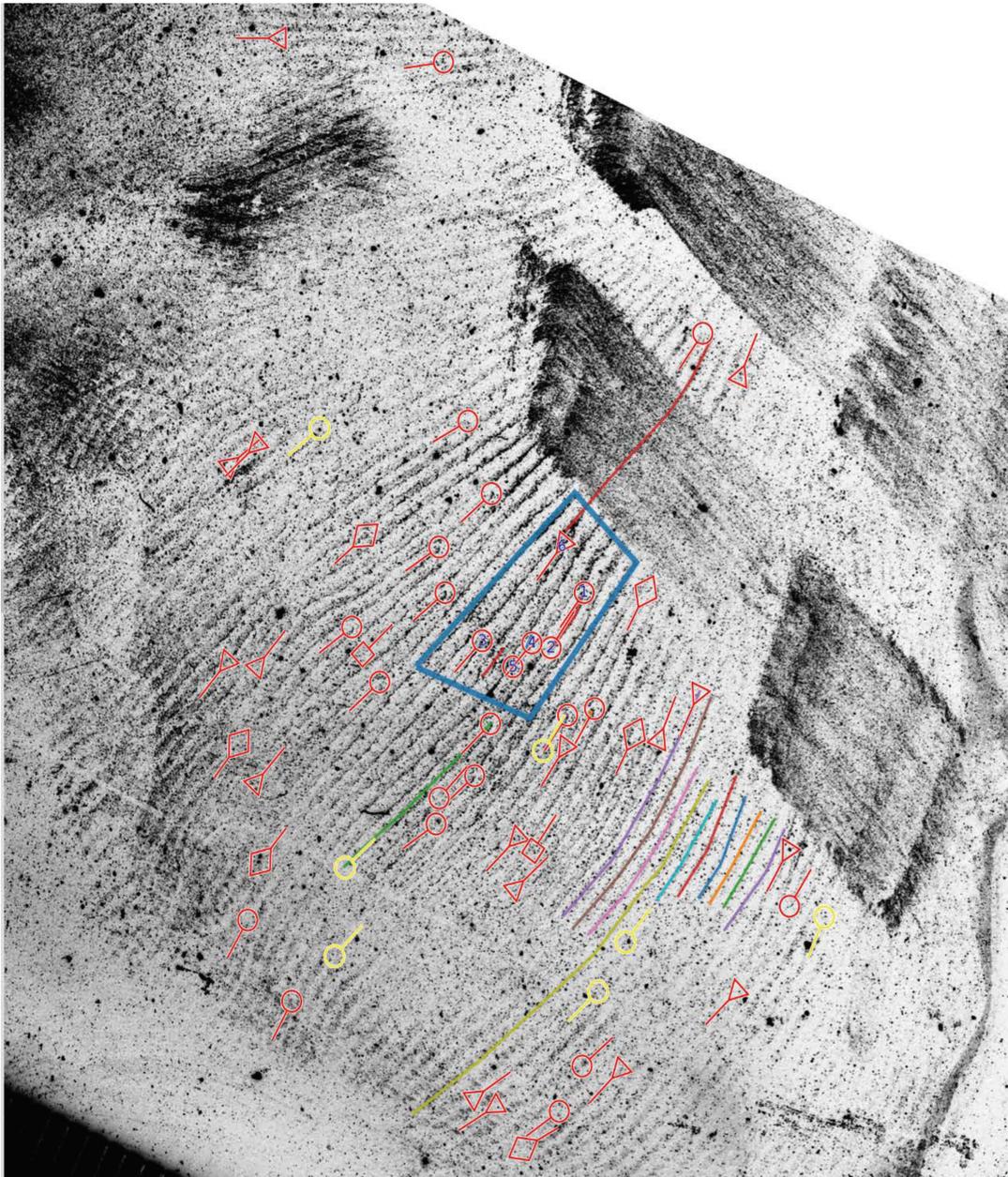
# Analysis



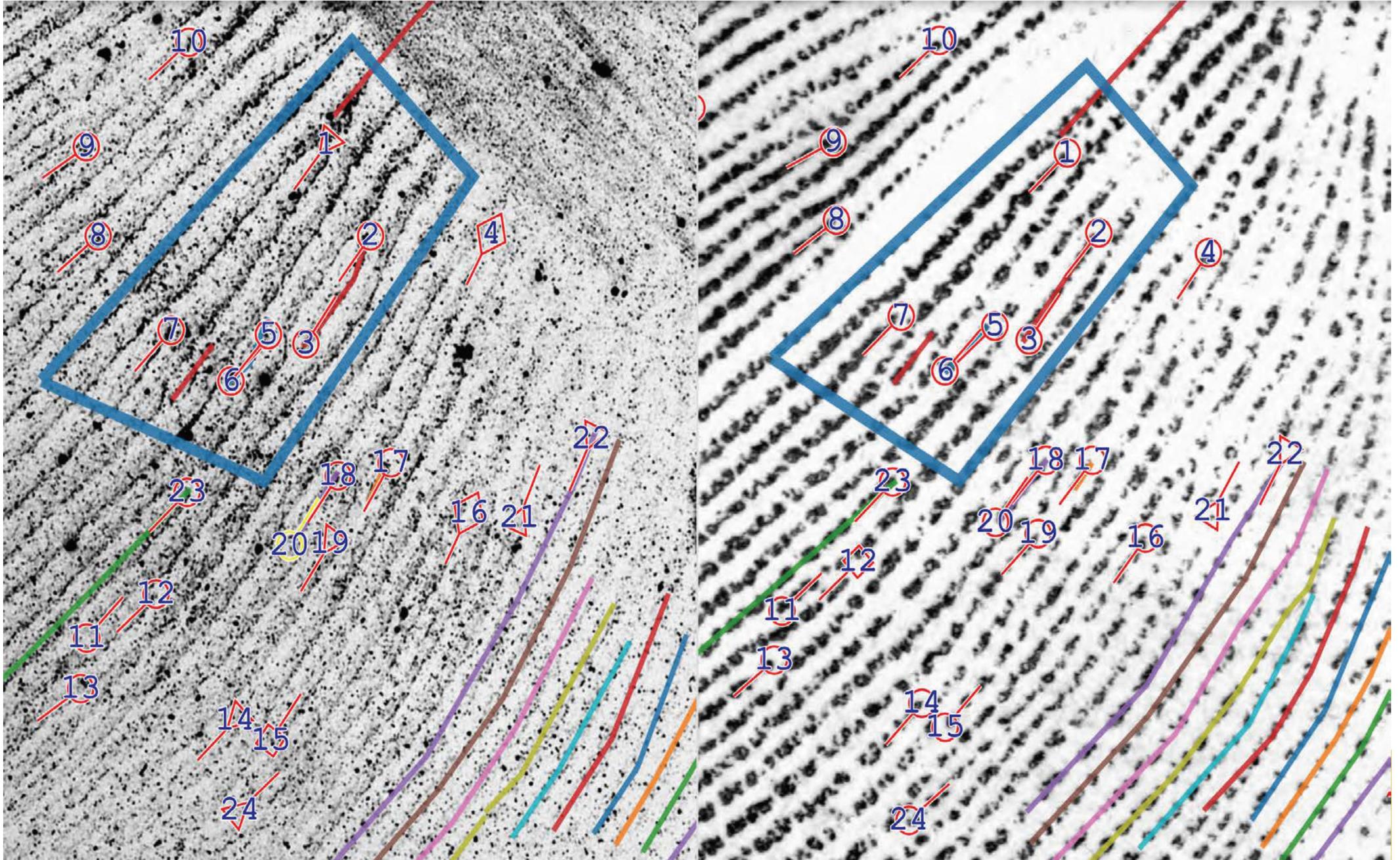
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# Comparison



# Comparison (close-up)



# Some additional questions by the defence

- What is the **body of the scientific research** that investigated the possibility for distinct palm print impressions to share common features?
- What are the **error rates** associated with such examinations?

# Report in this case (15 oct. 2014)

The observations made the mark and the palmprint of Mr K provide *extremely strong support* for the proposition that Mr K, rather an unknown individual, left the mark on the scene.

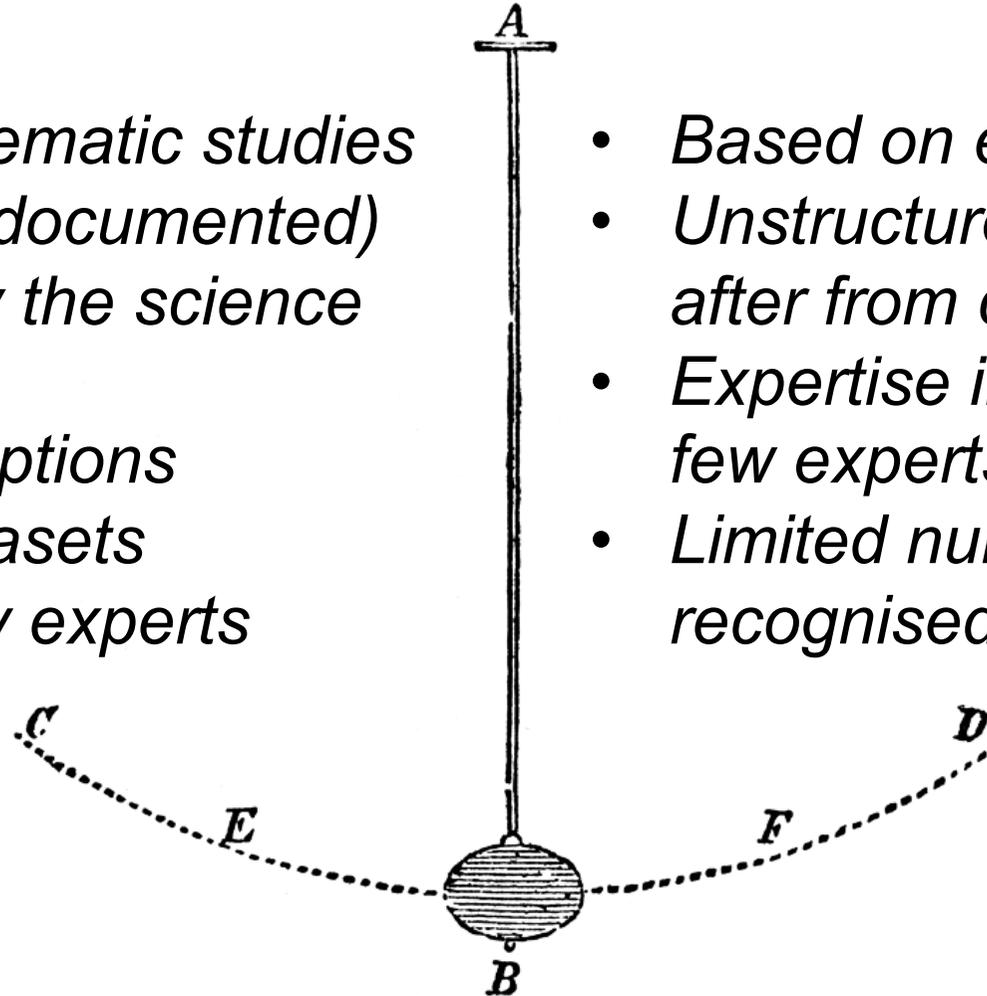
By *extremely strong* support, we mean that these observations are *in the order of a billion times more likely* if Mr K left the mark rather than an unknown individual.

# A system in tension

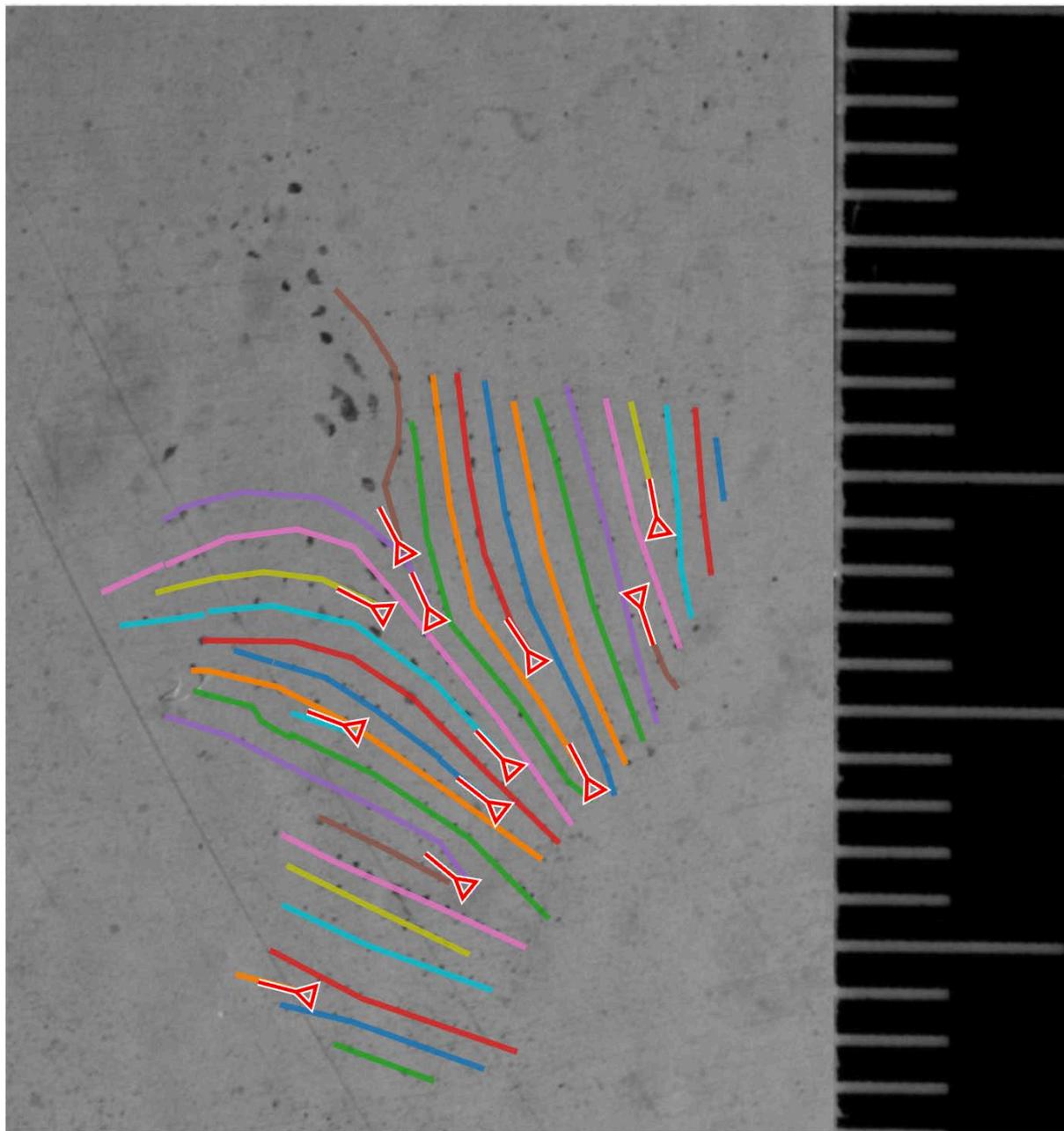
**Blind**  
trust

- *Relevant systematic studies (published or documented)*
- *Scrutinised by the science community*
- *Tested assumptions*
- *Extensive datasets*
- *Used by many experts*

- *Based on experience*
- *Unstructured data collection after from casework*
- *Expertise in the hands of a few experts*
- *Limited number of recognised publications*

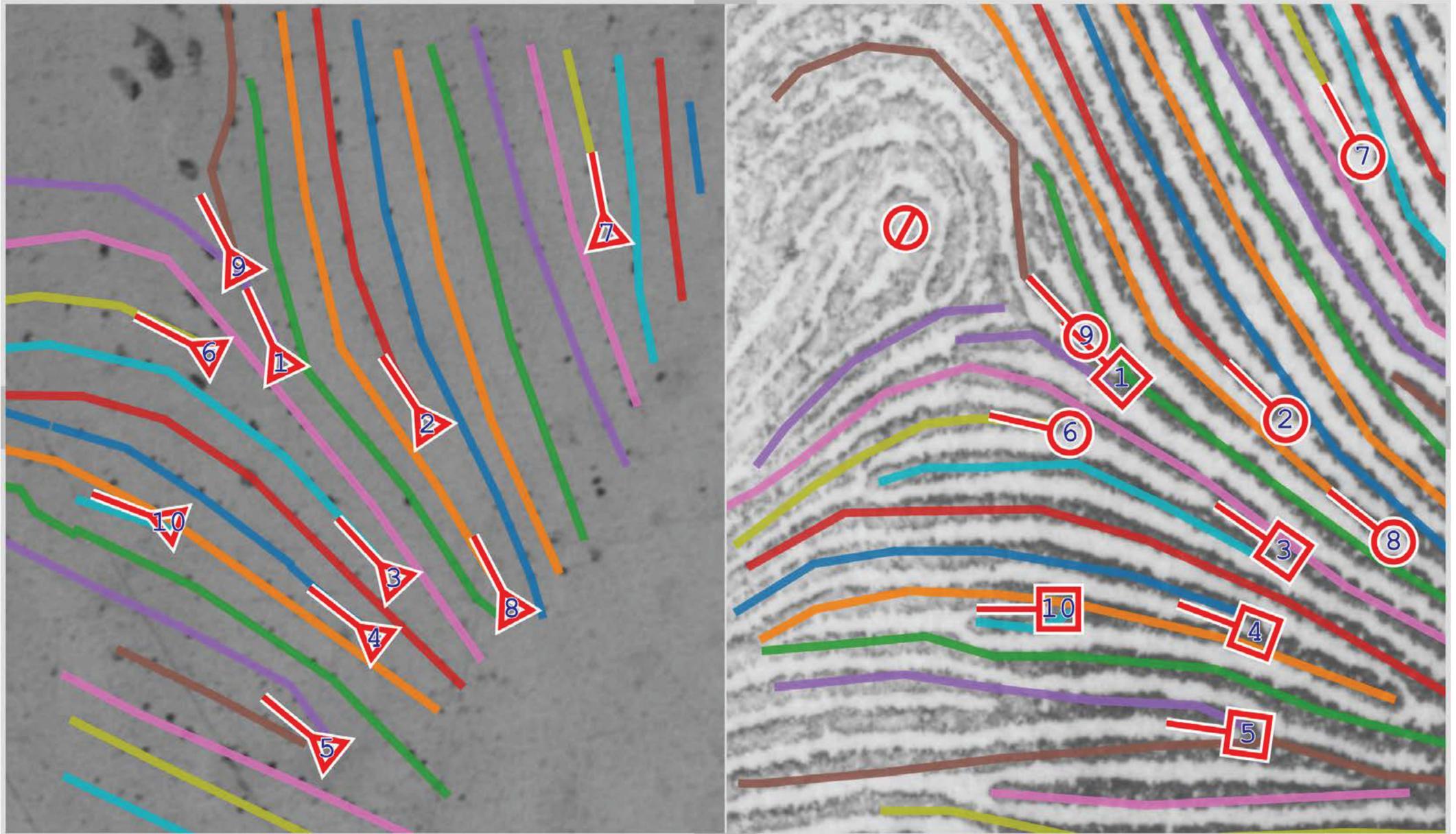


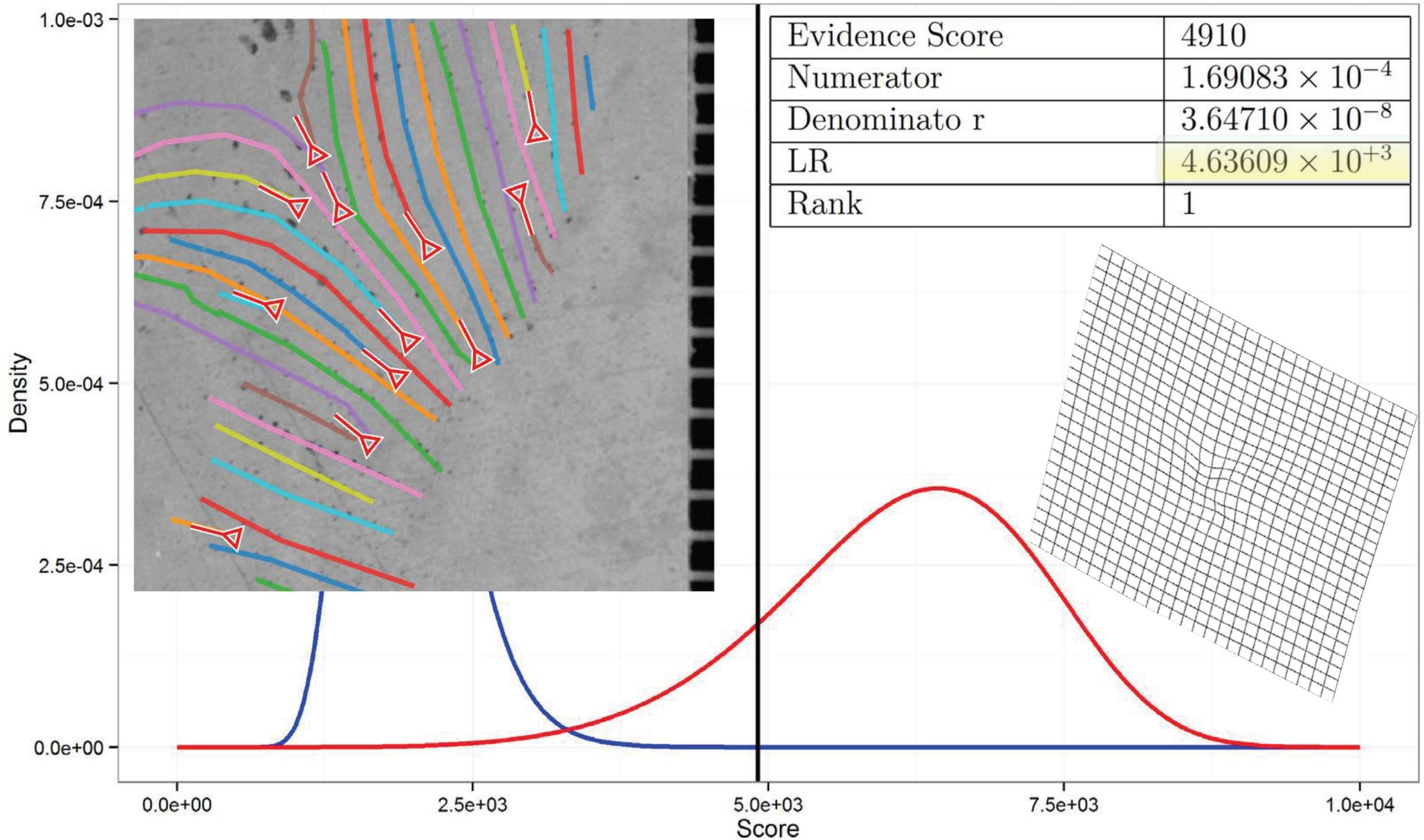
# How will experts report in the future ?



Documented analyses carried out by independent experts.

Serve as a basis to established an agreed **consensus** on the observations that will be used in the comparison.





# Experts conclusion

The observations made between the mark and Mr K's print provide *strong support* for the proposition that Mr K, rather than an unknown individual, left the mark.

By *strong support*, we mean that making these observations are *of the order of a thousand times more likely* if Mr K left the mark rather than an unknown individual.

# Three questions

- *Do we let experts decide on an “identification” ?*
  - **No**, courts should not defer decisions to experts
- *Do we allow experts to formulate informed judgments ?*
  - **Yes**, but it must go beyond *ipse dixit*
- *How will experts report in the future ?*
  - With more forensic **education** and with **transparency**

# Contact details

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