

Method For Fingerprint Identification

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Introduction

This document outlines methods and procedures for use in the identification of fingerprints. It has been composed as a result of close co-operation with very experienced and qualified fingerprint experts from several European countries and may serve as a touchstone and recommendation for good practice.

The primary goal is to protect the solidity of fingerprint evidence recognizing the responsibility towards society. The described methods and procedures are developed with awareness of this responsibility and understanding of the risks of the profession.

They serve as a guideline for a process that generates the most positive evidence upon identity that is available. Those guidelines, however useful and important as they may be, will only be effective if they are executed by well-trained and experienced experts that understand their meaning and are allowed to operate in a sound environment.

It was an honor to be chairman of this group and a pleasure to participate in the debate. A debate of which the spirit did justice to the founders of fingerprints.

A.J. Zeelenberg
Chairman of the IEEGFI,
Head of the National Fingerprint Department, Netherlands

Executive summary



The Interpol European Expert Group on Fingerprint Identification (IEEGFI) was instigated in 1998 following a proposal accepted at the 26th European Regional Conference held in Slovakia in May 1997. The proposal to assess the feasibility of formulating a European Fingerprint Identification Standard was endorsed by the Interpol European Committee in

November 1997, which set the basis for the work to be undertaken by the IEEGFI in the following statement:

'Bearing in mind the methods and procedures for identification of fingerprints in use by Interpol European member countries, the Interpol European Expert Group on Fingerprint Identification is asked to explore the feasibility of determining a common European method for fingerprint identification. This new method will include standard fingerprint identification procedures and an agreed number of minutiae and other characteristics.'

The countries which comprised the membership of the Group are representative of the various methods being utilized in Europe for the identification by means of fingerprints. From the discussions which have been held have emerged two main systems of comparison/identification and the presentation of such identifications as evidence. These two systems can be described as:

- a. the empirical standard approach
- b. the holistic quality approach.

The Report of the IEEGFI provides guidelines for fingerprint bureau operation systems. In doing so, it outlines the two different approaches to fingerprint identification and makes recommendations on the manner in which the processes should be addressed and the personnel should be assessed. The IEEGFI considers that whether European fingerprint bureaus use either of the two approaches to fingerprint identification in the manner explained, providing they adopt the recommendations relating to process control, training and competency assessment, the results obtained and evidence provided should be error-free and positive.

The procedures which provide the safety factor in each of the systems incorporate the necessity for:

1. Fully documented processes which enable the actions taken to be audited.
2. The persons undertaking the work have been thoroughly trained. Reference is made to the Standardised Fingerprint Training Report by the Interpol European Working Group on Fingerprint Training.
3. The persons undertaking the work are formally tested as to their competency in decision making on identity on a regular basis.
4. The appropriate environment is provided for the persons undertaking the work to obviate pressures and bias being brought to bear.

The IEEGFI considered the aspect of results produced in one country being accepted in another. The difficulties with different legislative requirements and the different approaches being taken in identification will necessitate any identification provided by one country to another being fully assessed by the recipient. Only the receiving country can or should decide on the validity of an identification for its own judicial process. This procedure is in line with that articulated in the recommendations of the Interpol European Working Group on Fingerprints which reported to the European Conference in May 1997.

The IEEGFI also has registered within the Report its concern with the increase in the operational use of live scan systems. The move to a paperless environment has risks for fingerprint identification and evidence in so far as the images resulting from these systems are not true replicas of the 'prints that are taken'. The software compresses the image which therefore loses detail which may be crucial in the establishing of an

identification. There is additionally the 'legal acceptance' of such information. There are, as a result, dangers which can militate against positivity in fingerprint identifications.

Recommendations

The IEEGFI takes the view that, whichever of the two methods of fingerprint identification is used within a country, there are fundamental quality aspects which should be applied in order to achieve accuracy and consistency of performance. Therefore the following recommendations/guidelines are provided to assist bureaus to fulfill their objectives in a professional manner.

Operation procedures for a fingerprint bureau

1. It is recommended that every fingerprint bureau should document all of its procedures fully detailing all of the processes undertaken to accomplish its work.
2. It is recommended that changes to procedure should be thoroughly considered and documented as to reason before being implemented.
3. It is recommended that the identification procedure adopted within a fingerprint bureau is based on:
 - a. The initial assessment and conclusion of a comparison.
 - b. The verification-assessment and conclusion of a comparison.
(Two different experts operating independently is a minimum requirement, most countries have three independent assessments)

Each expert in reaching a decision would follow the process outlined in this report. (i.e. the Information Phase, the Comparison Phase, the Evaluation Phase, the Conclusion Phase).

4. It is recommended that the work of a fingerprint bureau is independently audited on a regular basis to ensure that the work undertaken is in accordance with the documented procedures.

Competency assessment of fingerprint experts

1. It is recommended that each fingerprint expert is regularly tested on a formal basis on his ability to make fingerprint identity decisions.
2. It is recommended that, in conjunction with the testing process, procedures are adopted for dealing with the fingerprint expert who 'fails' the test.

Working environment

1. It is recommended that the environment in which a fingerprint expert works is one which excludes the possibility of outside influences and pressures.
2. It is recommended that each fingerprint expert is provided with, or has access to, appropriate technological aids to assist in the 'comparison/identification' process (e.g. magnifiers, light sources, enlarging comparators, photographic enlarging, etc.)
3. It is recommended that fingerprint experts are not time-constrained in undertaking a comparison.

Standards of behavior

1. It is recommended that fingerprint experts should:
 - a. Abide by a code of ethics. An example of an ethical code of conduct from 'The Council for the Registration of Forensic Practitioners in the United Kingdom' is attached as [Appendix 2](#).
 - b. Operate in a professional manner and be accountable for actions taken.

Inter-country procedure

1. It is recommended that only the receiving country can or should decide on the validity of an identification for its own judicial process.
2. Identifications established by another country should be confirmed by the receiving country.

Further recommendations beyond the mandate

1. The Interpol European Expert Group on Fingerprint Identification has fulfilled its mandate as far as possible and has, in the present report, detailed a number of important recommendations related to the methodology and the procedures of the fingerprint identification process. It is the overall opinion of the members of the Working Group that it is also important to detail the practice of the comparison process and develop definitions and guidelines that can be recommended in order to encourage further uniformity and quality assurance in Europe.

Therefore, the Group would recommend that consideration be given by the European Regional Conference for a further extension of the mandate of the IEEGFI with new terms of reference which details are given in [Appendix 3](#).

2. With the discussions of the IEEGFI-II, to be, a wide variety of topics ranging from the validation of quality to the application of psychology will be covered. Delegates should therefore be able to contribute with observations, feelings and opinions that are found to be difficult to address already in the mother tongue. Furthermore, the task will cover typical language-dependent issues such as the design of terminology and definitions that will function as the 'grammar' of the job. This nomenclature of identification will facilitate and promote cross-border discussions in future. In order to guarantee full and equal participation, it is of vital importance that interpretation is supplied. In the light of the present composition of the Working Group, this would mean that French interpretation should be granted.
3. The fingerprint business covers a large variety of specific disciplines ranging from court presentations to particular archiving, from managing the chain of evidence to managing large computer systems, from detection techniques to training staff, etc. Furthermore, as there is virtually no support from universities or private companies that deal with the same subjects, fingerprints experts have to build up and maintain their knowledge independently. In the light of this, the members of the Working Group feel that experts and managers from the national fingerprint bureaux could learn a lot from each other in exchanging experiences, concerns, ideas, problems and solutions. It is therefore recommended that the European Regional Conference initiates an International Conference on Fingerprints in 2001 with the aim to exchange information on a basic level. Additionally, the achievements of the various Interpol working groups since the last international

conference in 1995 could be one of the subjects of discussion at such a conference.

Initiation and installation of the working group



1. Based on the decision made by the 26th European Regional Conference held in Piestany, Slovakia in May 1997 and a survey by the European Liaison Bureau, the Interpol European Committee decided at its 18th meeting in November 1997 to set up the Interpol European Expert Group on Fingerprint Identification (IEEGFI).

Specific triggers for the initiative were:

- The wish to set up standardised training for fingerprint experts in Europe (The Working Party on Fingerprint Standards (WPFS)/The Implementation Group on Standardised Fingerprint Training).
- The growing number of cases in which evidence between member countries is exchanged.
- The likelihood of experts giving evidence across the borders in the near future will generate the chance of opposing opinions in court and, as a result, cause damage to fingerprint evidence.
- A proposal for a working group from the Dutch delegation at the 26th European Regional Conference.

To ensure that fingerprint evidence is solid and that conclusions of one expert can be supported by another, regardless of his/her origin, it was felt that a common method, with procedures and standards, would be highly preferable.

2. The mandate subsequently formulated by the Interpol European Committee in November 1997 reads as follows:

'Bearing in mind the methods and procedures for identification of fingerprints currently in use by Interpol European member countries, the Interpol European Expert Group on Fingerprint Identification is asked to explore the feasibility of defining a common European method for fingerprint identification. This new method will include standard fingerprint identification procedures and an agreed number of minutiae and other characteristics'.

3. The meetings of the IEEFGI were arranged by the Interpol General Secretariat who invited the predetermined delegations from France, Germany, Hungary, Latvia, Moldova, Norway, Netherlands and United Kingdom. The General Secretariat participated as well. Netherlands were invited to take the chair which they did after support of the first meeting. The General Secretariat took up the task of taking the minutes of the meetings.

For practical reasons, the delegation of Netherlands also agreed to do the paperwork related to the chair and to compose a draft report. The UK delegation offered to perform correction services.

4. Latvia and Moldova both communicated that they were unable to attend. From the

subsequently selected countries by the Working Group, Ukraine also made known that they were unable to participate. It was decided that Greece and Poland would be invited. They both gladly accepted the invitation and have participated since.

5. The United Kingdom was represented by two members; one from New Scotland Yard representing the Association of Chief Police Officers (England, Wales and Northern Ireland) and the other from the Scottish Criminal Record Office, representing the Association of Chief Police Officers (Scotland).
6. Finally the Working Group comprised the following countries:
 - France,
 - Germany
 - Greece
 - Hungary
 - Netherlands (chair, secretariat)
 - Norway
 - Poland
 - United Kingdom
 - plus Interpol General Secretariat (organisation, minutes)
7. With the initiative of the Working Group, it was recognised that the matters to be discussed were delicate and would be difficult to voice. Although absence of simultaneous interpretation had been explicitly conveyed to participating countries, it has however, hampered the discussions with delegation holding back momentarily from full participation.
8. Meetings were held at the Interpol General Secretariat in Lyons on:
 - 24th and 25th February 1998,
 - 27th and 28th October 1998,
 - 24th and 25th February 1999,
 - 17th and 18th November 1999
 - 15th and 16th February 2000.
9. Presentations were given by all delegations on their procedures and views expressed on the subject of a common standard.

A brainstorming session was held in February 1998. The results were used later for further discussions and implemented in the report.

Delegations provided papers on their procedures and standards. These papers will be made available to Interpol member countries on the Internet Web Site of Interpol General Secretariat.

At the second meeting, general concern in relation to the spread of live scan technology was identified.

The Working Group adopted the proposal to send a letter expressing this concern about live scan to the 21st meeting of the Interpol European Committee held in November 1998. The Committee took note of this letter ([Appendix 1](#)). A copy of it

will also be available on the Interpol Web site.

General position of fingerprint evidence



1. Fingerprints have a long history as a tool for identification both for civil and forensic purposes. Their reliability are proverbial and are often used as a yardstick and a reference model for other (new) forensic techniques mainly to profit from their widespread image. Identification by fingerprints has enabled recognition of individuals on a large scale by police and civil authorities for decades and often functions as the cornerstone of their registrations. Swift and reliable detection of attempts to deceit with false identities serves the integrity of records and police investigation. Fingerprints will remain to fulfil this function for a long time to come. The properties of fingerprints guarantee this. The ease of taking, transmitting, coding and filing prints in (automated) systems has facilitated access to immense files all over the world.

A rough estimation is that between 5 and 15 % of the world population is fingerprinted and has its prints on files. Computers all over the world constantly match millions of records per second penetrating collections in depth even with fragments of prints and generate fast results. The axiom that not two persons have the same fingerprints is already firmly based. With the comparison of billions of prints per day, the opposite is never found, so the uniqueness is constantly confirmed in an unprecedented way.

2. In the investigation of crime, fingerprints found on the scenes lead to more suspects and generate more evidence in court than all other forensic techniques combined.

Results over the years, expressed both in numbers and reliability, have led to a high level of acceptance of fingerprint evidence which is seldom challenged.

3. Specific aspects of fingerprint evidence

Fingerprint services are often located within police services or closely connected to them, contrary to other services investigating forensic evidence that are often situated in separate forensic laboratories. The investigators are often police officers or civilians trained specifically in fingerprints whilst in laboratories scientists encompass a variety of forensic disciplines. The conclusions of fingerprint identifications are the most positive possible even in instances where latents from a scene of crime are deemed 'borderline'. Fingerprints connect a suspect with certainty to a scene of crime excluding at the same time all other possible donors for the print.

A fingerprint technician may have a dualistic function. In searching latents at the scene of crime and searching files, his prime objective and motivation are finding the donor. Once a likely hit has been found, he has to perform a metamorphosis and become an independent and unbiased forensic investigator.

There are few techniques where the processes of selection and proof are so interwoven.

4. Concerns

1. The setting of fingerprint expertise as outlined in the previous sections contains a number of potential risks. Blind acceptance, dualism in the function, positioning in the organisation and non-scientific origin of its investigators generate a 'field of force' that in itself is not ideal for independent and unbiased investigation.
2. Reported mistaken identifications are likely to find their origin in an unhealthy culture, grown in an environment in which those forces do not have a quality controlled process. Mistakes in fingerprint identification can be avoided but they do occur nevertheless. Their occurrence damages the image of the reliability of fingerprints as an institution.
3. The exchange of evidential conclusions between countries using different standards could, in particular cases, show that opinions differ on the question whether identification is beyond any doubt. The same differences may occur with experts delivering second opinions in another country or system. Both systems/organisations involved may generate perfectly safe and sound evidence but may have different opinions coming from their standards and their application. Even if none of the conclusions is wrong per se, it will be exploited by the defence. They could refer to the general requirement for scientific practice that repetition/replication of the processes and their outcomes are proving validity.

5. Methods and procedures - General purpose

1. The main mission of the fingerprint expert is to deliver reliable conclusions. The expert's task is to translate the naked information into sustainable facts. With fingerprints of good quality and ten prints, there is generally no room for interpretation and error and hardly any chance of mistaken judgement on identification. However, with latents, the poorer the detail at hand, the greater the role of the expert becomes. He/she has to compare, judge and validate. With the application of tolerances, he declares dissimilarities to be within 'normal' ranges and not originated by a look alike.

When borderline cases are processed by several people, differences of opinion may arise. The information in the investigated print and its similarity with the comparison print may be valued as different ranging from under- to overvalued. One expert may call an identification of a bad print solid whilst another expert concludes to questionable. Some may regard an identification based on a certain borderline latent irresponsible; others could call it flatly wrong and even dispute the suggested donor. Those situations do occur. Society, however, may expect in general that forensic evidence is reliable, especially if its conclusions claim to be absolute as the fingerprint profession does.

2. If the outcomes of a process are claimed to be correct, then the minimum requirement is that the ingredients of the process are known and controlled. Repetition/replication is a scientific requirement and the first test applied to verify a factual conclusion.
3. The basis of fingerprint evidence is empirical. Effectively fingerprint experts state: 'we are right now because we have never been wrong doing it this way'. Their statement becomes more than a personal opinion by linking it to the empirical, historical and common domain of all experts.

The combination of a scientific method, detailed procedures and solid standards serve as instruments to obtain all of this.

General statements



1. Identification is a word that derives from the Latin word 'identitas' with the root 'idem' that means 'the same'. Similar expressions are found in most modern languages. In English (and other languages) the word can have several meanings, varying from nominating a group with common properties to the forensic meaning of connecting information to one individual, also named individualisation (Tuthill).

When, in this document, identification of a fingerprint is mentioned, the forensic meaning is that:

'The fingerprint or latent print being examined was made by this donor excluding all other possible donors'.

2. The method presented in this document is predominantly recommended for latent fingerprints of which the information is questionable. This means that this method is not fully required for fingerprints of which the quality and quantity of information is apparently good, such as with ten print cards/forms. Some elements however may be advisable nevertheless.
3. Fingerprint evidence should only be stated as absolute and positive conclusions. **There is no basis for likely or probable conclusions neither based on statistics nor upon personal judgement.** If sufficient information is present, a positive conclusion about donor ship is always possible. If there is insufficient information disclosed to enable a decision to be made concerning identity, the print will be determined as being of no value for positive identification. There can be no basis for speculation as to identity in such prints since the chances of being wrong are unknown.
4. Environment
 1. Mistaken identifications have some common causes. The (latent) fingerprints being examined were of bad quality, the expert was biased and there was pressure involved. The expert(s) was (were) sure to be right and could most of the time not be convinced of the opposite. Independent experts investigating the print later judged most of the times the prints to show insufficient detail for identification or even for comparison. Real verification did not take place.
 2. False identifications are human errors but errors are human. If man were able to judge independently and free of bias, mistakes would be virtually impossible. The fingerprint expert is working in a 'field of force' that generates pressure towards results. Open pressure but mostly hidden, pressure from outside but also from the inside. The need for result can be considerable in high profile cases. The longing for result leads to guided perception and biased evaluation. More subtle is the mechanism of subconsciously deciding while comparing. If one has found 6 points in agreement and gets the 'warm feeling', the perception and validation are guided often leading to upgrading information, ignoring differences and stretching tolerances.

3. Everything should be undertaken to keep the pressure off the investigating process. It is the responsibility of the management to create an open and sound culture in the first place. A sound culture starts with proper goals for the organisation. The goal of the forensic specialist is not generating results but scientifically sound conclusions regardless who 'profits' from them.

The organization should not be involved in the judicial system as a party and express verdicts in terms of winning or losing.

5. Hierarchy

1. Hierarchy (rank) in scientific decision-making is considered to be inappropriate. The dangers of such a process, which must be recognised and overcome if a hierarchical system is used, are that:
 - a. The 'junior' tunes his/her opinion to that of the 'senior';
 - b. The culture of the longer serving expert 'sees more';
 - c. The pressure on the junior to please the senior.
2. The decision making process in this respect must ensure that it is based on the following principles:
 - a. The facts must be freely evaluated and argued;
 - b. The facts must 'speak' for themselves;
 - c. The information must allow demonstration (even to layman);
 - d. The verifier must be able to reject or confirm without fear or favour;
 - e. Every expert must be respected for his/her unbiased opinion;
 - f. Only the quality of the information is important not outside pressure from any nature.
3. Even if an ideal situation is created, pressure and bias will always be around like in any social structure. It is therefore important to acknowledge this fact, recognise it in practice and put mechanisms in place to address it.

The outcome of the identification process could be represented as the product of the multiplication of human input from the expert and the quality of the identification process. This quality can only be obtained by knowledge of the process and by implementing control mechanisms such as methods and procedures elaborate in paragraph 9.

The expert



1. With the selection of experts, strong accent should be placed upon a right attitude and broad education, reflecting the responsibilities and function the expert is going to hold.

An expert should know what 'field of force' he/she is working in and recognise the signs of pressure and bias. He/she must be balanced and socially accomplished to handle them. An expert has to render account of his work in a professional manner. The expert should not feel attacked or act defensively nor secretively.

An open self critical attitude benefits to sound work and responsible presentation. Willingness to explain and demonstrate facts and findings should be normal. The recognition that accountability is necessary forms not only the cornerstone for quality but is also positive to society and colleagues.

2. The expert must be well equipped in order to be able to undertake the job in the right way. An important basis is a high level of experience and proper training. Experience is necessary to reference the judgement of several values of the comparison. The feel for responsible tolerances comes from practice. The required knowledge can only be obtained from an extensive number of comparisons in the zone where the extreme border of solid identifications twines with dangerous look-alikes.
3. Experience must grow in a well-guided setting. A balanced view can be acquired in a situation where consultation, discussion and correction are present. Doing it often is not enough, one must learn it the right way too. Training is important. Regular checks and ongoing education are essential in maintaining the professionalism required.
4. Competency
 1. Experts' competency should be formally tested at agreed intervals. A system of formal, independent assessment of an expert's ability to accurately make comparisons (come to the correct conclusion) should be put in place.
 2. The system adopted to re-evaluate experts will have to ensure that there is:
 - a comparison exercise involving the decision as to identity on at least 10 pairs of latents/ 10-prints;
 - provision of the appropriate environment and equipment for the comparisons to be undertaken;
 - independent assessment of the comparison results, with anonymity being maintained to ensure that there is no bias by the assessors;
 - feed back to the expert through the management;
 - an appeal procedure for the expert to challenge the assessors findings should the expert 'fail' the assessment;
 - a process for refresher training and re-test if a 'failure' is upheld;
 - a document policy for handling situations where an expert 'fails' the re-test. (The policy should be that the person can no longer be employed in the role of an 'expert'. However the future employment

of that person has to be the decision of the employing country or department e.g. this could range from being used as a 'non expert' and retrained to qualify again to become an expert, to being dismissed.)

Reference to other working groups



The Working Group on Standardized European Fingerprint Training has issued its report which was endorsed by the 26th European Regional Conference. The subsequent Implementation Group on Standardized Fingerprint Training has developed a basic training for beginners in the fingerprint profession.

Ethics

1. The expert is morally expected to perform an impartial, complete and objective examination and evaluation and to deliver an unbiased conclusion. It is also expected that the expert behaves during the expert activity in a way that it increases the experts own prestige as well as that of his profession.
2. Ethical conduct can be characterised as: 'To withstand the inclination to act wrongly'. For doing it rightly, two things are important: firstly that the right way is defined, and secondly that one adopts the right role. If the role of an independent expert, who gives input to the judicial process, is exchanged for 'crime fighter' or the perception that one has the task to liberate society from evil, then the result (an identification) becomes more important than impartiality. However sympathetic such a mission may seem, it is wrong if someone's views as a civilian interfere with the professional conduct society may expect from him/her in the judicial system.
3. Ethics are not in our genes. People who make mistakes in general are not bad by nature but may behave differently - and sometimes wrongly - in difficult situations, particularly if they are subject to conflicting interests which they fail to recognise and/or are not properly prepared for. Ethical conduct therefore can be developed in a sound and open culture.

Signs of unethical conduct are: justifications with arguments outside fingerprinting, bending the rules and turning doubt into double effort rather than prudence.

Detailing of methods and procedures

1. Method

The method used in any organisation should be detailed in writing and be auditable. The rules of the game should be known before it starts and not be changed during the game. This provides both transparency and continuity. The empirical basis for any identification requires doing it the same way. Replication (another expert using the same methods should arrive at the same conclusion about the same material) as scientific requirement is best served with a standard method and procedures and virtually impossible without it.

2. Regulated change

Changes should be made with great care and after thorough investigation of the (long term) effects. The chance of making a mistaken judgement should not rise (absolute evidence requires a proved, zero error rate). The change requires

maximum support of the field and should be well documented. The procedure for change should be well defined. It speaks for itself that changes should never be initiated for, or during, a particular case to favour such a case.

3. Process

The following are a number of basic conditions and procedures required for the comparison process:

- The first fingerprint examiner should have minimal links with the case in order to be independent. In an ideal situation, the collector of the evidence of the scene of crime should be excluded.
- The examination is done in a quiet environment that is separated physically and mentally from the police investigation process.
- Management must provide and secure an uninterrupted investigation time frame in a secluded area.
- It is recommended that the process is performed by the expert as one uninterrupted job. This is to avoid repetition of detection and validation of the minutiae. Repetition of perception is not cognition but recognition and has the nature of confirming the known. The fabulous capacity of the brain to recognise the known leads to an unconscious upgrade of the original information and biased perception.

It is often said that a 'difficult mark' giving problems one day is easy the next. This is mostly attributed to the fact that someone was tired. It must be accepted that there is a distinct danger for an identification to be easier the next day because one starts with the preconception of identity and takes the similarities found so far as irrefutable facts. They become real by storage in the memory and therefore great care has to be taken when reassessing the print on a subsequent occasion.

It is vital for the quality of the process to be performed in good conditions. A quiet working space, good lighting and equipment for comparison such as lamps with superior optical properties, pointing/marketing devices, enlargement facilities and/or (computer) screens with overlay facilities are minimal requirements.

4. Separated stages of the identification process

For a methodical approach, the identification process is divided in several stages of coherent activities in order to promote free gathering of information, honest validation and sound decision making. The process can therefore be divided into the following steps: the information phase, the comparison phase, the evaluation phase, the decision phase, the verification and the final conclusion.

5. Information or analysis phase

In this phase, the latent is studied without any knowledge about the comparison print. The information is detected, evaluated and validated in the most objective manner. Everything that is judged to be valid fingerprint information should be established here in order to be verified in the comparison print later. Distortions, superimposed prints and all other relevant observations should be made in this phase. This is the basis for an honest comparison, validation of similarities and possible explanation of differences. If, in the information phase, the print is

judged to be unfit for identification, this decision should rarely be overruled later. If a decision is nevertheless overruled, this should be signalled, carefully discussed and well justified.

6. Comparison phase

The original latent and the quality and the quantity of the data found in the information phase are the starting point. Unbiased establishment of the facts is the aim. The potential for making a decision early in the comparative process must be recognised. The comparison must be an unbiased 'step by step' building process ensuring that the data in the latent and donor print agree with nothing in disagreement which cannot be logically explained (and accounted for). The decision must be made at the end of the process only.

Every single detail is checked as to whether location aspects and relations are similar to 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.

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.

8. Conclusion phase

The found volume of similar information is measured against the standard that is in force. If that is met, or exceeded, the conclusion of identification is possible but not obligatory. The expert has to judge himself whether he/she is entirely satisfied and whether the conclusion of identity is solid and all risks excluded. If satisfied with the identification, the case should be passed on for verification. It is not proper (or acceptable), if in doubt, to leave the conclusion to the verifier, and to adapt/ accommodate to his/her opinion later.

9. Verification

The proposition for identification is presented neutral to the verifier. All kinds of comments and even the most subtle signals about the nature of the case or conclusion are avoided. The verifier has the assigned task and knows his responsibility. He has to make up his own mind freely and impartially.

Discussion and consultation in this phase is not desirable because it influences the bare detection and validation of the facts and the forming of an opinion. Discussion and consultation may take place only after one has made up his mind about what he has seen. The subject of the discussion is not the conclusion and

who is right but must centre on the facts, the validation and the application of the rules.

The nature of the verification phase is scrutiny not confirmation. Mistaken identifications suffer almost always from absence of real verification due to haste, blind confidence, pressure for result or a premature broadcasted success.

10. Questionable identity procedure

It is of paramount importance that during verification there are provisions for the differing opinions. If not, it puts pressure on the decision because it suggests that it will never happen. A questionable ID procedure is such a provision and should be a normal and standard available one. In this process other experts, who have not be involved in the case, will independently judge it.

11. Possible conclusions

The following conclusion may be the result of the comparison process:

- the investigated print is identified as coming from the same donor as the comparison print;
- the investigated print shows an insufficient volume of information and is unfit to bear any conclusion of origin;
- the investigated print is unfit for identification but shows (class) details that exclude specific donors with certainty;
- if a print shows insufficient but coinciding detail and a statement of the expert is required (in exceptional cases), his/her statement could be: 'the investigated person cannot be excluded as the donor of the latent' (without suggesting probable evidence);
- the comparison print is of insufficient quality, the process is stopped and may be repeated with new comparison material

Definitions



1. The basis for fingerprint identification are two axioms:
 - **Fingerprints are unique**
 - **Fingerprints do not change during life.**
2. The basis of fingerprint identification practices is the fact that the unique nature of fingerprints is expressed in papillary ridges that show features of a principal nature that keep their properties even under adverse conditions. Location, direction and relations stay the same when printed under pressure, while stretching the flexible skin, and even with distortion, to a relative high level.
3. Scientific research and extensive practice have shown that fingerprints, after development in the womb, do not change during life (and even until long after death), preserve ridge patterns and detail. It has been proved after long research and years of practice that the principal aspects from the ridge detail do not

change with growth. As the detail is embedded in the dermis or true skin, it is restored to the original when the skin comes to rest after temporary damage to the epidermis or outer skin such as burns, blisters, abrasion and even callus. Only when the dermis is affected after external damage e.g. with a deep wound, the skin will develop scar tissue changing the papillary detail. This detail becomes permanent, however, after some time and may make that piece of skin even more distinctive.

4. Identification is: **'the conclusion of an expert that two fingerprints show sufficient information in agreement**, and no principal differences, in order to point one donor as the sole source, and whose conclusion is verified and confirmed by another independent expert'.
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.
6. **Features can be described as minutiae** and other ridge formations. **A minutia** is an event which occurs in a regular flow of papillary ridges. The event is a natural/ biological disturbance to the normal parallel system of the ridges (e.g. a ridge stops or starts).
7. **The value of the event** is given by the rarity of the occasion taking into account the type of direction, relations to other points and the position in the pattern. **The quality value is related** to clarity and the presence of ridge detail. Two or more points that coincide/overlap count for one point/event only. [For example two or three lines that come from different directions which join at the delta point.].
8. Other ridge formations **relate to the shape, position and orientation** of pores and the shape and configuration of individual ridges (the study known as ridgeology).
9. A point of agreement is a point in compared prints where location and appearance have a similarity that meets a specific value and where that similarity falls within the ruling tolerance.
10. **Look-alikes** are fingerprints from different origin that show an unexpected level of similarity that has the potential danger of a false conclusion about identity.
11. As a rule, the quality of the differences (e.g. explained by distortion) should not be higher than the quality of the similarities.

When a dissimilarity is 'explained away' by arguing that the information is too bad and not valid, then similar information with equal quality should also not be regarded as valid.

In certain cases, compared prints show minutiae of which appearance and even location differ. If these differences are attributed to a demonstrable distortion, this would not withhold the possibility of identification. Typically, the latent will be reconstructed virtually (to correct the assumed distortion) in order to establish whether no principal differences remain (e.g. different ridge count or number of events). After such a process, corrected minutiae should not be used as true and valid. Since the data looked different in the first place and reconstruction has taken place on the basis of the assumed original, this would be scientifically false. This is condensed in the following rule of thumb: 'explained differences are not

similarities'.

If a certain area is blocked out because of distortion, neither differences nor similarities in the same area should be accepted.

12. Tolerance

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 of the dissimilar. The pitfall is that a premature assumption of donor ship leads to transplantation of data from the 'original' into the blur of the latent. It is circular reasoning like: this print comes from this donor, prints are unique, thus all data must be the same and subsequently all differences are not real. With identifications proved to be mistaken, it became clear that the involved experts had ignored the differences. Evaluation of those comparisons often contains 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. The rule is therefore that: 'Tolerances should not vary dependent on the quality of the impression'.

13. The value of the location and direction of 'pattern forced' minutiae is lower since the event is regarded to be more dependent from surrounding events than to be random. In certain areas of common patterns in fingerprints, we see minutiae that more or less originate by this pattern.

For instance, in the core of a multiple spiral pattern, all ridges flow in the same direction (e.g. clockwise) and since there is no room for them to continue in the core, the type of event (ending ridge), direction (ending towards the core), the location (core area) are similar and more forced than random. On the contrary, an ending ridge in an area without a distinct pattern is judged to be a more random event regarding the aspects of direction and location and by nature to be of a higher value.

Second part of the mandate: 'an agreed number of minutiae and other characteristics'



1. From the early days of fingerprint identification, it has been recognised that, although fingerprints are unique in detail, in practice one has to take into account that the information is not always ideal and that tolerances have to be applied with the establishment of similarity. Therefore look-alikes caused by distortions and by chance do occur up to a certain level of information.
2. To avoid false conclusions based on those look-alikes, it is wise to require a minimum quantity of information for identifications. Standards addressed to as 'minimum point rules' used since the early days of fingerprinting contain safety margins to allow for variations, for the unexpected and to guarantee solidity of the positive statements.
3. Identification is not just counting points. It needs an expert to establish a certain volume of information whether this is predefined or not. This volume is comprised

of quantity, quality and similarity. Their aspects may interfere and compensate for each other. The required minimum quantity may even vary independently of quality.

4. In the USA, after a 3-year study by a Standardisation Committee, the use of a minimum numerical standard was discouraged by the adoption of a resolution at a conference of the International Association for Identification stating: 'no scientific basis exists for requiring that a predetermined minimum of friction ridge features must be present in two impressions in order to establish positive identification'.

The decision whether the information in a particular case is sufficient was left to the discretion of the individual expert, based on a total quantitative and qualitative analysis.

5. Recently in Europe (in the United Kingdom and Norway), there exists a movement towards the expert opinion system. In England, Wales and Northern Ireland, it will be implemented in April 2000, with Scotland aiming for a similar start date. The system is already in operation in Norway.
6. Overall, this means that there are two different systems in use in Europe: one is known as 'the holistic approach (non-numerical)' and the other as 'the empirical standard approach' (numerical). They are described and advocated in the next two chapters.
7. There is an agreement between parties that fingerprint evidence should be positive and that no probable evidence should be given based on prints with insufficient information.

There is also common recognition that look-alikes do occur and that there is a real danger for false conclusions based upon too little information.

The opinion of the identification for both systems is based on friction ridge information found in agreement during comparison.

The difference is the philosophy of approach, not the confidence in the identifications made by those systems.

Holistic approach to identification of the friction ridge surface



1. When identifications are processed, experts currently tend to explain and demonstrate the identification only on the number, and sometimes the type, of ridge characteristic. The holistic approach will/could explain and mention further aspects, some of which we tend to take for granted. Persistence and uniqueness are the foundation on which the science of fingerprints is based. If this is true for ridgeflow and minutiae, it must follow that it is also true for the other aspects of ridge structure. The manner in which this information is used in the identification process is explained below.
2. First level

- overall pattern configuration;
- this does not have sufficient uniqueness to individualise.

The pattern formation is probably the first aspect that an expert will use in the identification process. However, this is very rarely mentioned in explaining the identification. Example would be: 'If an expert compares an arch pattern mark with a whorl pattern and if the two items being compared are the same pattern, this is the first step in the identification process'.

3. Second level

- specific friction ridge path/flow of the ridges;
- specific path of accidental features, such as scars, subsidiary ridges and flexion creases;
- the location and type of ridge characteristics.

Identifications are currently processed on the number and sequence of the ridge characteristics. Although ridge characteristic on subsidiary are sometimes used, the fact that subsidiary ridges appear in two impressions is by itself an aspect that could be used in the identification process. Fingerprint experts would state that scars and flexion creases are never used in the identification process. However most experts would agree that they are used in the searching and the initial stages of the identification process. All these are aspects of the identification process. All experts use the number of characteristics and the coincident sequence to explain and demonstrate an identification. However, the fact that ridges appear with no characteristics is not mentioned. This again is another unique feature of the ridge system. (It is worth recording that the Americans also use the 'dot' as a characteristic that is a single pore ridge.)

4. Third level

- third level detail is small shapes on the ridge (edgeoscopy);
- including ridge unit thickness, thinness and relative pore location (poroscopy);
- third level detail is always used in agreement with second level detail.

5. This is the additional aspect that experts are expected to look for. As mentioned above, it is used with the aspects in the second stage. It includes the items mentioned above and adds strength to explain and demonstrate identifications and/or non-identifications with a limited number of characteristics.
6. To make a decision whether the information in a particular case is sufficient, the expert must evaluate the clarity of the print, ascertain the quantity in agreement and the quality of the agreement. An opinion is then formed as to whether the prints are in agreement and if there is sufficient uniqueness to eliminate all other donors. This opinion is subjective and is based on the experience, knowledge and ability of the experts.

7. Biological uniqueness exists or does not exist. The biological differentiation as a natural and consistent occurrence or uniqueness cannot sometimes be partial and other times not partial. Any portion of a fingerprint, no matter how large or small, has only one source of origin.

[Reference is given to the research of David Ashbaugh from the Royal Canadian Mounted Police on this subject.]

Empirical standard approach



1. The countries advocating a numeric standard argue that it is the cornerstone for solidity and the claim of positive conclusions. The properties that allow allocation and quantisation of unique details is the essence of the difference between fingerprints and other (biological) evidence. The application of the standard enables a step by step validation and decision making process that give the best possible opportunities for verification and a true conclusion.

The choice for an empirical standard controlled system is a conscious one and adhered to after evaluation of all the ingredients of the process, knowing the properties of fingerprints, knowing where the mistakes come from and taking up the consequences that the position of positive evidence requires.

2. Positive evidence
Fingerprints enable a conclusion about donor ship with absolute certainty. Critics state that absolute conclusions with fingerprints cannot be given for a principal theoretical reason (the absolute does not exist in life) or that evidence can only rise to a level of certainty to be validated by man, and/or statistical calculations, like with other evidence. Fingerprint experts persist that fingerprints offer the possibilities because of their specific properties and in spite of all other sorts of evidence that miss those. The best proof is the fact that identification with ten prints is executed and tested in practice far beyond any scientific requirement and was never proved to be wrong. Showing the coinciding data after identification convinces even the most sceptical viewer. It is like proving that a car is of a certain brand and type, if all features are the same, one has established a fact no one will argue.

It is of paramount importance to preserve the specific aspect of positive evidence with fingerprints in particular since we may expect evidence to be challenged and scrutinized more and more vigorously in the times to come.

3. How to obtain positivity
Statistics will not supply the right basis for positivity because statistic calculations never reach a 100%, neither will a human assessment based on personal conviction because it will remain an opinion.

In the empirical standard system, the way used to generate evidential conclusions with absolute certainty is to uplift an opinion of an expert above the personal. The empirical standard serves as a linking pin to the common, historical and safe domain of knowledge and experience. With an identification, we state that the conclusion is safe now because we have never been wrong using it. For that, the standard must be safe in itself. In practice, this means that it also leaves room for the unexpected and that in fact the standard has a safety margin. In this way, we can fulfill a vital requirement for positive evidence, that is to know and to

demonstrate, not in general but in any particular case, that the rate of error is zero.

4. Sufficient information

In fact, the basic question with identification of fingerprints is whether there is sufficient information. If there is sufficient information, a conclusion about identity can be drawn beyond any doubt. The standard therefore carefully defines what is sufficient and concentrates by the validation on the specific reliable aspect of fingerprints that are inherent and even keep their properties in adverse conditions. The location aspects of minutiae, like nature, direction, variation and relations serve as such. This does not mean that other aspects of ridge detail are ignored or not noticed. In the empirical standard system they are an integrated part of the evaluation and establishment of similarity and can contribute to the value of specific points or for the whole print if they match. All experts have learned about third level pores and ridge detail and know about Locard's appreciation of them.

Identification without observing ridgeology is however 99% of practice and is supported with the empirical standard system as well. With ten prints and complete single fingerprints looking at ridge detail is nice but not necessary. With questionable latents around the standards they serve the comparison process.

Below the (numerical) standard they cannot support absolute conclusions under the empirical standard system because there are no known standards that can be effectively applied.

There is general acceptance that a standard of 12 points is regarded to be safe. In some cases a lower number may be used, for instance if quality compensates for quantity between compared prints. It must be stressed, however, that the application of a standard requires a detailed system of definitions, rules and guidelines

5. Legal and convincing

Delivering a conclusion of identification by an expert using a standard may be compared with the way in which courts in a lot of countries test evidence in general. Evidence must be legal and convincing to be accepted as reliable. With fingerprint evidence there is a parallel. The identification must meet all the rules (legitimate) and in particular the set standard and, next to that, the expert must be convinced of the reliability. In some cases, an expert may feel or think he/she knows a donor or he may even be convinced of it, but the print does not meet the standard. This is inevitable since the standard is firm and has a margin. The identification may be convincing for some but is not legal (in conformity with the rules) and it fails. To change at that moment and put the conviction in place of common empiricism is drawing a conclusion of a different nature and should at least be voiced that way, if presented. Since we know that the conviction of the expert is the basis of most mistakes made with the identifications of latents, we apply the empirical standard.

Feelings about presumed donor ship with prints failing to meet the standard may be awkward and give support to the argument that standards are arbitrary and should not be used. Indeed, the standards in this respect are arbitrary like any standard in any process we want to calibrate. The standard allows for some variation in quantity and quality but will indeed not fit all cases, that is the nature of a pre-set standard. The primary function of the standard is to guard safety, not to fit all cases in accordance with the opinion of some.

To base a conclusion upon coinciding ridge detail only is a possibility that is advocated. In the empirical standard approach, it is regarded as a different type of evidence. The shapes compared are at micro level and in practice rarely match exactly. The process of comparison involved may lead to a state of mind that everything that fits is accepted and everything that is not ignored. This state of mind and the ignorance of differences is exactly what is countered with the empirical standard system because it is the basis for mistakes.

In fact, if experts talk about matching ridge detail the opinion is that most of the times it is not the shapes that exactly match but there is similarity in location aspects such as position, variation, and relation to other details.

6. Other functions of the empirical standard

The standard and its application serve more important goals.

1. The application of a standard is a very important mechanism to keep the whole method safe and sound. The possibility for an expert to stop the process of identification due to insufficient information keeps the pressure of both him and the process. When the process is stopped for that reason, the situation is that he cannot deliver an empirically founded conclusion (requirement of reference to long practice) of which he may have confidence that it will be confirmed by other experts (requirement of repetition). If a standard is not respected by him or his environment, he is forced to move on. This pressure on one hand may lead to an upgrade of the value of information in order to meet the standard. On the other hand, it may generate a gradual and often not recognized twist in the perception of the role of the expert. Instead of answering the question whether the print can be identified under the ruling, safe method, he may start asking him/herself whether he thinks, feels or 'knows' that this print is coming from this donor (or not). Although the question: 'Is it him or not?' may be a burning one and 'yes or no' seems to be the logic of the situation, it remains a grossly false simplification of the difficult assignment he faces at that moment. The danger is that feelings about the print become leading for the process and that the expert becomes more vulnerable for all types of influences described before in this document. In particular, in high profile cases, a standard may be attacked when the expert says no.

Changing the standard does not solve what is seen as a problem because a next case will be around this new borderline creating the same, but even more critical, problem. Abolishing the standard to solve the 'problem' would effectively mean that the best tools of the empirical standard system would be set aside in the area where they are needed the most to generate safe and positive conclusions. Secondly, without a yardstick, the natural effect on the long term will be that more and more conclusions will be based on less and less information.

Some outsiders like members of the prosecution and scientists have argued that by adhering to this 'standard' system, valuable information is withheld from the courts. Those critics fail to recognize the very important function of the standard as the cornerstone of the empirical standard system. They also fail to see what harm pressure can do. You must have been in the position of a fingerprint expert to know what effect it can have and how important it is to be able to counter it. The standard is put there in the interest of society by responsible experts overseeing the whole spectrum.

The factual reproach that 'valuable information is withheld from the courts'

is dubious at least. If an expert has established in the best possible and most reliable way that a fingerprint has insufficient detail to bear a solid conclusion, then 'lack of quality is the conclusion'. These types of conclusions are used in almost any forensic discipline. It is proposed that an expert should give an opinion about the value of the similarity anyway. Since he has no tools (like statistics) to do so, he can only express his 'feeling', if honestly done a conclusion could be that there is say an x% chance that a print is coming from a certain donor but a y% chance that he is a 100% wrong. In a situation where an expert says he cannot properly validate his opinion and does not know the chance that he has made an error, it is difficult to know the extent to which this evidence helps a court to reach a decision.

A system in which fingerprint experts deliver positive evidence most of the time and probable evidence once in a while does not serve anyone. It will not only have a negative effect upon the reliability and value of fingerprint evidence as a whole but it will also force the expert in two types of roles that should at least be meticulously separated to avoid confusion and mistakes in the end.

The proposition from the critics is rejected because it will not improve the system but derail it. It will not help the expert but rather pressurize and confuse him/her.

2. The application of the standard centres the discussion around verifiable facts and structures decision making in a step by step manner. The appointment of coinciding minutiae as formal dactyloscopic points (that tribute to the threshold) makes it possible to give detailed norms, guidelines and rules of thumb about 'does and don'ts' functioning as the grammar of the identification process. We are able to record in detail 'how we do it'. It facilitates that the identification process becomes controllable and transparent and also makes it possible to have a fruitful debate in difficult cases.
3. By describing in detail 'how we do it', verification whether it is done in the right way becomes really possible. Without that instrument only a conclusion can be checked eventually resulting in a debate about opinions instead of having a discussion about the process and the facts. This opens up all kind of psychological and social influences that distract from the facts and create risks. Wrong identifications can be easily detected and demonstrated by application of the standard.
4. The standardised method makes it possible to repeat the process and make it consistent. Similar judgements in similar cases are possible with a standard. Consistency and replication are very important scientific requirements for processes that claim reliable outcomes.
5. The standard makes it possible to pass our norms through the time and to gain and preserve empirical value. The standard itself is also constantly tested and can be adapted if the main function 'safety' is at stake.
6. The reference to a firm, common, reliable and proved standard is the best way to counter attacks in court if the conclusion presented is marked as 'just an opinion' and that the error rate is unknown.
7. The standards makes it possible to determine whether marks are of no

value and can be discarded. This is not only important for the comparison process but even more when a crime scene is investigated.

Consideration regarding the systems and their conclusions



The IEEGFI considers that whether European fingerprint bureaus use either of the two approaches to fingerprint identification in the manner explained, providing they adopt the recommendations relating to process control, training and competency assessment, the results obtained and evidence provided should be error-free and positive.

Appendix



Appendix 1

To the Interpol European Committee

The European Expert Group on Fingerprint Identification is extremely concerned about the increasing use of so-called live scan units. This equipment is used for the taking of fingerprints and fast transmission to AFIS systems. Although the need for fast transactions of fingerprints is understood, the Group is of the opinion that the systems being manufactured do not provide the quality of image necessary for full expert evaluation of fingerprints, as the images from live scan:

1. are compressed and therefore lose data and create artefacts;
2. are a composition of data taken in sequence with a moving finger and a moving scanner and tend to create false data;
3. are inferior to prints taken with ink and paper;
4. are more costly (estimate \$50 000 and more);
5. are not quicker in the taking.

The perceived advantages are the possibilities of repetitive taking and fast transmission of prints. The last mentioned property could also be obtained with other state-of-the-art facilities.

The live scan units promote a paperless environment but at the same time doing away with valuable data. Those data are not only very important for the evaluation process but can be of paramount importance for future improved encoding algorithms based on ridge detail and as a result halt the progress of fingerprint identification.

The Group therefore strongly recommends that in-depth research be undertaken to develop a system which produces a 'raw image' (original and not manipulated by software). This system should be easy to use and produce even better images than with ink and paper independently from the skill of the 'taker'. Better images could boost the efficiency and effectiveness (accuracy with searches) of fingerprints operations significantly.

The 'raw image' would enhance the ability to provide positive evidence with images that accurately reproduce all the features of the print being captured (equivalent to an analogue image).

On behalf the Working Group,
A.J.Zeelenberg,
Chairman

Appendix 2

Good practice for forensic practitioners

Ethical good conduct guidelines

[Acknowledgement is given to the Council for the Registration of Forensic Practitioners (CRFP) United Kingdom on whose Code of Conduct the guidelines below are based. The CRFP widely consulted and researched the subject across the many specialists within forensic science in designing the code.]

1. Recognise that your overriding duty is to the court and the administration of justice: it is your duty to present your evidence, whether written or oral, in a fair and impartial manner.
2. Act with honesty, integrity, objectivity and impartiality: you will not discriminate on grounds of race, beliefs, gender, language, sexual orientation, social status, age, lifestyle or political persuasion.
3. Comply with the code of conduct of any professional body of which you are a member.
4. Provide expert advice and evidence only within the limits of your professional competence and only when fit to do so.
5. Take appropriate action if you have good grounds for believing there is a situation which may result in a miscarriage of justice.

In all aspects of your work as a provider of expert advice and evidence you must:

6. Take all reasonable steps to maintain and develop your professional competence, taking account of material research and development within the relevant field and practising techniques of quality assurance.
7. Declare to your employer any prior involvement or personal interest which gives, or may give, rise to a conflict of interest, real or perceived; and act in such a case only with their explicit written consent.
8. Take all reasonable steps to ensure access to all available and relevant evidential materials; to establish, so far as is reasonably practicable, whether any may have been compromised before coming into your possession; and to ensure that their integrity and security are maintained whilst in your possession.
9. Accept responsibility for all work done under your supervision, direct or indirect.
10. Conduct all work in accordance with the established principles of your profession, using methods of proven validity and appropriate equipment and materials.
11. Make and retain all contemporaneous, clear and accurate records of the examinations you conduct, your methods and your results, in sufficient detail for another forensic practitioner competent in the same area of work to review your work independently.
12. Report clearly, comprehensively and impartially, setting out or stating:
 - a. your terms of reference;

- b. the material upon which you based your investigation and conclusions;
 - c. summaries of your and your team's work, results and conclusions;
 - d. any ways in which your investigations or conclusions were limited, especially if your access to relevant material was restricted; or if you believe limitations on your time, or on the human, physical or financial resources available to you, have compromised the quality of your work.
13. Reconsider and, if necessary, change your findings, conclusions, opinions or advice 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.
14. Preserve confidentiality unless:
- a. you are authorised by your employer to disclose something;
 - b. a court or tribunal orders you to disclose something;
 - c. the law obliges you to disclose something; or
 - d. your overriding duty to the court and to the administration of justice demands such a disclosure.
15. Preserve legal professional privilege: this may be waived only by the employer. It protects communications, oral and written, between professional legal advisers and their clients; and between those advisers and expert witnesses in connection with the giving of legal advice, or in connection with, or in contemplation of, legal proceedings and for the purposes of those proceedings.

Appendix 3

Draft recommendation

Subject : Extension of the mandate of the Interpol European Expert Group on Fingerprint Identification and organisation of an International Fingerprint Conference in 2001 by the General Secretariat of the ICPO-Interpol

CONSIDERING the contents of the report on Method for Fingerprint Identification elaborated by the Interpol European Expert Group on Fingerprint Identification, particularly paragraphs 2.1 and 13.4,

RECOGNISING the need to define and establish common terminology concerning the content of the fingerprint identification process for use by all fingerprint bureaus and practitioners in the European region of Interpol,

CONVINCED that the countries represented in the Interpol European Expert Group on Fingerprint Identification have sufficient knowledge and experience to address the preceding issues,

TAKING INTO ACCOUNT that the members of the Interpol Expert Group on Fingerprint Identification have developed the necessary confidence to undertake in-depth discussion about sensitive subjects regarding fingerprint identification,
The 29th ICPO-Interpol European Regional Conference, meeting in Reykjavik from 17th to 19th May 2000:

RECOMMENDS:

- that the existing Interpol European Expert Group on Fingerprint Identification (IEEGFI) be renamed the Interpol European Expert Group on Fingerprint

Identification-II (IEEGFI-II), be given a new mandate and provided with interpretation facilities into French and English in order to fulfil the following Terms of Reference:

'To explore, define and establish common terminology concerning the content of the fingerprint identification process and the general application of this process to the detection, validation and comparison of ridge detail, so as to provide basis for communication and promote uniformity';

'To define and establish recognized principles concerning application of this process so that it can be standardized, controlled and made objective. This may cover aspects such as definitions, norms, standards, rules, guidelines and rules of thumb'.

- that an Interpol International Fingerprint Conference, where all aspects regarding fingerprints and the work undertaken by Interpol in this field in the past ten years can be discussed, be arranged by the General Secretariat of the ICPO-Interpol in 2001.