Information Bulletin for Shoeprint/Toolmark Examiners

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FOREWORD

Dear readers,

I assume many of you have already been waiting for information about the next meeting for Shoeprint and Toolmark Examiners. Now in this IBSTE, you can find the first information about the coming SP/TM meeting and the declaration of the host for the 5th SP/TM meeting. The form for Call for Papers will also be found in this issue. In the future you will be informed about the SP/TM meeting through the IBSTE issues and also through the special web page, which the contact person and one of the main organisers of the meeting, Steinar Eriksen, is planning at the moment.

Time really flies! It was quite a surprise for me to notice that it was almost exactly ten years ago when the International Symposium on the Forensic Aspects of Footwear and Tire Impression Evidence was arranged in Quantico by the Forensic Science Research and Training Center of the FBI Academy. The Symposium was remarkable in may ways. It was the first international meeting allocated only for Shoeprint and Tire Track Examiners and it gathered together over 200 mark examiners from different parts of the world. The Symposium was really a good starting point for the good international co-operation we nowadays have among mark examiners. You can read the opening presentation of the FBI Symposium given by Ernie Hamm: "Track Identification: An historical Overview" in this issue. Expanding the knowledge, changing experiences, developing of methods and good contacts to colleagues in different laboratories are still as important for mark examiners as they were ten years ago.
So now it is good time for all mark examiners to start planning presentations, posters or possible workshops for the next SP/TM 2005 meeting.

Enjoy the summer!
Anja Ytti

THE 5th EUROPEAN (**SPTM**) MEETING FOR **S**HOE**P**RINT AND **T**OOL**M**ARK EXAMINERS in 2005

GENERAL INFORMATION

The 5th European meeting for Shoeprint and Toolmark Examiners will be held in Stavern, Norway on 24th -27th of May 2005. The meeting will be held in the Conference Center in Stavern. The host for the meeting is the National Criminal Investigation Service, Laboratory Division, Technical Division.

CONFERENCE FEE

The conference fee including hotel and meals will be appr. 420 €

CALL FOR PAPERS

If you would like to present a paper or a poster presentation at the meeting please fill the form for Call for Papers attached to this IBSTE. The deadline for sending the abstracts for the presentations is 28th of February. The form for Call for Papers is asked to be send by fax or by email or to the address:

Steinar Eriksen

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Laboratory Division
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0034 Oslo
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CALL FOR PAPERS

for the 5th SP/TM meeting in Stavern, Norway 24th - 27th of May, 2005

☐ Presentation at the meeting

☐ Poster presentation

☐ Other

Title:…….

Authors……..……

Time required……...

Presenting author…….

Please send to:

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ANNUAL REPORT 2003 (ENFSI WG Marks)

Marks WG

Dr. Horst Katterwe

GENERAL

The Marks Working Group is one of the forensic science working groups of the European Network of Forensic Science Institutes (ENFSI).This working group covers examinations in a wide range of disciplines including tool marks, lock and key examinations, manufacturing marks, restoration of erased numbers, footwear marks, tyre marks, glove marks, bare feet and other related topics (but not fingerprint).

The general aims of the Marks Working Group are

- To raise the level of expertise in marks examiners
- To promote best Quality Assurance practises in the fields of expertise covered by the Working Group.

These aims are to be achieved by

- Ensuring that there is an interchange of information between examiners in different organisations through scientific meetings, personal contacts and a regular information bulletin.
- Promoting research covering the various types of examination conducted by members of the working group.
- Establishing good contacts between the Marks Working Group and other relevant groups (either other ENFSI working groups or external organisations such as IAI and AFTE).

- Considering collaborative exercises with a view to standardising the levels of conclusion reached in different organisations.

1.MEMBERSHIP

At the end of 2003 the Group had 42 full members; the members represented 35 different countries.

As the work of marks examiners not only covers toolmarks and shoeprints but also a wide array of other types of examinations, the Group prefers to keep the guest membership „very open“, thus gaining benefit from the experiences of a big number of experts, especially during the so called SPTM conferences. Of course in a SPTM conference the „WG Business Meeting“ is incorporated but it doesn't take up too much of the time.

2. STEERING COMMITTEE (since EAFS Meeting, Istanbul, Turkey, Sept. 2003)

Chairman: Dr. Horst Katterwe
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Kriminaltechnisches Institut
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2.1. „HISTORICAL BACKGROUND OF THE STEERING COMMITTEE“

2.1.1. Steering Committee ENFSI WG MARKS, 1995 - 1998

Chair:
Heikki Majamaa, Finland
Members:
John Birkett, UK
Jaques Hebrard, France
Horst Katterwe, Germany
Jan Keijzer, Netherlands

2.1.2. Steering Committee ENFSI WG MARKS, 1998 - 2000

Chair:
Heikki Majamaa, Finland
Members:
John Birkett, UK
Frank Crispino, France
Henk Dovermann, Netherlands
Horst Katterwe, Germany

2.1.3. Steering Committee ENFSI WG MARKS, 2000 - 2001

Chair:
Horst Katterwe, Germany
Members:
John Birkett, UK
Isaac Keereweer, Netherlands
Gerrit Volckeryck, Belgium
Anja Ytti, Finland

2.1.4. Steering Committee ENFSI WG MARKS, 2001 - 2003

Chair:
Horst Katterwe, Germany
Members:
John Birkett, UK
Isaac Keereweer, Netherlands
Silvia Ramsl, Austria
Gösta Strand, Sweden
Anja Ytti, Finland

3. TERMS OF REFERENCE

WG newsletter

Again, like in the four past years, several issues of the publication 'Information Bulletin for SP/TM Examiners' (IBSTE) were published (in 2003: 3 issues). At the end of 2003, the print of the Bulletin was about 250 copies which were delivered to 36 countries. The editor is Anja Ytti / Finland (see also: http://www.poliisi.fi/wgm/).

WG www site

Updating the information on the www site of the MWG has mainly involved adding the latest Information Bulletins and new requests for help on the Wanted Page. The WG wwwsite is updated by Sirkka Mikkonen and Anja Ytti (both from Finland): http://www.poliisi.fi/wgm/.

Contacts to other WG'S

The ENFSI Marks WG has contact to other WGs:

WG Quality and Competence Committee (Anja Ytti)

Conclusion Scale Group "Firearm" (Horst Katterwe)

There are good contacts to the IAI (International Association of Identification) and to the AFTE (Association of Toolmark and Firearm Examiners).

4. AND 5.STATEMENT OF OBJECTIVES & PLAN INCL.

Achievements against plan (issues solved; outstanding issues)

SCALE COMMITTEE

Both the comments by those who are in favour of the L.R. approach as well as the ideas of the more traditional „probability scale“, which are in favour of the „full Bayes‘ rule“ were discussed. Chairman Horst Katterwe had prepared a summary of the main objections for the use of „probability scales“ made by the FSS and the Lausanne

University. In another paper Horst Katterwe has commented on these objections and reproaches (see IBSTE Vol. 8, No.1,2,3,2002). The main issues to be remembered from this discussion (also reported during the Business Meeting of the ENFSI WG Marks in Istanbul, EAFS, Sept. 2003 with F. Taroni (special guest)):

- most of the traditional mark examiners are already using Bayes‘ rule implicitly, without realising.
- some of the mark examiners are using Bayes‘ rule explicitly. They are making conclusions, using a „probability“ wording,. including an estimation of prior odds: based on the inherent assumption that no two tools, shoesoles are exactly alike. The population of the working surface of a tool, shoesole is one (the premise (postulate) of the „one-sample-population“).
- Using default prior odds would also make it possible to transform a „probability scale“ into a „support“ (likelihood) scale and vice versa (based on the estimation of the priori probability by means of the „Principle of Maximum Entropy“).
- The goal of the committee is to find a way to harmonise the conclusion scales, so that different examiners would draw the same conclusions when examining the same case and one would be able to compare the conclusions drawn in different labs in different countries even though they don’t use the same wordings.

Christophe Champod‘s and Graham Jackson’s letter in response of Horst Katterwe’s point of view certainly was a breakthrough in the discussion. A compromise had been reached. As an aside: the differences between the ideas of traditionalists (the „Old Europeans“) and Bayes‘ adepts aren’t too big anyway. From this moment, the committee could go on with the „real work“.

It had already been discussed at the Wiesbaden meeting (March 2000) how many steps would be needed to differentiate between different levels of resemblance, without becoming too complicated to be handled by experts and laymen. A six-level scale got the support from all the members of the scale committee:

The committee believes that two „absolute“ conclusions are necessary: one positive and one negative („categorical conclusions“). One inconlusive Level is added in between („possible yes / possible not“). Since, most of the time, it is easier to exclude an object as the possible source of a mark than to include it, it was decided to add one negative and two positive „non-absolute“ conclusion levels.

Six-Level-Conclusion-Scale of the ENFSI WG Marks based on the estimation of the prior probability by means of the „Principle of Maximum Entropy (PME)“ after Shannon C E, Weaver W: Mathematical Theory of Communication 1949, reprinted 1975;

References:

Katterwe H: The Scale Committee of the ENFSI Marks Working group and the Range of Conclusions including PME, in Proceedings SPTM Berlin 2001, 185-193, ISBN 3-00-009338-9.

Jaynes E T: Information Theory and Statistical Mechanics (PME), Physical Review 106, 620-630, 1957.

Egerton R F: Electron-energy-loss spectroscopy including Bayesian methods of deconvolution (maximum-entropy-method: PME), Micron 34, 127-139 (2003).

Level	**Likelihood (partial Bayes' rule)**	**Probability (full Bayes' rule)**
1	Identification	*Identification*
2	- Very strong support for proposition A - Strong support for proposition A	*Very probably*
3	Moderately strong support for proposition A	*Probably*
4	- Moderate support for proposition A - Limited support for propositionA - No support - Limited support for proposition ⊕ (⊕ = Non A) - Moderate support for proposition ⊕	**Inconclusive** (possible yes / possible no)
5	- Moderately strong support for proposition ⊕ - Strong support for proposition ⊕ - Very strong support for proposition ⊕	*Probably not*
6	Elimination	*Elimination*

As each member gave his/her argumentation for each of the six levels, different points of view arised. Isaac Keereweer from the Dutch NFI explained how shoeprint examiners evaluate acquired features on shoe outsoles in his country. The value given to the feature depends on its complexity and size, following strict guidelines. This system, which had already been presented at the Stockholm SPTM meeting 1999, has proved to be successful in the Netherlands to get an harmonisation of the conclusions being drawn. Some members of the committee criticised the system as being too strict and too severe, since a great number of very many acquired features are needed to conclude to „identification". Besides these points of criticism, everyone agreed that this type of system is ideal to get everyone in line and that the principle to assign values to each acquired feature, depending on size and complexity, is a good one.

Cooperation with judges of Superior Courts:

During the German Marks Conference in May 2003 in Berlin there was an important paper of Dr. Sander, Supreme judge of the Superior Court Berlin about Interpreting

Evidence. The judge emphasised the importance of a harmonized conclusion scale and gave the following references:

F. W. Rösing, Standards für die anthropologische Identifikation lebender Personen auf Grund von Bilddokumenten, Zeitschrift für Strafrecht, 230-232, 1999;
R. Knußmann, Zur Wahrscheinlichkeitsaussage im morphologischen Identitätsgutachten, Zeitschrift für Strafrecht, 175-177, 1991.

In these publications there are examples about a conclusion scale („probability scale“) and the Bayes rule.

„Development-Test“:

Shoeprint-Collaborative-Test concerning, if „prior odds = 1“ are a „practicable estimation“!

Each member of the conclusion scale committee made a collaborative test by redoing the shoeprint comparisons which have been distributed by the NBI/Finland for the SPTM meetings in 1995 and 1997. Conclusions from these comparisons had been made and explained, using the proposed six steps scale (full Bayes‘ and / or Likelihood Ratio) and

i. the propposal of the NFI/Netherlands (strict scheme to define the value of accidental characteristics),
ii. the current procedure that is being applied in the lab of the member

Result: the participant reached the same level (acceptable „error rate“ of about „1 step“), independent of each other when using LR (especially the participant from the FSS) and / or the „Probability Scale“.

Sum it up: Prior odds = 1 (based on the scientific background „principle of maximum entropy“) is a good estimation, because this estimation is proved in practice work.

AUTOMATIC COMPARISON OF MARKS

The automatic comparison of marks is still a problem which must be solved to effectively support the toolmark examiner‘s work. Nowadays powerful tools in the field of image processing and pattern recognition in combination with increasing performance of the computer technology are available to achieve this aim.

At the request of the Forensic Science Institute of the Bundeskriminalamt (BKA) the Fraunhofer Institute for Production Systems and Design Technology (Fraunhofer IPK) in Berlin in cooperation with the Engineer's Office of Intelligence Technologies (INBITEC) also in Berlin carried out a feasibility study to test suitable analytical methods for computerized comparison of toolmarks.

For this purpose, toolmarks were produced under different conditions at the Forensic Science Institute Berlin. The surface profiles of the marks were measured with a laser surface scanner, with a 'MicroCad system' (three-dimensional imaging device based on the principle of structured light), and attained as gray value images by light microscopy photography, respectively.

A report of the first part of the project - a feasibility study - was given in Stockholm 1999, the second part was a development of a prototype applicable in forensic science examinations in the BKA Wiesbaden and in the PTU Berlin. The third part of the project "development of a commercial system for the use in European forensic labs" will be the next step: are there EU funds?

In addition to these methods the BKA asked the "Institut für Mess- und Regelungstechnik, Universität Karlsruhe/Germany" for cooperation in the field of image processing strategy. The Institute in Karlsruhe developed a new image processing method (enhanced image obtained by fusion methods) and a new image processing strategy that enables an automatic extraction of signatures from striation patterns.

RESTORATION OF ERASED NUMBERS

Project of the BKA/KT22 (leader: H. Katterwe): Interactions of spices (cloves) with plastics and the restoration of erased numbers in polymers.

COLLABORATIVE EXERCISES

The members of the Group participate in collaborative exercises. Shoeprint and toolmark profiency tests are being arranged in the USA: CTS – Crime Laboratory Proficiency Testing Program.

CERTIFICATION PROGRAM IN FOOTWEAR IDENTIFICATION

The International Association for Identification (IAI) has established a Footwear Certification Program for shoeprint examiners. The only possibility to participate in the written part of the exam has been offered in the annual IAI Training Conferences which are held in the USA.

The Marks Working Group suggested to the IAI that it would be taken into consideration whether the MWG could be authorised to give the written exams for FW Certification in Europe. At the end of 1999, the proposal was accepted. At the EAFS 2000 meeting in Cracow the written part was offered for the first time and at the 4th SPTM-meeting in Berlin 2001 for the second time. Up to that time six European shoeprint examiners (from Sweden, Norway, Finland and Belgium) have been certified according to the requirements and testing set by the IAI Footwear Certification Board.

There are two IAI-documents, which give a description of the Certification process: "Requirements for Footwear Certification and Application" and "Footwear Re-certification Policy and Procedures".

CAP SUBPROJECT

CAP: Competence Assurance Project. Development of Standards for Reporting Scientists in the fields of Documents and Marks examination, and developing assessment strategies for the translated standards in these areas (created during the

ENFSI Annual Meeting in Linköping in May 2002). The Cap subproject has members from four laboratories and for each laboratory it is the meaning that there should be one document person and one mark person. Initially the members want to especially look for what should be common knowledge and understanding to the two specialities. The members want to avoid that every working group has to invent the wheel. In due time the working group will get involved, but the members need to do some work before. At the present the following marks-laboratories are involved: SKL, NFI, FSS.

MEETINGS

Steering Committee Meeting, Vienna / Wien, January 16-17, 2003

Agenda: ENFSI members and 15 Expert Working Groups, IBSTE;W wwwsite; Proceedings SPTM Berlin 2001; EAFS Istanbul 2003; SPTM 2005; Contact to other WG's; EWGC meeting in Wiesbaden 2002; Projects: collaborative exercises, barefoot examination cases, footwear databases, scale committee, automatic comparison of marks, new projects: best pratice manual (guidelines: Marks), restoration of erased numbers; Membership in a project group; Annual report 2002 of the Marks WG; Next steering Committee Meeting in Zürich (Jan. 2004).

Conclusion Scale Committee, Vienna / Wien, January 17-18, 2003

Agenda: Retrospective views: London 2002; IAI, Las Vegas 2002 (Bayes' Rule and a „one-sample-causality-model" for evidence interpretation; Daubert Hearings); FBI-Visit 2002 in Washington DC (Shoeprint/Toolmarks/Firearms); IBSTE (Sept. 2002: Taroni, Buckleton and Comments Katterwe); definitions of terms being used in shoeprint casework;

The six steps conclusion scale of the ENFSI Marks WG: theoretical argumentations for each step, experimental step-standards and their photographic documentations to help

verify that the results of the examination are properly; next meeting in Zürich (Jan. 2004).

EAFS 2003 European Academy of Forensic Science Meeting, Sept. 22-27, 2003, Istanbul, Turkey:

A good overview of this conference is written by Anja Ytti in IBSTE Vol. 9, No. 3, December 2003. The Marks Working Group had arranged specific programs for mark examiners on four different days. The program included oral presentations, poster presentations, one shoeprint workshop, steering committee meeting and business meeting.

Steering Committee Meeting, Istanbul, September 22, 2003

Agenda: Annual report; web site; about projects; project sheets; changing of statutes; quality assurance; conclusion scale report; voting SPTM 2005; next steering committee: Zürich 2004.

Business Meeting, Istanbul, September 22, 2003

Agenda: Annual report 2002, web site; about projects; project sheets; changing of statutes, quality assurance; conclusion scale report (special guest: F. Taroni); voting; SPTM 2005; next steering and conclusion scale committee meeting in Zürich, Jan. 2004, next business meeting (SPTM 2005).

FUTURE MEETINGS

1) Steering committee meeting in Zürich, Jan. 2004.
2) Conclusion scale committee meeting in Zürich 2004.
3) SPTM 2005 (to be confirmed).

6. PLAN FOR THE NEXT YEARS (2004 – 2006)
(see enclosure Strategic Plan EWG Marks (2004 – 2006))

Marks Working Group – Summary 2003

Acting Chair	Steering Committee	Members	Meetings 2003	Web	EU-Proj.	Results achieved Objectives 2003
Horst Katterwe BKA Wiesbaden Kriminalt. Institut Postfach 1820 D-65193 Wiesbaden/ Germany	Horst Katterwe BKA Dave Baldwin FSS Isaac Keereweer NFI Silvia Ramsl BK Austria Lennart Jonasson SKL Anja Ytti NBI Finland	42 (full)	Vienna 2003 EAFS Istanbul 2003	Inform. Bulletin Libraray Meetings Proceeding Forum (Wanted)		Scale committee with regular meetings Projects: automatic comparison of marks; restoration of erased numbers in polymers CAP subproject Newsletter Standardization of footwear pattern DB Collaborative ex Certification program for footwear identification (cooperation with IAI)

Strategic Plan EWG Marks (2004 – 2006)

STANDING COMMITTEE ON EXPERT WORKING GROUPS

Strategic Goal	**Objectives** (in order of priorities)	**Actions** (in order of priorities/action)	**Initiative** (Responsibility for action)	**Time Frame** (Deadline to achieve)
Research & Development (New Methods, Validation, etc)	Conclusion scale including the full Bayes' rule and the principle of maximum entropy	Meetings of the WG Marks Scale Committee	Chairman Dr. H. Katterwe, BKA and steering committee	2005
	Automatic comparison of marks	Experimental studies in the BKA Wiesbaden, PTU Berlin	Dr. H. Katterwe, BKA	2006
	Restoration of erased numbers in polymers with the help of spices (cloves)	Experimental and theoretical studies in the BKA	Dr. H. Katterwe, BKA	2006
Education & Training (Guidelines, Workshops, etc)	Certification of marks examiners in different countries	IAI-Certifications during SPTM conferences	A. Ytti, NBI Finland	ongoing
	CAP subproject	Development of standards for reporting scientists	Quality Assurance Group	ongoing
	Best Practice guidelines for marks examiners	Begin to develop best practice areas identified as this WG's responsibility	Steering committee	ongoing
	Multilingual of Marks	Complete the multilingual project	Steering committee	ongoing
Quality Assurance (Manuals, Collaborative Ex.)	Collaborative exercises in shoeprint, toolmarks cases	Tests in all ENFSI-Institutes, including the CTS-tests	all ENFSI-Institutes	ongoing
	QM-methods : marks	Special methods in marks	Steering committee	2006

TRACK IDENTIFICATION: AN HISTORICAL OVERVIEW

Ernest D. Hamm

Jacksonville Regional Crime Laboratory
Florida Department of Law Enforcement
P.O. Box 4999
Jacksonville, FL 32201

International Symposium
on the Forensic Aspects of
Footwear and Tire Impression Evidence

FBI Academy
Quantico, Virginia

June 27, 1994

Comment of the Editor: This was the opening presentation at the International Symposium on the Forensic Aspects of Footwear and Tire Impression Evidence arranged at the FBI Academy, Quantico in 1994. It is now published here with the permission of Ernie Hamm.

Which discipline is the oldest form of forensic identification? Is it the science of firearms identification? It has been generally accepted that firearms identification started sometime after 1900 following the publication of A.L. Hall's booklet, The Missile and the Weapon.

Perhaps it is questioned document examination? It is a little difficult to establish just when questioned document examinations involving handwriting comparisons, as we understand them today, actually became recognized. It seems as if the early 1900's is frequently cited, but there was a book published in 1871 titled, The Handwriting of Junius Professionally Investigated by Mr. Charles Chabot, Expert.

The beginning of latent print identification is perhaps the easiest form of forensic identification to document. The most common reference is the criminal identification attributed to Juan Vucetich in 1892, but there are also the identifications made by Henry Faulds in Japan prior to 1880. In fact, Paul Kirk, author of Crime Investigation, once wrote that the work in fingerprint identification was the starting point of what was to become known as "criminalistics" or "forensic science".

There is one type of comparative examination that is being practiced by all of these disciplines --firearms, documents, and latent prints, as well as other laboratory services -- and which should be considered the oldest of all types of forensic identification. It is the examination of track evidence.

What is meant by "track" evidence? A track is defined as "a mark or series of marks left by a person, animal or thing that has passed, as a footprint, wheel rut, wake of a boat, etc.". Track evidence would be the identification of these marks and prints as they relate to a criminal investigation.

Just how old is track identification? When man first started to hunt for meat and realized that animal tracks served as a means of finding the type of animal they sought for food, or perhaps ones

they wanted to avoid as dangerous, men have been involved in track identification. They learned to distinguish between the track of a bear and the track of a deer. They could do this through the different track designs made by the pad of the animal. They were relying upon class characteristics, being able to separate one class of animal from another. They would have been able to distinguish between animals of the same species through things like deformities, such as evidence of an injured leg which would be revealed in the gait features of the animal or perhaps a missing toe or claw from an individual pad. These are individual characteristics. You now have two elements needed for making an identification through a comparative examination, class and individual characteristics. Track identification in its basic form is as old as when man changed from being a gatherer and became a hunter, and that occurred a long, long time ago.

In practical police work, footwear identification has been dated from the Richardson case in Scotland in 1786. In his book, Science Catches the Criminal, Henry Robinson related an incident involving footwear impressions. During the inquiry in the circumstances surrounding the murder of a young girl, the investigating officer noticed some boot prints near the body and followed these across a bog, noting that the outsole appeared newly patched and having a lot of nails. The tracks indicated a running man, whose boots had made deep impressions in the soft earth of the bog. The officer made some crude casts of the boot prints. He later checked the casts against the boots of individuals that appeared at the funeral of the victim and was able to find a match with Richardson's boots. Robinson wrote that this incident may have been the first recorded use of a form of criminalistics in the investigation of a crime, but there was no legal citation found relating to this case. However, there have been early legal rulings on footwear impression evidence.

In the summer of 1844, a man was tried at Stafford, England, for the murder of an elderly woman. Some the evidence presented in the case involved impressions of right and left boots. The right

boot impression had the mark of a tip around the heel and the left boot had the impression of a patch fastened to the sole with four different sized nails and, in some places, nails were missing. The prisoner's boots were carefully compared with the footprints and exactly corresponded as to the patch, the tip, and the number, shape, sizes, and arrangement of the nails. There was no doubt that the impressions of these footsteps had been made by the prisoner's boots. An 1886 Illinois case was cited in a 1991 appellant decision as precedence in recognizing footprint identification as competent evidence. Yet, even with early references to the application of this form of forensic identification, footwear impression evidence lacked recognition as a separate and distinct form of forensic examination.

Track-type examinations are being conducted by firearms examiners, latent print examiners, questioned document examiners, examiners of trace and microanalysis evidence, chemists, and criminalists. If track identification is so old, why doesn't it enjoy its own identity instead of being accomplished as an "additional duty" by a variety of forensic examiners? Perhaps it is because of the actions during that first use in 1786. The identification was accomplished by the police investigator on the scene and did not apparently require any special knowledge or ability. To an extent, this attitude may prevail to this day, as was revealed in a November 1988 newspaper. There was a letter in the editorial section from a satisfied citizen praising the actions of the local police after he had interrupted a burglary of his house. Quoting from the article, "The man was gone. I had just raked my yard the night before, so I knew the ripple-sole shoe prints were fresh and did not belong to my wife or myself. I got my flashlight and saw prints all around my home." The writer then comments on the officers' response time and their preliminary actions and then continues, "The officer who left came back after a few minutes, followed by a third patrol car. There was a man in the back seat. His shoes were compared to the prints in my yard. There was no room for doubt, because they were a perfect match.".

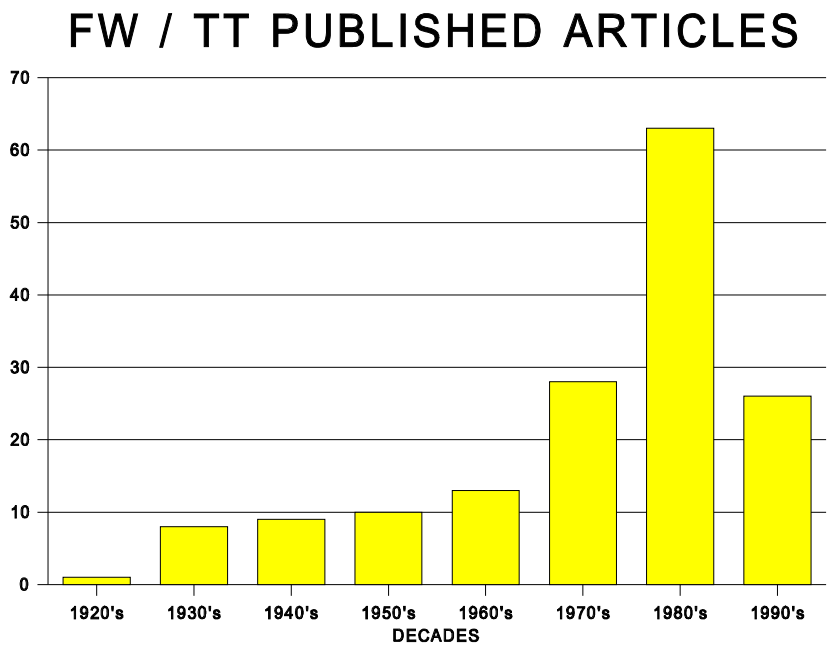
According to this, everyone can observe tracks, compare them and made positive identifications. A trained examiner is not required.

One reason suggested for the lack of recognition of track identification as a separate discipline is the low number of examinations in the area of impression evidence, at least in some jurisdictions. This low number can probably be attributed to the lack of education to the value of this evidence. The presence of footwear evidence is almost guaranteed at any scene involving crimes against persons and property and tire tracks are possible whenever a vehicle of any type is used in the crime. This evidence probably stands a better chance of being present than fingerprints and latent print evidence is not considered to be low on the list of laboratory examinations. Track evidence, like fingerprints, only has to be properly searched for and recovered to be of value. If the submission of impression evidence is low in incidence, I believe it is because individuals responsible for the processing of the scenes are not making an effort to obtain this meaningful type of evidence. The reasons for first response officers failing to make an effort to protect scenes and recover track evidence can probably be traced to a lack of training on the value of tracks or not knowing or not being comfortable with the methods of how to properly recover the impression evidence.

Another reason that the value of track identification may be minimized is because it is viewed as only circumstantial in nature. While an item of footwear can be positively identified to a crime scene, who was wearing the shoe at the time the track was made? This same argument could be applied to the science of firearms identification. The bullet can be positively matched to the weapon, but who fired the weapon? In the case of firearms examination, that argument fell by the wayside and firearms identification enjoyed recognition as a separate field of forensic identification. The firearms discipline has since developed techniques, such as gunshot residue testing, to associate the discharging a weapon to an individual. There have also been strides made in connection with footwear evidence to identify the person who has been wearing the

shoe. Studies are being conducted on the insole areas of the shoe that are directed toward the identification of the foot. Techniques, such as the visualization of insole impressions through ultraviolet and laser illumination, have been used to establish an identification of a foot to a shoe. In any event, evidence should not be neglected or disregarded because it is considered only circumstantial in nature. It can still be extremely valuable to proving or disproving the facts of a case.

Also, information concerning footwear and tire track evidence was not being widely disseminated in police professional journals. The accompanying chart shows the developing interest in this form of identification:



Of course, it must be mentioned in this international setting that this information pertains to selected English language publications. There are, without doubt, a number of outstanding technical articles that were published in non-English professional journals, as well as some other English publications, that do not appear in this tabulation. The vast majority of the articles in the

first four decades, 1920 through 1950, were published in the FBI's "Law Enforcement Bulletin" and the British publication, "The Police Journal". Starting in the 1960's, there was involvement by a variety of professional publications of the United States, Canada and Great Britain. As a result of this type of dissemination, footwear and tire track evidence has become more and more recognized for its value in criminal investigations. It has also been realized, especially in the past few years, that opinions concerning the origin of questioned tracks should be conducted by persons having experience and ability in an area of comparative examination, and not left to the untrained individual. This change in attitude about footwear and tire track evidence can be seen in the development of specialized seminars and technical conferences.

One of the first efforts to bring track identification to the forefront as a separate and distinct form of forensic identification can be attributed to the Illinois Department of Law Enforcement. Through the efforts of Ed German, a seminar devoted entirely to techniques associated with the examination and identification of footwear and tire track evidence was held at Springfield, Illinois in October 1982. While this seminar was brief, only lasting two days, it served to illustrate the need for such specialized seminars in the areas of footwear and tire track identification. As a result, the Federal Bureau of Investigation conducted the first Technical Conference on Footwear and Tire Track Identification in April 1983. This conference, held here at the FBI Academy, was the outcome of the efforts of Special Agent Bill Bodziak of the FBI Laboratory, who had been the principal instructor at the Illinois Seminar. Another technical conference was held the following year and the FBI Academy has since established regularly scheduled training sessions in impression evidence. In addition to the seminars here at the FBI Academy, Bill Bodziak took the "show on the road", conducting specialized sessions throughout the United States and Australia.

Other departments also developed specialized seminars. Sergeant Ed Davis of Michigan State Police developed a 1985 session

at the Michigan State Police Academy at East Lansing with instruction by Dr. Roger Davis of the Metropolitan Police Forensic Science Laboratory, London, England. The Florida Department of Law Enforcement hosted footwear identification seminars in 1986 at Jacksonville and again in 1988 at Tallahassee. These seminars were not restricted to local department participation. They all involved examiners from a variety of forensic disciplines and from different federal, state and local departments. Two of these seminars, the 1985 Michigan and the 1988 Florida sessions, had international representation with instruction by Dr. Davis. Also, in 1987, Special Agent Bodziak of the FBI chaired a special committee on impression evidence for the International Association of Forensic Sciences. He developed a program in the area of footwear and tire impression evidence for the association's 11th Annual Meeting in Vancouver, Canada, and again for their last conference in Dusseldorf, Germany. In March 1989, Dr. Davis conducted a Shoe Print Processing Seminar at Springfield, Illinois that was developed by the Midwest Association of Forensic Scientists. In May of 1989, Heikki Majamma of the Central Criminal Police Laboratory, Helsinki, Finland organized and hosted the first Scandinavian seminar on footwear identification techniques. This seminar was held in Helsinki and was attended by examiners from Finland, Norway, Sweden, Denmark and the Netherlands.

This evolving interest in footwear and tire impression evidence resulted in more and more discussions among examiners about having impression evidence being recognized as a separate discipline on a level with the other disciplines with which it had been associated for years. It was at the 1988 Educational Conference of the International Association for Identification (IAI) in Sacramento, California that Joel Geller proposed the formation of a Special Committee of the IAI in the area of footwear and tire track identification. This committee was to plan a special session program for the 1989 IAI conference. This initial committee, which I had the honor to Chair, consisted of Joel Geller, Alex Mankevich, Terrell Kingery, Dave Peck and Ken Zercie and represented state

crime laboratories in Florida, Maryland, Illinois and Connecticut. The committee did an excellent job of developing a program for the 74th IAI Educational Conference and included presentations in footwear manufacturing techniques by Bill Bodziak of the FBI, and how they relate to identifications; tire track identification methods by Lawren Nause of the Royal Canadian Mounted Police, casting of two and three dimensional tracks, chemical development techniques for prints in blood, impression evidence photographic techniques and other subjects.

An ultimate goal of the Special Committee was to have footwear and tire track identification established as a standing Sub-Committee of the International Association for Identification. It had been shown that this type of evidence was becoming more and more recognized as a valid form of forensic identification and needed recognition by an organization such as the IAI. It was realized that there were many areas of the "new" (even if it had been around longer than any other discipline) form of identification that needed to be addressed. The following areas of concern were noted by the Special Committee:

> Training Programs: While some departments had training programs, a study of training methods had been conducted by Joel Geller and published in the July 1988 issue of Fingerprint Whorld. This revealed a diversity of training methods and a lack of structured training programs. There were few established training programs in the area of track identification to insure that these examinations were being conducted in a professional manner. This demonstrated a need for establishing a training program in footwear and tire track examinations. The development of an approved training program was a long-term goal of the IAI. After a number of years and revisions, a final draft of such a program is to be presented to the IAI Board of Directors at their upcoming meeting in Phoenix, Arizona.

Educational Programs: Any type of physical evidence will not of value to an investigation unless it can be recovered and made available to a qualified examiner. It is important that the value of footwear and tire impression evidence be known to officers in the field and that they know how to recover it. It falls upon the examiner of such evidence to educate the officer, as well as police and judicial administrations, about this valuable type of evidence. The publication of articles in professional journals, as well as general police publications, should be encouraged to demonstrate the importance of this evidence and the need for having trained and qualified examiners.

Quality Control: It was felt by the Special Committee that there should be an avenue to insure that examinations are conducted professionally and within the acceptable limits of the forensic sciences. The identification of a track to an item of footwear or a tire by the untrained person on the scene should not be permitted. The conducting of a comparative examination by an individual not familiar with the significance and consequences of forensic opinions should not be permitted. This is not just to protect against erroneous identification. A trained and qualified examiner can probably see more in a comparative examination and this can result in a more conclusive opinion, and an opinion that can withstand the scrutiny of another qualified examiner or a cross-examining attorney.

Program Development: There is work to be done in the area of techniques and methods employed in the examination of impression evidence. A proficiency test administered in 1987 and again in 1988 by The Forensic Science Foundation showed a need for knowing standard methods of conducting comparative examinations of track evidence and reporting those results. The most recent proficiency test again

illustrated this need and, unfortunately, a need for quality control. These testing programs, as well as other surveys, have emphasized a need for discussions dealing with the standardization of terminology and comparison methods. There are also areas of research in enhancing and recovery methods that can be conducted which can serve to expand the knowledge and benefit of this form of identification.

Because of the concerns in these areas, the International Association for Identification took the recommendations of the Special Committee and established a Standing Sub-Committee in the area of Footwear and Tire Track Evidence in 1990. The IAI took the initiative to give this form of identification the recognition and professional support it deserves. It was time that this oldest form of applied criminalistics assumed its own identity and purpose. Since 1990, there have been a number of specialized seminars in the area of impression evidence examinations that have been sponsored by a variety of forensic science organizations and police agencies. Starting with its first 'break out' program in 1989, the annual conferences of the IAI have consistently produced excellent presentations in the area of footwear and tire track evidence. It has continued to attract international involvement with presentations by Heikki Majamma of Finland and John Birkett of England. Bill Bodziak of the Federal Bureau of Investigation, serving on the initial IAI Special Committees and all of the Standing Sub-Committees as both Chairman or member, recognized the need for an International Symposium on Footwear and Tire Impression Evidence in order to expand the knowledge and experience developed by the many jurisdictions and agencies throughout the world. It is through his efforts that this goal has been achieved and we are here today. It is going to be an exciting and informative week.

Almost 25 years ago, man embarked on the voyage of all times, a trip to the moon. On July 25, 1969 they made the first visit of a human to another planet by leaving their spacecraft and walking on the moon. The images of astronauts stepping down to the surface of

the moon and walking about the lunar terrain appeared in newspapers, televisions and magazines all over the world. Astronaut Neil Armstrong took many of the still photographs and he also took one that appeared numerous times in various publications. A photograph that was to establish the proof of their accomplishment, the stamp of identity that man had indeed visited the moon, the track left by their passing. As it was a quarter of a century ago on the moon, as it was in the early days of the development of man, as it is now, the track, mark, impression, print is still recognized as the sign of the existence of an object or person, the evidence of an event. In the words of Ralph Waldo Emerson in 1841,

> "Commit a crime, and the earth is made of glass...you cannot wipe out the foot-track...so as to leave no inlet or clew, some damning circumstance always transpires".

This International Symposium will certainly help to ensure that the 'circumstance' is properly looked for, recovered and evaluated in the interest of justice.

REFERENCES

Bridges, B.C. (1942). Practical Fingerprinting. New York: Funk & Wagnalls

Browne, Douglas G. and Brock, Alan (1954). Fingerprints, Fifty Years of Scientific Crime Detection. New York: E.P. Dutton & Co.

Geller, Joel (1988). Are we adequately trained in footwear/tire track identification. Fingerprint Whorld, 14, 53, 26-28

Hamm, Ernest D. (1989). Track identification: an historical overview. Journal of Forensic Identification, 39, 6, 333-338

Harris John J. (1982). A brief glimpse of forgery, the law and document examination in England before 1990. Presentation. Meeting of the American Society of Questioned Document Examiners.

Kearney, Jack (1978). Tracking: a blueprint for learning how . El Cajon: Pathways Press

Kirk, Paul L. (1963). The ontogeny of criminalistics. Journal of Criminal Law, Criminology and Police Science, 54, 235-238

Lee, Tommy and Kathy (1988, November 17). Timely response from police officers draws compliment. The Florida Times Union, p. A2

Morland, Nigel (1950). An outline of scientific criminology. London: Cassell and Company.

Robinson, Henry M. (1935). Science catches the criminal. New York: Blue Ribbon Press

Schoolcraft v. People (1886). 117 Ill.271

State of Illinois v. Charles A. Campbell, Appellant Review, Docket No. 71335-Agenda, 11-September 1991

The Forensic Sciences Foundation. (1987). Collaborative Testing Services. Footwear Analysis: Report No. 87-11.

The Forensic Sciences Foundation. (1988). Collaborative Testing Services. Footwear Analysis: Report No. 88-11.

The Forensic Sciences Foundation. (1993). Collaborative Testing Services. Footwear Analysis: Report No. 93-11.

Webster's New World Dictionary. College Edition (1964). Cleveland: World Publishing Company

Wills' Principles of Circumstantial Evidence, 7th Ed., London: Butterworth & Co.

HELP!

A long time ago, tired of browsing through books and folders, I started building a database with dimensions of all possible cars available on the market. The aim was simple : comparing the data collected on the scene of crime with tire tread stance, wheelbase and other “class characteristic” measurements of the cars in the database.

It helped me to give a quick expert advice on the possible origin of tire tread marks, not only for casework in my own lab, but also for colleagues from other labs. Copies of the database were sent to every colleague who asked for it and later on it was available for downloading from the internet.

To cut a long story short : I moved to the Brussels lab and discontinued the updates on the database, mainly because Brussels’ concrete doesn’t yield many tire-impressions. I’m still convinced though, that the database – if updated - has it’s value for examiners all over Europe (and eventually, the rest of the world). However, I don’t have the time anymore to do it all on my own. Instead, I’m looking for co-workers : enthusiastic volunteers, knowledgeable about cars and tire marks who don’t care about money.

Anyone interested can contact me :

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UPCOMING CONFERENCES

IAI Annual Conference
August 22-26, 2004
St. Louis, MO
www.theiai.org

IABPA Annual Conference
October 6-8, 2004
Tucson, AZ
www.iabpa.org

5th MEETING for SHOEPRINT and TOOLMARK EXAMINERS (SP/TM)
May 24-27, 2005
Stavern, Norway
www.stavernjko.no (to take a look at the surroundings in Stavern)

Rooky policemen at the crime scene.

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