Session:
Current Issues and Trends in the Crime Laboratory - Developments in the Last Ten Years - New Challenges for the Trace Examiner

*Trace evidence: A European perspective*

Bundeskriminalamt
Forensic Science Institute
Germany
Structure

• General trends in Europe
• European Network of Forensic Science Institutes
• Developments in the particular discipline
• Summary
Definition of Europe

Bernard-Henri Levy (* 1948)

Europe is not a place, it is an idea.

Philip Johan von Strahlenberg (* 1676-1747)
The border between Europe and Asia to lie at the Ural mountains and north of the Caucasus.

By this definition, which is also the INTERPOL definition, the western part of Russia is part of Europe.
46 independent states with 680 Mio inhabitants
27 are members of the European Union (EU) with 454 Mio inhabitants
1989  Fall of Berlin wall
1990  Reunification of Germany
1991  Collapse of the Soviet Union
      Maastricht treaty - European Union
2002  Introduction of EURO
2004  Ten new countries enter into the EU  25 (15)
2007  Rumania and Bulgaria entered the EU  27 (25)
Dramatically political and social changes during the last decade.

Big efforts in the harmonization / conversion of the institutions of the candidate countries.
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European Network of Forensic Science Institutes (ENFSI)

1993: First meeting of 11 lab directors in Rijswijk/Netherlands

1995: Establishment of ENFSI;

25 foundation member out of 17 countries;
Memorandum of Understanding

2007: 54 members from 31 countries
ENFSI - Central issues

- Transfer of knowledge from more developed forensic institutions to new members
- Encouragement for all ENFSI laboratories to comply with best practice and international standards for quality and competence assurance and implementation of a quality management system such as ISO 17025
- Harmonization of methods and procedures across Europe
Structure of ENFSI

Expert working groups (EWG) similar to the Scientific Working Groups (SWG).

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Expert working groups:

- Digital Imaging
- DNA
- Documents
- Drugs
- Explosives Analysis
- Fibres Group
- Fingerprints
- Firearms
- Fire & Explosion Investigation
- Handwriting
- Information Technology
- Marks
- Paint & Glass
- Road Accident Analysis
- Scene of Crime
- Speech & Audio Analysis

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European Fiber Group (EFG)

European Fiber Group established in 1993
(17 labs from 12 countries)

- 60-70 participants at annual meeting
- Best practice manual for fibre examiners

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European Fibers Group (EFG)

- Annual collaborative exercises
- Establishment of “Young Persons Fibre Workshops”, now renamed “Development Workshops”
- Future project: Raman database for dyes

European Paint Group (EPG)

European Paint Group established in 1997
(28 labs from 15 countries)

Goals set in 1997:
- The establishment of European Paint Collection
- The establishment of a combined data base on paint
- The performance of collaborative exercise on a European level
- The recommendation of standard operating procedures for the examination of paint
- An exchange of the most up to date information in the area of paint analysis including case work
- The co-ordination of combined research projects
EUCAP: European Collection of Automotive Paint

EUCAP – member = crime laboratories from 23 European countries
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2006/2007

Transformation toward a web based application (IRCGN/France).

For 2008 summer courses are planned at the BKA for the application of EUCAP.

European Paint Group (EPG)
European Paint & Glass Group (EPG)

1999 a glass subgroup was formed as part of the EPG

Main focus:

• Annual collaborative exercises
  for refractive index measurements
  for elemental analysis of glass

• Best practice guidelines (to be finalized in 2007)
Common standard material
As part of the collaborative exercises an external std glass of high optical homogeneity (BKA-K5) has been distributed to all European laboratories.

Education & Training
2006 a training course on the quantitative analysis of glass fragments was held in Prague, Czech Republic.
In 2005 a subgroup “Tapes and Security dyes” dealing with materials such as adhesive tapes, plastics, and security inks was established.

Based on the “Adhesive Tape Database” of the BKA that was established in 2001, a European Tape Collection was founded in 2003.

**BKA Tape Database**

- 2500 items
- IR-spectra library
- properties
Future activities: Focus on securities dyes

Implementation of database:
Pictures of banknotes
Description of color & chromatographic effect
TLC-data
REM pictures of colored fibers
Further characterization of dyes
Marks Working Group

Development of a six-level conclusion scale.

To be applied in evaluation of the results of collaborative exercises or for the use in casework.

New (old) technology

Scanning electron microscopy (SEM)

New developments

Environmental SEM (ESEM)
- no coating necessary

SEM-Focused ion beam (FIB)
- Microchip manipulation
- Paint analysis
- (cross sections of nanolayers)

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SEM-Focused ion beam
(cross sections of pigments)

Microchip manipulation

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New & old technology

Raman spectroscopy: Despite its complexity it has a growing number of applications in case work.

Laser ablation ICP-MS

DNA analysis of botanical material

Ongoing database activities
unsolved homicide
trace material from the trunk of suspects car
statement of suspect: „... I have never been at that place ...”

question: „does the leaf originate from one tree at the LC?“

1998

pendunculate oak
Quercus robur

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DNA analysis of botanical material

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DNA analysis of botanical material

2004

The frequency of the DNA profile in 6 short tandem repeat (STR) loci is approx. 1/2.5 Billion oak trees

Match

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Summary

Major political and social changes in Europe during the last decade.

Quality management is the big issue of the future.

EWG of ENFSI is the happening place.

Interpretation of results will receive more attention in the future (ISO 17020).
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