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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

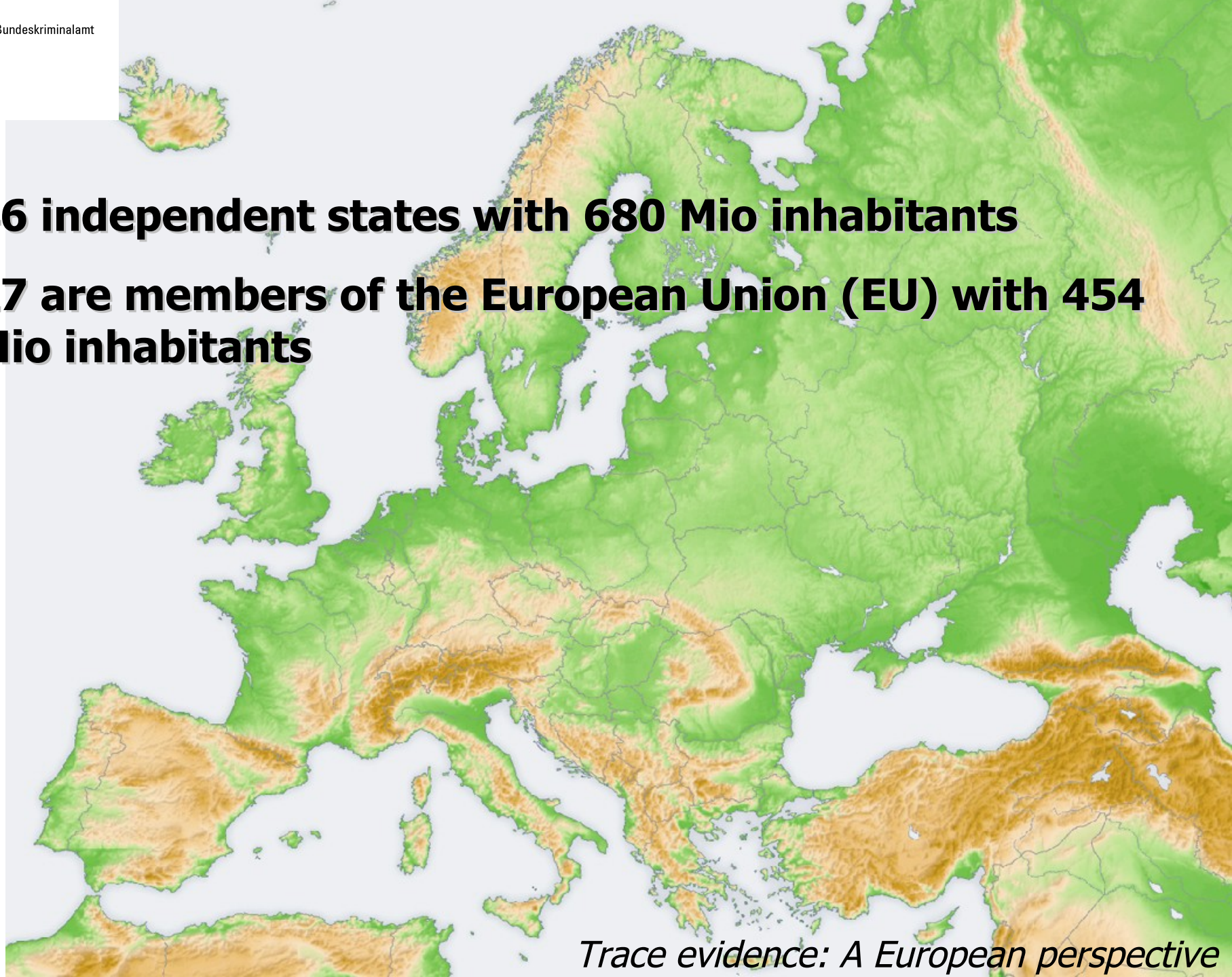
Definition of Europe

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

5 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.

www.enfsi.org or www.enfsi.eu

European Network of Forensic Science Institutes (ENFSI)

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

1995: Establishment of ENFSI;

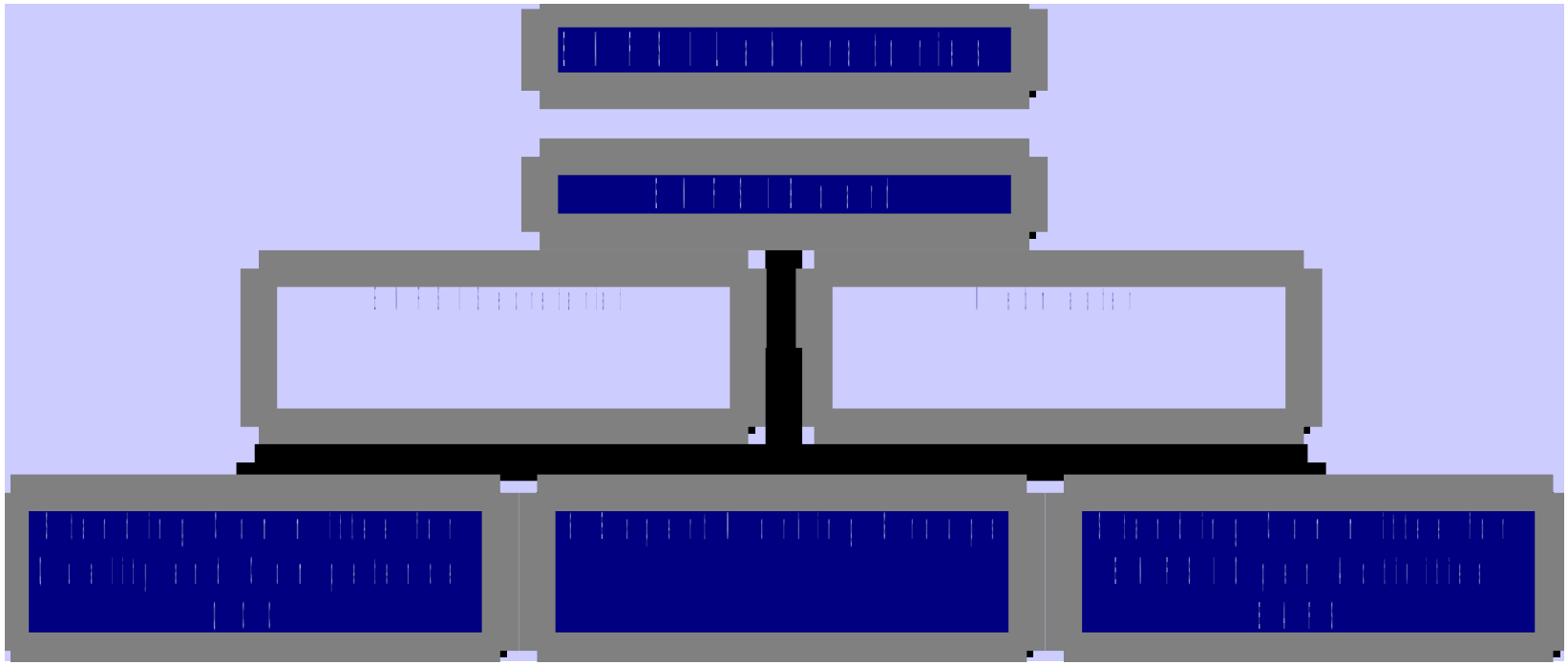
25 foundation member out of 17 countries; Memorandum of Understanding

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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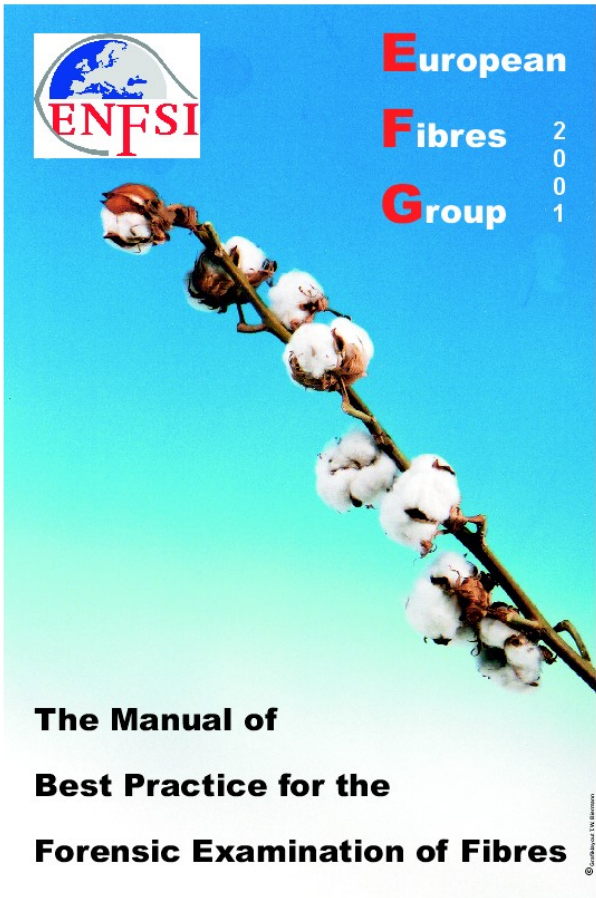
Expert working groups:

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

European Fibers 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



European Fibers Group (EFG)

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

Wiggins KG: The European Fibres Group (EFG) 1993 - 2002. Anal Bioanal Chem; 2003 (376) 1172-1177

European Paint Group (EPG)

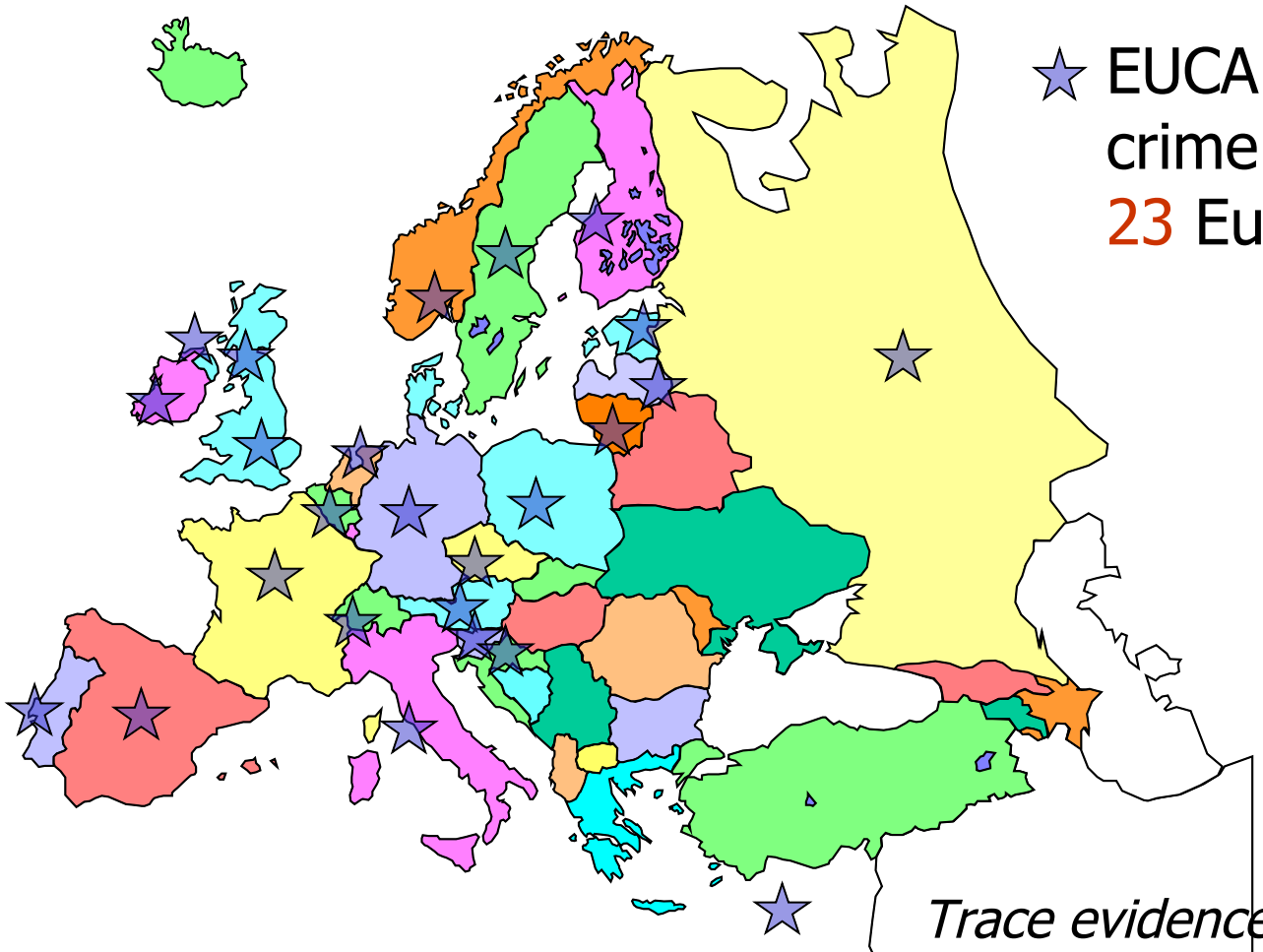
European Paint Group established in 1997
(28 labs from 15 countries)

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

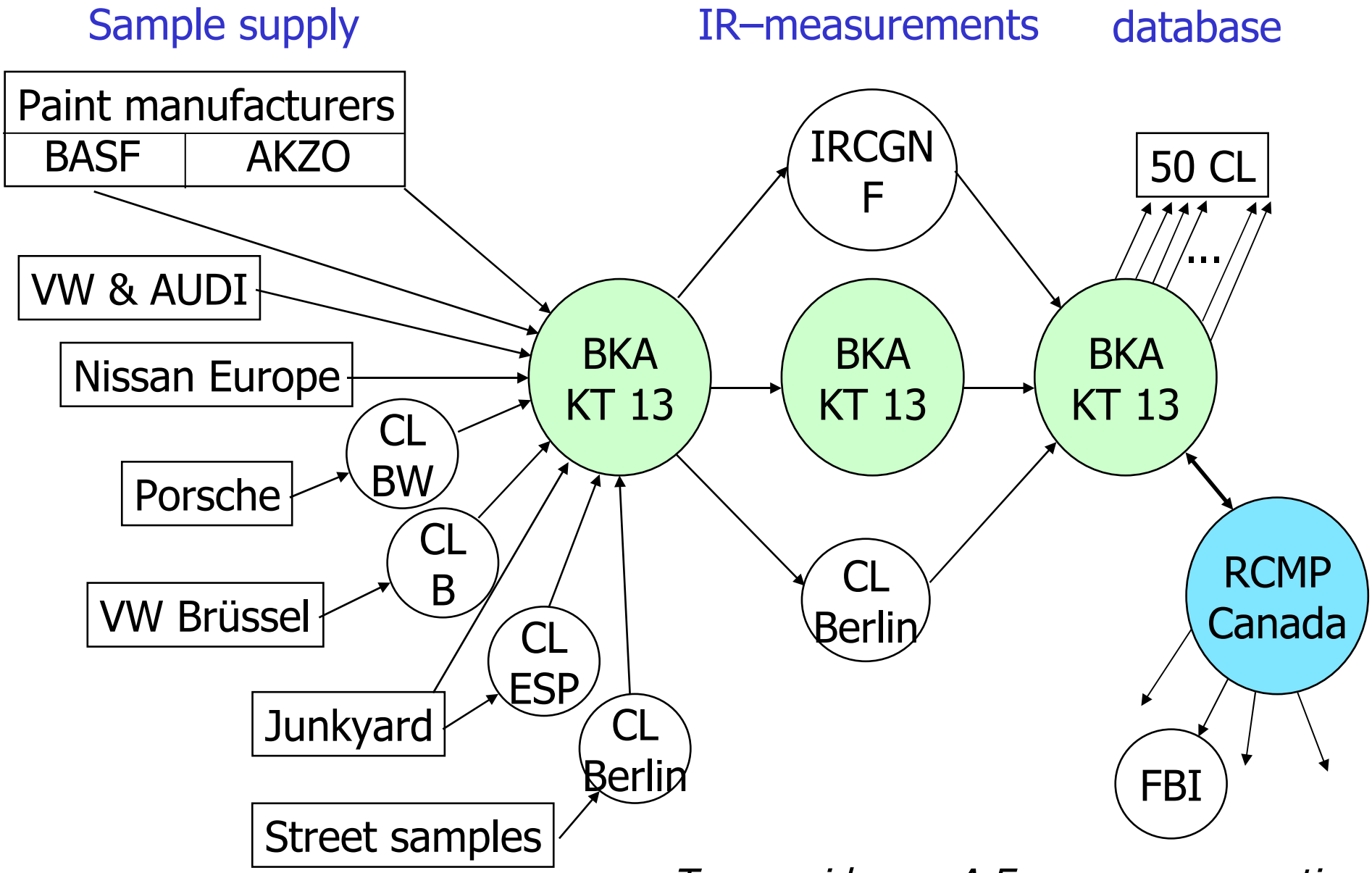
European Paint Group (EPG)

EUCAP: European Collection of Automotive Paint



★ EUCAP – member = crime laboratories from 23 European countries

EUCAP process chart



European Paint Group (EPG)

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 & 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)

European Paint & Glass Group (EPG)

Glass subgroup

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.

European Paint & Glass Group (EPG)

Tape subgroup

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

European Paint & Glass Group (EPG)

Tape subgroup

Future activities: Focus on securities dyes

<u>Implementation of database:</u>

Pictures of banknotes

Description of color & chromatographic effect

TLC-data

REM pictures of colored fibers

Further characterization of dyes

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Marks Working Group

Development of a six-level conclusion scale.

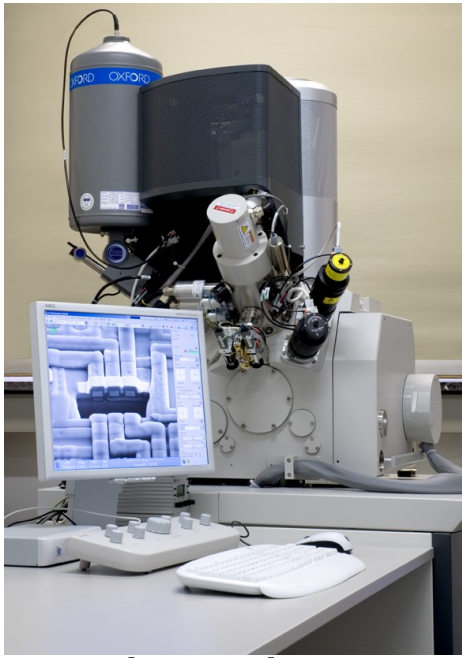
To be applied in evaluation of the results of collaborative exercises or for the use in casework.

Katterwe H: Conclusion Scale for Shoeprint and Toolmarks Examinations, Journal of Forensic Identification; 2006 (56) 255-280

New (old) technology

Scanning electron microscopy (SEM)

New developments



Environmental SEM (ESEM)

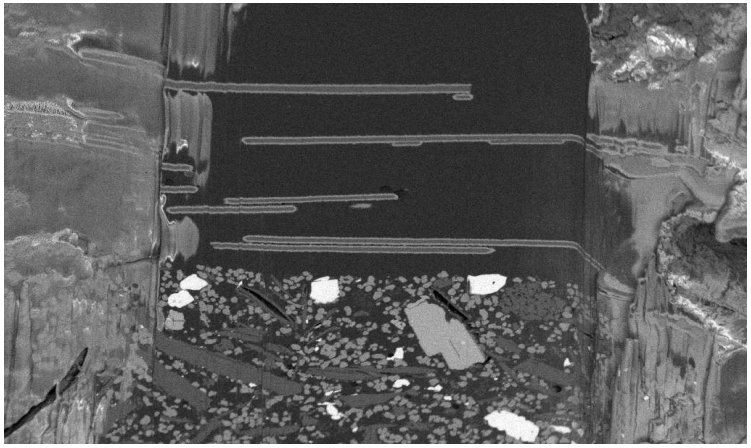
no coating necessary

SEM-Focused ion beam (FIB)

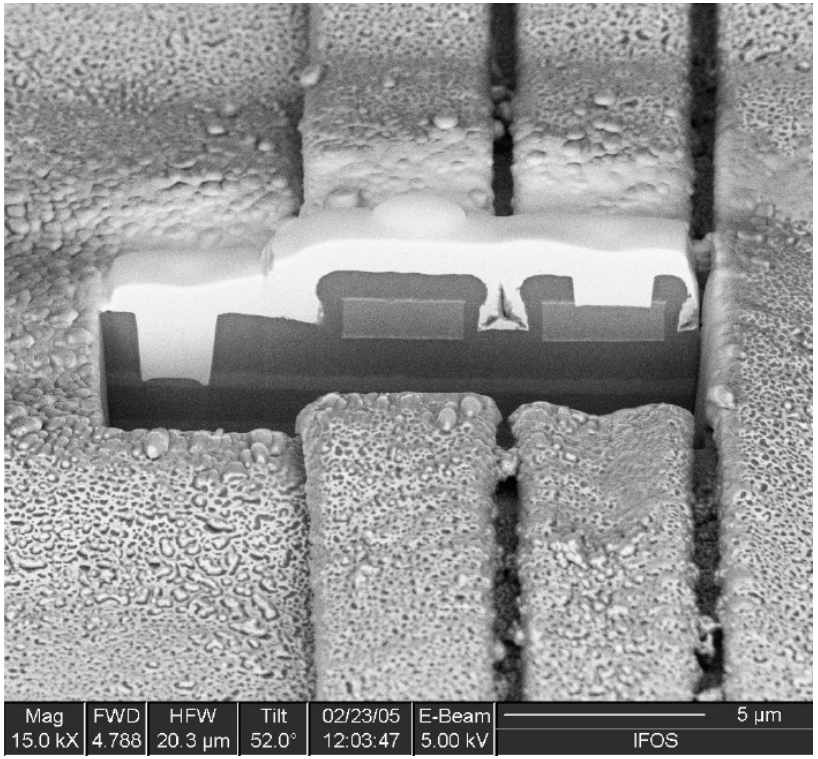
Microchip manipulation
Paint analysis
(cross sections of nanolayers)

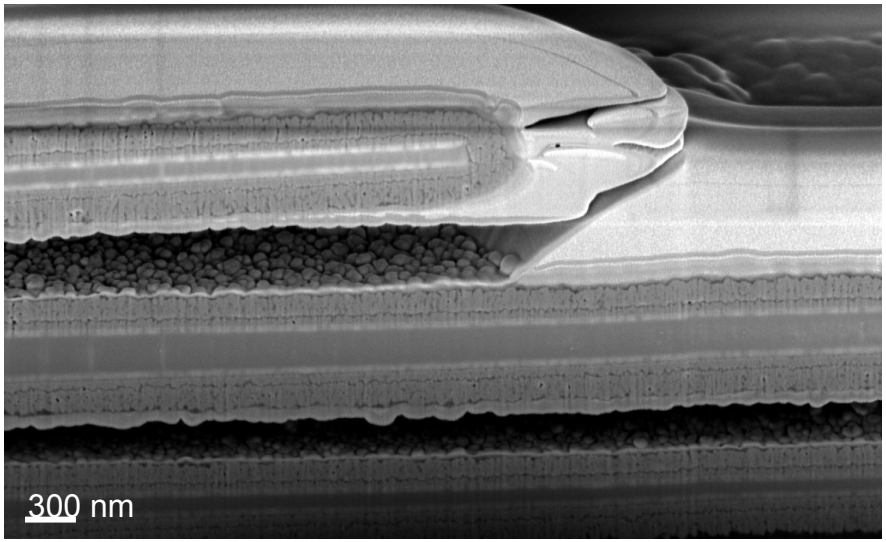
SEM-Focused ion beam

(cross sections of pigments)



Microchip manipulation





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

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DNA analysis of botanical material

1998

unsolved homicide

trace material from the trunk of suspects car

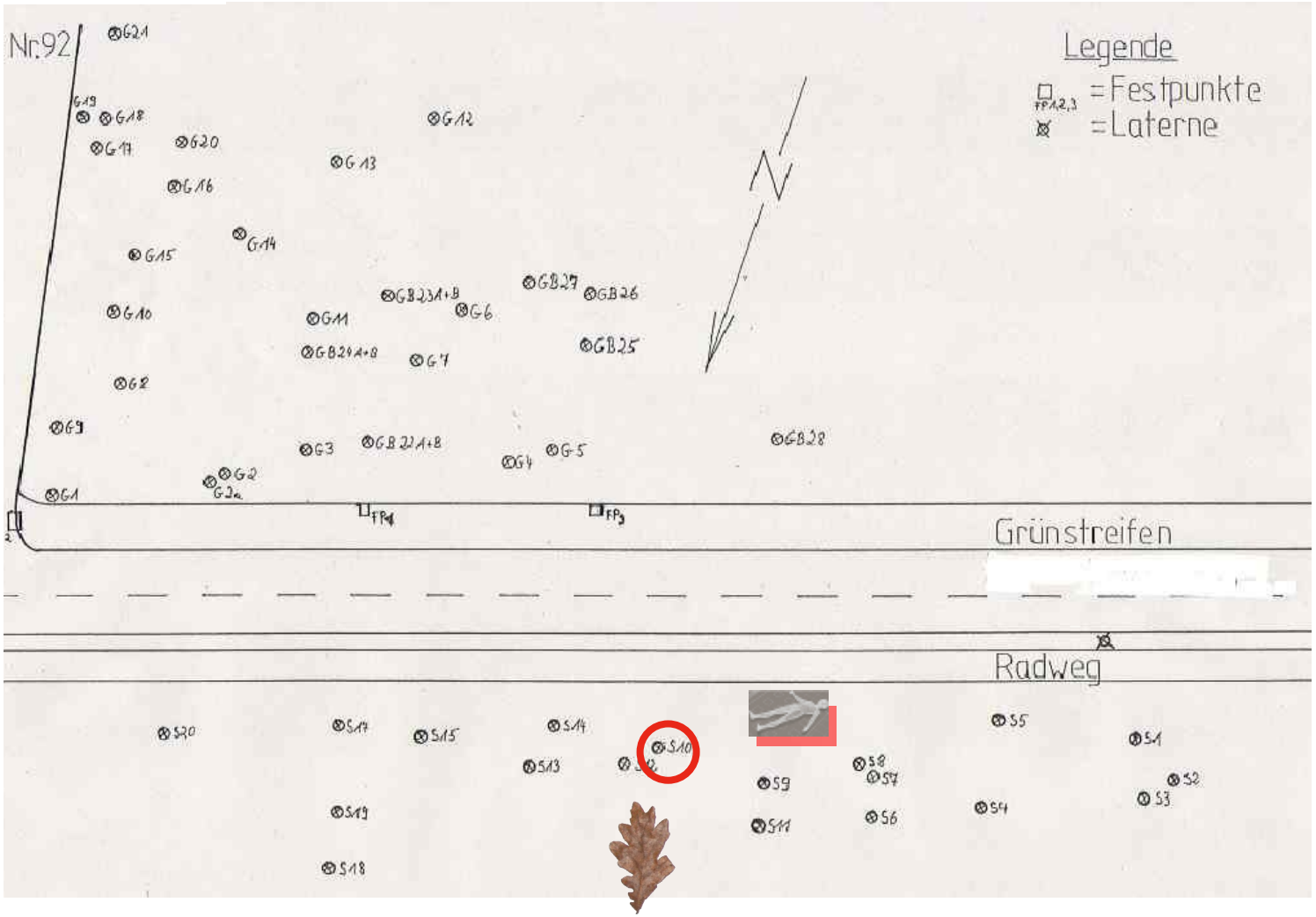
statement of suspect: „... I have never been at that place ...“

pendunculate oak

Quercus robur

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

DNA analysis of botanical material



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DNA analysis of botanical material

2004

	Baum	STR1		STR2		STR3		STR4		STR5		STR6	
		AG 36	AG 36	AG 1/5	AG 1/5	AG 9	AG 9	AG104	AG104	MSQ13	MSQ13	MSQ4	MSQ4
comp	G08	206	222	164	176	190	198	162	184	215	221	215	230
comp	G09	206	218	170	178	196	202			221	227	211	215
comp	G10a	212	212	170	178	196	202	182	188	221	223	211	212
comp	G10b	212	212	170	178	196	202	182	188	221	223	211	212
comp	G11	208	212	170	172	206	206	160	182	215	223	211	217
comp	G12	212	230	170	176	192	192	182	190	215	223	207	217
comp	G13	220	220	170	176	202	206	178	190	215	223	209	218
comp	G14	212	212	170	172	190	206	164	182	197	221	217	218
comp	G15	206	208	158	178	194	206	180	182	221	223	211	218
comp	G16	206	208	158	178	194	206	180	182	221	223	211	218
comp	G17	218	220	158	176	194	202	182	210	189	221	211	217
comp	G18	218	218	170	180	190	200	182	198	223	229	207	212
comp	G19	208	212	170	170	198	202	182	200	197	197	215	218
comp	G20	212	218	178	178	192	200	174	198	215	223	218	218
comp	G21	214	220	160	176	200	202	208	210	189	215	211	218
comp	S01	214	230	170	176	192	200	162	198	221	221	218	220
comp	S03	216	216	170	172	192	192	190	190	215	223	218	218
comp	S04	208	220	158	170	202	206	160	206	197	221	207	209
comp	S05	206	218	160	176	192	202	164	182	223	223	207	209
comp	S06	208	230	160	172	194	204	160	212	215	221	209	218
comp	S07	220	220	172	176	198	206	160	180	221	225	211	220
comp	S08	216	216	158	170	198	208	178	182	215	221	218	230
comp	S09	206	212	172	176	190	192	160	212	197	215	209	218
comp	S10	218	220	176	180	190	196	202	202	215	215	218	218
comp	S11	212	214	170	176	190	198	170	182	215	215	211	218
comp	S12	214	220	172	174	192	196	180	190	191	215	212	215
comp	S13	208	230	176	178	194	196	204	204	215	221	209	218
comp	S14	206	218	176	176	202	206	182	210	215	223	211	218
comp	S15	208	220	176	178	190	204	160	184	221	223	218	218
comp	S16	206	212	170	172	190	192	174	180	189	215	218	218
comp	S17	218	220	170	172	192	196	164	178	223	223	207	207
comp	S18	212	220	176	176	198	202	178	190	197	225	212	218
comp	S19	208	206	158	178	192	196	186	212	197	223	211	217
comp	S20	212	218	176	176	190	208	168	180	223	229	217	217
trace	102	218	220	176	180	190	196	202	202	215	215	218	218

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

Match

kt32@bka.bund.de

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).

Acknowledgements

Cornelia Nehse, Germany

Knut-Endre Sjastad, Norway

Dr. Christa Dern, Dr. Gabriele Gorzawski, Dr. Georg Jochem, Dr. Ulrich Simmross, Dr. Thomas Schäfer, Dr. A. Hellmann; BKA

www.wikipedia.org