



DNA

The Polymerisation of Policing
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HANDOUT

© June 2008

In the UK (Common Law):

Prosecutors do not lead the investigation

No distinction pre-investigation/investigation

Jury not judge decides facts (incl. guilt or not guilty)

**Less than 20% crime scenes forensically examined
(only small proportion yield samples)**

INVESTIGATION

Proactive –v- Reactive

Locard's Principle

**DNA Reactive – needs crime scene
(Cold Case Review)**

Police often arrive at crime scene 'blind'

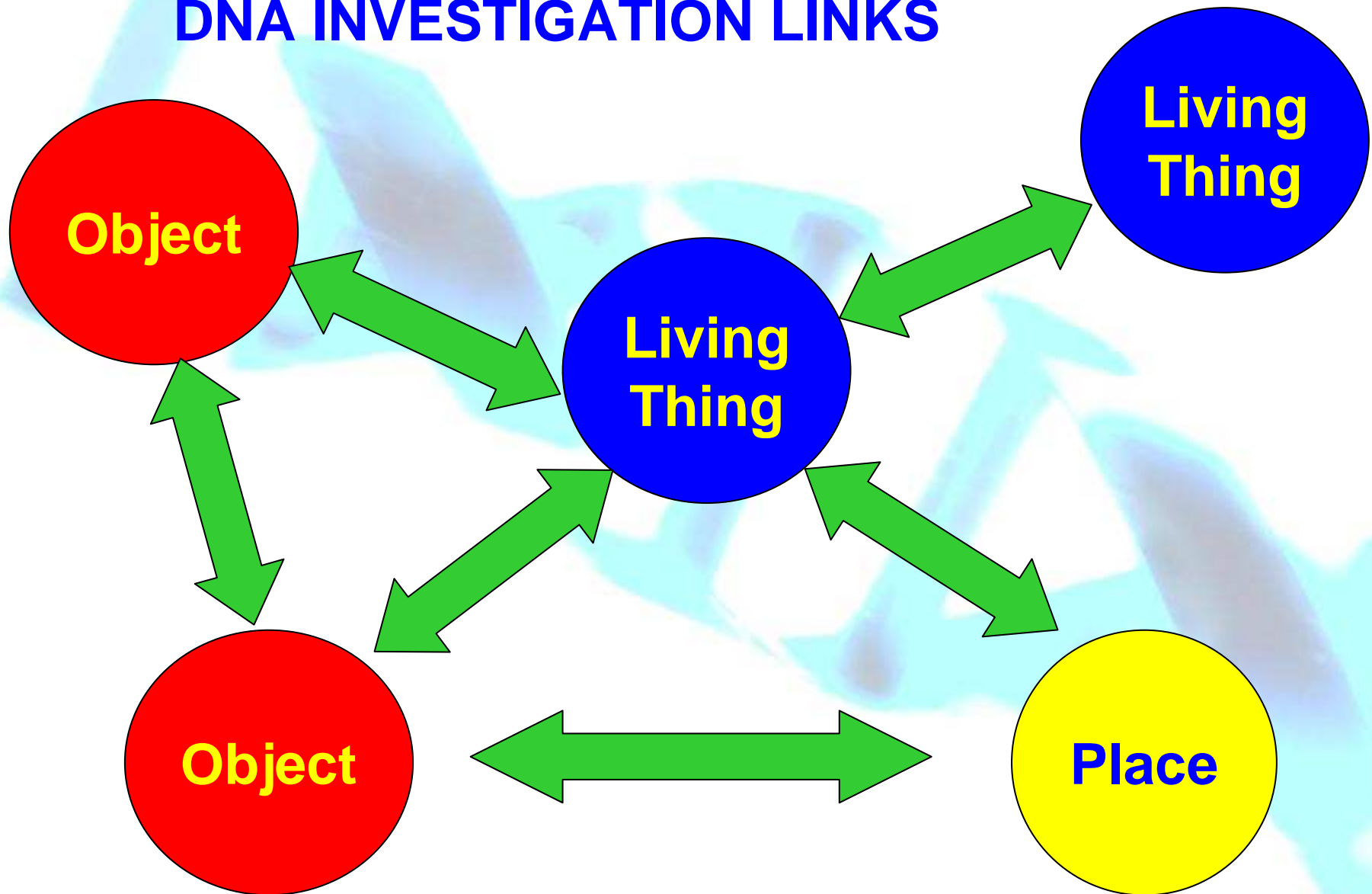
INVESTIGATION

**Especial relevance for
Organised crime or terrorism?**

- **Professional**
- **Experienced**
- **Precautions**
- **Costs (serious crime =bigger budget)**
- **Harm reduction**

- **(Reactive)**

DNA INVESTIGATION LINKS



DVI

**Familial
Comparison**

Victims

**Crime Scenes
Stains**

IDENTIFICATION

**Human
Profiles**

Suspects

Culpatory

Exculpatory



RISKS

- **Blinding by science (failure to corroborate)**
- **Basis of the comparison – Probability**
- **Cross contamination
(SOCOs are human too)**
- **Easy to plant**

CHALLENGES

- **Poor/incompatible procedures**
- **Increasingly difficult to avoid cross-contamination**
- **Forensically aware criminals
(Especially OCGs and Terrorists)**
- **Data Protection**

European Standard Set (ESS)

**Interpol
Standard
Set of Loci
(ISSOL)**

Minimum 6 out of 7 Loci

**CODIS
Core
Loci**

USA,
Australia,
Canada,
Denmark,
Finland,
Ireland,
Norway,
Spain

**Complexity of
different standards**

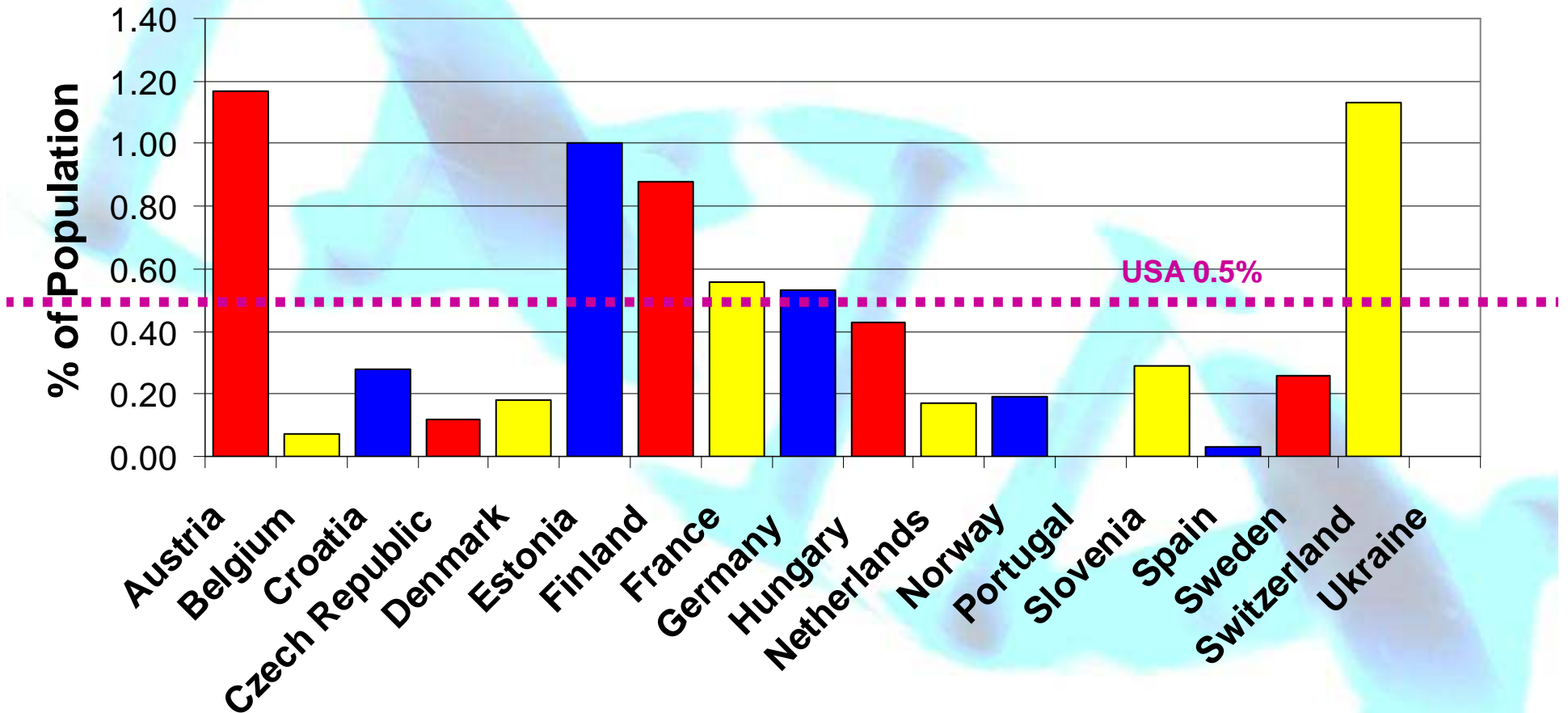
UK,
Austria,
Bulgaria,
Switzerland

SGM Plus

Prüm?

DNA Databases in Europe (excluding the UK)

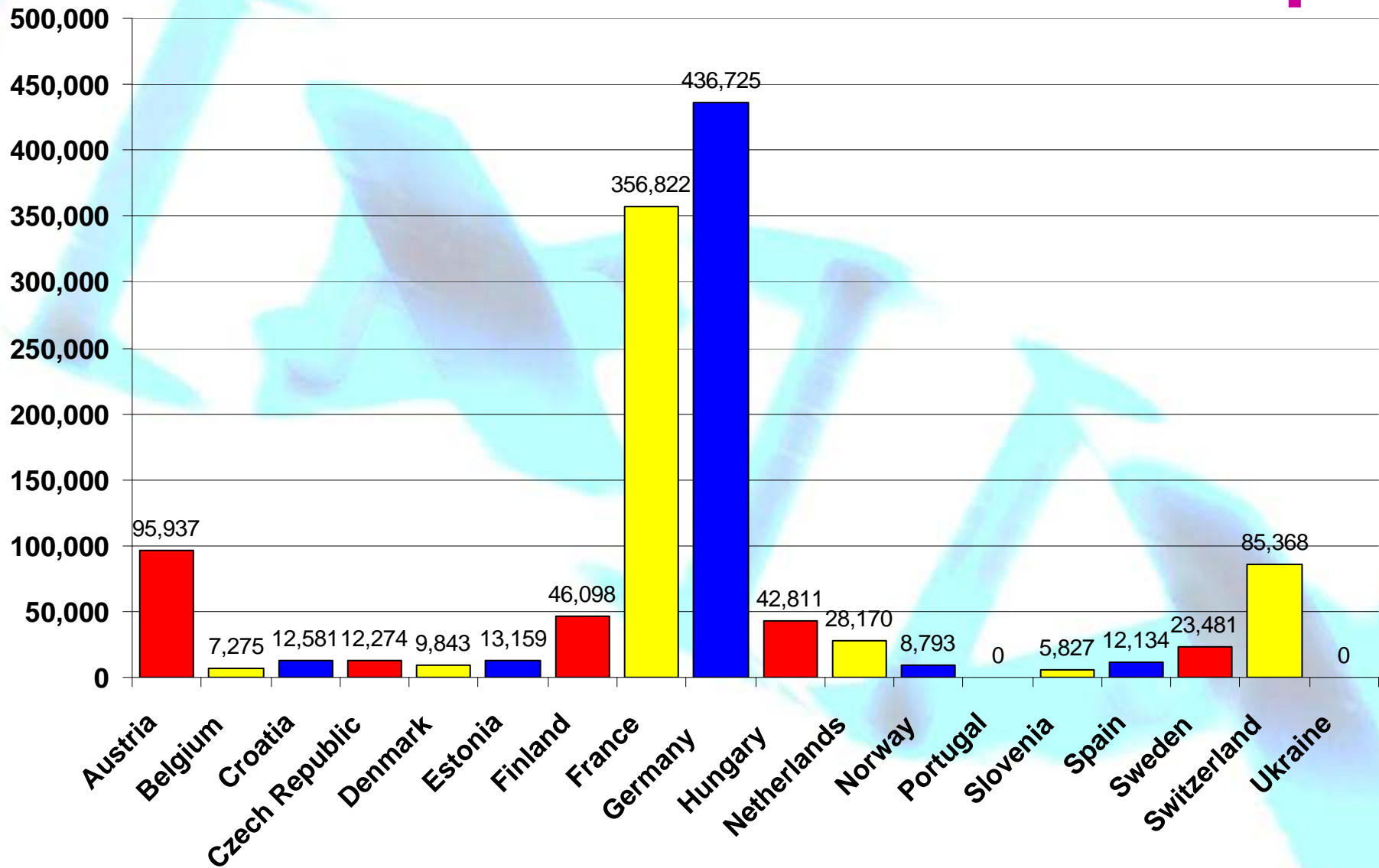
(August 2007)



Source: ENFSI

Note: 0% indicates less than 0.01% of population
(i.e. will not show up on the chart; Portugal only keeps crime scene stains).

USA 1.5M



National Population Statistics 2007 (est) [internetworldstats.com/US Census Bureau](http://internetworldstats.com/)



How many profiles are duplicates?????

UK has 5.2% of population

(Home Office Website updated 2005??)

By August 2007:

4.5M people (900,000 children)

= closer to 7.5%

Increasing at 30,000 profiles per month

3,500 matches per month

2007 40,000 detected cases involved DNA

£300,000,000 over 5 years

Source: Daily Telegraph 26 Nov 2007

In the UK

**S 64(1A) PACE 1984,
(as substituted by s 82 CJPA 2001)**

**fingerprints and DNA
of arrested, but unconvicted persons
retained indefinitely.**

**Approved by UK 'House of Lords'
(Supreme Court)**

**R v. C.C. South Yorks Police, ex parte L. S.
R v. C.C. South Yorks Police ex parte Marper (2004) UK HL39**

Article 8 ECHR Privacy



**R v. C.C. South Yorks Police, ex parte L. S.
R v. C.C. South Yorks Police ex parte Marper (2004) UK HL39**

Forensic Science Service Expert claimed:

128,517 DNA profiles on database which would previously have been deleted

5,922 linked to crime scene stain profiles.

R v. C.C. South Yorks Police, ex parte L. S.
R v. C.C. South Yorks Police ex parte Marper (2004) UK HL39

Data Protection – proportionality principle

Hit rate of only 4.6%

What of other 95.4 % DNA profiles?

**R v. C.C. South Yorks Police, ex parte L. S.
R v. C.C. South Yorks Police ex parte Marper (2004) UK HL39**

FSS expert:

“...approximately 1,700 offences have been detected involving over 1,000 offenders that might otherwise have gone undetected using profiles which would previously have been removed.”

72 “serious” offences

**R v. C.C. South Yorks Police, ex parte L. S.
R v. C.C. South Yorks Police ex parte Marper (2004) UK HL39**

**This number of offenders
represents only
0.78 % of 128,517 non-deleted profiles**

**1,700 offences
72 “serious offences”
= 4.24%**

**(How “non-serious” were other 1,628 offences?)
(How many would have been detected without DNA?)**

**R v. C.C. South Yorks Police, ex parte L. S.
R v. C.C. South Yorks Police ex parte Marper (2004) UK HL39**

Lord Steyn (quoting Home Office statistics)

40% chance that a crime scene sample matches immediately with an individual's profile.

**However,
the vast majority of crimes are committed by a minority of known recidivists whose DNA samples are already held on record.**

**R v. C.C. South Yorks Police, ex parte L. S.
R v. C.C. South Yorks Police ex parte Marper (2004) UK HL39**

Lord Brown:

**“The more complete the database,
the better the chance of detecting criminals,
both those guilty of crimes past and those whose
crimes are yet to be committed.**

**The better chance too of deterring from future crime
those whose profiles are already on the database.”**

Unfair?

R v. C.C. South Yorks Police, ex parte L. S.
R v. C.C. South Yorks Police ex parte Marper (2004) UK HL39

Lord Justice Sir Stephen Sedley

“Indefensible”

(wants universal database)

September 2007

Nuffield Council on Bioethics

“Unjustified”

Appeal to ECHR Pending

“The forensic use of bioinformation: ethical issues”

Nuffield Council on Bioethics

www.nuffieldbioethics.org



DNA is increasingly robust and reliable.

Risks, especially when the scientific techniques are pushed to their limits.

**Deliberate or accidental contamination,
Misinterpretation of mixed samples,
Mistaken interpretation of partial profiles,
Misuse of statistics to establish the probability of a match.**



*“It is our view that the authority of the police to take and store both fingerprints and biological samples from all arrestees without their consent, regardless of the reason for the arrest, is **disproportionate** to the aims of identifying a person and of confirming whether or not a person was at a crime scene. Suspicion of involvement in a minor (at present ‘non-recordable’) offence does not justify the taking of bioinformation from individuals without their consent”*

*“....there is, at present, a **lack of convincing evidence** that retention of profiles of those not charged with or convicted of an offence has had a **significant impact** on detection rates and hence it is difficult to argue that such retention can be justified.”*



**"It is poor civic hygiene to install technologies
...that could someday facilitate a police state"**

Bruce Schneier
Cryptographer and Security Expert



DNA is a powerful tool but

...danger of creating unrealistic expectations

UK DNA Database had 550,000 entries:

- **False;**
- **Misspelt;**
- **Incorrect name;**
- **12.5% file error.**

Daily Mail 26 Feb 2008

1 crime solved for every 800 new profiles added to the UK DNA DB (0.125%)

(Diminishing returns once recidivists sampled)
(Solved anyway??)

Daily Telegraph 6 May 2008

Example: Right DNA, Wrong Man

DECEMBER 2001

17 year old girl

Bexleyheath, Kent, UK

Stranger rape

Attacker: “Tall”, “Black” “Large”

COLD CASE REVIEW 2007

Hair on ring

DNA Match

Trial Feb 2008

Accused: 1.65m, White, Slim

No evidence offered

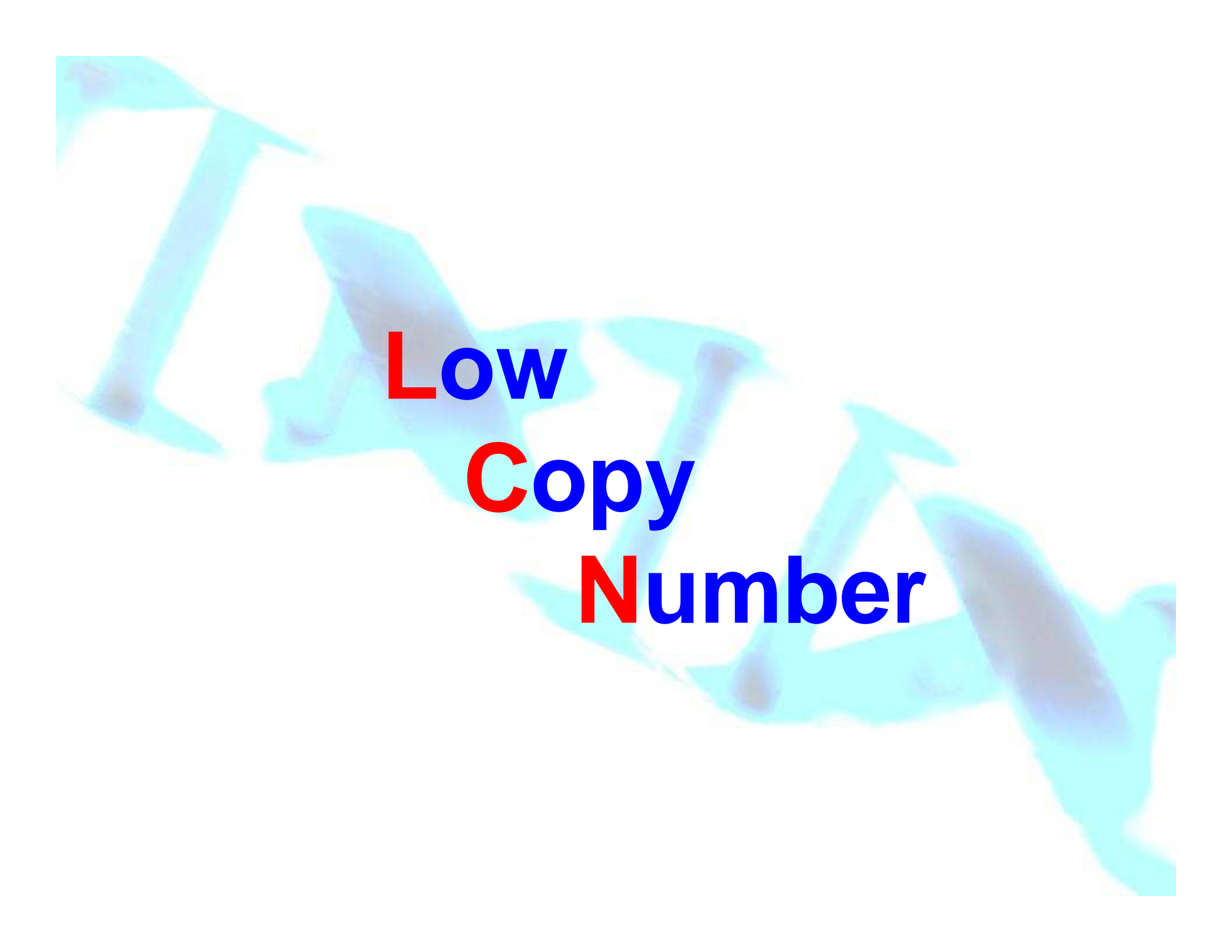
A spokesman for the CPS said:

"We charged on the basis of DNA evidence which we were satisfied with. We asked for further tests and in light of the results we decided that there was no longer a realistic prospect of conviction."

Judge Price

"He is a wholly innocent man, who might have been the victim of a gross miscarriage of justice."

**Nothing wrong with the DNA process
Blinded by Science?**



Low
Copy
Number

Anna Lindh, murder, Sweden in 2003

LCN on the knife handle used to kill Swedish foreign minister, Anna Lindh. Found a mixed profile. Part from Lindh, and part from Mijailo Mijailovic. He was convicted

Low Copy Number

Peter Falconio, murder, Australia in 2001

Peter Falconio & Joanne Lees, travelling through the Australian outback. DNA sample on the tape used to bind Joanne Lees, DNA from her T shirt, a blood smear on the gear stick of the couple's vehicle matched Bradley Murdoch. He was convicted in December 2005.

Only labs in UK, NL, NZ

Omagh Bombing 15 August 1998

- **Real IRA**
- **Car Bomb**
- **230kg Explosive**
- **Shopping area**
- **29 Dead, 200 Injured**

Sean Hoey arrested 6 Sept 2006

- **Nephew of other accused**
- **LCN found bomb timers**
- **Trial 20 dec 2007**
- **Evidence discredited**
- **Not guilty**
- **(Non-jury trial)**

Prof Brian Caddy

Emeritus Prof Forensic Science, Strathclyde University

Independent Review

DNA technique 'fit for purpose'

The technique... is scientifically robust and appropriate for use in police investigations

But it recommended improvements in how police forensic teams collect the cells to ensure there is no contamination.

Prof. Allan Jamieson,
Director of Forensic Institute Glasgow

"The real issue is: do we know what it means when you see a profile?"

"For example, when you mix two people's DNA together, it's like mixing the coins in their pockets together. They end up on the table and you have to say which coin came from which person. You simply can't do that." Guardian 28 February 2008



Caddy or Jamieson?

Both eminent experts

Who is right or wrong?

Science may be sound, but what of the system?

Only reasonable doubt needed



CASE STUDIES

(DNA supported successes)



Case 1: Body in a Field

Cambridgeshire Police

Remains of a charred body in a field.
No identification

Operation Warsaw

January 2002

Body found charred, gunshot, stabbed

Bag of rubbish

Scrap from medical appointment

2 names

Cigarette lighter

(Name on scrap of paper arrested, no charge)

Victim no DNA/fingerprint match

Facial reconstruction

Dental work analysed

Skin & bone contaminants

Ukraine

Possible UK region 3 – 6 years

Targeted 2000 letters where 2 surnames

**Response from
mailshot**



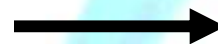
Factory



Similar



Medical Room



Batch No.

Paper towels

Latex gloves



**In depth forensication
Traces of victim's blood
Traces of gunshot residue**

**Armenian
Security
Guard**

**Father-in-law
DNA
On lighter**

'SAKO'



**People
remembered**

**Missing since
night before
body found**

Arrested

Guard's 'brother'



**Interpol
Name & Description**

Familial DNA



Belgian Police



**Father-in-law
DNA
On lighter**

**Denied
Ever being to UK**

**Fingerprint
on Hotel register
where son lived**

**Arrived
day
before**

**Left
day
after**





**Armenian Gangster
Narcotics
Illegal Immigration
Prostitution**

Wanted in Ostend and Moscow re Murder

Known criminal in at least 3 countries

No fingerprints/DNA available internationally

DNA aided identification

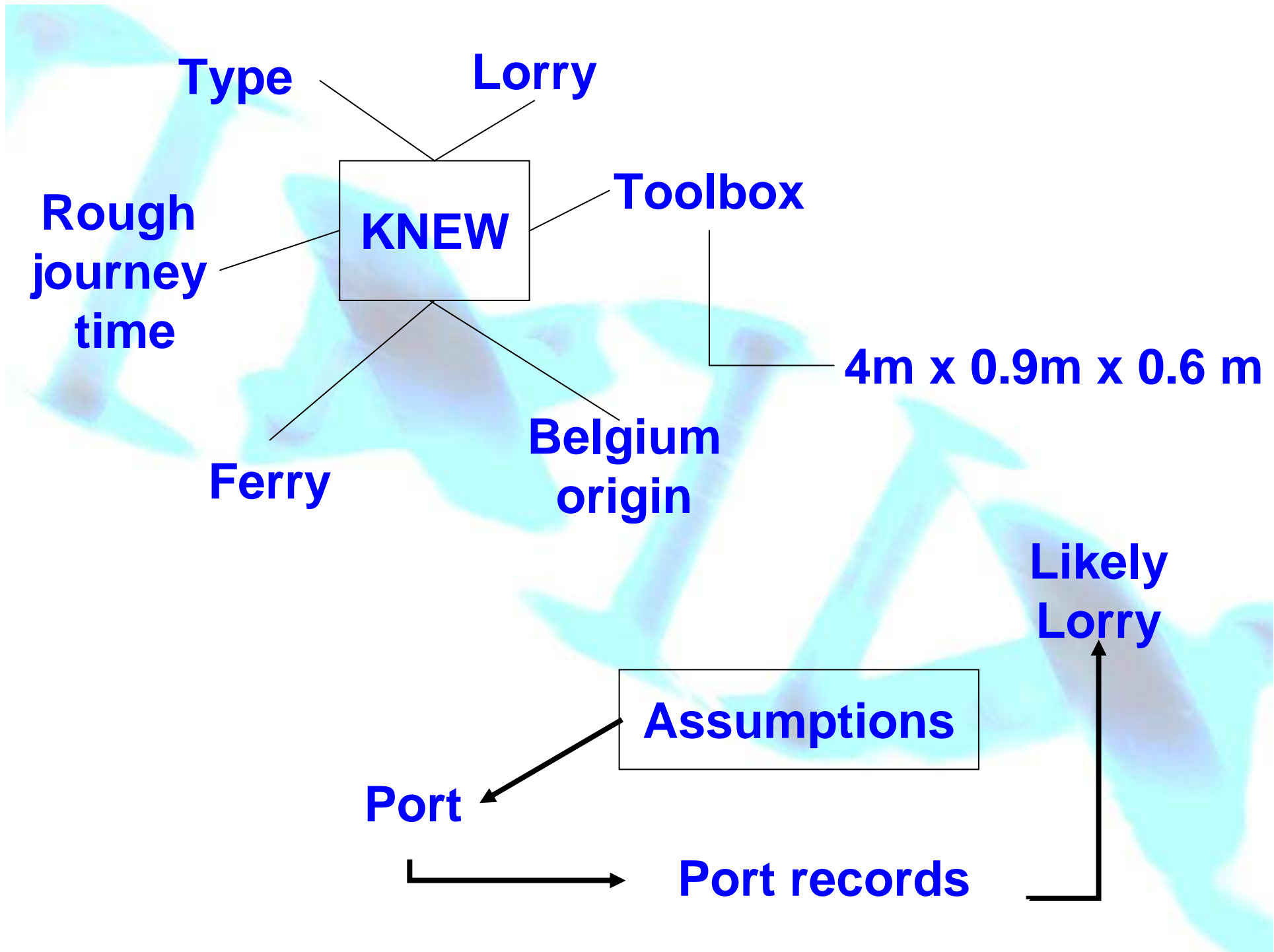
Linked Father in law to crime scene

Case Two: The Meat Lorry Manslaughter

Essex Police

**Find the vehicle and driver
Show the driver committed the crime**

Identify the victims



Likely Lorry

Danish owners (full cooperation)

Lithuanian Driver “Didn’t know” defence

Tachograph

Cigarette packet in toolbox

DNA link to driver

UK-DK DNA liaison

(Operational meeting Europol)

Victim Identification

Photos/photofits

Interpol DNA no match

Survivor Asian

Asian Appearance

Clothing exclusive to South Asia

PT phone number

Led to Next of Kin

Indian LO took familial DNA

Lithuanian Driver found guilty Dec 2007

Manslaughter for one of the victims

8 year sentence

DNA linked driver to toolbox

DNA linked one victim to family

SUMMARY

- **Extremely valuable and exciting tool**
- **Possible to be contamination free?**
- **Over reliance on technology**
- **Rigorous procedures essential**
- **Failure to investigate fully?**
- **International Variation**
 - ❖ **standards**
 - ❖ **quality of handling**
 - ❖ **size of databases**
- **Professional criminals take precautions**

Steven David Brown

steven.brown@inzeit.eu

Steven David Brown (ed.)

“Combating International Crime: The longer arm of the law”

Published: Routledge 2008

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