

DNA IN THE DOCK

► Martine Jacot

Genetic fingerprinting provides virtually flawless proof and is helping to identify criminals and free people jailed for crimes they did not commit. But does it violate basic human rights?

Police and judges in Western countries all agree that the arrival of genetic testing in their daily lives is a far more revolutionary development than the introduction of fingerprinting at the end of the 19th century. It is now just about impossible to say a criminal has “disappeared without leaving any trace,” even if he or she wore gloves.

Forensic science has made a great leap forward since 1985, when British scientist Alex Jeffreys discovered a new way of identifying people genetically through their DNA (deoxyribonucleic acid), the molecule at the core of each living cell. It is now possible to draw up a person's genetic identity card within five or six hours at minimal cost¹ working from infinitesimal pieces of evidence,² such as a minute speck of blood, a single hair, a trace of saliva left on a cigarette butt, a stamp, a glass or a toothbrush, from sweat on clothing or, more important, a tiny drop of a rapist's sperm. However despite this “proof”, we should remember that just because a person's “traces” have been found at the scene of a crime, it does not necessarily mean they are guilty.

Death row prisoners cleared

Except in the case of identical twins, the structure of a person's DNA is unique. About 10 per cent of DNA contains chromosomes. The rest of it, whose purpose is unknown, is “non-coding” DNA which provides no information about health or genetic abnormal-

1. The cost of a producing a basic genetic profile from a good-quality sample has fallen sharply in recent years, to about \$50 in the United States and Britain and around \$80 in France, for example.

2. Provided all the evidence is carefully collected at the scene of the crime and then kept at the right temperature and analysed by reliable laboratories.



In a Strasbourg (France) laboratory, a speck of blood for genetic analysis is taken from a boot.

© F. Demange/Camma, Paris

ities, at least not yet, and is partly made up of identical sequences. It is these “repeat units” that are analysed to compile a person's genetic profile, which takes the form of a series of figures. These data are like bar codes which can be easily stored as a computer file. This is a positive development, say many Western criminologists and the families of crime victims. Defenders of civil liberties who predict new Orwellian nightmares, beg to differ.

An Afro-American called A.B. Butler is one of those whose life was saved by DNA testing. He was freed in January 1999 after 16 years in prison in Tyler, Texas, and his 99-year jail sentence for kidnapping and raping a young white woman in 1983 was quashed. As soon as he heard about DNA tests, he asked to be given one, knowing that the police had kept a sample of the rapist's sperm. Three laboratories confirmed that his genetic fingerprint was not that of the rapist.

Since the FBI began testing people's

DNA in 1989, at least 54 prisoners serving long sentences, mostly for rape, have been declared innocent in the United States. The defence of 35 of them was handled by the law school at New York's Yeshiva University as part of the Innocence Project (IP) launched in 1992 by Prof. Barry Scheck. The project's goal is to make DNA tests routine when evidence has been kept in the case of prisoners who claim to be innocent but cannot afford a good lawyer. The stakes are high. Six of the prisoners freed by the efforts of the students and teachers involved in the project were on death row.

Building databases

“Genetic testing can also help find the real criminal more quickly,” says Scheck. “It can help solve old crimes that have puzzled everyone and save a tremendous amount of time and money in an investigation. It can also help curb serial killers or compulsive rapists,” who could be identified before they commit more crimes. Such “advances” pre-

► suppose the existence of ways to compare the genetic profile of someone being sought and the profile of a suspect. This means building a database of genetic fingerprints. In the absence of such databases, police in the Western world investigating serious crimes proceed by trial and error, analysing DNA from entire villages and neighbourhoods.

Police in Britain, who were pioneers in the field, created such a database in 1995 “backed by women’s groups who supported technology that could identify rapists quickly,” says Peter Martin, a former chief of Scotland Yard’s laboratories. “When it was then found that rapists often already had a record of petty crime,” the database was expanded.

An identikit picture from a piece of chewing gum

In Britain, anyone arrested or suspected of a crime can be asked to provide a saliva sample to compile their DNA identity card. The database currently has the “bar codes” of about 700,000 people, and in 10 years time five million of the country’s 58.6 million people are expected to be in it. In five years, the database has enabled thousands of matches or “cold hits” to be made that Martin says have led to the identification of more than 260 murderers, 400 rapists and 2,500 burglars.

Police everywhere are naturally keen to gather all the information they can. Some are now dreaming of being able to make an identikit picture of a criminal just from a piece of chewing gum found near the scene of the crime. Current analysis done on non-coding DNA by the PCR³ method enables the sex of a person to be determined but not the age or colour of hair or eyes. But it will be possible in the future, scientists say. Some human rights defence organizations say such cataloguing must stop immediately and deplore the inadequacy of safeguards to protect individual liberties.

The fiercest debate about this issue is raging in the United States around the FBI’s launch in October 1998 of a national database, Codis, which combines biological and computer processes to link up databases in each of the 50 U.S. states. The FBI says it has 260,000 files on people that

3. Polymerase Chain Reaction, or genetic amplification, which became routine in the late 1980s, is the fastest, cheapest and most accurate method. It requires less DNA than the earlier RFLP (Restriction Fragment Length Polymorphism) method, which is no longer used in Western countries. It is now possible, by looking at a specific marker on sex chromosomes, to identify a person’s sex by PCR.

have already helped pinpoint the authors of more than 200 crimes, though so far only sex offences and violent crimes.

Resistance to the compilation of such databases has focused on one key question. Should a sample for a DNA test be taken from someone without their permission? The law in Western countries is not always clear on this but the principle has been accepted—in Germany, the Netherlands, Norway, Sweden, France and the U.S.—that a sample of blood or saliva can be taken on the orders of a judge or a police officer in the course of

‘When there’s an investigation among the inhabitants of a village after a crime, sample-taking should be voluntary, yet a refusal (to allow a DNA test) can be interpreted as grounds for suspicion.’

an investigation.

But the line between police requirements and individual liberties is still a very hazy one. “When there’s an investigation among the inhabitants of a village after a crime, sample-taking should be voluntary,” says Jean Michaud, a member of the French National Ethics Committee, “yet a refusal (to allow a DNA test) can be interpreted as grounds for suspicion.”

Many police admit however that a person’s DNA can always be analysed from their confiscated toothbrush or their coffee cup without them knowing, which does not directly violate their “physical person” or their “human dignity”, concepts recognized in laws on bioethics that have been passed in many Western countries. Such “unfair methods” are clearly condemned in theory but not explicitly by law.

Constitutional protection

In the United States, the Massachusetts state legislature passed a law in 1997 allowing the archiving of data on convicted criminals with retroactive effect. All prison inmates in the state were therefore “asked” to give a blood sample, ostensibly for the “statistical” reason that many prisoners commit new crimes after their release. But some refused, citing—on the advice of their lawyers—the fourth amendment to the U.S. constitution which protects citizens against “unreasonable searches and sei-

zures”. A Boston court set a precedent in August 1998 by ruling in their favour and giving the opinion that taking DNA samples without permission was a clear violation of human rights.

“Why don’t we make a database of all poor people?” asked one of the prisoners’ lawyers, Benjamin Keehn. “Are they also more likely to commit crimes? Where do you stop?” The protest against such moves, which has spread to other states, is organized by the American Civil Liberties Union (ACLU) Freedom Network, which has 250,000 members. The ACLU appealed before the National Commission on the Future of DNA Evidence, a 19-member body of distinguished experts set up at the request of President Bill Clinton, against the extension of the federal Codis system to any person who was arrested.

ACLU’s associate director, Barry Steinhardt, said it would mean “equating arrest with guilt” and would give “police officers, rather than judges and juries, the power to force persons to provide the state with evidence that harbours many of their most intimate secrets and those of

A GENETIC DATABASE FOR EUROPE’S POLICE

In 1997, the European Union Council of Ministers* “invited member states to consider establishing national DNA databases” and “exchange DNA analysis results” as a way of making “a significant contribution” to criminal investigations, provided it was “limited to exchanging data from the non-coding part of the DNA molecule, which can be assumed not to contain information about specific hereditary qualities.

“It is up to each member state,” the Council said, “to decide on the conditions under which, and the offences regarding which, the DNA analysis results may be stored in a national database.

The taking of DNA material for the purpose of storing DNA analysis results should be subject to safeguards designed to protect the physical integrity of the person concerned.”

It added that “creation of a European DNA database should be considered as a second step once the conditions for the exchange of the DNA analysis results are realized.” ■

* <http://europa.eu.int/eur-lex/fr/lif/dat/1997/fr>



© F. Demange/Canma, Paris

Genetic bar codes on a luminogram.

their blood relatives.”

Another set of vital questions arises from this debate. Who owns the DNA used to establish a person’s genetic ID—the person concerned, the laboratory which did the test, or the police? Should the sample be destroyed or kept, and if kept, for how long? The “bar codes” in the files may for the moment be of little use to snoopers, but the “original” DNA samples contain chromosomes and therefore a mass of genetic information about the person and their relatives, since the 23 pairs of chromosomes we all have are passed down half and half from each of our parents.

Who can guarantee that the DNA samples held in the police databases and laboratories will not one day be analysed

by nosy people working for, say, life insurance companies to find out if someone is likely to develop this or that disease? Germany, Austria, Finland, Sweden, Denmark and the Netherlands have all removed this risk by ordering the destruction of the samples once the ID has been established. Other countries allow police and labs to keep them—forever in Britain, for 40 years in France’s planned database and for various periods in different U.S. states. The excuse is usually that the sample might need to be examined again in the future.

A Pandora’s box

Especially in the last group of countries, non-governmental organizations and ethics committees have criticized

the growth of “small genetic databases” collected by laboratories with government authorization and by private firms acting in accordance with the law.

Steinhardt points to a survey carried out by the American Management Association which found that six per cent of employers were already using genetic tests as part of job-hiring procedures without the knowledge of the candidates. The Pentagon, he told the U.S. commission, currently has samples from three million of its present and former employees in a database originally set up to help identi-

‘Why don’t we make a database of all poor people? Are they also more likely to commit crimes? Where do you stop?’

fy soldiers killed in the Viet Nam War.

“Once the genetic information is collected and banked, pressures will mount to use it for other purposes than those for which it was gathered,” he said. “In fact, on several occasions, the FBI has already requested access to this data for purposes of criminal investigations.”

Prof. Philip Reilly, a member of the commission, agrees. “There is a proliferation of databases with DNA in all sorts of areas in our society which theoretically could be linked one way or another.” He also notes that “we already collected in 1999 blood from 99.8 per cent of the babies born in the United States and we are storing it without their consent. We also subject it to DNA analysis in some cases.”

The U.S. commission finally recommended that details of the 15 million people arrested in the U.S. every year not be archived at federal level. ACLU says it will fight the establishment of any genetic database, which it regards as a Pandora’s box. It is also contesting in court a recent Massachusetts law which authorizes disclosure of details from the police genetic database for undefined “humanitarian purposes”.

The easier science makes it to compile genetic profiles from DNA, the more urgent it becomes to have effective safeguards against the possible misuse⁴ of the genetic

4. Article 7 of the Universal Declaration on the Human Genome, adopted by UNESCO in 1997, says that “the confidentiality of genetic information associated with an identifiable person” must be protected.