UK to set up DNA database of criminals . . .

Paris. Britain is to set up the world's first national database of DNA profiles from convicted criminals, putting DNA alongside fingerprints among the forensic scientist's frontline tools. The United States is expected to follow suit by the end of the year.

The decision reflects an emerging consensus that the controversies over the reliability of DNA profiling are little different from those of other forensic tests, and that they will be quickly resolved, not through public debate, but by defence lawyers.

Most observers also agree that a database of limited DNA profiles of convicted offenders poses no new ethical problems. They point out that it would be little different from databases of fingerprints or mugshots, and may provide a major new 'deterrent' against violent crimes.

The UK civil rights group Liberty says it opposes a national database for offenders, because it would "be open to abuse", but it accepts a database limited to DNA from sex offenders and murderers. It also wants guarantees that individuals would have the right to check their stored profiles, and that courts would not convict individuals on DNA evidence alone.

Under the British scheme — announced last week by Michael Howard, the Home Secretary —police could take DNA samples from anyone charged with an offence punishable by imprisonment. Their profiles would be digitalized on optical discs, and be routinely screened against samples of DNA taken from crime scenes. The database would cost around £28 million in the first year.

One area of uncertainty is whether the police will keep DNA profiles from acquitted suspects on file. According to Howard, removing such profiles may be technically difficult because they would be stored on the same disc as other samples from a case.

Senior police officials are also concerned that DNA samples will not be taken from those previously convicted of serious crimes, unless they offend again following their release. This means the database will be ineffective until it has been in operation for several years. But introducing retrospective legislation would pose legal problems, said Howard.

The forensic science service is expected to provide Howard with full details of how the database will operate within the next few weeks. The final plans will be opened to consultation for three months, before becoming law under the Criminal Justice and Public Order Bill, which is expected to pass through parliament before the end of the year.

The US Federal Bureau of Investigation (FBI) is also about to launch a national database of DNA profiles. Eight states have already begun, and between them hold 24,000 DNA records of convicted offenders, according to an FBI spokesperson. Several suspects have already been identified and convicted of serious crimes using the state databases.

Some scientists, however, remain concerned over the reliability of forensic DNA profiling techniques in general, and the use of databases in particular. Daniel Hartl, a population geneticist at Harvard▶

. . . while US may regulate DNA testing laboratories

San Francisco. As analysts examine DNA evidence in the O. J. Simpson murder case, US legislators are considering regulating the laboratories performing such tests. A crime bill now being debated in Congress would place forensic DNA testing under the regulatory authority of the Federal Bureau of Investigation (FBI) and set standards for licensing of laboratories. It would require proficiency testing twice a year by an accredited company and would set aside $250,000 for a feasibility study of national blind proficiency testing.

Some forensic DNA experts believe that laboratory error is underestimated in courtroom debates over the technology (see above). Defence lawyers for Simpson, who has been charged with murdering his ex-wife and another man, have already begun homing in on the performance record of Cellmark Diagnostics, which is analysing DNA evidence in the case.

Cellmark has been accused of sloppy analysis because of two false matches the Maryland company made during a 100-sample proficiency study administered by the California Association of Crime Laboratory Directors (CACLD) in the late 1980s. Critics point out additional errors made in a report to the CACLD that were later corrected. Cellmark admits that the first report was confusing but says it was not in error.

Industry-wide results from that study and a later analysis by Collaborative Testing Service suggest an overall false-positive rate of one per cent to four per cent of reported matches, estimates Jonathan Koehler, assistant professor at the University of Texas at Austin.

But Cellmark argues that its error rate is a mere 0.5 per cent on the basis of the original proficiency test plus another 300 samples analysed in the intervening years. The company now conducts its own tests as well as subscribing to several testing programmes, said Mark Stolorow, director of operations for Cellmark. "In the last five years there have been no documented errors either in our proficiency tests or in our case work," he said.

Defence lawyers, however, criticize Cellmark's tests for lack of scientific rigour. In general, errors result from misinterpretation of data, ambiguous data and mixing of samples, says William Thompson, associate professor at the University of California at Irvine.

The crime bill would ask the FBI to develop standards for performance and for proficiency testing. This would result in greater acceptance of the technology in the courtroom, says Stolorow.

The majority of courts in the United States do accept DNA evidence, but a few states, including Arizona, Massachusetts and Minnesota, continue to express concern. In California, where the Simpson case is being tried, appellate courts have been backing away from their original enthusiasm.

In November 1992, the California Supreme Court upheld an appellate panel's ruling in a San Francisco case, People versus Barney/People versus Howard, that statistical methods for evaluating DNA evidence remained in scientific dispute. Therefore, the court said, such statistical procedures were inadmissible, as was the DNA evidence itself.

IMAGE UNAVAILABLE FOR COPYRIGHT REASONS

AP/Pool, Ken Lubas, LA Times

O. J. Simpson: his DNA may decide trial.

While appellate courts have followed the Barney decision, lower courts generally continue to admit DNA typing. A newer method based on PCR technology is being tested for the first time at the appeals court level in a sexual assault case scheduled for a decision very soon.

The high-profile Simpson case is certain to influence acceptance of DNA analysis by the public and in the courtroom, both prosecution and defence lawyers say. This comes at a time when the National Research Council is preparing to re-examine the use of DNA typing (see *Nature* **367**, 101; 1994).

Sally Lehrman

▶University, says courts need to guard against the "likely" risk that a search of tens of thousands of profiles would yield a random match between an entry and a crime sample.

Hartl says that courts need to confirm such matches by checking a fresh sample from the suspect against a larger number of genetic loci. This would also check for errors in data entry, he adds. Hartl agrees, however, that the profiling procedures used by courts have generally improved. And "DNA-savvy" defence lawyers have made courts more aware of potential sources of errors, he says.

The controversy over the probabilities of a match occurring by chance began in 1991, when Hartl and Richard Lewontin — now also at Harvard — argued that the FBI's use of only three reference US populations — Caucasians, Blacks and Hispanics — did not take into account the presence of numerous ethnic subgroups.

Simply put, this would mean that if an Amish committed a murder, for example, then DNA from another innocent Amish suspect would more closely resemble that found at the scene of the crime than would DNA from the Caucasian, Black or Hispanic reference groups. In more usual circumstances, the same logic would apply to Polish, Italian and other ethnic subgroups in the United States.

Lewontin and Hartl's arguments gave defence lawyers scientific ammunition, and sent the FBI scurrying around the planet to collect data on the genetic make-up of ethnic subgroups (see *Nature* **355**, 663; 1992). According to Hartl, however, the FBI has not yet changed its practices in the light of these data. "They argued that the differences in frequencies between ethnic groups didn't matter. Their data show that they do, and it's very inconvenient."

Hartl argues that the entire problem of statistics could be avoided by using eight probes instead of the three or four now commonly used. He says that eight — as now used in the state of Minnesota — would "make it inconceivable, by any scientific standards, that the blood came from someone else". But Cellmark, a major DNA fingerprinting company based in the UK, defends the four locus 'standards' as "sufficiently discriminatory". **Declan Butler**

Linus Pauling dies

Nobel prize winner and anti-nuclear campaigner Linus Pauling died last week at the age of 93. See leader article, page 584.

Royal Society of Canada spurned as national academy

Ottawa. A panel appointed in 1992 by Canada's former Progressive Conservative government has recommended against making the 100-year-old Royal Society of Canada the country's national academy.

According to its report, submitted to the present Liberal government last April but released to the public only on 11 August, "the Society does not have the organizational capacity to evolve into the kind of Academy envisioned by the panel". The report says that in the panel's view such an academy should "represent the perspectives of all sectors in the economy, generate funds to ensure its independence from government, and achieve and maintain the public profile required to stimulate and contribute to public debate of complex issues".

Instead of using the Royal Society, the panel recommended setting up a new body, independent from government but funded initially by up to C$250,000 a year, and led by a "limited number of highly regarded Canadians". Its "pivotal role" would be "to identify, analyse and provide advice on issues of critical importance to Canadians" — issues as diverse as "the impact of technology on jobs, ethics and biotechnology, and sustainable development".

The mandate of the panel, chaired by Brian Segal, publisher of the popular news magazine, *Maclean's*, and including two Royal Society fellows, was to advise the federal government on whether it should support the formation of a national academy and whether the Royal Society could serve in that purpose.

The society, founded in 1883 and granted its royal charter by Queen Victoria, was modelled on the Royal Society of London and l'Institut de France. As an independent, non-profit-making organization, it promotes learning and research in the arts and sciences. Its fellows (numbering around 1,400) are elected on the basis of distinction in their field. Its usual operating budget has been around C$500,000 annually, from subscriptions and other sources.

The society has for some time considered itself as Canada's national academy: its descriptive brochure, published in 1990, is subtitled *Profile of a National Academy*, and the brochure describes its role as such.

In 1989 the government's department of industry provided a grant of C$5 million over five years to enable the society to strengthen its organization, management and fund-raising capacity, apparently with the aim of further developing its "academy" role. Under the terms of the grants, it was also to produce three studies that would evaluate Canadian research, consider the advancement of women in scholarship and promote public awareness of science.

But on 24 December last year, the department terminated the final C$250,000 instalment of the grant without warning. This led to the dismissal of all but three of the society's core staff of about a dozen.

An assessment of the society's use of the grant, led by a consultant appointed by the federal department, was included in the panel's report. It said that less of the money than intended was used to fund the studies, mainly because the society failed to obtain the expected revenues from other sources. Moreover, it was not happy about the studies themselves. It characterized the society's work in research evaluation as "poor", and in the advancement of women as "medium" in quality and usefulness. The third study is continuing.

The society has reacted defensively to the panel's report. It already performs many of the proposed new academy's functions, it says. It has, for example, mounted expert panels for studies of issues such as the impact of AIDS, at the request of the government, which have been well received.

It accuses the government of "trying to reinvent the wheel", and warns that the creation of a new academy could cause confusion, particularly abroad because "many national academies abroad recognize the Royal Society of Canada as their Canadian counterpart... and are perfectly happy with this arrangement"

The proposal that the head of the academy would be recruited and paid by the industry department would be regarded with suspicion, it argues. Additionally, it could run into difficulties with Quebec's French-speaking intellectuals, many of whom are nationalists: "a new synthetically created pan-Canadian organization, fostered by the federal government, could well arouse suspicion (and cause the abstention) of many Quebec scholars, artists and scientists", while the society has dealt with the two cultures for more than a century.

The society also points out that during the five years during which it received the industry department grant, it raised more than C$6 million from other sources, which was used to fund activities appropriate to a national academy.

While the panel claims that its new academy would "build on the strengths of existing organizations" and "maximize the impact of scarce resources", observers note ironically that some of its functions were formerly carried out by the Science Council of Canada, which was abolished by the same Conservative government that created the panel. **David Spurgeon**