

Making forensic science more scientific

The US Congress should create an office to study, standardize and certify those who apply science to crime as well as the techniques they use, urge **Peter Neufeld** and **Barry Scheck**.

A groundbreaking report by the National Academy of Sciences (NAS) last year recognized that much of forensic science is not rooted in solid science. Many forensic disciplines — such as hair microscopy, bite-mark comparisons, fingerprint analysis, firearm testing and tool-mark analysis — were developed solely to solve crimes. They evolved mainly in the context of individual cases, which often had significant variation in resources and expertise. They have not been subjected to rigorous experimental scrutiny, and there are no standards or oversight in the United States or elsewhere to ensure that validated, reliable forensic methods are used consistently. With the exception of DNA analysis, no forensic method has been proved to reliably and accurately demonstrate a connection between evidence and a specific source.

We see first-hand the consequences of this problem. Innocent people are misidentified as suspects and, in some cases, convicted of crimes they did not commit, while the guilty go free. Indeed, unvalidated or improperly used forensic science contributed to approximately half of the 251 convictions in the United States that have been overturned after DNA testing since 1989. In many cases, the real perpetrator went on to commit further violent crimes.

The NAS made a powerful and persuasive case for the gravity of the situation and outlined a road map for meaningful reform. Its central recommendation is for the US Congress to create a federal entity to ensure consistency, validity and reliability in the forensic sciences.

Campaign trail

To develop legislation based on the report's recommendations, we have over the past year met with members of Congress and their staff, testified at several congressional hearings and worked with key stakeholders in the scientific and criminal-justice fields. Members of the judiciary and science committees in both chambers of Congress, plus law-enforcement officials, a wide range of scientists (including statisticians, forensic experts and analysts and academic researchers) and others agree that the report provides an important opportunity to improve our system of justice.

We advocate the creation of an office of forensic science improvement and support

(OFSIS) within the US Department of Commerce to spur independent research, develop standards and ensure compliance. The director of an OFSIS would be appointed by the US Secretary of Commerce in consultation with the NAS and the National Science Foundation. The director would work with a forensic-science commission (including physicists, geneticists, criminologists, cognition experts, chemists and others) and an advisory committee (including experts such as judges, prosecutors, defence attorneys, law-enforcement officials and forensic scientists).

An OFSIS would develop a research agenda for basic and applied forensic sciences, and would direct a grant programme to encourage research partnerships between the private sector and academia. It would also devise standards and certification for forensic devices, assays, techniques, training, practitioners and providers. These would include requirements for written reports and testimony parameters. The Department of Justice would encourage forensic practitioners and law-enforcement agencies to comply with standards developed by an OFSIS.

Even with a growing consensus in favour of creating an OFSIS, pockets of resistance remain. A small minority of people within the forensic-science and law-enforcement fields defend the status quo because they are invested in the system as it stands. They do not speak for their entire field, but they will argue that an OFSIS is not necessary and that laboratory accreditation is sufficient, even though accreditation alone would not resolve many of the underlying problems identified in the NAS report. They argue that an OFSIS would cost too much (particularly as the US budget deficit grows) and that it could create chaos in the US justice system by reopening countless old cases.

These concerns do not stand up to scrutiny. Setting up an OFSIS within the commerce department would keep the operation small, streamlined and efficient, and connect it with similar functions already undertaken within the agency (such as the development of performance standards for certain technology used by law-enforcement agencies). Already,

hundreds of millions of dollars in public funds are used for forensic science — funds that would be deployed more wisely and efficiently through an OFSIS. Additional research and the development of forensic assays, devices and techniques could also spark job growth and increase revenue in the public, private and academic sectors. An OFSIS would be future-focused rather than directed at past cases, and the US court system is well situated to handle any implications this might have for existing convictions.

Battling bias

The OFSIS proposal also responds to a central concern of the NAS report committee: the potential for real or perceived bias if this new function is controlled by law enforcement rather than being a mainly scientific agency.

We anticipate that legislation responding to the NAS report's recommendations will be introduced in the next few months.

Scientists are crucial to building support for the OFSIS proposal. Those who belong to associations should advocate for organizational position statements that support our OFSIS proposal. To

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learn more and get involved as individuals or groups see www.just-science.org.

Political and criminal-justice ends — rather than research imperatives — have taken forensic science off course. We can bring about substantial improvement only if we trust scientists to take charge of forensic science, free of politics and independent of outside influence. The US Congress will have the opportunity to take strong action this year. It must: putting forensic science on a stronger scientific footing in the United States will help to solve crimes, promote fair adjudications and strengthen the integrity of judicial proceedings on our shores and beyond. ■

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See Editorial, page 325; News Features, pages 340, 344 and 347; and online at www.nature.com/scienceincourt.