

DNA Fingerprinting

Colin Norman's News & Comment article "Caution urged on DNA fingerprinting" (18 Aug., p. 699) does not adequately or fairly represent the issues at hand. The article clearly leaves the impression that there have been years of flawed work and incompetent testing in the field. The article does not mention that LIFECODES Corporation has done the DNA typing in more than 80 cases that have been tried with the use of DNA evidence and that in more than 90% of those cases the data were examined by research scientists and subjected to admissibility hearings. In every one of those instances the validity of the test and admissibility of the results were affirmed. Further, in the 14 August ruling, DNA evidence did not, as indicated by Norman, fail in its first "serious" judicial challenge.

Quoting Justice Gerald Sheindlin's conclusions (1):

1. There is general scientific acceptance of the theory underlying DNA identification.
2. DNA forensic identification techniques and experiments are generally accepted in the scientific community and *can produce reliable* [emphasis added] results. Hence, the *Frye* standard of admissibility is satisfied.
3. A pre-trial hearing should be conducted to determine if the testing laboratory substantially performed the scientifically reliable results to be admissible as a question of fact for the jury.
4. After a pre-trial hearing in this case [Castro], the DNA identification evidence of exclusion is *deemed admissible* [emphasis added] as a question of fact for the jury. The testing laboratory did substantially perform the scientifically accepted tests thereby obtaining sufficiently reliable results, within a reasonable degree of scientific certainty.
5. After a pre-trial hearing in this case [Castro], the DNA identification evidence of inclusion is *deemed inadmissible* [emphasis added] as a matter of law. The testing laboratory failed in several major aspects to use the generally accepted techniques and experiments for obtaining reliable results, within a reasonable degree of scientific certainty.

This constitutes the decision and order of the Court.

From Justice Scheindlin's decision, we think it is clear that he was able to see through a number of issues that the defense in the Castro case blew out of proportion. We agree that the inclusionary aspect of this data had some ambiguities that were a function of the samples as well as the probes and technology in use in 1987. When tried against 1989 standards, these data were not as compelling as they could have been. Unfortunately, the membrane on which the

DNA was examined had been exhausted by repeated hybridization and could not be further analyzed with the use of the probes and technology available in 1989, when the case finally went to trial. However, that does not invalidate the results that were generated, especially when they are viewed in conjunction with all the evidence in the case.

We welcome the use of pre-trial reviews and the development of standards. As pioneers in this field we have not only led in the development of the technology but have had to set standards for our work that would, as far as possible, anticipate all scientific and legal scrutiny. If a serious judicial test has "failed to put sufficient limits" on forensic DNA typing, then perhaps defense attorneys are beginning to be confronted with having to accept the reality of scientific data that is valid, reliable, and powerful.

On 15 September 1989, Joseph Castro pled guilty to murder and admitted that the blood on his watch was that of the victim, Vilma Ponce. This is exactly the conclusion arrived at by the scientists at LIFECODES after they examined the results of the RFLP (restriction fragment length polymorphism) test.

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REFERENCES

1. *State v. Castro* (S. Ct.), Bronx County, NY, Opinion of Gerald Scheindlin, 14 August 1989.

DOE Supercomputer Resources

Marjorie Sun's article on supercomputers (Research News, 11 Aug. p. 596) mentions the Department of Energy in passing but ignores the department's 15-year success in providing supercomputer resources to its grantees and contract researchers in universities, national laboratories, and industry.

The specific instance mentioned by Sun, analysis of DNA structure by Suse Broyde and Brian Hingerty, is part of a comprehensive, competitive DOE program to provide large blocks of supercomputer time for "Grand Challenge" problems (a term coined by Kenneth Wilson). Under this program the equivalent of approximately 36,000 Cray-1 hours were provided this year on Cray 2, Cray X-MP, and ETA-10G computers to tackle 17 different problems in fields such as semiconductor design, elementary particle physics, ultrahard materials, and high-temperature superconductivity, an average of more than 2,000 hours per problem. (The Cray-1 hour is a convenient, if

obsolescent, unit for measuring computing resources on different supercomputers.) The intent of this program is to determine whether large amounts of supercomputer time devoted to individual problems can make a decisive contribution to the solution of these problems. As in Broyde and Hingerty's case, we think the answer will be yes, and we expect to continue this program in future years.

Although DOE's supercomputer resources are often erroneously considered to be devoted solely to military applications, the Office of Energy Research funds supercomputer centers at Lawrence Livermore Laboratory and Florida State University, whose computers (including two Cray 2's, a Cray X-MP, a Cray 1, an ETA-10G, and a Cyber 205) are used by over 1,000 researchers in more than 90 universities, in addition to researchers in national laboratories and industry. These computers are directly served by MFENet and ESNet and can be accessed through several other networks as well. They are devoted solely to open, unclassified research.

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ICBM Modernization

John M. Deutch provides an interesting and thought-provoking discussion of "The decision to modernize U.S. intercontinental ballistic missiles" (ICBMs) (Articles, 23 June, p. 1445). Unfortunately, Deutch's comments tend to perpetuate some errors that need to be corrected if we are to adequately judge the need for ICBM modernization and the type of modernization that might be most desirable. First, Deutch implies that the ICBM force is somehow the sine qua non of strategic capability. This may have been the case when submarine-launched ballistic missiles (SLBMs) were less accurate and provided only the "counter value reserve." However, with the deployment of the D5 missile, this difference will disappear. The Fleet Ballistic Missile Submarine (SSBN) force will be able to attack the full spectrum of targets in the Soviet Union, which Deutch himself admits.

Second, Deutch implies that our SSBN force is not as "controllable" as are our ICBMs. In fact, on-alert SSBNs are in constant communication with higher headquarters, and the fact that they are is continuously verified by an exhaustive monitoring program. In addition, the SSBN force is just as likely to receive an Emergency Action Mes-