Initial Conditions

EDITOR'S NOTEBOOK

Private Matters

HOW TIMES HAVE CHANGED! ALMOST NINE YEARS AGO *THE SCIENCES* published "A Question of Identity," by Simon Ford and William C. Thompson [January/February 1990], an article that took a dim view of the claims then being made about the value of DNA evidence for identifying crime victims and perpetrators. The subtitle set the tone, archly placing the word *fingerprints* in ironic quotation marks. Ford and Thompson cited the potential for contaminated or deteriorated samples; for sloppy laboratory work; for inconsistencies in the expert interpretation of results; and for overestimates of the statistical chances against a random event posing as a significant finding.

Now, as this issue goes to press, the FBI has announced it has assembled a national database of DNA fingerprints (no ironic quotes), which will enable law enforcement officers to scan criminal records throughout the country for a match with biological evidence recovered from a suspect, from a victim or from the scene of a crime. In his article, "Arresting Evidence" (page 20), one of this generation's leading biologists, Richard Dawkins of the University of Oxford, comes close to a ringing endorsement of DNA fingerprinting. How is the reader, the citizen, to understand such a reevaluation? More important, will the new database and its derivatives infringe on what the U.S. Supreme Court justice Louis D. Brandeis famously called "the right to be let alone"?

The change, it turns out, is less dramatic than it might appear. The dangers emphasized by Ford and Thompson remain, as Dawkins makes clear, but they can probably be managed. Evidence is seldom pristine, and DNA is no exception: careful handling is the solution. The laboratories have largely cleaned up their acts. And, according to Dawkins, the dangers of divergent expert opinion and statistical overestimates are probably overstated for the practical needs of the judicial system.

Dawkins's first take on the privacy issue is straightforward: "If it could somehow be guaranteed that a DNA database would be used only for catching criminals, . . . [and] if [it] would substantially help the police catch criminals, the objections [to it] had better be good ones to outweigh the benefits."

Furthermore, the FBI database does not, by itself, pose many of the grievous potential problems often cited by civil libertarians. All that the database stores is the number of so-called short tandem repeats occurring at thirteen known sites along human DNA: essentially, a series of numbers that uniquely identifies a person. The repeats themselves are genetic "junk": they are not transcribed into proteins, and so they add not a jot to any of the features that make up personal characteristics. Hence, the information in the database could not be used to infer, say, a person's eye color, or her risk of contracting a disease.

So what's wrong with this picture? Surely a database restricted to convicted felons does not upset the balance between fighting crime and preserving civil liberties. And let's even grant that it's a slippery slope: the criteria for inclusion in the database will change. What harm does inclusion in the database pose to an innocent person? What have you got to hide?

First, there is a structure to the tandem repeat number: as Dawkins makes clear, it can be—and has been—applied to determine paternity. Second, behind the FBI's national computer linkage stand tissue samples collected by the fifty states; if the database were enlarged, the tissue samples of the innocent people on file would create an extraordinary potential for the invasion of privacy. Insurance carriers or employers, for instance, could readily discriminate on the basis of such information.

Beyond those objections, the question, "What have you got to hide?" subverts Justice Brandeis's dictum and reverses the burden of proof from the state to the citizen. Do I have anything to hide? No—or rather, I don't think so. But expectations count for much, and I don't want your expectations of me to be colored by the personal information that can be derived from my DNA. Even more darkly, if you are bent on discrediting me, I cannot control what you will make out of the information snippets you cull from my DNA, but I can't deny their truthfulness either. And when the truth gets twisted, it can be even more harmful than baseless lies.

—PETER G. BROWN

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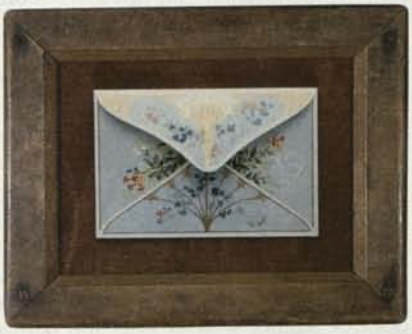
Peer Review

LETTERS FROM READERS

GROUND NASA?

The July/August issue of *The Sciences,* with its stunning series of articles about the frontiers of life, has made clear the immense relevance of recent breakthroughs in astrobiology. It should also lead to a new debate about the potential for the contamination of extraterrestrial environments.

In the past two years the examination of scientific claims for the evidence of life in a meteorite from Mars has spurred many projects aimed at better defining what is properly called "life." As *The Sciences* makes clear, those reevaluations must take account of an enormous range of forms, from bacterial blooms in undersea volcanic eruptions to radiation-tolerant organisms to forms of life that prosper in total darkness, deep inside our planet. The thrust of the entire issue is a vibrantly optimistic panorama of all the discoveries that can be expected, as space probes reach new areas of Mars, the hypothetical oceans of Europa and other bodies in our solar system.



Andrew Bush, Envelope #941, *1997*

Nevertheless, there is an important corollary to the discovery that life is more pervasive and durable than anyone had imagined before. Although none of the authors mentioned the point in *The Sciences,* their results seem to suggest a new but critical qualification about the current state of biological knowledge: no one can accurately predict how many terrestrial microorganisms our space probes will be depositing into the atmosphere, soil and oceans of Europa, Jupiter, Mars and the other bodies that NASA has targeted. Terrestrial organisms that stay alive in the cavities of space probes, or get picked up on the way out of the earth's atmosphere, may be able to destroy or alter the evolutionary patterns of forms of life on other planets. If life is more durable than biologists ever suspected, how credible are NASA's current efforts at sterilizing spacecraft before they are launched?

Although the title of my message is purposely provocative (it would be a pity to "ground NASA" just as all those discoveries are being made), an intense effort should be made to assess the probability that we will contaminate other worlds. Pursuing space exploration in the current state of ignorance about the survival of earth-based microorganisms in space may one day be seen as an example of misguided arrogance, reminiscent of the attitudes that allowed contaminated blood to continue to be transfused at the dawn of the AIDS epidemic. In that instance, too, some biologists estimated that the probability of spreading a dangerous organism was vanishingly small.

JACQUES F. VALLÉE
San Francisco, California

SMALLPOX SCANDAL?

The editors of *The Sciences* would seem to have propagated a misconception that I suspect is far more grievous than the misleading allegation made (and subsequently withdrawn) by CNN and *Time* magazine with the "Operation Tailwind" story, which caused such a furor after it was aired this past June. A colleague has just sent me a copy of Wendy Orent's article, "Escape from Moscow," [May/ June]. Several statements in it are both false and scandalous.

On page 29 Ms. Orent writes: "In Novosibirsk, the inspectors were shown dismantled missiles but not their payloads." First, no missiles, dismantled or undismantled—nor *any other weapon system*—was shown to the U.S. and U.K. inspectors in 1991 (or on any other occasion). Second, the sentence that follows ostensibly quotes Peter Jahrling of the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID): "I don't think anyone knows what happened to them." Nevertheless, in a conversation with me on August 21, 1998, Jahrling stated that he specifically told Ms. Orent that he did not believe any kind of biological-warfare (BW) weapons were produced at the Novosibirsk facility. Jahrling added that the editors of *The Sciences* were welcome to contact him for confirmation of that statement. [Editor's Note: Mr. Jahrling's telephone number has been deleted here to preserve his privacy.] Third, the sentence immediately following that quotation begins with a "Nevertheless," but in reality the sentence is about an entirely different subject.

Earlier, on pages 26–27, Ms. Orent writes: ". . . *tons* of the deadly virus are thought to exist *in Russia* [my emphasis]."

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