

Letters to the Editor

Discussion of "Effects of Presumptive Test Reagents on the Ability to Obtain Restriction Fragment Length Polymorphism (RFLP) Patterns from Human Blood and Semen Stains"

Sir:

In spite of their statement that it is "prudent" to perform presumptive testing on samples removed from stains, the article by Hochmeister et al., "Effects of Presumptive Test Reagents on the Ability to Obtain Restriction Fragment Length Polymorphism (RFLP) Patterns from Human Blood and Semen Stains," Vol. 36, May 1991, pp. 656–661 might lead naive forensic scientists to believe that an acceptable method of performing presumptive tests for blood or semen is to apply the test reagents directly to the article being examined. While we are astonished to see this technique used from time to time, we believe that properly trained forensic scientists realize that it is NEVER appropriate to apply presumptive reagents to evidence items unless it is impossible to remove a sample of the suspected stain or area for such testing. Use of sampling techniques such as wet or dry cotton-tipped applicators, folded pieces of filter paper, mapping transfer techniques, or cutting or scraping a portion of the suspected stain are the appropriate procedures to be followed.

Two situations in which direct application of presumptive reagents might be considered are: large areas which are being searched for traces of blood using luminol (such as carpet at a crime scene) or visible finger, shoe, or other impressions in blood. In the first situation, the chances of a stain that is not visible in the first place having enough material for genetic testing is very remote. In the case of a bloody impression, every effort should be made to remove a sample of the blood before attempting to enhance the impression by the addition of appropriate reagents.

In all other situations that we can imagine, a sample of the suspected stain, or samples from the area to be tested, should be removed for testing. Test reagents should never be added directly to the evidence.

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Author's Response

Sir:

In our paper on p. 659, we state

This study demonstrates that evidentiary body fluid stains purposely or inadvertently contaminated with luminol, benzidine dissolved in ethanol, or phenolphthalein still may be successfully typed by RFLP procedures. Direct testing of vaginal swabs or semen stains with BCIP or STMP has no effect on a subsequent RFLP analysis. In spite of these findings we recommend that analysts continue the prudent practice of testing small portions of an evidentiary stain prior to submission for RFLP analysis, as is currently done for conventional genetic marker analysis.

We state this because it is what we generally advocate.

If Barnett et al. have a concern with the practice of some forensic scientists, perhaps they should be writing letters to those scientists with whom they disagree or who do not read our entire paper. However, we do appreciate their letter, because it is apparent that there still is a small subset of forensic scientists (of which Barnett et. al are included) who are not fully cognizant or appreciate the issues regarding the DNA typing laboratory and DNA reliability.

1. There are times when the evidentiary material submitted to a DNA typing laboratory may have been subjected to a presumptive test by a previous laboratory. Whether or not one advocates a particular practice for presumptive typing is moot. It is possible that the submitting laboratory could have had justifiable reasons for proceeding in the manner they did. But after the fact, it is irrelevant to the DNA typing laboratory. Experience of the effects of various presumptive typing reagents on the quality of DNA can enable the laboratory to evaluate more effectively those situations.

2. Barnett et al. obviously are unaware of some of the issues surrounding DNA reliability. If they were cognizant of the issues they would have appreciated that the data in our paper was further evidence on the reliability of DNA typing. Regardless of the chemical insult, there were no false positive or false negative results.

3. RFLP typing as used in our paper can be extremely sensitive. At times, as little as 10 ng of human genomic DNA can provide DNA typing results. Thus, exceedingly small evidentiary samples possibly can be typed. Additionally, with the advent of PCR-related techniques, even smaller quantities of material may be analyzable. Therefore, it can be anticipated that there may be situations in which an entire evidentiary sample could be subjected to a presumptive test. If a forensic scientist is aware of the effects of presumptive test reagents on the quality of DNA, more judicious decisions may be made regarding what tests should be applied.

In conclusion, our paper is but one of many that provides data to assist the forensic science community in the effective use of DNA typing.

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Discussion of "Alleged Brain Damage, Diminished Capacity, Mens Rea, and Misuse of Medical Concepts"

Sir:

Dr. Irwin Perr is to be commended for his case study illustrating the potential misuse of medical concepts in forensic psychiatry (Vol. 36, May 1991, pp. 722-727). With the

astounding advances in biological psychiatry during the past decade comes the risk that all causes of human behavior will be viewed as exclusively biological by the forensic psychiatrist: a felonious *reductio ad absurdum*. Functional biological substrates underlie all behavior, but in the species *homo sapiens* there are always mediating psychological and socio-cultural factors. Unless, of course, the forensic science evaluator is studying a functionally decorticated individual raised in complete isolation. Such mediating variables are often more centrally causative and specific to the criminal behavior than the defendant's biology. The defendant's psychology is measured in a reliable and valid manner through the use of psychological tests; the socio-cultural factors are measured through careful history taking independent of the defendant's self-report.

Psychological testing, moreover, is crucial when questions of *mens rea* and diminished capacity are raised because these psycholegal (rather than biolegal) constructs are more closely inferentially linked to measures of thinking, emotion, and motivation than they are to measures of central nervous system (CNS) biochemistry and anatomy. Huge inferential leaps of faith from biology to behavior, often influenced by the implicit or explicit wishes of counsel, will only damage the scientific credibility of our forensic science specialty, of which there is precious little to nurture.

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Author's Response

Sir:

I thank Dr. Meloy for his kind words and note that he, too, is cautious about the claim of biological disorder as an adequate explanation of all behavior. However, I would point out that clarification of the issue of causation is usually not required for most legal purposes in criminal cases, and as one looks at the "psychological" and sociocultural factors, one is often likely to be a rather speculative arena where opinions may not reasonably reach the level of medical or scientific probability or certainty.

Though I use psychological testing (either by myself, a psychologist, or a neuropsychologist), I am well aware of the risk of abuse and misinterpretation with such techniques. "Careful history" is helpful, but like everything else, is often of doubtful worth. Reliability and validity are problems in any technique, particularly when applied to law. I do not believe that psychological testing is "crucial" when *mens rea* and diminished capacity are at issue; they may be helpful but are rarely, if ever, "crucial."

Two important points must be kept in mind. A major one is that diagnosis (and accordingly, extent of disorder) is determined by a clinically based diagnostic system based on symptoms and, related to that, history. In general, there is no psychiatric disorder in which psychological testing is diagnostic. Of course, there are exceptions to that rule. Testing is a reasonable procedure for evaluating what we consider to be intellectual capacity where the IQ is of relevance and is so recognized in the official diagnostic system. On the other hand, motivation, education, faking, language familiarity, cultural background, concurrent mental disorder, and a host of other factors can affect the results of IQ tests. For example, I have seen reported IQ's of 60 to 100 on the same person within a short period. I have also encountered manipulation by examiners to achieve a result favorable to the side by which they were hired.

A second one is the use of neuropsychological testing in which the procedures are often extremely helpful, particularly in combination with other medical and neurological data and the sophisticated laboratory and radiologic techniques now available. I would also add that most testing generally measures current functioning and does not provide

meaningful data about cause or etiology. Dr. Meloy is quite correct in questioning the utility of many biologic measures for two reasons: (1) many tests such as EEG's, BEAM's, MRI's, X-rays, and so forth may show variances within the norm that do not reflect known pathophysiology and (2) even where abnormality may be present anatomically or physiologically, there is generally no known correlation to clinical deficit.

Testing of other kinds often lacks specificity, though the testing may be supportive (or nonsupportive) of a diagnosis such as schizophrenia; the testing is not diagnostic by itself.

In my series of review of questionable work by professional "experts," I have been scrutinizing the worth of the conclusions and criticizing where I think appropriate the opinions of psychiatrists, neurologists, psychologists, and a host of others. Much of the so-called scientific opinion submitted to our legal system is not only of little worth, but in actuality, constitutes a misuse of professional systems, which are either not designed for the legal arena or are easily manipulated.

I do not disagree with the statement that huge inferential leaps of faith from biology to behavior damage scientific credibility (I might alter that to "with or without faith").

I do not mean to demean the attempt to understand behavior and thinking; that noble effort represents a goal for which we have a long way to travel. It is also an area in which sometimes the little that we do know may indeed be helpful to a legal decision-maker in deciding on a course of action.

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Reference Omission

Dear Sir:

Because of an oversight, work done with luminol and its effects on bloodstains by Duncan et al. [1] was not included in my paper "Effects of Luminol on the Subsequent Analysis of Bloodstains" (Vol. 36, Sept. 1991, pp. 1512-1520). I apologize for this omission.

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Reference

- [1] Duncan, G. T., Seiden, H., Vallee, L., and Ferraro, D., "Effects of Superglue, Other Fingerprint Developing Agents, and Luminol on Bloodstain Analysis," *Journal of the Association of Official Analytical Chemists*, Vol. 69, No. 4, 1986, pp. 677-680.