PEOPLE STATE NEW YORK v. MANUEL SEDA

529 N.Y.S.2d 931 (1988) | Cited 0 times | New York Supreme Court | March 8, 1988

OPINION OF THE COURT

In the afternoon of February 8, 1986 the body of Edwina Ferrell was found in the rear of the building located at 1990 Lexington Avenue. The victim had died as a result of multiple stab wounds. Later that day the defendant was questioned by detectives and indicated that he had been the victim of an attempted robbery during which he had cut his own hand with his assailant's knife. That evening, Seda consented to the recovery by police officers of a bloodstained blue jacket from his home. Those bloodstains, as well as samples of the deceased's and the defendant's blood, were forwarded to the New York City Medical Examiner's office and were subjected to a scientific procedure known as electrophoresis. There, a number of genetic markers were developed and identified which excluded the defendant's blood and included the deceased's blood as a possible origin of the bloodstain obtained from Seda's jacket. The results of that testing were challenged by the defense and a hearing, addressed to the admissibility of the Medical Examiner's findings, was conducted.

This court is therefore presented with the interface of two disciplines, science and law, generally thought of as separate and distinct. The task then, in resolving the admissibility of this scientific evidence, is to determine whether the procedure employed here has "gained general acceptance in the particular field in which it belongs" (Frye v United States, 293 F 1013, 1014). While the defense does not contend that electrophoresis in general lacks acceptance or reliability, it is contended that the technique used by the Medical Examiner's office in which four genetic markers are simultaneously developed in a single gel is, in concept, inherently flawed; that the 4-in-1 system has not achieved general acceptance within the scientific community and finally that the application of the procedure here was not conducted in accordance with established scientific technique.

While the jury's role as fact finder has been vigorously defended, courts of this State have allowed the introduction of an expert witness' opinion on an ultimate issue where it concerns a matter requiring professional or skilled knowledge. (Selkowitz v County of Nassau, 45 N.Y.2d 97.) That witness must be a person who possesses the knowledge required to draw correct inferences from evidence relating to a matter that is not within the realm of common experience. (Ellis v Thomas, 84 App Div 626.) Preliminarily however, it must be adequately demonstrated that the evidence from which those inferences are drawn is probative. In assessing scientific evidence, its probative value cannot be disassociated from a showing of the validity or the accuracy of the procedure from which the evidence derives. If the procedure or the theory underlying its operation is not valid then the evidence will not be relevant, and, therefore, inadmissible.

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In order to properly assess the validity and reliability of scientific evidence, courts very often must rely on the testimony of expert witnesses. Proof that experts in the relevant scientific community have validated a technique demonstrates that it is reliable and therefore probative, assuming proper application of a scientific technique combined with a scrupulous adherence to the relevant criteria. A fundamental assumption to the introduction of expert witness testimony is however that the jury will be capable of evaluating the novel scientific evidence. The ability of a jury to quickly comprehend and assess electrophoretic testing of blood samples cannot be assumed. The evidence here sought to be introduced involves a highly technical subspecialty of serology, far beyond the realm of ordinary experience. While most people today are aware of and have at least a minimal understanding of ABO blood groups and genetics, few lay people would, in such a short period of time, be able to grasp the concepts of electrophoresis, genetic markers, molecular mobility and various other scientific precepts necessary to a careful and meaningful evaluation of the blood tests performed here.[1] Under such circumstances, the lay jury may rely to an even greater degree on the expert witness and his testimony may be accepted and credited without being properly evaluated and tested. While cross-examination may, in most cases, be an adequate cure, here it would be naive and facile to suggest that the heightened risk of prejudice to the defendant can be so easily neutralized.

The general rule governing the admissibility of novel scientific evidence applied in this State was originally formulated in Frye v United States (293 F 1013, supra). There the Court of Appeals for the District of Columbia observed that "Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs." (Frye v United States, 293 F 1013, 1014, supra.) Although the Frye standard has been widely accepted by those courts which have addressed the admissibility of novel scientific technique, it has not been without its critics. It has been observed that "[instead] of using Frye as an analytical tool to decide whether novel scientific evidence should be admitted, it appears that many courts apply it as a label to justify their own views about the reliability of particular forensic techniques."[2] Problems with the Frye standard also arise when the specialized community which may appropriately be called upon to judge whether a procedure has gained general acceptance is too narrow. In that scenario, "the consensus judgment mandated by Frye becomes illusory; the judgment of the scientific community becomes, in reality, the opinion of a few experts."[3]

One author has concluded that the Frye test does not guarantee the reliability of genetic marker testing.[4] In those areas in which the Frye standard has functioned effectively and adequately, "The ultimate guarantor of reliability * * * is that the new test is put into practice and this practice eventually shows whether the procedure is unreliable or has limitations. The test creates incentives to check the reliability and limitations of the procedure before it becomes widespread. When a procedure has become so widely used in a field that any flaws in the procedure would have become

known, the courts can conclude that not only has the new test been accepted as reliable by the relevant scientific community, but that the test also is reliable."[5]

Electrophoretic analysis of evidentiary bloodstains is however performed only in forensic laboratories, and its results are not used by scientists in ways that would inevitably reveal the limitations of the procedures. Electrophoretic analysis of genetic markers is therefore different from other scientific procedures.

"Acceptance by the relevant scientific community normally means that a procedure has been employed in such a way that the procedure's reliability would become known. This is not true for the forensic detection of genetic markers because these procedures are not used in ways that would reveal any limitations. The reliability of these forensic tests can only be shown from controlled experiments. Therefore, the Frye standard, which relies on the general acceptance of a test to affirm that test's reliability, does not serve its purpose. Mere widespread use of the forensic procedures proves nothing about their trustworthiness. Furthermore, an additional compelling argument why Frye should not be applied to the genetic marker test derives from the unique nature of the field that uses these tests."[6]

The early acceptance and ultimate rejection of the paraffin test is illustrative of those areas where the application of the Frye standard has permitted proof of an unreliable procedure to be admitted. The paraffin test purported to detect gunshot residue on the hand of a person who had recently fired a weapon. It was introduced in this country in the early 1930's and was quickly adopted by law enforcement agencies. Although the first reported case permitting its admission into evidence was decided in 1936, it was not until the late 1960's that the first comprehensive examination of the test was published in a scientific journal. That study concluded that the test was unreliable. The test had been "enthusiastically embraced by crime laboratories"[7] for nearly three decades, undoubtedly satisfying the Frye standard and also, we now know, undoubtedly allowing into evidence results of an unsound and unreliable scientific technique.

In evaluating the evidence presented at the hearing conducted by this court, the standard will therefore be twofold. Initially, the court must resolve whether the 4-in-1 procedure employed here has gained general acceptance within the scientific community, the traditional Frye analysis. Secondarily, because of the highly technical aspects of this subject, it is incumbent on this court to evaluate the reliability of the test as it was performed by the Medical Examiner's office. To do otherwise would in this court's estimation evidence a lack of responsibility. Bearing these issues in mind, a general description of electrophoresis is now appropriate.

Electrophoresis is a physical method which, through the use of electric current, separates biologically significant genetic markers found in all blood groups. "[A] test sample is placed on a gel medium in an ionized buffer solution. When an electric current is run through the solution, the sample separates and migrates on the medium into characteristic patterns. These are then fixed,

dyed, and read visually by the analyst." (People v Brown, 40 Cal 3d 512, 529, 726 P2d 516, 523, revd on other grounds sub nom. California v Brown, 479 U.S. 538.)

The most commonly known genetic marker is the ABO system, which was first published in 1900 and 1901.[8] The presence of these markers are not determined through electrophoresis and, because so many people fall into each of the ABO groups, the system can yield only limited results for purposes of evidentiary proof. Later other, polymorphic, genetic marker systems were detected, among those the five markers at issue in this case: esterase D (EsD), phosphoglucomutase (PGM), glyoxalase I (GLO), carbonic anhydrase II (CAII) and erythrocyte acid phosphatase (EAP). The phenotypes of these markers are developed through the electrophoretic procedure. Depending on which of those genetic markers is sought variations will be made in the buffer solution, the electrical current, the period of time allowed for separation and migration of the molecules, the gel and the staining agent.

When the completed electrophoretogram is viewed, the phenotype, a pattern of the genetic marker, will display itself in a unique series of bands. These patterns are distinct from others because each protein or enzyme bears a different charge which will cause the molecules to migrate through the gel at varying speeds. As a safeguard, "controls" or "standards", known types of genetic markers, are often included for comparison and to ensure that the process has been properly conducted. Although there are slight variations, the electrophoretic process is essentially the same for both liquid and dried evidentiary bloods. There are however three basic systems employed in electrophoresis and it is on this issue that the defendant has focused his challenge.

As its name suggests, in the single system a single genetic marker is developed on a thin gel with all of the parameters of the procedure being set to the optimum specifications for the enzyme or protein in question. Under the multisystem, also known as the Wraxall system,[9] a variation of which was used by the Medical Examiner's office here, three markers are developed on a thin single gel. The stain is placed on the gel and after the electrophoresis is completed a filter paper is placed above the gel and is then soaked with a staining agent which visualizes the first marker to be developed. Once completed, that filter paper is stripped off the gel and the process is repeated for each of the markers to be developed. In this system, the parameters, while not set to meet the specifications of each enzyme, are calculated to fall within the general range of those criteria. Finally, in the combination system, the stain is placed into a thick gel and is permitted to soak through it. The gel is then sliced into a number of thin gels on which a single marker is developed as it would be in the single system. With these basic tenets of electrophoresis established, the testimony adduced at the hearing must now be considered.

Dr. Robert Charles Shaler, the former chief of the serology laboratory at the New York City's Medical Examiner's office, was called by the prosecution and was qualified as an expert in the field of electrophoresis. He explained that in this case he had employed a 4-in-1 method of electrophoresis analysis on the bloodstains obtained from the Seda jacket, the sample provided by the defendant and

the post-mortem sample of the deceased's blood. In his comparison of the three samples, he found that while each of the genetic marker types on the jacket and the post-mortem sample were consistent with each other and could therefore have a common source, the EsD and GLO types of the jacket stain and the defendant's blood sample did not match and could not have shared a single origin. Dr. Shaler therefore concluded that the bloodstain on the jacket could have been that of the deceased and could not have been that of the defendant.

Dr. Shaler described the 4-in-1 method, in which four genetic markers (EsD, PGM, GLO and CAII) are simultaneously developed, as an adaptation of the 3-in-1 multiple system developed by Wraxall and Stolorow in a Law Enforcement Assistance Administration sponsored study. While the witness testified that the 3-in-1 multisystem was widely used in crime laboratories and maintained that the adapted method likewise produced valid results which are not compromised by the identification of the fourth genetic marker, Dr. Shaler was able to recall only one other laboratory in the United States that had previously employed the technique. Dr. Shaler's testimony also revealed that contrary to the requirements of the laboratory manual he had devised for electrophoretic analysis, he had failed to record any of the parameters of the analysis he performed inasmuch as he acted as his own "quality control" and, in the event of any irregularities, would have repeated the analysis.

Dr. Shaler also testified that the results of the electrophoresis analysis, the electrophoretograms, were not preserved or photographed. Nor were the electrophoretograms read or analyzed by another scientist or technician in the serology laboratory. Finally, the witness also admitted that the 4-in-1 system had in this instance been used as a determinative test, although he himself had co-authored one of a number of articles that suggested that the use of multisystems should generally be limited to rapid screening tests.

Dr. Neville Colman testified for the defense. Among his numerous professional affiliations, he is currently the director of the hematology laboratory and blood bank at the Bronx Veteran's Administration. He was qualified by the court as an expert in ABO blood group typing, and in laboratory and scientific method.

Dr. Colman described in detail the process by which a new technique or hypothesis becomes accepted in the scientific community. It began, according to the witness, with the development of a new hypothesis, idea, instrument, procedure, etc. The new concept is then internally observed against a blinded protocol. This would be followed by submission for publication in peer-reviewed journals. Often further experimentation or modification may be required prior to actual publication. Once published, the article is reviewed by others in the relevant field. The originator's findings are then tested independently by peers and later, papers either validating or refuting the original hypothesis, will be published. Dr. Colman described the successful completion of the process, saying, "By being tested in different places where the influences differ, eventually a piece of information will be sufficiently validated to gain acceptance." Based upon the testimony at the hearing and his observations at the serology laboratory, Dr. Colman concluded that the 4-in-1 system employed here

is not an established and accepted scientific method. He rested his conclusion on the lack of publications on the system and on evidence indicating that it is not being used in other laboratories.

The witness also voiced some criticism of the scientific technique employed in the serology laboratory. In his review of the laboratory, he found deficiencies in practices required by the lab manual in the labeling of reagents, the documentation relating to lab analysis, and in the maintenance records of the machinery. In the absence of a second reader he also stressed the importance of photographic documentation of the electrophoretograms which, he explained, provided an objective record of the results, preserved for review and reinterpretation.

Dr. Benjamin W. Grunbaum was the last witness called by the defense. Dr. Grunbaum is an acknowledged expert in electrophoresis technology and was qualified as an expert in biochemistry, forensic serology, blood typing and quality assurance.

The focus of Dr. Grunbaum's argument was on the procedure employed here, the 4-in-1 system. Dr. Grunbaum's criticisms of the multisystem have been well documented. To start, Dr. Grunbaum explained that pH is the measure of acidity or alkalinity of a medium which determines the net charge. By maintaining a fixed pH the molecules will then be subjected to that fixed net charge and the direction that the molecules will take can be predicted. He explained that by setting a pH other than the optimum for the marker sought to be detected, as is the practice in all multisystems, the activity of the molecules will be less than ideal. Lacking optimum activity, the markers will develop at a significantly slower rate and the bands will be diffused. Unlike Dr. Shaler, Grunbaum stated that the range of pH set in the instant analysis was unacceptable.

Grunbaum also challenged the stripping effect induced by the necessity of pulling off the filter paper as each of the genetic markers is developed. Dr. Grunbaum warned that when a filter paper, prepared to visualize a genetic marker, is laid over a gel for some length of time in the incubator, those molecules sought to be detected as well as the molecules of other markers will migrate towards the filter paper. He contends therefore that when the filter paper is stripped off a good part of the remaining marker's molecules are stripped off with it. Dr. Grunbaum suggested that the longer this process continues the more molecules are improperly removed and concluded that when working with materials that are already degraded, to wit, the evidentiary bloodstains, the stripping effect produces a "serious compromise".

Dr. Grunbaum emphatically stated that the 4-in-1 system employed by Dr. Shaler had not gained general acceptance within the scientific community. While Dr. Grunbaum knew of this system, he was not, prior to reviewing a survey of crime laboratories, aware that any member of the scientific community was utilizing it. Even after reading the survey, he was aware of only one laboratory other than the New York City Medical Examiner's office that employed the technique. In Dr. Grunbaum's estimation this did not constitute a scientific community sufficient to conclude that the system had been generally accepted.

The court has also examined a number of scientific papers addressing simultaneous separation of genetic markers. In The Development of Carbonic Anhydrase II (CAII) in the Group I Buffer System, [10] involving the same 4-in-1 method employed here, the authors specifically warned that the rarer variants of CAII may not be detectable in this system and concluded that the method should be used only as a screening procedure. The same conclusion was also reached in another paper which concerned a multisystem in which three genetic markers were simultaneously developed and which interestingly was co-authored by Dr. Shaler.[11] Not all articles have been critical of multisystem electrophoresis analysis. One article observed that "electrophoretic systems that provide information on multiple enzyme groups are preferable to systems that provide information on only one enzyme group because large sample quantities are not necessary."[12] And another concluded that "not only can [the Group I enzymes] be separated at the same time, but that there is a substantial improvement of the resolution of the isozyme bands of EsD and GLO compared to their respective single-system methods of conventional electrophoresis."[13] These articles, however, did not deal with the 4-in-1 system here employed and their findings must therefore be limited to the systems they studied.

In determining whether the prosecution has met the twofold test for admissibility, that is whether the 4-in-1 method of electrophoresis has been generally accepted within the relevant scientific community, and whether the test was reliably performed in the instant case, the existing case law, both in this jurisdiction and in others, relevant scientific and legal publications, and the record before this court must be carefully examined.

While there is an apparent absence of case law addressing the admissibility of the 4-in-1 methodology there is a growing body of law developing across the country on the admissibility of the multisystem, particularly the 3-in-1 system devised by Wraxall. What is most clear from these decisions is the lack of consensus among both the legal and the scientific community on the issue now before this court.

Not surprisingly the prosecution relies on a line of cases which have allowed the introduction of results obtained through multisystem electrophoresis analysis. In State v Washington (229 Kan 47, 622 P2d 986) the analyst who performed the tests had only a Bachelor of Science degree and had attended training courses and seminars. She testified that the method was used throughout the scientific community because of "its speed, consistency, and reliability". (State v Washington, supra, 229 Kan, at 50, 622 P2d, at 989.)

The Supreme Court of Kansas, while saying that the Frye standard was the applicable criteria, found that the multisystem was reliable. What apparently impressed the court here was not that the system yielded reliable and, more importantly, valid results, but rather that a large group of laboratories had implemented the procedure, which, this court concludes, is not necessarily synonymous with acceptance by the scientific community.

Although described as the bloodstain analysis system, it was the multisystem that was admitted in

State v Onken (701 SW2d 518 [Mo]). Once again there was no real challenge raised to the admission of the evidence and one witness was allowed to represent the opinion of the entire scientific community.

Most recently, in Plunkett v State (719 P2d 834 [Okla]) evidence of multisystem electrophoresis results were introduced through the testimony of a technician. A physician, board certified in internal medicine and hematology, testified that the system was employed in paternity and forensic medicine and that it was generally accepted in the scientific community in which he belonged. The Court of Criminal Appeals held that "[sufficient] evidence was therefore presented for the trial court to find that the multi-system test is reliable." (Plunkett v State, 719 P2d 834, 840, supra.)

Further reflecting the controversy over electrophoretically detected evidence are those cases where the multisystem has been excluded. In People v Harbold (124 Ill App 3d 363, 464 N.E.2d 734), the samples were typed according to 10 systems of genetic markers. The appellate court observed, "In this case, genetic marker evidence seems to have been received on the basis of Mark Stolorow's statement that these techniques are used in crime labs nationwide. Both of the cases we have found which consider the matter, State v. Washington (1981), 229 Kan. 47, 622 P.2d 986, and Robinson v. State (1981), 47 Md. App. 558, 425 A.2d 211, found scientific acceptance based on widespread use in crime labs. While this fact is certainly relevant to scientific acceptance (see e.g., People v. Jennings (1911), 252 Ill. 534, 546-49, 96 N.E. 1077 (fingerprint evidence)), we do not believe that use in crime labs alone can justify admission of evidence in the face of a bona fide scientific dispute. (Cf. People v. Baynes (1981), 88 Ill. 2d 225, 430 N.E.2d 1070 (polygraph evidence).) Not every useful investigative tool is necessarily admissible in a criminal trial." (People v Harbold, supra, 124 Ill App 3d, at 379, 464 N.E.2d, at 747.) Nevertheless the court declined to hold that the electrophoretic detection of genetic markers was unreliable as a matter of law. It was concluded that "some questions as to scientific acceptance of the technique remain unanswered in this record and in the case law." (People v Harbold, supra, 124 Ill App 3d, at 381, 464 N.E.2d, at 748).

In People v Brown (40 Cal 3d 512, 726 P2d 516, supra) the defendant, once again through the testimony of Dr. Grunbaum, challenged the electrophoretic analysis of bloodstains performed nearly 2 1/2 months after the samples were taken. The court found that "It is not clear from our unaided review of these authorities that impartial science has developed a consensus on the crucial issue: whether for the typing categories * * * at issue here, current methodology, employed by qualified technicians, can discriminate reliably between testable and untestable samples and between accurate and inaccurate results." (Supra, 40 Cal 3d, at 534, 726 P2d, at 527.) It was therefore concluded that "the answer must abide an adequate future trial record made with the help of live witnesses qualified in the applicable scientific disciplines. We therefore do not foreclose future attempts to admit stain-typing evidence based on a foundation such as we have described * * * In this case, such a record not having been made, the evidence should not have been admitted." (40 Cal 3d, at 534-535, 726 P2d, at 527.) The defendant's conviction however was not reversed as the court applied a harmless error analysis to the erroneous introduction of electrophoretic evidence.

Dr. Grunbaum also testified as a defense expert in People v Young (425 Mich 470, 391 NW2d 270). While the court concluded that general scientific acceptance had not been established by the prosecution, it also applied a harmless error analysis. Nevertheless, the defendant's challenge to the acceptance of the multisystem technique was found to have merit. As he did in the hearing before this court, Dr. Grunbaum argued that the filter used in the test of the EsD molecules had the unintended effect of compromising the GLO and PGM analysis. Noting that "[the] burden of establishing general acceptance of reliability is, however, on the prosecution" (People v Young, supra, 391 NW2d, at 281) the court rejected as proof of such reliability the unpublished study by Brian Wraxall, terming it "self-verification", and not a "sufficiently reliable procedure". (People v Young, supra, 391 NW2d, at 280.) The court concluded that, in the absence of independently conducted validation tests and control studies, whose results are then subjected to the scrutiny of the scientific community, the reliability of electrophoresis of evidentiary bloodstains had not been demonstrated. Echoing the testimony offered by the defense here, the court observed that "The scientific tradition expects independent verification of new procedures. When other scientists analyze and repeat the tests, they counteract the dangers of biased reporting. It is scientists not responsible for the original research that confirm its validity." (People v Young, supra, 391 NW2d, at 283.) It was suggested that through independent studies the potentially compromising effect of the filter stripping and the effects of crime scene contamination could be examined and resolved. Finally, the court considered the dangers of allowing implementation of an inadequately tested device, pointing to the paraffin test, and the Dalkon Shield where "[with] adequate testing, controlled studies and cautious marketing, [the manufacturer] could have discovered the increased risks which have been shown to be inherent in the Dalkon Shield's unique new design" (Hawkinson v Robins Co., 595 F Supp 1290, 1307 [D Colo 1984].[14]

The central issues presented in this case are whether the 4-in-1 methodology has been generally accepted in the scientific community and whether it was reliably performed in this instance. Dr. Shaler initially indicated that the 4-in-1 method was used in major crime laboratories across the country. On closer examination however it became clear that those laboratories were actually using the 3-in-1 multisystem and not the 4-in-1 adaptation of the system employed by Dr. Shaler. In fact, on two occasions, Dr. Shaler admitted that the 4-in-1 method was used only by the Medical Examiner's office and by Petersack in the New Jersey crime lab system. Still later, Dr. Shaler revealed that he was not aware whether his New Jersey colleague was currently using the system. Assessing the record in the light most favorable to the prosecution it must be concluded that, at best, two laboratories in this country employ the 4-in-1 electrophoretic technique. While general use in crime laboratories does not necessarily connote general acceptance in the scientific community, evidence of such limited use does persuade the court that the procedure has not been generally accepted by even the technical personnel whose standards may be less exacting than those of scientists.[15]

The prosecution appears however to equate the technique in issue here with the multisystem devised by Wraxall. Suggesting that one electrophoretic multisystem may be substituted for any other such system, the People rely on the acceptance of the Wraxall system to persuade the court that all

multisystems have gained general acceptance in the scientific community. As the court in People v Harbold (supra) refused to equate use with acceptance, so does this court decline to conclude that use and acceptance of the Wraxall system requires acceptance of the 4-in-1 method. This argument overlooks the suggestion of Matthews and Stolorow, that the joint system be used only as a screening technique. It is hard to conceive of criticism less suspect and on this basis alone, it could be concluded that the 4-in-1 methodology has not been accepted by the scientific community.

The prosecution has also overlooked the controversy or "lack of consensus" that still surrounds the Wraxall multisystem. The only blind trials of the validity and reliability of the Wraxall multisystem have been those conducted by the originator of that system. As was observed in People v Young (supra), self-verification is not a proper substitute for independent, unbiased review and testing of a new technique. This criticism is equally applicable to the 4-in-1 system. Had there been proof of this kind of testing even in the absence of a showing of extensive use, a finding that the system may or may not be valid could have been reached. Lacking such evidence it must be concluded that the system has not been sufficiently appraised by unbiased scientists and, accordingly, that the technique has not achieved general acceptance.

Nor is the court persuaded that the 4-in-1 system is not, as Doctor Grunbaum described, a compromised system. With the obvious exception of Wraxall and Stolorow many of the scientific papers reviewed by the court indicate that multisystems should be used as rapid screening techniques rather than for the purpose of reaching determinative results. And of course, the Matthews and Stolorow article, specifically suggesting that the 4-in-1 system should not be used, is particularly persuasive. Once again, in the absence of independent review by the scientific community, it is impossible to resolve whether the system does provide valid and reliable results or whether the history of the paraffin test is repeating itself.

What is easier to review is the manner in which Dr. Shaler conducted the tests here. The articles examined by the court consistently warn that the parameters of multisystem electrophoresis, and in fact all electrophoretic systems, must be carefully set and scrupulously observed. The failure to do so may cause the banding to diffuse unnecessarily or to develop insufficiently. Dr. Shaler obviously recognized that the integrity of the electrophoretic results would depend in large part on the manner in which the procedure was performed and therefore devised a laboratory manual which regularized the technique to be employed. Nevertheless, Dr. Shaler failed to make recordings with regard to any of the three electrophoretic setups that were performed on each of three different bloodstains, saying instead that had anything of consequence occurred he would have recorded it and repeated the analysis. Dr. Shaler's explanation that he acted as his own quality control does not excuse what must, at best, be seen as a cavalier approach entirely incongruous with the empiric nature of science. In fact, the appropriate characterization is of little significance; the result is that the court, the defense and the prosecution as well are deprived of sufficient evidence on which to determine whether the electrophoretic analysis was performed in accordance with the laboratory manual and scientifically recognized parameters.

Dr. Shaler's explanation of transcription and transposition errors provide no greater reason for confidence in the practices of the serology laboratory in this case. Shaler's characterization of these errors as "mental mistakes" only make clearer that not alone were his staff susceptible to human error, but that he too was capable of such faults. This is most significant inasmuch as the court has been asked to determine the reliability of the electrophoretic analysis conducted here solely on the basis of Dr. Shaler's recollection of events that in part occurred nearly two years ago. Lacking the actual electrophoretograms, photographs of those plates, or even contemporaneous bench notes containing data rather than results and, in light of the evidence of inconsistencies and lack of memory by the witness, the court finds itself unable to make such a determination.

Additionally, the court is not favorably impressed by many of the laboratory practices that were referred to at the hearing. While economic considerations must always be addressed in government agencies, that photographs which upon inspection might eliminate challenges could not be obtained because the office could not afford a single camera is ludicrous. Surely the expense of a single camera cannot approach the cost of having serologists and technicians spend days in court away from their duties and responsibilities. It must also be concluded that the laboratory manual was not compiled and has not been maintained or updated in accordance with accepted scientific method. Testimony at the hearing also demonstrated that the reagents used in visualizing the markers are not adequately labeled or tested and that documents relating to machine maintenance are not preserved. Based upon all of these deficiencies, the court finds that the electrophoretic analysis performed here was not reliable and therefore not probative or relevant.

These findings should not be construed as a complete validation of the opinions espoused by the defendant's expert, Dr. Benjamin Grunbaum, nor as a condemnation of the well-respected work of Dr. Shaler. Dr. Grunbaum has, as a number of decisions have noted, been engaged in a nearly singular assault on the multisystem method of electrophoresis. This court would no sooner accept the argument of a single critic than it would validate a procedure on the basis of a single supporter. Nevertheless, many of Dr. Grunbaum sentiments have simply echoed the statements and opinions voiced by Dr. Shaler himself. Dr. Shaler did not attempt to minimize the errors contained in his notes. Nor did he suggest that photographs of the electrophoretic plates would not have been a valuable tool in assessing his conclusions. Finally Shaler did not contradict Dr. Grunbaum's statements emphasizing the importance of strict adherence to the parameters of the electrophoretic procedure.

This court concludes that the 4-in-1 system employed here has not gained general acceptance in the scientific community. Additionally, the court finds that the procedure itself was not reliably performed. Based upon the record before the court, it must also be observed that the admission of such evidence would not be subject to harmless error analysis and that its impact on the jury would be substantial and very likely irreversible. For these reasons, the defendant's motion to suppress the results of electrophoresis analysis performed by the Medical Examiner's office is granted.

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[Portions of opinion omitted for purposes of publication.]

1. See, People v Borcsok, 114 Misc. 2d 810, 814, affd 107 A.D.2d 42 ("Certainly, there can be little doubt that the results of blood typing by way of enzyme analysis is well beyond the knowledge of an average juror").

2. Giannelli, The Admissibility of Novel Scientific Evidence: Frye v. United States, a Half-Century Later, 80 Colum L Rev 1197, 1221 (1980).

3. Giannelli, The Admissibility of Novel Scientific Evidence: Frye v. United States, a Half-Century Later, 80 Colum L Rev 1197, 1209-1210 (1980).

4. Jonakait, Will Blood Tell? Genetic Markers in Criminal Cases, 31 Emory LJ 833 (1982).

5. Jonakait, Will Blood Tell? Genetic Markers in Criminal Cases, 31 Emory LJ 833, 848-849 (1982).

6. Jonakait, Will Blood Tell? Genetic Markers in Criminal Cases, 31 Emory LJ 833, 851-852 (1982).

7. Moenssens & Inbau, Scientific Evidence in Criminal Cases, at 7, n 12 (2d ed 1978).

8. Jonakait, Will Blood Tell? Genetic Markers in Criminal Cases, 31 Emory LJ 833 (1982).

9. See, Wraxall and Stolorow, The Simultaneous Separation of the Enzymes Glyoxalase I, Esterase D, and Phosphoglucomutase, 31 J of Forensic Sciences 1439-1449 (No. 4, Oct. 1986).

10. Matthews and Stolorow, The Development of Carbonic Anhydrase II (CAII) in the Group I Buffer System, 1X J of Police Science and Administration 99-101 (No. 1, 1981).

11. Nielson, Simultaneous Electrophoresis of Peptidase A. Phosphoglucomutase, and Adenylate Kinase, 21 J of Forensic Sciences 510-513 (No. 3, July 1976).

12. Wolson and Stuver, Simultaneous Electrophoretic Determination of Phosphoglucomutase Subtypes, Adenosine Deaminase, Erythorcyte Acid Phosphatase and Adenylate Kinase Enzyme Phenotypes, 30 J of Forensic Sciences 904, 905 (No. 3, July 1985).

13. Wraxall and Stolorow, The Simultaneous Separation of Enzymes, Glyoxalase I, Esterase D, and Phosphoglucomutase, 31 J of Forensic Sciences 1439, 1440 (No. 4, Oct. 1986).

14. The court's attention has also been drawn to a number of decisions which the prosecution purports to stand for the proposition that the multisystem has been "universally admitted" in New York courts. In none of those cases (Matter of Abe A., 56 N.Y.2d 288; People v Crosby, 116 A.D.2d 731; Matter of David M. v Dwyer, 107 A.D.2d 884; People v Borcsok, 114 Misc. 2d 810, affd 107 A.D.2d 42; People v McCann, 115 Misc. 2d 1025) was the methodology employed or the number

of genetic markers identified made clear. Moreover, some of the decisions do not even disclose whether electrophoresis analysis was performed.

15. "Even if empirical validation is recognized, a technician's testimony should never suffice to establish the validity of a novel technique: '[The] technician merely follows prescribed routines, and is not expected to understand their underlying fundamentals. He knows how, but not why.' Because it is critical to know the 'why,' or, as in the case of empirical validation, the implications of not knowing the 'why,' the views of scientists are essential. Moreover, a technician would not be qualified to testify about the general acceptability of a technique because presumably only a scientist would be sufficiently conversant with the views held by those in the relevant field." (Giannelli, The Admissibility of Novel Scientific Evidence: Frye v. United States, a Half-Century Later, 80 Colum L Rev 1197, 1214-1215 [1980].)