People v. Vallejo: Setting the Precedent for the Admission of DNA Evidence

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I. INTRODUCTION

Thus, in no small measure do we appreciate Doctor Zweig'sacceptance of our invitation for him to share not only his knowledge of life sciences, but his experiences as well, in initiating judges to the new marvels of science that will inevitably invade their courtrooms.

- Hon. Chief Justice Hilario G. Davide, Jr.[1]

Article 15 § 1(b) of the International Covenant on Economic, Social and Cultural Rights states recognizes "the right of everyone. . . (b) To enjoy the benefits of scientific progress and its applications. . .."[2] One of these scientific breakthroughs which have garnered so much attention is the several applications of deoxyribonucleic acid (DNA) technology. This technology has been used to study diseases, discover cures, identify bodies, research about anthropological history, and so on.

It has also found a place in the field of law as evidence. It has been sixteen years since the United States trial courts admitted DNA test results as evidence.[3] Typically, Philippine courts have been slow in adopting the advances of their U.S. counterparts. In spite of the existing right of each person to enjoy the benefits of scientific progress, Philippine Courts have been reluctant to definitively accept this new technology in the proceedings before it. This delay could be attributed to a natural suspicion of something novel and unproven as well as a skepticism of Philippine technology. At present, however, the consistency of DNA test results have been well-documented. Furthermore, there are already several scientific laboratories with the proper facilities found in the country. With these factors, the Supreme Court has seemingly adjudged it to be the appropriate time to render a decision which could set a precedent for the admissibility of DNA evidence.

II. FACTS OF THE CASE

People v. Vallejo[4] involved a rape incident wherein the conviction of the accused Gerrico Vallejo was obtained by the prosecution using DNA evidence gathered from the victim's body. On the day of the crime, the victim, Daisy Diolola, a nine-year old girl went to the house of her tutor, the defendant's sister, for her lessons. An hour later, the victim returned home, accompanied by the defendant in order to get a book for her lessons. From the defendant's house, the victim proceeded to the house of her neighbor to watch television. The defendant then arrived, whispered something to the victim and together they left heading towards the *compuerta*. That was the last time the victim was seen alive.

The defendant was afterwards seen by some witnesses looking pale, uneasy and troubled, wearing clothes which were wet. The next day, the body of the victim was found tied to an aroma tree at the part of the river near the *compuerta*. An autopsy on the victim revealed that she was raped and then manually strangled to death. When the defendant was invited by the policemen for questioning, he executed an extra-judicial confession admitting to the crime saying that he was under the influence of drugs. A complaint was then filed against him for rape with homicide.

During the trial, the prosecution presented a number of witnesses. Some of them testified that the victim was last seen in the company of the

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1. *Cells, Genes, DNA Take Center Stage*, 1 SUPREME COURT BENCHMARK 3 (November 2000).
2. International Covenant on Economic, Social and Cultural Rights, G.A. Res. 2200A (XXI), 21 U.N. GAOR Supp. No. 16 at 49, U.N. Doc. A/6316 (1966), 993 U.N.T.S. 3, *entered into force* Jan. 3, 1976.
3. *See* KIMBERLY LONSWAY, DNA EVIDENCE AND ISSUES 2 (1998).
4. GR 144656, May 9, 2002.

defendant. Other witnesses also testified as to the validity of the defendant's extra-judicial confession, the same having been executed in the presence of a lawyer. The key pieces of the prosecution's evidence, however, arose mainly from the testimony of a forensic biologist of the National Bureau of Investigation (NBI) who testified that blood samples were taken from the defendant for the purpose of comparing with the blood found on his and on the victim's clothes. The result of the examination was that the defendant's blood type belonged to Group "O" while the blood found on his clothes and on the victim's clothes belonged to Group "A," which was the victim's blood type. Furthermore, a forensic chemist of the NBI took specimens from the vagina of the victim and conducted DNA tests on the specimens. She testified that the vaginal swabs from the victim taken during the autopsy contained the DNA profiles of the defendant and the victim.

The defendant raised the defense of alibi, saying that he was at home during the entire period of the commission of the crime. He also alleged that he was tortured by the police into making and signing the extra-judicial confession.

The trial court rendered a decision finding the accused guilty beyond reasonable doubt of the crime charged. Based on the overwhelming evidence presented, the court determined that the defendant raped and killed the victim. On this account, the defendant was sentenced to death. The case was then elevated to the Supreme Court on automatic appeal, and was affirmed on the ground that there was enough circumstantial evidence to convict the defendant. The Court rendered much importance to the findings of the NBI forensic biologists and chemists that the blood and DNA tests revealed the identity of the defendant. Also, the Court upheld the validity of the extra-judicial confession executed by the accused.

III. Legal History

DNA refers to the chain of molecules found in every cell of the body except in red blood cells which transmit hereditary characteristics among individuals.[5] DNA testing, profiling or fingerprinting is an analysis of the DNA resulting in the identification of an individual's patterned chemical structure of genetic information.[6] It may be used in criminal cases to identify or rule out criminals and in civil cases in order to determine paternity.

In Philippine jurisprudence, the earliest mention of DNA was in the case of *People v. Teehankee*[7] wherein the court acknowledged the accuracy and

5. S.C. Halas, *Current Trends in DNA Typing and Applications in the Judicial System*, 4 Court Systems J. 47, (1999).

6. Black's Law Dictionary 480 (1991).

7. 249 SCRA 54 (1995).

authoritativeness of scientific forms of identification evidence such as fingerprint or DNA testing.[8] According to the Court, as compared to eyewitness identification, scientific identification is more reliable. This doctrine was reiterated in *Andal v. People*[9] but while the court emphasized the significance of DNA testing, it considered such evidence unnecessary in light of the presence of other pieces of evidence against the accused. Despite this acknowledgment of accuracy, the court had in the past looked down upon the admissibility of DNA evidence.

A. Lim v. CA*: Non-recognition of DNA Evidence*

In *Lim v. CA*,[10] the plaintiff filed an action for support against the defendant. She claimed that the defendant was the putative father of her daughter. Before the birth of the child, the plaintiff, a receptionist in a club, and the defendant, met while the former was at her job. The defendant courted her and they soon lived together with the defendant paying the rentals of the apartment. The plaintiff left for Japan while she was pregnant but returned the same year to give birth. When the plaintiff gave birth, the defendant shouldered all the medical and hospital expenses. He also caused the registration of the child's name in the birth certificate with his surname. The couple then parted ways and soon thereafter, the defendant began denying his relation to the child and refused to give support.

The trial court ruled in favor of the plaintiff and ordered the defendant to give a monthly amount as support. This decision was subsequently affirmed by the Court of Appeals. In disposing of the case, the Supreme Court stated that "DNA being a relatively new science... has not as yet been accorded official recognition by our courts. Paternity will still have to be resolved by such conventional evidence as the relevant incriminating acts, verbal and written, by the putative father."[11] The Court then considered the love letters between the parties and the defendant's conduct wherein he acknowledged paternity over the child during her birth and before the parties' separation. The Court thereby affirmed the ruling of the lower courts.

In this case, the Court clearly expressed its preference for conventional evidence in the light of the DNA testing being a recent scientific discovery. It also patently labeled this form of evidence as unofficial and not recognized by the courts.

8. *Id.*

9. 307 SCRA 650 (1999).

10. 270 SCRA 1 (1997).

11. *Id.* at 1.

1. *Tijing v. CA*: Court's changing perspective

Four years after the promulgation of *Lim v. CA*, the court changed its perspective on the usefulness of DNA evidence in litigation in the case of *Tijing v. CA*.[12] This case involved a petition for *habeas corpus* filed by the petitioners to recover their youngest son who was previously abducted by their employer. To prove their case, the petitioners presented testimonial evidence as to the inability of the respondent to bear a child. They also pointed out the striking physical similarities between the alleged mother and the child in question. The Supreme Court then took into consideration the fact that the respondent failed to preseent evidence as to her giving birth to the child and eventually the Court granted the petition for the issuance of a writ of *habeas corpus*. In the penultimate paragraph of its decision, the Court said:

> Parentage will still be resolved using conventional methods unless we adopt the modern and scientific ways available. Fortunately, we have now the facility and expertise in using [a] DNA test for identification and parentage testing. The University of the Philippines Natural Science Research Institute (UP-NSRI) DNA Analysis Laboratory has now the capability to conduct DNA typing using short tandem repeat (STR) analysis. The analysis is based on the fact that the DNA of a child/person has two copies, one copy from the mother and the other from the father. The DNA from the mother, the alleged father and the child are analyzed to establish parentage.[13]

The Court admitted, albeit impliedly, that since it was such a novel scientific technique, parties could still challenge the use of DNA testing as evidence. However, the Court went on to say that "eventually, as the appropriate case comes, courts should not hesitate to rule on the admissibility of DNA evidence."[14] In reaching this conclusion, the Court took into great consideration another paternity case, *Jao v. CA*,[15] where it was stated that "courts should apply the results of science when completely obtained in aid of situations presented, since to reject such results is to deny progress."[16]

The scientific procedure referred to in *Jao* was the blood grouping test. In the test conducted by the NBI, the result was that the child could not have been the possible offspring of the plaintiff and the defendant. The plaintiff questioned the admissibility and competency of the test results. She asserted that probative value should be given to blood tests only when they

12. 354 SCRA 17 (2001).

13. *Id.* at 26.

14. *Id.*

15. 152 SCRA 359 (1987).

16. *Id.* at 366.

tended to establish paternity, thus implying that probative force exists only when the result is affirmative and not negative. The Court disregarded this argument by stating that "[a]s an admitted test, it is admissible in subsequent similar proceedings whether the result be in the negative or in the affirmative."[17] The Court, furthermore, elucidated on the admissibility of advanced scientific testing procedures. It mentioned the fact that in other States, the admissibility of blood tests have been the subject of legislation and that there exist numerous American and European decisions recognizing its admissibility. By citing *Jao*, the case of *Tijing* reflected a trend towards revamping the view of non-recognition of medical procedures such as DNA testing which used to be the rule as enunciated in *Lim*.

2. Admissibility Standards in American Jurisprudence

The trend in Philippine jurisprudence mirrored its counterpart in American jurisprudence. In the United States, the leading case on the admissibility of scientific evidence used to be the case of *Frye v. US*,[18] which required a general acceptance of DNA in the scientific community before it could be admitted in court. In this case, the defendant offered an expert witness to testify on the result of a deception test made on the defendant. The test involved the systolic blood pressure deception test.

It was asserted that blood pressure is influenced by change in the emotions of the witness, and that the systolic blood pressure rises are brought about by nervous impulses sent to the sympathetic branch of the autonomic nervous system. Scientific experiments, it is claimed, have demonstrated that fear, rage, and pain always produce a rise of systolic blood pressure. Conscious deception or falsehood, concealment of facts, or guilt of crime, accompanied by fear of detection when the person is under examination, raises the systolic blood pressure in a curve which corresponds exactly to the struggle going on in the subject's mind, between fear and attempted control of that fear, as the examination touches the vital points in respect of which he is attempting to deceive the examiner.

In other words, the theory seems to be that truth is spontaneous, and comes without conscious effort, while the utterance of a falsehood requires a conscious effort, which is reflected in the blood pressure. The rise thus produced is easily detected and distinguished from the rise produced by mere fear of the examination itself. In the former instance, the pressure rises higher than in the latter, and is more pronounced as the examination proceeds, while in the latter case, if the subject is telling the truth, the pressure registers

17. *Id.*

18. 293 F. 1013 (D.C. Cir. 1923).

highest at the beginning of the examination, and gradually diminishes as the examination proceeds.

Prior to the trial, the defendant was subjected to this deception test, and in court the scientist who conducted the test was presented as an expert to testify to the results obtained. The court however refused to admit the evidence even when the defendant advocated the performance of the test in court itself. The district court posited that:

> [j]ust 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.[19]

Ruling as to the non-admissibility of the test results, the court then explained that the systolic blood pressure deception test has not yet gained standing and scientific recognition among the authorities in the field including psychologists and physiologists that would justify the court in admitting the testimony on the results derived from the test. This case therefore, laid down the standard before courts could admit evidence based on novel scientific techniques: general acceptance in the scientific community. The court elucidated further by stating that the general acceptance test required a two-step analysis, namely, the identification of the field in which the underlying theory falls and the determination of whether the principle has been accepted by most members of the field.

The *Frye* test originally envisioned a process whereby the admissibility of a scientific technique would be decided in reference to the stages of its evolution. After its invention or discovery, the technique would have to be subjected to rigorous analysis by the scientific community during its experimental stage. Only after this community agrees that the technique was valid would its use as evidence be admissible in court.

The way in which the *Frye* test determined when evidence had reached the point of admissibility was to see if the technique was generally accepted by the relevant scientific community. After its promulgation, the *Frye* test was subsequently used in a variety of cases for determining the admissibility of other types of scientific evidence such as voice prints,[20] gunshot residue tests,[21] ion microprobic analysis[22] and neutron activation analysis.[23]

19. *Id.*
20. Reed v. State, 391 A.2d 364 (1978).
21. State v. Smith, 362 N.E.2d 1239 (1976).

The *Frye* test was favored in the U.S. jurisdiction because it assured that those who "most qualified to assess the general validity of a scientific method will have the determinative voice."[24] Because the experts are assigned to the task of assessing a particular method, the courts will have them to rely on in deciding whether or not to admit it as evidence.

In subsequent cases, the courts have lauded the *Frye* test as it promotes a degree of uniformity of decision since it relies on the consensus of the members of a field and not on the subjectivity of individual judges.[25] It gives an assurance that the test is critically examined by those who would be in a best position to do so. In another case, the court said that "without the *Frye* test or something similar, the reliability of an experimental scientific technique is likely to become a central issue in each trial in which it is introduced, as long as there remains serious disagreement in the scientific community over its reliability."[26]

In 1993, the United States Supreme Court changed the long-standing law of admissibility of scientific expert evidence by rejecting the *Frye* test as inconsistent with the Federal Rules of Evidence in the case of *Daubert v. Merrell Dow Pharmaceuticals*.[27] In this case, the plaintiffs brought suit against the defendant company claiming that their children were born with congenital defects caused by the mother's prenatal ingestion of an anti-nausea drug manufactured by the company. The plaintiffs presented as evidence the testimonies of eight witnesses who conducted laboratory tests and concluded that the drug can cause birth defects. The District Court and the Court of Appeals rejected the offered testimony by invoking the *Frye* test. They held that the evidence was inadmissible unless it is generally accepted as reliable in the relevant scientific community. The Supreme Court reversed the ruling and ratiocinated that nothing in the Rules gives any indication that general acceptance is a necessary precondition to the admissibility of scientific evidence.

The Federal Rules of Evidence and not *Frye* was the standard for determining admissibility of expert scientific testimony. *Frye's* "general acceptance" test was superseded by the Federal Rules' adoption. Rule 702 of the Federal Rules of Evidence provides the appropriate standard to assess the admissibility of scientific evidence. What is required is that the trial judge should ensure that all the scientific evidence admitted is relevant and reliable.

22. United States v. Brown, 557 F.2d 541 (1977).
23. United States v. Stifel, 433 F.2d 431 (6th Cir. 1970).
24. United States v. Addison, 498 F.2d 741(D.C. Cir. 1974).
25. People v. Kelly, 17 Cal. 3d 24, 31 (1976).
26. Reed v. State, 391 A.2d 364 (1978).
27. 113 S. Ct. 2786 (1993).

The reliability standard requires that the testimony must pertain to scientific knowledge and that there must be a valid connection to the pertinent inquiry as a precondition to admissibility. In doing so, the trial judge must determine whether the expert is proposing to testify on scientific knowledge that will assist the trier of fact in understanding the fact in issue. In order to qualify as scientific knowledge, an inference or assertion must be derived by the scientific method. Proposed testimony must be supported by appropriate validation, based on what is known. Many considerations will bear on the judge's inquiry, including whether the theory or technique in question has been tested, whether it has been subjected to peer review and publication, its known or potential error rate, and the existence and maintenance of standards controlling its operation, and whether it has attracted widespread acceptance within a relevant scientific community.

The inquiry is a flexible one, and its focus must be solely on principles and methodology, not on the conclusions that they generate. Thus, the requirement that an expert's testimony pertain to scientific knowledge establishes a standard of evidentiary reliability. The court added that the rigid standard imposed in *Frye* would be at odds with the Rules' liberal thrust and their general approach of relaxing the traditional barriers to opinion testimony. Instead of the stiff general acceptance standard, the court should instead fully utilize cross-examination, presentation of contrary evidence, and the careful instruction on the burden of proof in assessing scientific evidence.

The case of *United States v. Bonds*[28] relied on the case of *Daubert*, which makes general acceptance only one factor to consider in determining admissibility of scientific evidence. In this case, the defendants were convicted of charges of conspiracy and federal firearms by the trial court based on a DNA test result from hair and blood samples found within the vicinity of the incident. The admission of the DNA results was opposed by the defendants on the basis of the *Frye* ruling which requires general acceptance by the scientific community.

The Supreme Court upheld the lower court's admission of the DNA test results holding that the *Frye* test was superseded by the ruling in the *Daubert* case which made Rule 702 of the Federal Rules of Evidence the primary consideration. What the courts must determine is the validity of the principles of methodology underlying the testimony itself and not the validity of the conclusions or the validity of the results of the testimony. Therefore, if the methodology is valid then it would follow that the conclusions derived therefrom are valid and reliable.

The changing perspective of the courts towards acceptance of DNA testing paved the way for the doctrinal ruling in *People v. Vallejo*, wherein

28. 12 F.3d 540 (1993).

the court not only express a general view of the trustworthiness of the procedure but also recognized its actual application in litigation.

IV. Instant Case

The medical evidence presented by the prosecution were the results of the laboratory examination conducted on the blood found on the clothes of the defendant and the victim, as well as the results of the DNA test conducted on the samples of vaginal swabs taken from the victim compared with the buccal swabs taken from the defendant. The laboratory examination on the blood revealed that the blood on the defendant's clothes contained the victim's blood type "A" and not his blood type "O." Meanwhile, the specimens from the vaginal swabs taken from the victim matched the DNA profile of the defendant.

The Court used these pieces of evidence as circumstantial evidence to convict the defendant. In upholding the validity of the results on the examination conducted on the blood found on the clothes, the Court stated that even if there was no direct determination of the blood type of the victim, it could be reasonably inferred that the victim was blood type "A" since the victim sustained contused abrasions all over her body which would necessarily produce the bloodstains on her clothing. The forensic biologist explained that it was the victim's blood which predominantly registered in the examination. Thus, it could be inferred that the blood on the victim's clothing matched the blood found on the defendant's clothes.

As to the DNA results, the Court gave a thorough discussion of the nature and procedure used in the examination. It described DNA as the genetic code of a person's cells, which is unique and distinct except when the person has an identical twin. The examination is commenced by collecting evidence samples of DNA from the victim's body. Also, samples of the suspect's DNA would also be collected and such is called the reference sample. Both samples are subjected to chemical processes to discover whether or not an association exists between the evidence sample and reference sample. The court then said that there are three possible test results: a) exclusion, b) inconclusive, and c) inclusion.

An exclusion is said to result when it is ascertained that the evidence sample and the reference sample originated from different sources. The test produces inconclusive results when it is impossible to determine that both samples came from the same source because of degradation, contamination or failure of some aspect of the protocol. If the test is inconclusive, the analysis should be repeated with different samples to obtain better results. An inclusion would result when the samples are similar and thus originated from the same source.

The forensic chemist of the NBI testified that while the bloodstains taken from the clothes of the victim, as well as the strands of hair and nail specimens did not contain human DNA, the vaginal swabs from the victim yielded positive for the presence of human DNA and upon further analysis it matched the DNA profile of the defendant. The forensic chemist explained that the reason why bloodstains, specimens taken from the hair and nails did not contain human DNA was because they were previously soaked in smirchy water and thus contaminated. The samples proved to be inadequate. However, the vaginal swab from the victim was not contaminated and was well preserved and was therefore able to establish that the defendant raped the victim because the DNA in her vagina matched his DNA profile.

In outlining the procedure for DNA testing, the Court recognized the reliability of the outcome of the process and expressed confidence in the scientific method used. The Court thus paved the way for the introduction of these kinds of evidence in future litigation. In fact, it listed down several factors that would assist trial courts in assessing the probative value of the DNA evidence. The courts should thus consider "how the samples were collected, how they were handled, the possibility of contamination of the samples, the procedure followed in analyzing the samples, whether the proper standards and procedures were followed in conducting the tests, and the qualification of the analyst who conducted the tests."[29] By giving these factors, the Court reiterated its recognition of DNA as evidence.

It is important to note that the Court treated the DNA evidence not as direct evidence but only as circumstantial evidence. Direct evidence is that which proves the fact in dispute without the aid of any inference or presumption.[30] Meanwhile, circumstantial evidence is the proof of fact or facts from which, taken either singly or collectively, the existence of the particular fact on dispute may be inferred as a necessary or probable consequence.[31]

In trial, direct evidence bears more weight because it is positive evidence to the precise point in issue. An example of this is an eyewitness who saw an accused commit the felony. Circumstantial evidence, on the other hand, is also admissible although it refers to facts indirectly related to the fact in issue because the fact in issue could still be reasonably inferred. In criminal cases, circumstantial evidence is sufficient for conviction if: (a) there is more than one circumstance; (b) the facts from which the inferences are derived are

29. *Vallejo*, G.R. No. 144656, at 18.

30. 6 OSCAR HERRERA, REMEDIAL LAW 401 (1999).

31. *Id.* (citing People v. Ramos, 240 SCRA 191 (1995)).

proven; and (c) the combination of all circumstances is such as to produce a conviction beyond reasonable doubt.[32]

It is interesting that in spite of its pronouncements in *Teehankee* and *Andal* that scientific identification is more reliable than eyewitness identification, the Court considered the latter as direct evidence but the former as a "more reliable" form of evidence only as circumstantial evidence. In deciding against the defendant, the Court treated the results of the DNA test merely as one of the circumstances, such as the observable discomfort of the defendant upon his investigation, which produced the conviction. The Court, in effect, refrained from giving more weight to DNA evidence by failing to categorize it as a form of direct evidence.

V. ANALYSIS

A. DNA: An overview of the fingerprinting process

1. Background and Information

Deoxyribonucleic acid is the organic substance found in the nucleus of cells of living organisms which store chemically encoded genetic information. The DNA of a person is the blueprint from which a person's characteristics are derived. Structurally, DNA is a double helix — two strands of genetic material intertwined and spiraled around each other. Each strand contains a sequence of bases (also called nucleotides). A base is one of four chemicals namely adenine, guanine, cytosine and thymine. The two strands of DNA are connected at each base. Each base will only bond with one other base, as follows: Adenine (A) will only bond with thymine (T), and guanine (G) will only bond with cytosine (C). This genetic code contains the information derived from both sets of parents passed on to their children and that which determines a person's genealogical make-up.[33]

A person's appearance such as skin color, face shape and body structure is the outward manifestation of the DNA pattern. The DNA within each individual is unique. This is the result of a parent donating a unique set of genes which combine with another parent's unique set of genes. Therefore, the end result would be a child having a unique variation of DNA. The only exception is in the case of identical twins. Identical twins share the same DNA pattern because after conception, one fertilized egg splits into two. It then follows that the resulting fetuses would share the same DNA pattern.

32. REVISED RULES ON EVIDENCE, RULE 133, § 4.

33. E. Donald Shapiro & Michelle Weinberg, *DNA Data Banking: The Dangerous Erosion of Privacy*, 38:3 CLEVELAND STATE L. REV. 486 (1990).

Another attribute of DNA is its stability. The age of a person does not change his DNA, it would remain constant throughout his lifetime. Furthermore, every cell of the body contains exactly the same DNA pattern. Therefore, the DNA found in a person's blood is similar to that in his nails, skin cells, saliva and other tissues.[34] However, it cannot be found in red blood cells because DNA is contained only in nucleated cells and since red blood cells are not nucleated they do not carry DNA. One of the implications of these attributes of DNA is that a DNA sample could be gathered and if well preserved, it can be compared with other DNA samples taken years after and it would still yield accurate results. Additionally, DNA from one source such as saliva could be compared to DNA taken from another body source such as a hair follicle for example and the fact that they were derived from different parts of the body would not affect the results.[35]

2. The Fingerprinting Procedure Explained

DNA testing consists of two elements, namely, (a) the creation of a DNA profile using basic molecular biology protocols, and (b) computing the mathematical probability using population genetics.[36] The chemical structure of everyone's DNA is the same. The only difference between people is the order of the base pairs. There are millions of base pairs in each person's DNA that every person has a different sequence. Using these sequences, every person could be identified solely by the sequence of their base pairs. However, because there are millions of base pairs, the task would be very time-consuming. In response to this problem, scientists use a shorter method instead, utilizing the repeating patterns in DNA. While these patterns do not give an individual fingerprint, scientists are able to determine whether two DNA samples are from the same person, related people, or non-related people. Scientists use a small number of sequences of DNA that are known to vary a great deal among individuals, and analyze those to get a certain probability of a match.

34. Grace Gonzales, Applicability and Admissibility of DNA Testing in Philippine Courts (1996) (unpublished J.D. thesis, Ateneo de Manila University School of Law) (on file with the Ateneo de Manila Professional Schools library).

35. White et.al, *Mapping Approaches to Gene Identification in Humans*, 147 W.J. MED. 423 (1987).

36. This section will proceed to discuss the technical aspect of DNA testing. *See* Ann Meeker-O'Connell, *How DNA Evidence Works at* http:howstuffworks.com (last accessed Aug. 31, 2002)

Once a DNA sample is obtained, as a first step in creating a DNA fingerprint, the scientist will concentrate on the polymorphic[37] regions in it. There are two kinds of polymorphic regions namely sequence polymorphism and length polymorphism. Sequence polymorphisms are usually simple substitutions of one or two bases in the genes themselves. Meanwhile, length polymorphisms are simply variations in the physical length of the DNA molecule. DNA evidence uses a special kind of length polymorphism found in regions of the genome which do not produce protein. These special variations come from stretches of short, identical repeat sequences of DNA. A particular sequence can be repeated anywhere from one to 30 times in a row, and so these regions are called Variable Number Tandem Repeats (VNTRs). The size of a DNA fragment will be longer or shorter, depending on how many copies of a VNTR there are. The use of this information in DNA evidence is that the number of tandem repeats at specific places[38] on the chromosomes varies between individuals. For any given VNTR loci in the DNA, it will have a certain number of repeats. One copy of each chromosome is inherited from the mother and father. This means that an individual will have two copies of each VNTR locus, just like he has two copies of real genes.

The basic procedure used to isolate an individual's DNA fingerprint is called Restriction Fragment Length Polymorphism (RFLP) analysis. What the scientists do is to determine the number of VNTR repeats at a number of distinctive loci to come up with an individual's DNA profile. In a particular person's DNA, and in a particular VNTR area in that person's DNA, there is going to be a certain number of repeats in that area. The DNA fingerprint is made by counting the number of repeats for a specific person for a specific VNTR area. For each person, there are two numbers of repeats in each VNTR region, one from each parent and both counts are taken. Once this is repeated for a number of different VNTR regions, a profile is built for a person that is statistically unique. The resulting DNA fingerprint can then be compared with the one left at a crime scene to see if there might be a match.

Let us say that DNA is collected from a sample such as blood or saliva. The DNA would have to be isolated and purified by removing any materials which may contaminate the DNA. Once the DNA genome is isolated, it is then cut up with restriction enzymes to produce short, manageable DNA fragments. These bacterial enzymes recognize specific four to six base

37. The prefix "poly" means "many" and the root "morph" means "forms" or "shapes." A polymorphism is a place in the human genome where a base can take on multiple forms.

38. These specific places are called *loci*. A "locus" is a *unique* location on the DNA strand; a way of specifying a base or section of the genome.

sequences and reliably cleave DNA at a specific base pair within this span. Cleaving human DNA with one of these enzymes breaks the chromosomes down into millions of differently sized DNA fragments ranging from 100 to more than 10,000 base pairs long. These DNA fragments are then sorted by size using gel electrophoresis. In this process, DNA is loaded into a slab of a gel-like substance, agarose and placed in an electric field. Once the DNA has been separated, the relative size of each fragment can be determined based on how far it has moved through the agarose. Because DNA fragments that have been separated on an agarose gel will begin to disintegrate after a day or two, it is important to permanently save the DNA fragments in this segregated state by transferring and permanently affixing DNA to a nylon membrane. First, the DNA is denatured from its native double helix into a single-stranded state. The positively charged nylon membrane is then placed on top of the agarose gel and used to sop up the negatively charged DNA fragment. In order to locate a specific VNTR sequence on a single stranded DNA fragment, a DNA probe is made out of a DNA sequence complementary to that of a VNTR locus after which the probe is then labeled with a radioactive compound. The probee is then allowed to be bound to like DNA sequences on the membrane. The radioactive tag may be used to find where the probe has attached. Once the radioactive probe is stuck to its target on the membrane, a picture may be taken of it using special X-ray film, meanwhile, the X-ray film picks up radiation emitted from the natural decay of the isotope used in your probe. On the film a darkened band is seen that indicates the places on the membrane where the probe has bound to DNA containing the VNTR sequence. These darkened bands from different DNA samples could then be compared to each other to indicate similarity or dissimilarity.

However, the results from just one VNTR locus are not by itself sufficient for identification. For any given VNTR locus, a fragment length corresponding to a certain number of sequence repeats occurs in a certain number of individuals. To achieve the necessary result, a combined analysis of a number of VNTR loci located on different chromosomes should be conducted. The final DNA profile is compiled from the results of four or five probes that are applied to a membrane sequentially. Each probe targets a different VNTR locus. Using four probes would yield eight pieces of information about an individual. To add to the complexity, it turns out that each VNTR locus usually has approximately thirty different length variants or alleles. Each of these alleles occurs at a certain frequency in a population. Using four loci, the probability that you would find a given allele combination in the general population is somewhere around *1 in 5,000,000*. Therefore, analysis conducted on more bands and more loci contributes to the reliability of the test result. For example, in the United States, the Federal Bureau of Investigation conducts tests on 13 sites and the probability of someone else having the same DNA sequence is 1 in 50,000,000.

B. Potential Applications of DNA Evidence

There are several major forensic applications of DNA evidence.[39] The first is in criminal proceedings, wherein the DNA recovered from the crime scene can be used to identify the perpetrator. Since its first usage in 1986, forensic scientists have been able to identify about 700 persons to crimes by matching their genetic codes to body tissues found on the victims, weapons or crime scenes.[40]This is especially useful in rape cases because while other methods of identification such as fingerprinting succeeds in linking the suspect to the scene or weapon but not the crime, DNA samples of sperm obtained from the victim links the suspect directly to the rape itself.[41] In 1988, someone was convicted of rape in the United States for the first time using DNA fingerprinting. A test conducted on the blood cells of Tommie Lee Andrews showed that it matched the DNA samples from the sperm cells deposited by the rapist.[42] On the other hand, DNA tests have also been used to exonerate wrongfully accused and even convicted persons. A popular case is that of athlete Derrick Coleman of the National Basketball Association who was charged with rape. He was subsequently cleared after a DNA fingerprinting test on the semen involved revealed that it did not belong to Coleman.[43] Such was also the case of a convicted rapist who was freed *via* a gubernatorial pardon after DNA tests on the sperm collected from the victim proved that he could not have been the perpetrator.[44]

In civil actions, the primary application of DNA evidence would be in cases involving paternity and filiation. As previously discussed, the underlying principle in DNA parentage testing is that all genetic information passed from the parents to their children is contained in the DNA. A person's entire DNA sequence is inherited from his parents, thus all the bands in the child's DNA fingerprint must match one or both of his parent's patterns.[45] In testing for paternity, the procedure would be to eliminate the bands present in the mother. The residual bands must be present in the alleged father's DNA fingerprint. Upon comparison, the analyst would be able to determine if one is the biological father of the child.

39. Gonzales, *supra* note 34, at 29.
40. Kevin Krajick, *Genetics in the Courtroom*, NEWSWEEK, Jan. 11, 1993, at 45.
41. *Id.*
42. *Cells that convict*, U.S. NEWS AND WORLD REPORT, Feb. 22, 1988, at 11.
43. *Nets Coleman cleared of rape allegation after DNA test*, JET, Aug. 15, 1995, at 46.
44. *DNA testing frees a long-jailed man*, N.Y. TIMES, Oct. 22, 1994, at 8.
45. Gonzales, *supra* note 34, at 37.

C. Limitations

There have been challenges to the presentation of DNA evidence in criminal trials. One of these is the constitutional limitation on the power of the State to secure samples from the accused. Article III, § 17 of the Constitution states that "no person shall be compelled to be a witness against himself."[46] However, what the Constitution prohibits is the use of physical or moral compulsion to extort communication from the witness and not an inclusion of his body in evidence.[47] In the past, the Court has upheld the validity of subjecting the defendant to paraffin tests,[48] pregnancy tests[49] and handwriting analysis.[50] In the same vein, there should be no obstacle to obtaining samples from the defendant for the purpose of DNA testing.

Another cause for concern is the fact that the DNA procedure though highly touted as reliable, is not infallible. In fact, the VNTR pattern resulting from DNA fingerprinting cannot be said to be utterly unique. Actually, all that a VNTR pattern can do is present a probability that the DNA samples from two sources came from the same person. Should that probability be *1 in 5 billion* then identification would be highly reliable. However, if the resulting probability is only *1 in 50* there would still be serious doubt regarding the specific identity of the VNTR pattern's owner. Thus, there is an issue of generating a high probability. To address this problem, certain rare VNTRs or combinations of VNTRs should be used to create the VNTR pattern. This way, the probability that the two DNA samples do indeed match or correlate increases.

Furthermore, there exists the mathematical aspect of population genetics. VNTRs, are not distributed evenly across all of human population. This is because they result from genetic inheritance. A given VNTR cannot, therefore, have a stable probability of occurrence; it will vary depending on an individual's genetic background. The difference in probabilities is particularly visible across racial lines. Some VNTRs that occur very frequently among Hispanics will occur very rarely among Caucasians or African-Americans. Therefore, VNTR occurrence would lie heavily on the characteristics of a certain race and would also differ with the racial composition of a certain community. However, there is minimal research on this area, making way for more apprehension.

46. PHIL CONST. art. III, § 17.

47. JOAQUIN G. BERNAS S.J., THE 1987 CONSTITUTION OF THE REPUBLIC OF THE PHILIPPINES: A COMMENTARY 492 (1996).

48. *Id. citing* People v. Gamboa, G.R. No. 91374, Feb. 25, 1991.

49. *Id. citing* Villaflor v. Summers, 41 Phil. 62 (1920).

50. *Id. citing* Beltran v. Samson, 53 Phil 570 (1929).

Lastly, errors in the hybridization and probing process must also be figured into the probability. Any simple mistake such as using the wrong DNA sample or contaminating the sample in the process would lead to highly injurious effects. This is magnified when the DNA sample is miniscule. There would be not much room for error, especially if the analysis of the DNA sample involves amplification of the sample[51] because if the wrong DNA is amplified the consequences can be profoundly detrimental.

The reality, until recently, is that the standards for determining DNA fingerprinting matches, and for laboratory security and accuracy which would minimize error, were neither stringent nor universally codified. This is particularly distressing in light of the Philippine situation wherein the technology is highly novel. The lack of statutory recognition[52] given to DNA reflects the lack of nationwide standards in this field. The courts would have to assume as secure the internal laboratory procedures in the DNA testing site. Their assessment of the ability of the scientists who conduct the test is extremely significant as well. Else, it would be a shame if human error would cause the forfeiture of one person's liberty.

D. Ramifications of the Court's Ruling

Scientific evidence is admissible in court as real evidence but since the experiments or tests are conducted out of court, there are certain foundation requirements for its admissibility.[53] When experimental evidence is offered, it must be shown that the experiment was conducted under substantially similar conditions to those of the actual event. This would be pertinent, for example, in the case of skid tests to assess damage caused by an automobile.[54] When the evidence consists of results of examinations of a highly technical or complicated nature, a qualified expert should be presented to the court to testify as to the conduct of the test and the reality of the testing procedures.[55] When the scientific evidence becomes firmly accepted, the court may even take judicial notice of the reliability of the scientific test.[56] In any case, it must appear that the test has sufficient probative value to the material issues

51. It involves creating a much larger sample of genetically identical DNA from what little material is available.

52. Nimfa Vilches, *DNA Evidence and the Courts, at* www.inq7.net (last accessed Aug. 31, 2002).

53. 5 OSCAR HERRERA, REMEDIAL LAW 160 (1999) [hereinafter 5 HERRERA].

54. Culpepper v. Volkswagen of America, 33 Cal. App. 3d 510 (1973).

55. 5 HERRERA, *supra* note 53, at 160.

56. *Id.*

in the case. This probative value should outweigh any risk of adding confusion to the case and it must aid, not confuse the proceedings.

Although the Court has made statements in the past as to its belief in the reliability of DNA evidence, its novel application in Philippine cases still calls for the opinion of an expert witness knowledgeable in the procedure and articulate enough to communicate with the courts. Furthermore, DNA tests are extremely technical that courts cannot assess their reliability on its own. Rule 130, § 49 of the Rules of Civil Procedure states that "[t]he opinion of a witness on a matter requiring special knowledge, skill, experience or training which he is shown to possess, may be received in evidence." Expert testimony is allowed if the conclusion from the facts is beyond the capacity of ordinary or non-expert testimony. It is therefore necessary that before expert testimony is allowed, the competence of the witness must be shown.[57]

Moreover, two general elements should concur in order to warrant the use of expert testimony. According to McCormick, the subject of inference must be related to some field beyond the understanding of laymen. Also, the witness must have sufficient skill, knowledge or experience in such field that his opinion would probably aid in the search for truth.[58]

As seen in the case of *Vallejo*, the witness who testified as an expert was a forensic chemist of the NBI. By accepting the soundness of her testimony, the Court pronounced its acceptance of the competency of NBI forensic scientists in conducting and testifying on DNA evidence. In future cases, these specialists could testify as experts on DNA evidence having been shown to possess the necessary competence.

Another very important consequence of *Vallejo* is that it definitively establishes the use of DNA in sexual offenses. This could initiate a breakthrough in the prosecution of sexual offense cases as it did in the United States after its introduction.[59] A proposition has even been forwarded that the use of DNA in the prosecution of sexual offenses might serve to bar the operation of the statute of limitations. It has been argued that the statute of limitations under the Revised Penal Code rests upon the premise that

57. *Id.* at 788.

58. MCCORMICK, EVIDENCE § 13.

59. In the year 1996 there were more than 17,000 cases involving forensic DNA in the United States alone. Most of these were sexual assault cases involving DNA testing of specimens collected from vaginal swabs and semen stains. The first sexual assault defendant was convicted in the U.S. through the use of DNA evidence in 1987. Since then, DNA analysis has been used in over 20,000 cases culminating in convictions. *See* LONSWAY, *supra* note 3.

lapse of time weakens evidence. "In sexual offenses, where there is a high degree of contact between the victim and the offender a substantial amount of DNA evidence can be obtained. Due to its characteristics of non-deterioration, longevity, accuracy and invariability, DNA evidence could be used even beyond the statute of limitations since the evidence is not weakened by the passing of time.[61]

The most important implication of *Vallejo* is that it sets the precedent for the admission of DNA evidence. Even without a substantive law prescribing its application, Article 8 of the New Civil Code provides "judicial decisions applying or interpreting the laws or the Constitution shall form part of the legal system of the Philippines."[62] The doctrine of *stare decisis et non quieta movere* means "follow past precedents and do not disturb what has been settled."[63] *Stare decisis* mandates for the sake of certainty the application of a conclusion reached in one case to another case when the facts are substantially the same even though the parties may be different.[64] The main rationale for this doctrine is concern for stability in decisional law.[65] For the sake of this stability, when the Court has once laid down a principle of law as applicable to a certain state of facts, it will adhere to that principle and apply it to all future cases where the facts are substantially the same.[66] This principle entails that in future proceedings, DNA evidence in rape cases would be admissible. As the Court did not resort to an application of either the *Frye* or *Daubert* tests, it communicated the lack of need for it. Following its pronouncements in *Tijing*, the Court decided that DNA evidence is already an accepted form of scientific evidence and should it prove to be relevant, there is no need for it to pass through stringent examination as a prerequisite for admissibility. What the case of *Vallejo* achieved is to signify to trial court judges that DNA evidence is an accurate and reliable kind of evidence. It would not thus be surprising that in a number of years we would see the widespread usage of DNA evidence both in criminal and civil proceedings.

60. Ma. Carolina Orias, The Use of DNA Evidence in the Prosecution of Sexual Offenses and its Effect on the State of Limitations (2000) (unpublished J.D. thesis, Ateneo de Manila University School of Law) (on file with the Ateneo de Manila Graduate School Library).

61. *Id.*

62. CIVIL CODE, art. 8 (1950).

63. J.M. Tuason & Corp. v. Mariano, 85 SCRA 644 (1978).

64. Tala Realty Services Corp. v. Banco Filipino Savings and Mortgage Bank, 334 SCRA 114 (2000).

65. Kilosbayan v. Morato, 246 SCRA 540 (1995).

66. Republic v. Sandiganbayan, 255 SCRA 438 (1996).

VI. Conclusion

Traditionally, the Supreme Court has been hesitant to unequivocally express acceptance of DNA evidence for use in trial. This hesitation stemmed from a lack of satisfying knowledge about the whole procedure and its potential impact in future cases. It is admirable that the Court seemed to have taken measures to remedy this situation. Not only did the Court inquire into the availability of laboratory and testing facilities in the Philippines, the topic of DNA even became the subject of a paper presented during the Third Convention and Seminar of Philippine Judges Association.[67] With the Court's interest in DNA evidence, the ruling in *Vallejo* was an expected occurrence. In 2001, the Court foresaw a future decision which would rule on the admissibility of DNA evidence. Barely a year after, a *per curiam* decision achieved in setting a precedent for the admissibility of DNA evidence without much antagonism and fanfare and without even discussing admissibility standards under the *Frye* or *Daubert* cases.

The use of scientific methods in court has been increasing through the years in a variety of cases. As previously mentioned, blood grouping tests have been employed to establish paternity. Additionally, psychological tests, fingerprinting and polygraph testing have also been utilized. The use of DNA evidence is logically the next step in the collaboration of the courts and science in furtherance of justice.

67. Saturnina C. Halos, *Current Trends in DNA Typing and Applications in the Judicial System*, paper presented at the Third Convention and Seminar of Philippine Judges Association (June 11, 1999).

Airport Searches: An Additional Exception to the Search Warrant Requirement?

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