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RELEVANCE OF FORENSIC SCIENCE IN LAW AND ITS IMPORTANCE IN CRIMINAL INVESTIGATION SYSTEM

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INTRODUCTION

The word forensic comes from the Latin term forensis, meaning "of or before the forum."1 The history of the term originates from Roman times, during which a criminal charge meant presenting the case before a group of public individuals in the forum. Both the person accused of the crime and the accuser would give speeches based on their sides of the story. The case would be decided in favor of the individual with the best argument and delivery. This origin is the source of the two modern usages of the word forensic – as a form of legal evidence and as a category of public presentation. In modern use, the term forensics in the place of forensic science can be considered correct, as the term forensic is effectively a synonym for legal or related to courts. However, the term is now so closely associated with the scientific field that many dictionaries include the meaning that equates the word forensics with forensic science.

Criminal justice forms part of the set of processes, bodies and institutions that aim to secure or restore social control.2 The latter may be defined as 'the organized ways in which society responds to behavior and people it regards as deviant, problematic, worrying, threatening, troublesome and undesirable.3 Administration of criminal justice primarily rests on police, prosecution, courts and prisons. These four organs are engaged in the vital task of prevention, detection, prosecution, adjudication and penalization of offenders in society. Effective criminal justice machinery ensures a safe and peaceful society. In fact, the entire existence of an orderly society depends upon sound and effective criminal justice system.4 Amongst the functionaries of the criminal justice, the pivotal role is that of the magistrates and courts. They are responsible for deciding the guilt or otherwise of the alleged offenders and determining the sentence. This process of deciding the culpability of offenders by courts is a complex one involving appreciation of facts and evidence and establishing the charge sought to be proved. In the task, they are assisted by a specialized investigative body, the police. The latter are entrusted with the significant task of detecting and investigating crimes for the purpose of apprehending the alleged offenders and bringing them to justice. Any investigation speaks only with evidence. Truth stands proud in a Court of Law only on the solid and sound foundation of evidence".5

In the last few decades, the infusion of technology in crime investigation has been a major breakthrough in the process of advancement of criminal justice. Police utilize scientific tools and techniques to detect a crime, reconstruct the crime scene, identify the alleged offender and establish vital links; the courts, on the other, take account of these physical evidences, otherwise infallible, and determine with enhanced accuracy the innocence or guilt of the offender. Somewhere, the efficiency and effectiveness of the criminal justice functioning has come to be intertwined with the extent of use of technological tools in crime investigation.

Forensic science can be explained as a study and application of science to matters of law. This connection of science and law provides new ways and methods for discovering the reality. The word "forensic" is derived from the Latin word "forensis" which means forum, a public place where, in Roman times, senators and others debated and held judicial proceedings. Forensic science is an integrative subject combining several branches of learning used for inquiring crime scenes and collecting evidences to be used in the trial for prosecution of offenders in a court of law. The techniques of forensic science are used to scrutinize acquiescence with international agreements regarding weapons of mass destruction. Earlier, the main areas used in forensic science were biology, chemistry, and medicine. However, with time forensic science included various branches like toxicology, cyber forensic, hand-writing, fingerprinting, ballistics, forensic psychology, anthropology, geology, forensic engineering, and odentology. Forensic

1 Shorter Oxford English Dictionary (6th Ed.) Oxford University Press, 2007 ISBN 978-0-19-920687- 2
2 FRANCIS PAKES (ED), COMPARATIVE CRIMINAL JUSTICE pg. No.1 (Routledge, Oxon, Third Edition/2015).
3 DAVID SHICHOR, THE MEANING AND NATURE OF PUNISHMENT, (Waveland Press, Inc. 2006).
4 Committee on Reforms of Criminal Justice System, Government of India, Ministry of Home Affairs, Volume I, 2003.
5 U. S.Misra, CBI-The Role & Challenges 13 NPAJ Vol. 57(1 (2005).

scientists examine objects, substances (including blood or drug samples), chemicals (paints, explosives, toxins), tissue traces (hair, skin), or impressions (fingerprints or tidemarks) left at the crime scene.

Forensic expert provides an important source of information for criminal proceedings (whether international or domestic). They expertise from mass graves is no exception: findings from exhumations and examinations have featured in the ad hoc tribunals' trials and judgments. The fact is that only a very few professionals are equipped with the knowledge necessary to fully apply the potential of science in civil, criminal, and family legal matters.

HISTORY

The ancient world lacked standardized forensic practices, which aided criminals in escaping punishment. Criminal investigations and trials heavily relied on forced confessions and witness testimony. However, ancient sources do contain several accounts of techniques that foreshadow concepts in forensic science that were developed centuries later.6 The first written account of using medicine and entomology to solve criminal cases is attributed to the book of Xi Yuan Lu (translated as Washing Away of Wrongs7 8, written in China by Song Ci (1186–1249) in 1248, who was a director of justice, jail and supervision9, during the Song Dynasty.

Song Ci ruled regulation about autopsy report for court,10 how to protect the evidence in the examining process, the reason why workers must show examination to public impartiality.11 He concluded methods that how to make antiseptic and to reappear the hidden injure from dead bodies and bones, (using sunlight under red-oil umbrella and vinegar);12 how to calculate the death time (according to weather and insects);13 how to wash dead body for examining the different reasons of death.14 At that time, the book had given methods to distinguish suicide or pretending suicide.15

In one of Song Ci's accounts (Washing Away of Wrongs), the case of a person murdered with a sickle was solved by an investigator who instructed everyone to bring his sickle to one location. (He realized it was a sickle by testing various blades on an animal carcass and comparing the wound.) Flies, attracted by the smell of blood, eventually gathered on a single sickle. In light of this, the murderer confessed. For example, in the book also described that how to distinguish between a drowning (water in the lungs) and strangulation (broken neck cartilage), along with other evidence from examining corpses on determining if a death was caused by murder, suicide or an accident.

Methods from around the world involved saliva and examination of the mouth and tongue to determine innocence or guilt, as a precursor to the Polygraph test. In ancient India,16 some suspects were made to fill their mouths with dried rice and spit it back out. Similarly, in Ancient China, those accused of a crime would have rice powder placed in their mouths.17 In ancient middle-eastern cultures, the accused were made to lick hot metal rods briefly. It is thought that these tests had some validity[citation needed] since a guilty person would produce less saliva and thus have a drier mouth; the accused would be considered guilty if rice was sticking to their mouths in abundance or if their tongues were severely burned due to lack of shielding from saliva.

ROLE OF FORENSIC SCIENCE IN CRIME INVESTIGATION

Forensic science is one of the important aspects of criminal justice. Basically, it deals with scientific examination of physical clues collected from the crime scene. Forensic science explains the identity (who) of the suspect who

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6 Schafer, Elizabeth D. (2008). "Ancient Science and forensics:. In Ayn Embar - Seddon, Allan D. Pass (Eds.) Forensic Science. Salem Press p. 40. IOSBN978-1-1-58765-423-7

7 "Forensic Timeline" Cbsnews.com Retrieved 2011-12-20.

8 "A Brief Background of Forensic Science" Archived 2009-12-16 at the wayback Machine

9 Song, Ci, and Brian E. Mcknight. The washing away wrongs. Forensic Medicine in the thirteenth century China. Ann Arbor : Center for Chinese Studies, U of Michigan 1981. Print p. 3.

10 Song, Ci, and Brian E. Mcknight. The washing away wrongs. Forensic Medicine in the thirteenth century China. Ann Arbor : Center for Chinese Studies, U of Michigan 1981. Print p. 161.

11 Song, Ci, and Brian E. Mcknight. The washing away wrongs. Forensic Medicine in the thirteenth century China. Ann Arbor : Center for Chinese Studies, U of Michigan 1981. Print p. 76-82.

12 Song, Ci, and Brian E. Mcknight. The washing away wrongs. Forensic Medicine in the thirteenth century China. Ann Arbor : Center for Chinese Studies, U of Michigan 1981. Print p. 95.

13 Song, Ci, and Brian E. Mcknight. The washing away wrongs. Forensic Medicine in the thirteenth century China. Ann Arbor : Center for Chinese Studies, U of Michigan 1981. Print p. 86.

14 Song, Ci, and Brian E. Mcknight. The washing away wrongs. Forensic Medicine in the thirteenth century China. Ann Arbor : Center for Chinese Studies, U of Michigan 1981. Print p. 87.

15 Song, Ci, and Brian E. Mcknight. The washing away wrongs. Forensic Medicine in the thirteenth century China. Ann Arbor : Center for Chinese Studies, U of Michigan 1981. Print p. 79-85.

16 Parmeshwaranand, Swami. Encyclopaedic Dictionary of the Dharamasastra Volume 1. New Delhi: Sarup and Sons. p. 499 ISBN 8176253650

17 McCrie, Robert D. "General Managerial Fundamentals and Competencies."Security Operations Management. 1st ed. Amsterdam: Butterworth-Heinemann / Elsevier, 2007. 93. Print.

committed the crime. The evidence clearly indicates the type (what) of the crime committed. The circumstances speak out about the time (when) of the incident. The forensic evidence proves the location of the offence (where/crime scene).The forensic investigation finds out the modus operandi (how) of the offender. Lastly, it establishes the motive behind the crime. The forensic investigators reconstruct identity of the offender and the victim.18

During an investigation, evidence is collected at a crime scene or from a person, analyzed in a crime laboratory and then the results presented in court. Each crime scene is unique, and each case presents its own challenges19. Forensic science plays a vital role in the criminal justice system by providing scientifically based information through the analysis of physical evidence, the identity of the culprit through personal clues like fingerprint, footprints, blood drops or hair. It links the criminal with the crime through objects left by him at the scene and with the victim or carried from the scene and the victim. On the other hand, if the clues recovered do not link the accused with the victim or the scene of occurrence, the innocence of the accused is established. Forensic science, thus, also saves the innocent. After the emergence of DNA technology as a latest method of forensic science, it provides tremendous amount of information to the investigating officers that enable him to find the criminal purely from evidence which he has left at the scene of crime.20

Legal Provision:

Articles 20(3) of the Indian Constitution provide that no person accused of any offence shall be compelled to be a witness against himself. Article 20(3) is based upon the presumption drawn by law that the accused person is innocent till proved guilty. It also protects the accused by shielding him from the possible torture during investigation in police custody. Criminal law considers an accused as innocent until his guilt is established beyond reasonable doubt. The Universal Declaration of Human Rights, Article 11, states: "Everyone charged with a penal offence has the right to be presumed innocent until proved guilty according to law in a public trial at which he has had all the guarantees necessary for his defence21.

Article 20 (3) of the Constitution of India guarantees fundamental right against self incrimination and guards against forcible testimony of any witness. The fundamental right guaranteed under Article 20 (3) is a protective umbrella against testimonial compulsion in respect of persons accused of an offence to be witness against themselves. The protection is available not only in respect of evidence given in a trial before Court but also at previous stage. The protection against self-incrimination envisaged in Article 20 (3) is available only when compulsion is used and not against voluntary statement, disclosure or production of document or other material22. This right has been taken to ensure that a person is not bound to answer any question or produce any document or thing if that material would have the tendency to expose the person to conviction for a crime23. Sec. 73 of the Indian Evidence Act empowers the court to direct any person including an accused to allow his finger impressions to be taken. The Supreme Court has also held that being compelled to give fingerprints does not violate the constitutional safeguards given in Art. 20(3)24

There are questions as to whether forensic evidence violates Art. 20(3) of Indian Constitution or not? In The State of Bombay v. KathiKaluOghad& Others25, the court held that giving thumb impression, specimen signature, blood, hair, semen etc. by the accused do not amount to 'being a witness' within the meaning of the said Article. The accused, therefore, has no right to object to DNA examination for the purposes of investigation and trial.

The Bombay High Court in another significant verdict in the case of, Ramchandra Reddy and Ors. v.State of Maharashtra26, upheld the legality of the use of P300 or Brain finger-printing, lie-detector test and the use of truth

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18 N. B. Narejo, M. A. Avais, Examining the Role of Forensic Science for the Investigative-Solution of Crimes, 252 SURJ (SCIENCE SERIES) Vol. 44(2) 2012.

19 Forensic Sciences, National Institute of Justice, Office of Justice Programs, http://www.nij.gov/topics/forensics/pages/welcome.aspx, (last visited on 15.2.2016).

20 Jyotirmoy Adhikary, DNA Technology in Administration of Justice, (LexisNexis, Butterworths, 2007)

21 Universal Declaration of Human Rights, United Nations High Commissioner For Human Rights,http: //www.icnl .org /research /library /files /Transnational / UNIVERSAL _DECLARATION_OF_HUMAN_RI GHTS.pdf (last visited on 9.2.2016).

22 Justice U.C. Shrivastava, Immunity from Self-Incrimination under Art. 20(3) of the Constitution of India, JJTRI, U.P., http://ijtr.nic.in/articles/art19.pdf (last visited on 8.2.2016).

23 McDougall, Justice Robert, The Privilege against Self-incrimination: a time for reassessment , Paper presented at New South Wales Bar Association, 18 October 2008, http://www.supremecourt.lawlink.nsw.gov.au/agdbasev7wr/supremecourt/documents/pdf/mcdougall 181008.pdf, (last visited on 29.08.2014) p. 2; Ashish Goel, 'Indian Supreme Court in Selviv. State of Karnataka: Is a Confusing Judiciary Worse than a Confusing Legislation?',Vol. 44, JLPA,Asia and Latin America(2011).

24 Gaurav Aggarwal, Smart Study Series Forensic Medicine & Toxicology73 (ELSEVIER A division of Reed Elsevier India Private Limited, Gurgaon Haryana), 2009).

25 AIR 1961 SC 1808, 1962 SCR (3) 10.

26 2004 All MR (Cri) 1704.

serum or narco analysis. The court upheld a special court order allowing SIT to conduct scientific tests on the accused in the fake stamp paper scam including the main accused, Abdul Karim Telgi. The verdict also maintained that the evidence procured under the effect of truth serum is also admissible.

In a 2006 judgment, Dinesh Dalmia v State27, the Madras High Court held that subjecting an accused to narco-analysis does not tantamount to testimony by compulsion. However, in a subsequent case, i.e., Selvi & Ors v. State of Karnataka & Anr.28, the Supreme Court questioned the legitimacy of the involuntary administration of certain scientific techniques for the purpose of improving investigation efforts in criminal cases. In the above mentioned case,the Supreme Court held that brain mapping and polygraph tests were inconclusive and thus their compulsory usage in a criminal investigation would be unconstitutional.

The Code of Criminal Procedure, 1973 was amended in 2005 to enable the collection of a host of medical details from accused persons upon their arrest. Section 53 of the Criminal Procedure Code 1976 provides that upon arrest, an accused person may be subjected to a medical examination if there are "reasonable grounds for believing" that such examination willafford evidence as to the crime. The scope of this examination was expanded in 2005 to include "the examination of blood, blood-stains, semen, swabs in case of sexual offences, sputum and sweat, hair samples and finger nail clippings by the use of modern and scientific techniques including DNA profiling and such other tests which the registered medical practitioner thinks necessary in a particular case29."

However, the provision inserted through an Amendment in 2005 is limited to rape cases only. This section also does not enable a complainant to collect blood, semen, etc, for bringing criminal charges against the accused; neither does it apply to complaint cases30 .In similar lines, Section 164A Code of Criminal Procedure, 1973 provides for the medical examination of a woman who is an alleged victim of rape within twenty four hours and such examination includes the DNA profiling of the woman. Both the sections authorize any medical practitioner within the meaning of Sec. 2(h) Indian Medical Council Act, 1956 to collect a DNA sample. Question lies as to whether every medical practitioner is capable to collect and preserve DNA evidence. It is a well known fact that DNA evidence is entirely dependent upon proper collection and preservation of sample. Any simple mistake or unawareness can contaminate the sample and contaminated sample is of no use.

Under Indian Evidence Act, 1872, forensic report is considered as "opinion" tendered by expert. An expert may be defined as a person who, by practice and observation, has become experienced in any science or trade. He is one who has devoted time and study to a special branch of learning, and is thus especially skilled in that field wherein he is called to give his opinion31. The real function of the expert is to put before the court all the materials, together with reasons which induce him to come to the conclusion, so that the court, although not an expert, may form its own judgment by its own observation of those materials.32 The credibility of an expert witness depends on the reasons stated in support of conclusion and the tool technique and materials, which form the basis of such conclusion33. However, the court is free to disagree with the conclusions drawn by the expert and rely on other evidences for the purpose of decision.

The National Draft Policy on Criminal Justice Reforms34 has suggested that Indian Evidence Act needs to be amended to make scientific evidence admissible as 'substantive evidence' rather than 'opinion evidence' and establish its probative value, depending on the sophistication of the concerned scientific discipline.

Restrictive use of Forensic Evidence in Indian Legal Scenario:

The most important function of scientific investigation is to convert suspicion into reasonable

certainty of either guilt or innocence. However, till recently, the courts had to rely heavily on the non-scientific evidences because of the non-availability of proper technologies. There is a study of 2011 that shows that only in 47 cases in Supreme Court and different High Courts; DNA has played an important role. Out of these, 23.4% decisions

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27 2006 Cri. L. J 2401

28 AIR 2010 SC 1974.

29 Overview and Concerns Regarding the Indian Draft DNA Profiling Act, Council for Responsible Genetics, http://www. genewatch.org/ uploads/ f03c6d66a9b354535738483 c1c3d49e4/ India_DNA_Bill_Memo_2.0.pdf, (last visited on 2.2.2016).

30 Supra, n. 8.

31 Pragati Ghosh , Evidentiary Value of Expert Evidence under Indian EvidenceAct, 1872, http://www.shareyouressays.com/119180/evidentiary-value-of-expert-evidence-under-indian- evidence-act-1872, (last visited on 6.04.2015).

32 S.C. Parakh, 'Expert Witness' 421IJA Vol.55 (2011).

33 Prof. (Dr.) B. P.Tiwari, Evidentiary Value of Expert Opinion, 23 IIRRJ Vol. IV (2012).

34 Report of the Committee on Draft National Policy on Criminal Justice, Ministry of Home Affairs, Government of India, July, 2007.

were given by Delhi High Court alone. Furthermore, DNA evidence had been used in merely 4.7% murder cases and 2.3% rape and murder35. In yet another study of rape cases over the decade, the author has indicated that there has been an increased reliance by Indian courts on forensic evidence and DNA over the years, even though the figures are abysmally low and concerted efforts are needed to include scientific evidence in all criminal matters, where applicable36

The area of forensic science in India has, yet, not been fused. Many a time, neither the judge, nor the lawyer nor even the police appreciate fully, the advances or the extensive, promising potentialities of the science and the fusion of new technologies, methodologies, modalities and research. Multitask and multi-professional nature of forensic science needs an inter-professional approach, which is, many a time, lacking.37

The Committee on Reforms of Criminal Justice System38 also indicated that the present level of application of forensic science in crime investigation is somewhat low in the country, with only 5-6% of the registered crime cases being referred to the FSLs and Finger Print Bureau put together. There is urgent need to bring about quantum improvement in the situation, more so, when the conviction rate is consistently falling over the years in the country and the forensic evidence, being clinching in nature, can reverse the trend to some extent.

The reasons for reluctance of courts to use forensic evidence in criminal investigation are various. Mismanagement of physical evidence, including improper collection, preservation, non collection of clue evidence, non-maintenances of chain of custody, as well as delayed dispatch of physical evidence for scientific analysis has been repeatedly commented upon by the courts. Not sending an accused for medico-legal examination, non-lifting of fingerprints by the I.O or when bloodstained mortal object had been sent for chemical examination without covering the same by a wrapper immediately after seizure of the same then it's obvious that court would reject the report.39

Sometimes scientific evidence suffers from some kind of technical lacunas such as non-mention of blood group in Serologist's report40, tests were not done meticulously41, no supportive data were provided by the Expert along with report42, delayed examination of exhibits at the laboratory43 etc.

Delayed examination of exhibits at the laboratory can turn the merit of a case into a negative version. The delayed examination of biological, serological and viscera exhibit in poisoning cases puts a big question mark on the authenticity of evidence. The putrefaction of such exhibits can generate alcohol in the exhibits, on long standing, and may also not permit the detection of poison and conclusive serological results; likewise, in cases of drunkenness, the blood alcohol or urine alcohol negative samples may test positive for the presence of alcohol due to self-generation of alcohol on the putrefaction of samples. Sometimes, it is not possible for the Autopsy Surgeon to clarify the mode of death.44

Medico-legal examination is done to unearth real cause of injury or death. It can clearly tell the nature of death i.e. accidental/suicidal/homicidal and injury also. Documentation of medico-legal examination should, therefore, be prepared very carefully in order to arrive at scientific findings, which in many cases is not done in an appropriate manner. Forensic case data, thus, is still poorly integrated into the investigation and crime analysis process, despite evidence of its great potential in various situations and studies.45

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35 Dr. Nirpat Patel, Vidhwansh K Gautaman, ShyamSundarJangir, The Role of DNA in Criminal Investigation-Admissibility in Indian Legal System and Future Perspectives,15-21IJHSSI Vol. 2 (2013).

36 Dipa Dube, 'Determining the Applicability of DNA Evidence in Rape Trials in India', Vol. 2 (1), IJSSR, 2014.

37 Justice Jitendra N. Bhatt, A Profile of Forensic Science in Juristic Journey, http://www.ebc- india.com/lawyer/articles/2003v8a4.htm (last visited on 28.2.2016).

38 Committee on Reforms of Criminal Justice System, Government of India, Ministry of Home Affairs, Report, Volume 1, March 2003.

39 A. Dutta, R. C.Arora,and Dr. P.C. Sarmah, Analysis of Problems related to Forensic Examination in Offences against Human Body and Need for Auditing, Vol. LVIII (3),IPJ& pg. no.10-11(2011).

40 Kasha Beharav.State of Orissa, AIR 1987 SC 1507.

41 Himanashu Pahari v.State, (1986) Cri. L.J. 622.

42 Mahmood v. State of U.P., AIR 1976 SC 69.

43 Mahavir Singh v.State, Cri. Appeal No. 498/2007, decided on 22.5.09.

44 Enamul Haque v. State of West Bengal, CRM 17348 of 2010 & AST 1114 of 2010.

45 Olivier Ribaux, Simon J. Walsh and PierreMargot, The contribution of forensic science to crime analysis and investigation: Forensic intelligence, 171-181FSI vol.156 (2006).

IMPORTANCE OF FORENSIC SCIENCE IN CRIMINAL INVESTIGATIONS

Imagine a world where criminals run freely. Detectives and police officers collect evidence much the same way as they do today, but there is one main difference. Science is not used. Due to the lack of scientific analysis, there would not be a lot of useful evidence. Without the use of science, criminals could not be convicted of their crimes, ranging from common theft to a homicidal rampage, unless there was an eyewitness present at the crime scene when the crime occurred. Murderers would continue killing, thieves would continue stealing, and drug traffickers would continue dealing. Fortunately, in today's world, science is used in solving crimes. Clues a criminal leaves behind can be traced to themselves through scientific evidence. This field of science dealing with criminal investigation is known as forensic science, which roughly means the application of science to law (Microsoft 200). Forensic science can be used to determine many things from the evidence when it is collected properly without any contamination. Throughout history, evidence has been used to convict criminals of the crimes that they have committed. Today's society has improved upon the methods of the past to bring about more precise and accurate techniques. These techniques are more commonly known as the field of forensic science.

SUGGESTIONS

Forensic science has grown in its complexity and importance over the past several decades. This has led to greater demands being placed on law enforcement. In several cases, law enforcement has been questioned and criticized in the identifying, securing, and handling of critical forensic evidence. There is a clear need for law enforcement personnel to be more knowledgeable about forensic science criminal evidence.

College and universities provide the skills, knowledge, and problem-solving abilities necessary for complicated, changing tasks to be carried out (Lindqusit 1995). Therefore, colleges and universities are important in helping the field of forensic science to grow (Tilstone 1991). Criminal justice and criminology programs have responded by creating offerings ranging from a single course to a multitude of forensic science courses covering such sciences. The main goal of these courses should be to broaden the knowledge of students rather to make them experts. Students need to be aware that a handful of forensic science courses will not aid them in finding employment with crime laboratories (Lindquist 1994). Instead, these courses shall aid them in pursuing a law enforcement career.

CONCLUSION

In Indian scenario, there has been increased emphasis on the use of such technologies in criminal investigation and trials. The Commissions appointed on reforms of criminal justice have reiterated that the infusion of technology in crime detection can help the system to function efficiently. The relevant laws have been amended from time to time to make way for use of forensic technologies in crime investigation and trial. Yet, it may be said that there are existent flaws in the laws which need to be addressed. The courts are also reluctant to rely on scientific evidence due to their restrictive approach, or certain inherent defects in the evidence as produced.