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ABOUT US

"Journal of Unique Laws and Students" (JULS) which shall provide law students, young lawyers and legal professionals to deliberate and express their critical thinking on impressionistic realms of Law. The JULS aims to provide cost free, open access academic deliberations among law students and young lawyers. The ISSUE III of Volume I focuses on three themes i.e. (i) Arbitration Law (ii) Competition Law, and (iii) Criminal Law.

The journal strives to contribute to the community with quality papers on a vast number of legal issues and topics written by authors from various groups that have been reassessed and revised by our editorial team to reach the highest possible standard.

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PREFACE

On looking at today's scenario, there are numerous issues to know about. Our journal`s Issue III of Volume I has work on three crucial themes namely ***Criminal Law***, ***Arbitrational Law*** and ***Competition Law***. We would like to express our deep appreciation of the co-operation of the contributors, who so willingly devoted their time and energies.

We have tried to cover these wide topics with the relevant research and landmark judgments. We have used standard of words for the explanation, evenly attempted to clear the concepts and presented captivating writing to the readers. The works also contains some suggestions in respective fields.

The views expressed in the articles are purely and solely of the authors and the entire team of the Journal has no association with the same. Although all attempts have been made to ensure the correctness of the information published in the articles, the Editorial team shall not be held responsible for any errors that might have been caused due to oversight or otherwise. It is up to the rest of us to help make the journal a success story in the next several years.

FOREWORD

As a member of the Advisory Board of Journal of Unique Laws and Students (JULS) which seeks to support student dynamism in action, I take pride in writing this very brief Preface to **Issue III of Volume I** of the Journal. Through this sturdy student-led initiative, the Journal provides young lawyers and law students of the opportunity to deliberate on legal issues of contemporary interest and to express their well-researched conclusions in the form of double-peer reviewed articles.

In this issue of the JULS I am happy to see a wide array of articles on *Alternate Dispute Resolution (ADR), Arbitrability, Competition Law, Juvenile Delinquency, Gender Crime, Cybercrime, Criminalisation of Politics, Sedition and Witness Protection*. Laws and legal systems are dynamic in nature and laws evolve or are enacted to suit the changing needs of society. Young lawyers and law students can contribute to this dynamic process and even recommend law reform or analyse existing laws including case law. Young lawyers can also contribute to society as civil society activists engaged in efforts to improve the quality of law and its administration. The inculcation of critical thinking, which is one of the main objectives of the JULS, can no-doubt stand in good stead to young lawyers in moulding their future careers.

While I am happy that the very first issue of the inaugural volume of JULS was a tremendous success and its wide array of articles on diverse topics were well received by the legal fraternity, I take this opportunity to thank the contributors of articles as well as the vigilant and hardworking Editorial Board and my colleagues in the Advisory Board for the high standards achieved. In this Foreword, I take the opportunity to thank the publisher for coming out with another issue of JULS almost in time despite the trying conditions in which lawyers work and law students are placed, and I am glad that JULS through its on-line presence, is able to contribute immensely to this process of dissipation of legal knowledge and skills.

Justice Saleem Marsoof PC

Judge of the Supreme Court of Fiji

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EDITOR'S NOTE

Unique Law was established in the month of April 2020 and cheerfully brings **Volume 1 Issue III** of **Journal of Unique Laws and Students (JULS)**. This journal has become a successful climb in reaching to our goal of gaining visibility in the academic front and becoming a great platform in education community.

The journal aims to present merit papers on the numerous legal issues and these topics are authored by various groups of individuals that have been reappraise and emended by our team of editors to attend the highest possible excellence. These research papers, case analysis and shortnotes are the result and we feel privileged to have been able to act as editors.

We thank to all our authors for their obedient submission to the third issue of the Journal by Unique Law and also for their productive cooperation with the editorial team to garnish their work with perfection. We would also like to express our gratitude to our diligent editorial board, whose restless support and commitment made this Journal's Issue III a success.

TABLE OF CONTENTS

Arbitrability of IPR Disputes 1
Author: Aishani Navalkar

A Study of Juvenile Delinquecy 15
Author: Vidhika Panjwani

Competition Law: Precursors, Practice and Problems 33
Author: Sathya G. Krishnan

Criminalization of Politics Challenge to Indian Democracy 49
Author: Abhisena Singh

Critical Analysis of Reclusive Custody 60
Author: Akanksha Kumari

Cybecrime multifaceted one 72
Author: Mitali Aryan

Gender Crime in India- An Analysis under Indian Criminal Laws 95
Author: Rounit Deep

International Competition Aviation: An Analysis 111
Author: Vandana

Mob Lynching due to Mistaken Identities 123
Author: Juhi Handique

Juvenile Delinquency and Crime Prevention 142
Author: Simran Karamchandani

Matters Concerning Seat and Venue of Arbitration: Critical and Comparative Analysis 164
Author: Prity Kumari

Prevention Mechanism of Youth Crime 182
Author: Riddhi Rahi

Road Map of Evolution and Development of Competition Law: India .. 200

Author: Jaishree Singh

Scientific Mechanisms in Crime Investigation: A Study …….. 213

Author: Anisha Tak

Sedition Law: A Friend or Foe? …… 226

Authors: Aryan Data & Khushi Gupta

Understanding Sedition Law in India …… 239

Author: Golak Bihari Mahana

Witness Protection Scheme, 2018- A step towards Witness Protection .. 248

Author: Gargi Ojha

Witness Protection Schemes …… 259

Authors: Madhavi Sinha & Shikshanjali

Short note: An overview of Indian Courts helping hand: Alternative Disputes Resolution

……...…….. 274

Author: Tusharika Singh Gaharvar

Case Analysis: Bachan Singh V. State of Punjab AIR 1980 SC 898 …… 283

Author: Aarush Bhardwaj

Case Analysis: R V. MCNaughton (1843) 8t. R. 718 …….. 289

Author: Sristi Bubna

SCIENTIFIC MECHANISMS IN CRIME INVESTIGATION: A STUDY

Author: *Anisha Tak*[*]

ABSTRACT

This research paper aims at highlighting the application of scientific mechanisms or measures in conducting crime investigation. The elements of the scientific investigation like forensic medicine, scientific laboratories, digital forensics, criminal investigation and other scientific techniques are discussed. The legal provisions in India dealing with forensic science although not explicitly, like certain sections of the Indian Evidence Act, 1872 and the Criminal Procedure Code, 1973 are described. Consonance with constitution of some methods of scientific investigation of crimes like handwriting and signature identification, fingerprint, impressions of thumb, palm and foot ascertainment tests, narco analysis tests are examined. The constitutional validity is analyzed in regards to article 20(3) of the constitution. The issues and problems existing in the sector of forensic science in reference to research, training, education, laboratories, etc. are discussed. Various measures that could be employed for strengthening this field and upgrading its contribution in the crime investigation are also analyzed.

Keywords: *Scientific measures, Investigation, Narco, Forensic,Crime*

[*] 2nd year BA LL.B. (Hons) ; student of Rajiv Gandhi National University of Law, Punjab; Available at: anishatak20026@rgnul.ac.in

INTRODUCTION

Science plays a significant role in detection and investigation of criminal activities. Three categories could be framed to explain the contribution of science in investigation process. This includes forensic science, scientific laboratories, forensic medicine and criminal investigation, digital forensics and several other scientific techniques that have the objective of establishing evidence to deal with the legal issues.[1] Application of scientific methods in a structured manner is mainly done in investigation of crimes like murder or crimes that are committed against person. It includes formulation of an appropriate plan, development and construction of a suitable approach to handle the problem in question and then final interpretation and analysis of the conclusion accurately. In certain incidents, it becomes important to devise a chain of evidence to clarify the results obtained from the investigation.[2]

Evolution of scientific knowledge promotes the law enforcement institutions to apply the scientific methods in investigation. These instruments enable the proper scrutiny of the clues or traces found at the crime scene and the relevant proofs found with the persons involved in the same. A scientific report is prepared after the scrutiny of all these evidences. This report further assists the police in conducting investigations and later can be produced before the courts. Thus, scientific methods assist courts in taking decisions.[3] The evolution of scientific way of investigation is different for different nations. [4]

CONSTITUENTS OF SCIENTIFIC INVESTIGATION

a. Scientific Laboratories

Forensic science includes scientific laboratories to conduct scientific investigation. Inspection of the biological samples taken, human tissues and body fluids is done. Such samples are taken in several cases like that of poisoning, in the cases that involve the use of drugs and alcohol, etc. The officials of the laboratories are working in independent capacity of the police

[1] Francis E. Camps, *Science and Crime Detection*, 118 JOURNAL OF THE ROYAL SOCIETY OF ARTS 200, 200-210 (1970), http://www.jstor.org/stable/41370467, Sherry L. Xie, *Building Foundations for Digital Records Forensics: A Comparative Study of the Concept of Reproduction in Digital Records Management and Digital Forensics*, 74 THE AMERICAN ARCHIVIST 576, 576-599 (2011), http://www.jstor.org/stable/23079051

[2] J. B. Firth, *Forensic Science*, 93 JOURNAL OF THE ROYAL SOCIETY OF ARTS 228, 228-244 (1945), http://www.jstor.org/stable/41361975

[3] Alexander Joseph, *Scientific Instrumentation in Criminal Investigation*, 36 THE SCIENCE TEACHER 38, 38-42 (1969), http://www.jstor.org/stable/24152502

[4] Firth, *supra* note 2

department. Hence, these scientific investigators are impartial and give report which is not under the influence of police and therefore, have the authority to relieve the accused. [5]

Generally, police officers who have got the relevant training, select, collect, mark and pack the suitable material from the crime scene. The staff of the laboratories advice the crime scene officers in this regard. New techniques have been developed to scrutinize the stains of blood, skin, fluids, tissues, etc. under different type of conditions. The aim behind evolution of the new scientific methods and connection of these scientific techniques with the law enforcement framework is to assure that the resulting evidence would be productive. [6]

b. Forensic Medicine

Usually, two types of doctors play an essential part in scientific investigation. A police surgeon who examines the bodies of those people who die due to abnormal reasons or die through application of violence. They also examine the accused when they are charged for sexual offences or conduct of violent activities to ascertain whether they are required to be detained or not. Blood samples are also examined. Forensic pathologists are another kind of doctors who execute the autopsy of the bodies in post mortem rooms. This includes the use of X- Ray and photographic provisions. Fields like pathology, biology, physics, chemistry, metallurgy, firearms, pharmaceuticals, telecommunication, etc., are also taken into account under the scientific investigation. These fields are applied in coordination with the forensic science equipment and laboratories.[7]

c. Criminal Investigation

Police officers have the competence of conducting the investigation of crime. They have the man-power, expertise to carry out interrogations, connections with other police departments, team cooperation, etc. The scientific methods assist the investigation being conducted by the police officers. Coordination between the forensic scientists and the police officers allows handling the crime investigation in an efficient manner. The approach of the investigation being conducted by the police must be in reference to the findings in the autopsy and to the results obtained by the forensic laboratories. [8]

[5] Camps, *supra* note 1
[6] *Ibid*
[7] Camps, *supra* note 1
[8] *Ibid*

The interpretation and analysis should be done in an efficient manner by the forensic scientists so that the results prove to be constructive for the investigation. Efforts should be made to find accurate and speedy results through the means of the scientific methods. The scientific investigators should be an essential part of the police team carrying out the investigation. Hence, scientific methods provide great aid in finding the evidences and in the investigation process.[9]

d. Digital Forensics

Digital Forensic is a part of the forensic science. Digital forensics attempt to probe into the digital or electronic devices/ instruments and digital form of information that is generated by or stored into such devices. [10]

e. Other Scientific Instruments

The field of scientific methods is continuously widening. The range of forensic science is increasing gradually. Several technologies have developed in the contemporary times that is contributing in carrying out scientific investigation. Some of these are DNA tests, fingerprint technology,[11] handwriting identification, hair comparison[12], facial recognition or reconstruction, scanning electron microscopy, alternative light photography, LA-ICP-MS, etc.[13]

LEGAL PROVISIONS IN INDIA WITH REGARDS TO SCIENTIFIC INVESTIGATION

a. Indian Evidence Act, 1872

The Indian Evidence Act, 1872 (now would be mentioned as IEA, 1872) does not clearly deals with the position of the forensic or scientific evidences in the crime investigation and establishment of the same. However, certain sections deal with the status of such scientific techniques in the investigation.

[9] *Ibid*
[10] Xie, *supra* note 1
[11] B. Fakiha, *Technology in Forensic Science*, 7 THE OPEN ACCESS JOURNAL OF SCIENCE AND TECHNOLOGY 1, 1-10 (2019), doi:10.11131/2017/101258
[12] D. Michael Risinger, *The Nas/Nrc Report on Forensic Science: A Glass Nine-Tenths Full (This is About the Other Tenth)*, 50 JURIMETRICS 21, 21-34 (2009), http://www.jstor.org/stable/41550024
[13] Fakiha, *supra* note 11

Section 45 of the IEA, 1872 specifies that when the court is required to devise a view on certain matter that involves the questions of science or identification of the handwriting or fingerprints then the viewpoint of the expert who is a person possessing special skills in the field of science or in identification of handwriting or fingerprints on the question raised would be accounted as a relevant fact.[14]

Section 45A of IEA prescribes that if in a proceeding, there is a requirement for the court to frame a view on any point that is connected with any information that is send out or stored in any computer resource or in any digital or electronic form, the view of the Examiner of Electronic Evidence as per section 79A of the Information Technology Act, 2000 would be considered as a relevant fact. Such view of the examiner would be accounted as a viewpoint of an expert.[15]

If there is a requisite that a view needs to be formulated by the court in regards to the signature of a person that is in digital form then the stance of the official establishment that has certified such signature would be regarded as a relevant fact as delineated in section 47A of the IEA, 1872. [16]

Section 65B of the act, prescribes some requirements that should be fulfilled so that the electronic records could be admitted as a proof in the court. It is stated that the electronic records holding any information could be printed on a paper, stored, recorded or copied in optical or magnetic media produced by a computer and if the conditions mentioned in regards to the computer and information are found to be fulfilled then, such information would be accounted as admissible in the court without requiring further proof.[17]

Section 67 of the act states that the handwriting or signature that is claimed to be of a person on a document is required to be proved as that person's handwriting or signature. Section 67A of the act specifies that if it is argued that on an electronic record, electronic signature of a subscriber is attached then it must be proved that the electronic signature in question is that of the acclaimed subscriber. [18]

The court is empowered to compare the writing, seal or signature in question with the writing, seal or signature that is proved as per the satisfaction of the court to be of the person upon

[14] The Indian Evidence Act, 1872, § 45, No. 1, Acts of Parliament, 1872 (India)
[15] *Ibid.*, § 45A
[16] *Ibid.*, § 47A
[17] The Indian Evidence Act, 1872, § 65B, No. 1, Acts of Parliament, 1872 (India)
[18] *Ibid.*, § 67

whom it is alleged that the writing, seal or signature in question is his writing, seal or signature, to ascertain whether such claim is right or not. This method is applicable when there is a question to identify whether the finger impressions are of the alleged person or not. The court can ask a person who is attending the court to write down some words or figures to compare the same with those words or figures that are claimed to be written by the person so asked, in accordance to section 73 of the IEA, 1872[19]

Court can instruct to verify whether the digital signature that are claimed to be of certain person is his digital signature or not. This verification can be done by furnishing the Digital Signature Certificate by that person or the Controller or the Certifying Authority or by applying the public key given in the Digital Signature Certificate by any person for verification of such digital signature as specified in section 73A of the IEA, 1872.[20]

b. The Code of Criminal Procedure (CrPC), 1973

Some provisions specified in CrPC, 1973 are connected with the scientific methods of investigation of crime. These are-:

Section 53(1) of CrPC, 1973 allows for examination of the person alleged and arrested to have committed such offence which is of the nature or committed under such conditions that reasonable basis could be established as to form the opinion that examination of that person could be accounted as evidence for the commission of the alleged offence. This inspection by a registered medical practitioner would be considered as per law, when requested by a police officer whose rank is not under that of the sub-inspector and for any person who is working in bonafide faith and under his direction and assistance, for examining such person who is arrested as is essential on reasonable grounds to discern the facts that could be accounted as evidence in the court. Reasonable force that is necessary could be used for this purpose.[21]

Section 53A (1) permits examining a person who has been charged and arrested for committing or attempting to commit the offence of rape and reasonable basis could be established as to form the opinion that such examination of that person could be accounted as evidence for the commission of the alleged offence. This examination by a registered medical practitioner who is engaged in a government operated hospital or hospital governed by a local authority and in case of the unavailability, examination by any other registered practitioner of medical science

[19] *Ibid.*, § 73
[20] *Ibid.*, § 73A
[21] The Code of Criminal Procedure, 1973, § 53(1), No. 2, Acts of Parliament, 1974 (India)

within the radius of sixteen kilometres from the site where the offence has taken place, would be considered in consonance with law, when requested by a police officer whose rank is not under that of the sub-inspector and for any person who is working in a bonafide manner and under his direction and assistance, to examine such person arrested as is essential, on reasonable grounds to discern the facts that could be accounted as evidence in the court. Reasonable force that is necessary could be used for this purpose. [22]

A record of examination should be made in which the injuries or marks, if any, found on the accused should be included. The details of the material taken from the person of the accused for the purpose of DNA profiling should also be given. Reasonable information of the other material particulars should also be provided in this record.[23]

Section 54(1) of the CrPC, 1973 states that the inspection of the person arrested could be performed by a medical officer who is employed in Central or State service, immediately as the arrest of such person takes place, in unavailability of the medical officer, the examination could be performed a registered medical practitioner.[24] A report of examination should be created in which the injuries or marks of violence found on the body of the accused arrested and the estimate of the time of infliction of these injuries or marks should be included. [25]

Section 164A (1) of CrPC, 1973 allows for medically examining a woman upon whom the offence of rape is claimed to be committed or attempted to be committed. This inspection needs to be done by a registered medical practitioner after such women gives her consent for the same or after any person capable of giving consent on part of such women, provides the consent.[26] A report of examination needs to be prepared that shall comprise the information of the material collected from the person of the woman for DNA profiling, marks or injuries found, other relevant information with reasonable detail, general condition of the mental health of the women, etc. [27]

Examination in the above stated sections 53A, 54 and 164A of CrPC includes the examination of blood, blood stains, semen, swabs in the matters involving sexual offences, sputum and sweat, hair samples and finger nail clippings by the employment of modern and scientific techniques that consists of DNA profiling and several other such tests which are considered

[22] *Ibid.*, § 53A (1).
[23] *Ibid.*, § 53A (2).
[24] *Ibid.*, § 54(1).
[25] *Ibid.*, § 54(2).
[26] The Code of Criminal Procedure, 1973, § 164A (1), No. 2, Acts of Parliament, 1974 (India)
[27] *Ibid.*, § 164A (2).

essential by the registered medical practitioner in accordance to the specifications of each case. [28]

The police officers have to conduct investigation and prepare a report stating the apparent reason of death, giving information of such wounds, fractures, bruises, and other marks of injury as may be found on the body, and stating in what way, or by what weapon or instrument (if any) that may seem to cause such marks in case a person commits suicide or is killed by another person or by machinery or by animal or in an accident or under such conditions that creates reasonable question of execution of an offence as per section 174 of the CrPC, 1973.[29] 174 (3) of this section lays down certain provisions under which as per the rules of the State government, the body can be given for examination to nearest Civil Surgeon or any other qualified medical person appointed on part of the state government.[30]

Section 176 of CrPC states that the Judicial Magistrate or the Metropolitan Magistrate or Executive Magistrate or police officer conducting inquest or investigation can also direct for the examination of the body for the determination of cause of death of person in consonance to 174(3) (i, ii) of CrPC.[31]

A Magistrate can also direct for the medical examination of the accused for enquiring about the unsoundness of mind in case, the magistrate has relevant reasons to consider that the accused is of unsound mind and therefore, not competent to make his defence as per section 328 of CrPC code.[32]

Section 292 of the CrPC, 1973 states that any document which has the objective of being a report in the hands of Forensic Department or Division of Forensic Science Laboratory when submitted to him, in accordance to the notification of the central government for examination and report on any matter or thing during the course of proceeding can be accounted as a proof in case of any inquiry, trial or other proceeding as delineated in the provisions of this code. [33]

[28] *Ibid.*, § 53.
[29] *Ibid.*, § 174(1).
[30] *Ibid.*, § 174(3).
[31] *Ibid.*, § 176.
[32] The Code of Criminal Procedure, 1973, § 328, No. 2, Acts of Parliament, 1974 (India)
[33] *Ibid.*, § 292.

CONSTITUTIONAL VALIDITY OF SOME SCIENTIFIC METHODS

Article 20(3) of the Indian Constitution states that any person who is alleged of some offence cannot be compelled to be a witness against himself.[34] Right of protection against self-incrimination constitutes an essential element of common law criminal jurisprudence. This right is provided to a person upon whom accusation of an offence has been done. It safeguards the accused from becoming a witness and providing evidence against himself under compulsion.[35]

The field of science is advancing and different scientific methods are being developed that could be used to deal with crime.[36] The scientific tests prove to be very instrumental in conducting investigation. For example, test like Narco Analysis could aid the investigative agency when it is completely in dark and is not able to find any clue to establish the facts, evidences and truth. Such tests could provide some clues to the agency through which direction to continue the investigation could be established through which justice could be ensured to the innocent and the guilty could be punished. This kind of test is performed as a last resort only.[37]

Some of the scientific methods raise the question whether they are in conformity with the constitution of India. Many contentions were raised against the tests like Narco, DNA, etc., that they contravene the fundamental right against self-incrimination. The issue arises on the point whether these scientific methods could be utilized to collect the evidence against the accused. The courts have analysed some of the scientific methods and dealt with the issue of their validity. [38]

a. Fingerprints, Handwriting and Signature ascertainment Test

The honourable Supreme Court considered the validity of the scientific methods of handwriting and finger impressions identification in accordance to the Indian Constitution in the case of the State of Bombay v. Kathi Kalu Oghad and Ors. It was stated that "to be a witness" refers to providing knowledge related to the relevant facts in the question. This means communication of the personal knowledge of facts to the court that is having the nature of personal testimony

[34] INDIA CONSTITUTION. art. 20, § 3.
[35] MP JAIN, INDIAN CONSTTUTIONAL LAW (Lexis Nexis 8th ed. 2018)
[36] A.S. Dalal and Arunava Mukherjee, *Constitutional and Evidentiary Validity of New Scientific Tests*, 49 JOURNAL OF THE INDIAN LAW INSTITUTE 529, 529-542 (2007), http://www.jstor.org/stable/43952091
[37] Santokben Sharmanbhai Jadeja v. State of Gujarat, (2008) 1 GLR 497
[38] Dalal and Mukherjee, *supra* note 36.

makes one a witness. Summoning of a person by the authorities to provide a document for comparing the handwriting, signature or fingerprints, is a kind of mechanical process for conducting the investigation and inquiry of the case. Furnishing such document could not be considered as a statement which is having some personal knowledge that the accused possesses and thus, does not have the nature of personal testimony. Therefore, it cannot be considered that compelling the accused to give his fingerprints, impressions of palm, foot, thumb, specimen of handwriting or signature, by themselves incriminate the accused or has the tendency to do so. They are just a way to establish the facts and relevant issues in the case. Therefore, compelling an accused to furnish them does not breach article 20(3) of the Indian Constitution because the accused is not being forced to become a witness against himself. [39]

b. DNA Profiling

In Selvi and Ors. v. State of Karnataka, the dispute was on the constitutional validity of the DNA profiling method provided under the methods of medical examination as per sections 53, 53A and 54 of the CrPC, 1973 for conducting investigation. The honourable Supreme Court held that DNA profile is generation of a record through the DNA samples which are obtained from the bodily substances. The nature of DNA samples is that of the physical evidence against a person and is not like a personal testimony. They are the instruments to establish the link between the accused and the criminal act committed. Medical examination of DNA profile cannot be considered a testimonial act. Therefore, conducting this examination cannot account as impelling the accused to work like a witness against himself. Therefore, it is not against the provision delineated in article 20(3) of the Indian Constitution.[40]

c. Narco Analysis

In Santokben Sharmanbhai Jadeja v. State of Gujarat, the honourable Gujarat High Court described that Narco test results in the neutralization of the imagination of the person on whom such test is executed. The reasoning capacity is affected. The subject is able to answer simple questions and questions related to the facts that he already is aware of. It is difficult for the subject to lie or give false answers. After the administration of the test the subject is interrogated and the investigators record the answers to prepare a report to establish the evidences and discern the facts and truth. Article 20(3) of the Constitution is violated when a person is forced to become a witness or give statement against himself. Therefore, if the

[39] State of Bombay v. Kathi Kalu Oghad and Ors., AIR 1961 SC 1808.
[40] Selvi and Ors. v. State of Karnataka, AIR 2010 SC 1974.

statement recorded in this test is used against the accused and incriminates him then this test would be encroaching upon the protection given in this article. However, mere performance of the test that does not incriminate the subject(accused) cannot be considered a compulsive personal testimony. Thus, it is not against the constitutional provisions. [41]

ISSUES PREVALENT IN THE USE OF SCIENTIFIC METHODS

The point that the evidences generated through the use of forensic science are always reliable and accurate does not hold true in the real scenario. There is insufficient scientific research for confirming the authenticity of the results generated through the employment of scientific ways in investigation. There is a lack of research that could provide some measures which could quantify the uncertainty that could be found in the results of the forensic examinations. The strict standards of performance required in the scientific investigation are sometimes not sticked to. There is absence of proper administration in the forensic science area in some cases.[42]

Inadequacy of the research schemes highlights the biasness that could arise at the time of observation done by humans and the causes of human errors that could occur in the scientific analysis is one of the issues. Insufficient exploration of the new technology and inadequate survey of innovation are some impediments found in this field. One of the obstacles is the want of autonomy to the crime laboratories. In some cases, there is a lack of uniformity and compulsory licensing for the laboratories. The experts of forensic science field sometimes, do not report the outcomes of the examination in the standard and ordinary ways. Insufficiency and inefficiency in the education and training programs in the sector of forensic science is also a major issue.[43]

Measures for Upgradation of Scientific Mechanisms in Investigation Process

There is a requirement of development of the scientific methods and instruments for dealing with the issue of rising use of science in the violation of law and criminal activities. Research and development in the field of scientific investigation of crime is needed to be strengthened. The research could be done in the areas that enables making the operations of the scientific

[41] Santokben Sharmanbhai Jadeja v. State of Gujarat, (2008) 1 GLR 497.
[42] Harry T. Edwards, *Solving the Problems That Plague the Forensic Science Community*, 50 JURIMETRICS 5, 5-19 (2009), http://www.jstor.org/stable/41550023
[43] *Ibid.*

investigations better, bringing innovation in the analysis aspect of the examination, ensuring accuracy in interpretating the results, innovating new technology that could raise the efficiency of the laboratories, etc. Funding should be assured for these research projects. Forensic scientists and researchers need to be encouraged and incentivised to conduct the research.[44]

Forensic science is a dynamic field therefore, the forensic scientists should also be dynamic. Trainings need to be provided to the practitioners so that they could adapt to the comprehensive field of forensic science. Trainings would aid them in updating their knowledge. The trainings could also be provided in the fields of medicine, law, technology, etc., in addition to the trainings in forensic science. Forensic science comprises of several domains, different and unique techniques and diverse interpretations. Therefore, for learning forensic science and skills associated with it in a productive manner, formal education is required to be provided. Scientific investigation is aiding in delivering justice to the society. Hence, quality education is necessary for the development of quality professionals in this area. [45]

The laboratories should be well equipped with required equipment, technology, tools and facilities. Assessment of the ability and potential of the forensic laboratories should be done so that they can contribute to forensic science constructively. Accreditation and surveillance of the laboratories should be done to get more meaningful results. Integrity and confidentiality of the evidences found need to be ensured. Evidences, analysis and results must be of enhanced Equality. Indecisive and ambiguous conclusions of examination should be reduced. Efficiency should come with the speedy process of the scientific investigation of cases. The procedure of conducting the investigation must be proficient so that forensic science could assist in crime investigation in a beneficial manner.[46]

Advancement of science and technology has lead to the increase in involvement of science in the crimes committed and in the solutions dealing with the same. This necessitates regular interaction of forensic experts, police departments, judiciary, lawyers to understand the scientific development and its application in crime investigation. To assure justice and peace in the nation, there is a requirement that the forensic professionals should work in consonance with the legislations, rules and regulations, codes, associated agencies, police, etc. at the time

[44] Ministry of Home Affairs (MHA), New Delhi, *Perspective Plan for Indian Forensics* (July 2010)
[45] *Ibid.*
[46] *Ibid.*

of finding evidence, conducting investigation, implementing the laws. This interconnection should also be present during the trials, prosecution and execution of justice.[47]

CONCLUSION

Forensic science needs to be strengthened as it is contributing hugely in conducting investigation. This gives rise to the need of formulating proper strategies, reviewing and developing policies, upgrading the process of investigation, strengthening training and education in the field of forensic science. These steps are very essential as forensic science is acting as a safeguard from criminal activities. Coordination and an interlink between the varied domains of the forensic science should be assured. There is a requirement to resolve the conflicts created by scientific investigation so that forensic science could contribute efficiently.[48] The above stated issues in the field of scientific investigation should be dealt appropriately and the described measures for upgrading these methods should be implemented effectively. Explicit legal provisions in regards to the employment of scientific methods in investigation is not there. Therefore, for bringing clarity and strengthening scientific investigation, legal framework dealing with the same needs to be developed. All these steps would assist in the productive application of scientific mechanisms in crime investigation.

[47] MHA, *supra note 44.*
[48] *Ibid.*