CHAPTER-I
INTRODUCTION

1.1. Introductory

Man by nature is a fighting animal. Hence to think of a crimeless society is a myth. In fact, there can be no society without the problem of crime and criminals. The concept of crime is essentially concerned with the social order. It is well known that man’s interests are best protected as a member of the community. Everyone owes certain duties to his fellow-men and at the same time has certain rights and privileges which he expects others to ensure of him. This sense of mutual respect and trust for the rights of others regulates the conduct of the members of society inter se.¹ It is absolutely true that most people believe in ‘live and let-live’ policy. But there are some people who are law-breakers. They may be normal or abnormal persons by nature or circumstances. It is the duty of the state to punish the wrongdoer under the law of crime. Crime means a social harm which has been defined and made punishable by law.² A crime (or offence) is a legal wrong that can be followed by Criminal Proceedings which may result in punishment.³

Crime is taking place right from the beginning of the civilization. The germ of criminal jurisprudence came into existence in India at the time of Manu. He gave a comprehensive code which contains not only the ordinances relating to law, but

¹ Prof. N.V. Paranjape, Criminology & Penology with Victimology (2011), p.3
² Dr. C.K. Parikh, Parikh’s Text Book of Medical Jurisprudence and Toxicology (1996), p.3
³ Glanville Williams, Text Book of Criminal Law (2003), p.27
is a complete digest of the then prevailing religion, philosophy and customs practiced by the people. In ancient India it was the duty of the King to punish the offender. The Hindu law giver did not expressly distinguish between civil wrong and crime, still the differences in penalties and procedure which they have prescribed indicates that they clearly realized in what way the criminal aspect of an act differed from its civil aspect.

Mohammedan Criminal Law was introduced in India after the conquest of the country by the Muslims. Indian courts applied Mohammedan law in administration of justice. This law was based on Qoran and Hadis and was developed through Ijma and Kiyas. The Kazis were responsible for elucidating and expounding of the laws. Crimes were divided into the following classes: (i) crime against God; and (ii) crime against man. Crime against God is such as adultery and drunkenness; and crime against man are murder and robbery. Crime against God is treated as public wrongs and could be punished by society and community. On the other hand, the crime against man were treated private wrongs and hence could be treated or punished by individuals.

Mohammedan law was in existence when British came to India. The Britishers came to India in 1660 as traders in the form of The East India Company. In 1765 the East India Company acquired the Nizamat of the three province of Bengal, Bihar and Orissa. The company had then to administer justice. In the beginning they adopted the policy of maintaining status

5 Prof. S.N. MISRA, INDIAN PENAL CODE (2007), p. 69
6 Dr. J.N. PANDEY, THE CONSTITUTIONAL LAW OF INDIA (2013), P.2
quou. Gradually the defects of Mohammedan criminal law became clear and therefore, efforts were made to remove those defects. Warren Hastings tried to do away with the punishment of mutilation for dacoity. This was the first attempt made by the Britishers. Some important criminal’s reforms were made by Lord Cornwalis. Law of homicide was changed and murder was not more a private wrong. Law relating to robbery, perjury and sexual offences was also changed.\(^7\)

The punishment varied accordingly to the nature of crime. Broadly speaking, the punishment was fourfold, namely, Kisa or retaliation; Diyut or blood money; Hadd or fixed punishment; and Tazir or syasa, discretionary or exemplary punishment. However, the notions about Kazis about crime were not fixed and differed according to the purse and power of the culprits. As a result, there was no uniformity in the administration of criminal justice during the Muslim rule in India, and it was in a most chaotic state.\(^8\)

It is not an easy task to define crime. In all societies some norms, customs, traditions and culture are utilized by the people. If any of the custom or tradition is violated by any person of a society that is declared against the society norms. It is easy to say that any act against the society norms is a crime that could be defined as anti-social, immoral or sinful behaviour. Different persons have defined the crime in different way. Crime is an intentional act or omission in violation of criminal law committed without any defence or justification and penalized by

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\(^7\) Prof. S.N. MISRA, *INDIAN PENAL CODE* (2007), p.70  
the law as felony or misdemeanor.\textsuperscript{9} Crime is a committed or omitted act of law which is forbidden or commanded and for which punishment is imposed upon conviction.\textsuperscript{10}

Moreover, there are some victimless crimes. They are those in which there is no direct harm to any person but they are punishable under the law of State. For instances, begging, sale and use of prohibited substances such as tobacco in Haryana State and alcohol in some other states etc. In such cases, there is no direct harm to any person but they are unlawful in the eye of law.

Generally, there are three main kinds of crimes in India. They are as under:-

(i) Offences falling under the Code of Criminal Procedure;
(ii) Offences falling under the Indian Penal Code; and
(iii) Offences under Local or Special Laws or enactments.

In addition to the above, crime has also been described under the following heads:-

(i) Traditional Crimes, for example, theft, robbery, daciety, rape, hurt and rioting etc.
(ii) Economic Crimes, for example, tax evasion, gambling, prostitution and smuggling etc.
(iii) Social Crimes, for example, crime against children, crime against women, crime against the scheduled castes & scheduled tribes etc.
(iv) Political crimes are those crimes which are done by the politicians at the time of election, for example, booth capturing etc.

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\textsuperscript{9} Paul W. Tappan, \textit{Crime, Justice and Correction} (1960), p.80
\textsuperscript{10} Dr. RC Mishra IPS, \textit{Crime Trends and Criminal Justice} (2001), p.1
(v) Miscellaneous Crimes- There may be some miscellaneous crimes and are committed under the local and special laws. For example, Consumer’s Protection Act, 1986 and Drugs Act, 1940 etc.

It is the bounden duty of the State to punish the law breakers as per the procedure prescribed. In India, offences have been defined in the Indian Penal Code, 1860 and under Local and Special Laws enacted to deal with special offences. The procedure for conducting the trial has been provided in the Criminal Procedure Code, 1973. The evidence which is admissible to prove any case in the court of law has been described in the ‘Indian Evidence Act’. Our Constitution of India says under Article 51-A (h) that it shall be the duty of every citizen of India “to develop the scientific temper, humanism and the spirit of inquiry and reform.” And further says under Article 51-A (j) that it shall be the duty of every citizen of India “to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievements.”

Criminal procedure starts when the information comes to the police, but it is to be notable that offences are of two types: (i) cognizable offences; and (ii) non-cognizable offences. “Cognizable offence” means an offence for which and “cognizable case” means a case in which, a police officer may, in accordance with the First Schedule or under any other law for the time being in force, arrests without warrant”. On the other hand, “non

13 See, The Code of Criminal Procedure (1973), sec. 2 (c)
“cognizable offence” means an offence for which, and “non
cognizable case” means a case in which, a police officer has no
authority to arrest without warrant.\textsuperscript{14} As per above definitions,
procedure for initiating investigation in cognizable and non-
cognizable offences is absolutely different. Cognizable offences
are more serious offences than the non-cognizable offences. In
cognizable offences, the police can investigate without any
direction from a Magistrate while in a case of non-cognizable
offences the police cannot proceed with investigation without the
order of the court. Moreover, investigation is expensive,
particularly in cases where records are encrypted.\textsuperscript{15} Investigating
officer often uses to his own vehicles, mobile phones and bears
other necessary expenses during the work of investigation. It is
right to say that many times only individual investigating officer
has to go on the crime scene and perform a number of necessary
related work with investigation such as arrest of culprits etc.

It is the duty of all citizens of India to inform the police at
once about the commission of cognizable offences. When
someone approaches the police and gives the detail of the
commission of cognizable offence. This is called First Information
Report which is the foundation of any case upon which the
structure of investigation is built. It is very important document
upon which the success and failure of the prosecution depends.

1.2. Criminal Investigation

A criminal investigation is a search for the truth. It is the
systematic process of identifying, collecting, preserving and
evaluating information for purpose of bringing a criminal

\textsuperscript{14} Id. sec. 2(l)
\textsuperscript{15} Dr. RC Mishra IPS, Crime Trends and Criminal Justice (2001), p. (viii)
offender to justice.16 Criminal law and criminal investigations, like every other aspects of society, are subject to the forces of social organization. The primary characteristic of the society in which we live is change. There has been more change in man’s way of life in this century than in all the history of man before it. And those who survive the coming decade will in all likelihood see even further changes.17

The prime duty of the State is to protect the life and property of every citizen and to provide the peaceful environment. The Criminal Justice System assigns important responsibilities to the police to protect the power, the privilege, Fundamental Rights, Human Rights, Rights of Property and ethical values of the society. It is an important and valuable duty of the police to bring those who break the law before the Criminal Justice System.

In the 20th century, crimes were committed in very simple way. Lathi, Danda, Bricks or Stones were simply used for killing a person in dispute. Since the offences were committed in traditional manner, therefore, it was very easy for the police to capture the offender on the basis of eye witnesses etc. But now-a-days it is very difficult for the police to investigate the matter because of the fact that sometimes there is no eye witness available. Moreover, the crimes are also committed not in the nights even in the day time in any Gali, Mohalla or streets and nobody knows who the criminal was. For example, theft and chain snatching cases are increasing now-a-days in day time when the people are in their homes and at work and some of

16 Jerry L. Dowling, Criminal Investigation (1979), p.1
17 George B. Mettler, Criminal Investigation (1977), p.19
them are wandering outside their homes etc. It can’t be amazing that culprits are wandering and nobody knows them why they were wandering in streets or gali mohalla. Facilities of transportation, mobilization and vehicles pay an important role in increasing crime. In addition to this media plays a very important role. By focusing on crimes that are committed, rather than on arrests and prosecutions, the public perception is that crime occurs without restraint. Also, this creates confidence in criminals who believe they can get away with murder because there is no evidence to the contrary.  

In the present age, the hi-tech crimes are committed by the offenders. Every offender or law breaker is aware of various aspects of investigation through internet, newspapers, news channels and TV programs on crimes and tries to disguise his identity by wearing gloves in hands, monkey cap on face and by covering himself with the blanket while committing crimes. New techniques of committing crimes are used by the gangsters to accomplish criminal designs. Hi-tech world and use of computer network has given rise to cyber-crimes. These cyber-crimes cover a wide area of illegal activities which include frauds, hackers, viruses, pornography, harassment, stalking, data-diddling etc. White collar criminality has become a global phenomenon with the advance of commerce and technology. Due to new inventions and use of high technologies such as whatsapp, facebook, twitter, computer and internet etc. crimes are coming in new picture such as software or computer generated cyber-crimes are the challenges for the State. Therefore, a special Act called the Information Technology Act, 2000 has been enacted to tackle these problems.

18 Dr. RC Mishra IPS, Crime Trends and Criminal Justice (2001), p.20
1.3. **Scientific Aids to Investigation**

In case of cognizable offences the police have power to start investigation. The work of investigation involves a visit to the crime scene by the police officer who is conducting the investigation, preserve the crime scene, remove unnecessary crowd from the crime scene and call the forensic scene of crime unit/team as well as senior police officer whenever needed. All criminal investigation is concerned either with people or with things. Men alone commit crimes, but they invariably do so through the medium of things. It is these things that together constitute the broad field of physical evidence. These are the things that become physical evidence or clues for the investigating team. These physical evidences or clues are used as scientific aids to investigate the crime. Large numbers of criminals still escape because of the complex and high tech methods used for committing crime. The job of investigation is quite tough and challenging in Indian conditions. All these things have posed a serious problem before the investigating agencies and a result of that conviction rate in India has been reduced to 38.5 percent. During the investigation police should understand about the physical evidence and method how to collect and preserve them etc. The demand for scientific criminal investigation is increasing day by day. The main reasons are:

1. There is a sea-change in the social scenario. High connectivity with the higher-ups (leaders, officials), the acceptability of the corrupt and corruption, rapid and mobile communication facilities, extremely rapid mobility,

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and incognito existence in dense cities have brought in the invisible and the non-traceable anonymous criminal in the field.

2. The scientific criminal is abroad.

3. The traditional tools of proof are becoming non-available, non-reliable obsolete and ambiguous. The judiciary requires now very high standard of proof.

4. The computer, the internet and cyber space have brought in highly complex crimes. No crime scenes! No crime time frames!! No jurisdictional crimes!!! They are baffling the traditional trackers of crime.

5. The scientific methods are efficient, certain, specific, rapid, verifiable and unbiased.

6. The scientific methods are always available, applicable in all situations and investigations.²⁰

Criminals are making a full use of science to commit crimes in the modern age. In such a position it becomes necessary for the police to acquire necessary skills and scientific techniques to meet the challenges of crime and criminals. With advancement in science and technology the concept of crime as well as the methods adopted by criminals in its commission has undergone a phenomenal change. On one hand, the intelligent criminal has been quick to exploit science for his criminal acts; on the other hand, the police investigator is no longer able to rely on his age-old art of interrogation, development of sources and surveillance to detect crime. The barbaric and torturous methods of detecting crime have also no place in a civilized

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society. In these circumstances, what can the police investigator turn to, except the developing science? It is in this context, Forensic Science has found its existence. Its development has provided a powerful tool in the hands of the law enforcement agencies and the judiciary. Its object is to aid the administration of justice by correlating such knowledge and applying it to purposes of law. In short, it deals with medical aspects of law. There is an example, a woman may complain that she has been raped and accuses a man. Medical examination would reveal if she has been raped or it is a false accusation.

1.4. Scene of Offence

There are three major functions to be executed at the scene of an offense: coordination, technical service and investigative service. The first function is vested in the crime scene coordinator who has overall responsibility for the investigation at that time including technical and investigative services. This individual will make or approve all major decisions as they relate to the case. Technical services are concerned with processing the scene. Criminal investigation commences when the police comes to know of the commission of the crime. The Supreme Court has viewed the investigation of an offence generally consisting of:

(i) Proceeding to the spot;
(ii) Ascertained of facts and circumstances of the case;
(iii) Discovery and arrest of suspected offender;
(iv) Collection of evidence relating to the commission of the

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22 Dr. C.K. Parikh, Parikh’s Text Book of Medical Jurisprudence and Toxicology (1996), p.1
23 Charles R. Swanson, Jr., Criminal Investigation (1977), p.13
offence, which may consist of-

a. The examination of various persons (including accused)
b. The search of places and seizure of things considered necessary for the investigation.

(v) Formation of the opinion as to whether on the material collected there is a case to place the accused before a magistrate for trial and if so, taking the necessary steps for the same by the filing of a charge-sheet under section 173. The main objective of investigation is to collect the evidence so that the culprit may be arrested.

A person cannot commit a crime without performing some kind of activity. Whether such activity is violent or gentle, there is a good chance that criminals will either leave something at the scene or take something away from it that can help connect them to the crime. Perhaps, the best known example of physical evidence are fingerprints, which a person can leave simply by touching something. Tool marks, shoe prints, tire marks, and other impressions found at a crime scene can implicate a suspect if the object that made the impression is found in his or her possession.

For the purpose of criminal investigation evidences are of two types: testimonial and real. Real evidences are also called physical evidences. Testimonial evidence is evidence given in the form of a statement made under oath, usually in response to questioning. Physical evidence is any type of evidence having an objective existence, that is, anything with size, shape and dimension. Physical evidence can take any form. It can be as

large as a residence or as small as a fiber, as fleeting as an odor or as obvious as the scene of an explosion. Indeed, the variety of physical evidence that may be encountered by a police officer is enormous. Now the question is how to collect the physical evidence. Physical evidence can be obtained from the place of occurrence or crime scene. It is the duty of police officer who arrives at crime scene first to preserve the crime scene.

In general, physical evidence will be obtained from three main sources: (1) the scene of the crime, (2) the victim, if any, and (3) the suspect and his environment. Crimes against property will usually involve only (1) and (3); crime against person will involve all categories.

The crime scene can be a rich source of physical evidence. To reconstruct how the crime was committed, or determine, what actually happened, physical evidence must be reconsidered before it can be recorded, collected and preserved. In fact, legal requirements can limit the crime search to a single opportunity, should the property owner refuse to allow a second search. Other reasons for a thorough initial search include the possibility that the scene may be damaged by weather conditions, building construction in the premises housing the crime scene, or other facts.

A scene of occurrence of a crime is the place where a particular crime has been committed or where physical evidence of such crime is found when it is first brought to the notice of the police. It is a starting point for the investigator, which

27 Paul L. Kirk, Crime Investigation Physical Evidence and the Police Laboratory (1953), p.84
28 Dr. RC Mishra IPS, Crime Trends and Criminal Justice (2001), p.29
provides him with the information on the victim and the suspect and to reconstruct the crime. The scene of occurrence cannot be limited to one place only. It may extend to one or more places. It may also not be limited to immediate surroundings, but may extend to a wider area depending upon the nature of the crime committed. In a compact scene of crime, such as burglary, the scene may be divided into five parts, namely:

(1) Line of approach;  
(2) Point of entry;  
(3) Actual scene  
(4) Point of exit; and  
(5) Line of retreat.

The scene of crime may be classified as outdoor or indoor scene. A crime committed on a road or a field is an outdoor crime. Whereas a crime is committed in a house, a car, etc., is an indoor crime. There may be certain types of crime, which have no ‘scene’ at all. The crime of this nature are forgery, embezzlement etc.\textsuperscript{29} The trends of crime keep changing with the growing population and rapid development of towns and cities. Rise in crime in any place is a worrying factor for everyone and especially crime against women, children and weaker sections of the society is a great concern to all of us.\textsuperscript{30}

The first officer to arrive at a crime scene will find himself suddenly burdened with a great deal of responsibility. The actions that he takes in the first minutes will greatly affect the outcome of the subsequent crime scene investigation and the potential prosecution of the suspect. In essence, his duties upon

\textsuperscript{29} B.S. NABAR, \textit{Forensic Science in Crime Investigation} (2009-10), p.19  
arrival are as follows:

1. Determine if the victim (when applicable) is alive, or determine the extent of any injuries.
2. Determine if a crime has been committed.
3. Immediately notify the station or his supervisor as to the basic situation.
4. Request an ambulance or paramedics, if necessary.
5. Perform any necessary first aid.
6. Avoid damaging footprints, fingerprints, and other potential physical evidence as much as possible, keeping in mind that the primary objective of the officer is to save life and limb.
7. Secure and protect the crime scene to the greatest extent possible.
8. Be alert for the presence or possible return of the suspect.
9. Be alert for potential witnesses to the crime.
10. Be immediately available at the scene in order to prevent the arriving ambulance, paramedics, supervisor, backup units, and CSI officers from inadvertently destroying physical evidence.
11. Make an all-inclusive report when time permits.31

1.5. **Forensic Science**

In today's world, forensic science has been largely portrayed by television producers with programmes giving some insights into the subject. Forensic science is portrayed as being science used by police to investigate crimes- but this is only a half-truth. It is true that the largest employers of forensic

scientists in this country are police and agencies whose major workload is carrying out investigations of criminal activity. However, forensic science is also a science that aids the legal system, including the civil courts and public inquiries. The use of forensic science even extends to matters that do not go to court, such as the investigation of fires and accidents on behalf of insurance companies. These cases rarely reach the courtroom, but often involve some form of scientific investigation. Perhaps the most striking feature of forensic science as portrayed on television is the wide range of disciplines involved, both at the scene of the incident and in the laboratory. For many cases, the examination starts at the scene of an incident—and this is a specialty in its own right. If materials are not collected and properly stored, they cannot be examined. The crime-scene officers work for the various police forces, and it is they who identify and collect samples that may assist the investigator. Their work is varied, the next job may be another house-breaking, or it may be a major crime such as a murder or terrorist offence. No matter what, their responsibility is to recognize and collect what is important, and then sends it to a laboratory for examination.\textsuperscript{32}

Scientific aid is an important tool to assist the Criminal justice delivery system. Scientific aids to investigation provide general as well as specific technical information on different aids to detection and investigation of crime.\textsuperscript{33} There are numerous occasions when evidence recovered from crime scene is

\begin{footnotesize}
32 \textit{http://www.science-engineering.net/science/united-kingdom/forensics-the-science-of-crime}

33 Quoted from Giriraj Shah, \textit{Scientific Aids To Investigation} (1999)
\end{footnotesize}
forwarded to laboratories for scientific examination. There are a number of scientific aids which are utilized by the police or forensic scene of crime team experts in criminal investigation. It is essential to highlight here that physical evidence and clues when used as a tool for scientific investigation become scientific aids for the purposes to solve the criminal case and are very helpful to send the criminal to prison and safeguard the innocent. Advancement in forensic technology has significantly increased the conviction rate and refined the investigation process as well as makes the judicial process transparent. The various types of physical evidence met with in different crimes would be in form of DNA. DNA is a forensic tool in crime investigation. DNA test can be ascertained in many types of samples, they are; blood, semen, tissue, long bone, hair root, saliva, body fluid and teeth. The utility of DNA test is in the investigation of the following matters- disputed maternity or paternity, baby swapping, missing identity, murder, rape cases, immigration cases, road accidents. While hearing a criminal appeal filed by a husband to challenge the maintenance claimed by his wife under section 125 of Cr. P.C., the Supreme Court acknowledged the need for the new modern age science and its impact on the Justice Delivery System of India by accepting Paternity DNA Test as the ultimate conclusive proof for ascertaining matters relating to Paternity disputes, which is crucial in deciding appeals relating to maintenance and other reliefs to a petitioner wife. The Bench comprising of Justice C.K.

34 Dr. M. K. Goyal, *FSL BULLETIN* (June, 2008), p. 2
Prasad and Justice J.S. Khehar set aside the 142 year old presumption of Paternity of Legitimacy under section 112 of the Indian Evidence Act by stating that, the Evidence Act was enacted at a time when the new age modern science and DNA tests were not available.

DNA testing of a criminal provides clinching evidence regarding association/involvement of any person in a crime. DNA fingerprinting can be used as a vital input, and sometimes, the only decisive clue in some of the most complex cases, where all other evidence are lost or destroyed. It is now more than a decade since the first DNA was furnished in any court of law in India. Since then DNA technology has made advancements by leaps and bounds. The investigating agencies, judiciary, medico legal experts and to some extent common people are now aware of potential use of this technique in crime investigation, but the method itself called as DNA fingerprinting, is yet to get its due place in Indian law. The country is now on the threshold of enacting special legislation regarding various aspects of DNA data basing and testing. At the same time efforts are on in several Forensic Science Laboratories to keep stride with the needs of investigating agencies and upcoming legislation. Some cases which have been in limelight and the court of law has given due weightage to DNA test reports are Madhumita Shukla murder case, Tandoor Murder case and Priyadarshini Matoo murder case and so on. In Madhumita Shukla murder case the Criminal Investigation Department of Uttar Pradesh had sent the six-month old foetus of the slain poetess to the Centre for DNA Fingerprinting and Diagnostics in Hyderabad for finding out its paternity. The DNA of former Uttar Pradesh minister Amarmani
Tripathi has reportedly matched that of dead foetus of slain poetess Madhumita Shukla.\textsuperscript{36} Tandoor murder case also involved the use of DNA evidence to establish the identity of the victim.\textsuperscript{37} Naina Sahni was the victim of Tandoor murder case. On the night of July 2, 1995 Naina Sahni was murdered by her husband Sushil Sharma, a congress youth leader and MLA. The Dead body was taken to a restaurant called Bagiya and tried to dispose it off with the help of Keshav Kumar, manager of the restaurant. But police reached the spot and the manager was arrested but Sushil Sharma managed to flee. He surrendered on July 10, 1995 and was awarded life imprisonment by the Supreme Court.

Fingerprints also play an important role in providing identification of an individual. The identity of finger impressions has now been accepted by all courts of law. In 1902, Henery Jackson was the first man convicted in England, solely on fingerprint evidence. A fingerprint in fresh paint was left on the window frame of a house that had been burgled. This print was tallied with the print on one of the fingers of Henery Jackson, an old criminal, in the records of Scotland Yard. Since then, all over the world, fingerprints have been classed as one of the strongest forms of evidence, as to the identity or non-identity of a person.\textsuperscript{38} The Science of fingerprints identification is an exact science and the opinion of the fingerprint expert is acceptable under section 45 of Indian Evidence Act, 1872. The evidence given by a fingerprint expert need not necessarily be corroborated; but the

\textsuperscript{36} Dr. M. K. Goyal, \textit{FSL BULLETIN} (June, 2008), p. 11
\textsuperscript{37} \textit{En.Wikipedia.org/wiki/Naina_Sahni}
court must satisfy itself as to the value of the evidence of the expert in the same way as it must satisfy itself of the value of other evidence.\(^{39}\) Fingerprints are taken from the portion just below the tips of the finger and thumb and up to the first joint. No two leaves, stones or human beings are exactly alike. Fingerprints science is based on two principles, viz, (i) that these patterns remain permanent throughout from birth till decomposition sets in after death, and (ii) no two fingerprints are never identically alike. The Great Architect of the universe never made two things exactly alike. It is true that a man can disguise himself but a chance print reveals his true identity. Fingerprints are of four types- Arch, Loop, Whorl and Composite. The first recorded case in which fingerprints were utilized as a scientific aid was a case of double murder. A widow in order to marry another person had killed her children. But she claimed that some unknown person had killed them. There were no eye witnesses. While examining the scene of occurrence, the investigating officer observed two faint fingerprints in blood on one of the door leaves where the children had been killed. Comparison of the fingerprints on the door with those of the mother indicated that the prints were of her fingers. She confessed to the crime. In a famous murder and dacoity case the dacoits after looting and killing, used a bus for escape, which was later found abandoned. Numerous fingerprints were collected from the vehicle. The fingerprints records were checked. It was possible to identify three of the dacoits, which led to the arrest of the whole gang, ultimately. Stains which are

of blood, semen, saliva, urine, facial and perspiration which may occur on a victim’s person and clothing at the scene of crime, on suspect’s person and clothing and on the weapon used in committing crime; Soil will be useful in determining whether a person has gone to a certain place or not. If yes, soil shall be found in his shoes or pant’s cuffs and clothing if he has been thrown on the ground during the struggle or in a rape case if the rape is committed in a open field; glass in case of murders, vehicle accidents, theft cases and assaults etc. where firearms or any other object has been discharged through glass; hair which are present in crime scene in crimes of rape, murder, hit and run cases; ropes are used in case of committing hanging, suicide, strangulation and theft cases etc.; fabrics and fibers are found in the crime scene of murder, rape, robbery, hit and run cases etc.; paints or foot prints and tire marks are very useful scientific aids to make the chain between crime and criminals. Firearms and fires are the accurate science for tracing the origin of a fire, smoke, ash and physical evidence from fires.

1.6. Origin of Forensic Science in India

The origin and development of forensic science in India has been discussed in the following pages.

1.6.1. Before Independence

In India, the development of scientific institutions aiding crime detection came close on the heels of it in the western countries. In the beginning there existed chemical Examiner’s Laboratories, which were set up by the British rulers at Madras, Calcutta, Agra and Bombay in the second half of the 19th century. These Laboratories undertook general chemical analysis and toxicological work. The first Fingerprint Bureau of the world

1.6.2. **After Independence**

First State Forensic Laboratory was established by merging the existing Government Chemical Examiner’s Laboratory in 1952 to meet the need of modernization the methods of crime investigation. In 1955 Central Finger Print Bureau was established at Calcutta. After this, Central Forensic Science Laboratory was also established at Calcutta in 1957. The functioning control of above units was under the supervision of ‘Central Forensic Institutes’ set up by the Intelligence Bureau. Since 1974 administrative control of Central Forensic Institutes was transferred to newly established Bureau of Police Research and Development. This was the starting point for other States to establish organized laboratories in the State Capital.

1.7. **Position of Forensic Science Laboratories in India**

Forensic Science Laboratories and other Allied Forensic Science Institutions in India are offering scientific services in the administration of criminal justice. These laboratories and institutions are as under:

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41 Ibid
42 Ibid
43 Ibid., p 8
(I) **Institutes Under the Centre**

(i) The Central Forensic Science Laboratories, under the administrative control of B.P.R.&D., Calcutta (1957), Hyderabad (1968), and Chandigarh (originally Punjab FSL in 1961, later designated as Union Territory Laboratory and now re-designated (1978) as CFSL under B.P.R.&D.).


(vi) The General Manager, Mints, at Calcutta, Bombay and Hyderabad.


(viii) The Controller of Stamps and Stationery.

Office of the chief Controller of Explosives established in 1898 in Nagpur. Today, there are several circle and sub-circles located in different parts of the country, headed either by Deputy chief Controller, Controller, or Deputy Controller as noted below:

1. East Circle, Calcutta, headed by Deputy chief Controller;
2. North Circle, Agra, headed by Deputy Chief Controller;
3. West Circle, Bombay, headed by Deputy Chief controller;
4. South Circle, Madras, headed by Deputy Chief Controller;
5. Sub-circle, Gauhati, headed by Controller;
6. Sub-circle, Gomia, headed by Dy. Controller;
7. Sub-circle, Hazaribagh, headed by Controller,
8. Sub-circle, Asansol, headed by Controller;
9. Sub-circle, Rourkela, headed by Controller;
10. Sub-circle, Chandigarh, headed by Controller;
11. Sub-circle, Jaipur, headed by Controller;
12. Sub-circle, Bhopal, headed by Controller;
13. Sub-circle, Baroda, headed by Controller;
14. Sub-circle, Hyderabad, headed by Controller;
15. Sub-circle, Cochin, headed by Controller;
16. Sub-circle, Manglore, headed by Controller;
17. Sub-circle, Shivakashi, headed by Controller;

Central Detective Training Schools at Calcutta, Chandigarh and Hyderabad. These are training institutes for imparting specialized detective training
to investigating police officials on modern scientific methods of investigation.⁴⁴

(II) Forensic Laboratories at State Level in India

The State Forensic Science Laboratories exists in the following states with their year of establishment:-

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Names of States in which Forensic Laboratory were established</th>
<th>Year of establishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>West Bengal, Calcutta</td>
<td>1952</td>
</tr>
<tr>
<td>2.</td>
<td>Maharashtra, Bombay</td>
<td>1958</td>
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<tr>
<td>3.</td>
<td>Rajasthan, Jaipur</td>
<td>1959</td>
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<td>4.</td>
<td>Tamilnadu, Madras</td>
<td>1959</td>
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<tr>
<td>5.</td>
<td>Kerala, Trivandrum</td>
<td>1961</td>
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<td>6.</td>
<td>Orissa, Bhubaneswar</td>
<td>1962</td>
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<td>7.</td>
<td>Bihar, Patna</td>
<td>1963</td>
</tr>
<tr>
<td>8.</td>
<td>Jammu &amp; Kashmir, Sri Nagar</td>
<td>1964</td>
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<tr>
<td>9.</td>
<td>Madhya Pradesh, Sagar</td>
<td>1964</td>
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<td>10.</td>
<td>Assam, Gauhati</td>
<td>1967</td>
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<td>11.</td>
<td>Karnataka, Bangalore</td>
<td>1967</td>
</tr>
<tr>
<td>12.</td>
<td>Uttar Pradesh, Lucknow</td>
<td>1969</td>
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<td>13.</td>
<td>Haryana, Madhuban</td>
<td>1973</td>
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<td>15.</td>
<td>Andhra Pradesh, Hyderabad</td>
<td>1976</td>
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<td>16.</td>
<td>Punjab, Chandigarh</td>
<td>1981</td>
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<tr>
<td>17.</td>
<td>Meghalaya, Shillong</td>
<td>1986</td>
</tr>
<tr>
<td>18.</td>
<td>Himachal Pradesh, Simla</td>
<td>1987</td>
</tr>
<tr>
<td>19.</td>
<td>Delhi</td>
<td>1993</td>
</tr>
</tbody>
</table>

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1.8. Justification of the Study

In ancient times, crimes were committed in a traditional manner. Therefore it was easy for the investigating agency to investigate the offence at that time. But nowadays the situation has been changed to a great extent in the sense that the offences are being committed in such a manner that it is very difficult for the investigating agency to arrive at the conclusion as to what led to what. Innovative methods are being used by the offenders for committing crimes. This has imposed serious problems before the investigating agencies. The criminal jurisprudence requires that the guilty should be punished and innocent should not suffer. Therefore, some scientific aids are being used by the investigating agencies during the course of investigation of the offences. But the need of the hour is to analyze and evaluate whether these scientific aids are catering to the needs of the investigating agencies or not in the changed circumstances. The present research work shall focus on the working and functioning of the scientific aids in the disposal of the offences. The present research work shall also aim at the critical analysis of the role played by scientific aids used in the course of investigation by the investigating agencies.

1.9. Delimitation of the Study

A large number of scientific aids are being used by the investigating agencies for the investigation of the offences. These are DNA, fingerprinting, foot printing, tire marks, firearms, semen, blood, saliva etc. It is essential to mention here that it is very difficult to conduct research on the utility of all these scientific aids used during the course of investigation. Therefore, in the present research work the researcher shall focus on only
two important scientific aids i.e. DNA and Fingerprints. The research work shall aim at the analysis and evaluation of DNA and Fingerprinting as scientific aids to investigation. All relevant and related literature in addition to latest cases shall also be analyzed.

1.10. Research Methodology

The present research study will be an analytical study. All the related literature shall be reviewed during the course of research work. Latest cases decided by the Supreme Court and various other High Courts shall be analyzed and incorporated. Different journals on criminal law shall as well be consulted. The important cases wherein scientific aids of DNA or fingerprinting were used by the investigating agency shall be discussed thoroughly.

1.11. Objectives of the Study

The following will be objectives of the study:

1. To discuss the scope and ambit of the scientific aids used during the course of investigation.

2. To discuss the utility of scientific aids used for the investigation of the offences.

3. To analyze and evaluate the application of DNA as a scientific aid to investigation.

4. To analyze and evaluate the application of finger printing as a scientific aid to investigation.

1.12. Hypothesis

Scientific aids such as fingerprints and DNA profiling etc. are the most important tools and techniques which play an important role in solving the various criminal cases yet there is much need of their development in the present scenario. A
number of civil or criminal cases have been solved with the help of these techniques.

Fingerprinting is such a strong technique or scientific aid that cannot be challenged. Not only fingerprints of two persons but that of one person’s fingerprint does not match. What are the reasons that it is not serving so much as required in the present time. The reason is that criminals are much aware about these techniques through the internet and television programs etc. They use gloves and even clothes to cover up their hand ridges. In such conditions their fingerprints are not left on the spot. Thus this technique has become unreliable. In this research work the researcher has suggested some measures that can be followed to overcome the disadvantages.

No doubt, De-oxyribo Nucleic Acid (DNA) is the new concept that solves the paternity/maternity disputes, immigration problems and inheritance disputes including property matters etc. With the help of this technique a number of children have met their parents. So many problems have been solved by this scientific aid. But it is necessary to highlight here that no DNA can be conducted of the totally burnt bones. There are some criminal cases in which ashes and bones of dead bodies were sent to laboratory for DNA profiling but they were helpless to solve them. Therefore the researcher has moved on the hypothesis that in certain situations fingerprinting and DNA as scientific aids to investigation are not doing well.

1.13. Review of Related Literature

In order to get a better insight into the application of scientific aids in investigation, a brief review of available studies and other literature on the topic has been presented below.
These scholars/researchers have explored the various dimensions of the problems. This literature has been discussed in the following pages.

*A Guide to Scientific Aids in Crime Detection* (For Police Officers and Men) was written by D.N. Goyle, in the year of 1952. In this book the writer discussed on the topics of identification of individuals, inspection of the scene of crime, fingerprints, foot prints, blood and blood traces and other biological evidences on the crime scene.

James R. Richardson, wrote a book on the topic of *Modern Scientific Evidence Civil and Criminal* in 1961. This work on modern scientific evidence has been written and documented primarily for the practicing attorney in both the civil and criminal law fields. This division is based on the premises that behind all sound practice there is sound theory.

George B. Mettler, has discussed in his book (*Criminal Investigation*) the topics of historical notes on the ancient and modern origins of criminal investigation, the crime scene, types of investigation, methods of search, physical evidence, source of information etc.

In 1977, Kenneth W. Goddard, has discussed the topic of crime scene investigation, CSI (*Crime Scene Investigation*) Equipment, components of a crime scene, arrival at the crime scene, the crime scene investigation, recording of the scene and specific collection techniques etc.

45 Director, Punjab Criminal Investigation Department Scientific Laboratory, Phillaur
46 Professor of Law, University of Kentucky
47 George B. Mettler, Criminal Investigation, 1977.
Charles R. Swanson, Jr.,\textsuperscript{49} has discussed the topics on crime and its investigation, crime scene and associated procedures, physical evidence, field notes etc.

In 1979, Jerry L. Dowling,\textsuperscript{50} has discussed the investigation function, methods of preserving information, interview and interrogation, interview of witnesses, interrogation of suspects, sources of information, collection of physical evidence, casts and the prints at the crime scene etc.

Paul B. Weston,\textsuperscript{51} has as well, discussed the criminal investigation function of police, the legal significance of evidence, elements of investigation, crime scene, collection and preservation of physical evidence, laboratory and technical services etc.

Frederick Cunliffe's,\textsuperscript{52} book Criminalistics and Scientific Investigation (1980) deals with the physical evidence, microscope, investigating the crime scene, finger printing etc.

In 1987, Barry A.J. Fisher,\textsuperscript{53} has explained the role of the first officer at the crime scene, specialized personnel at the crime scene, processing the crime scene, establishing identity, trace evidence and miscellaneous material, blood and other biological evidence, impression evidence etc.

Dr. AK Bapuly,\textsuperscript{54} has discussed the detailed study on the topic of Science and its importance, strategies to be adopted in crime investigation, physical evidence e.g. finger and palm prints, footprints, shoe and tyre impressions, blood, semen and

\textsuperscript{49} Charles R. Swanson, Jr., Criminal Investigation, 1977.
\textsuperscript{50} Jerry L. Dowling, Criminal Investigation, 1979.
\textsuperscript{51} Paul B. Weston, Criminal Investigation Basic Perspectives, 1980.
\textsuperscript{52} Frederick Cunliffe, Criminalistics and Scientific Investigation, 1980.
\textsuperscript{54} Dr. AK Bapuly, Forensic Science Its Application in Crime Investigation, 2006.
other body fluids, dental evidence, nails and nail marks, skeletal remains, hair, fibres, cloth fragments and impressions, trace evidence- soil, glass, paint, etc. has been defined.

**B.R. Sharma** has taken into account a detailed study of crime, criminal investigation, computer crimes, science of occurrence, sketching the scene, police photography, voice identification, psychology etc. **James E. Girard**, discussed the topic of investigating the crime scene, investigating and processing physical evidence and DNA typing etc **B.S. Nabar**, has narrated the history of forensic science, scene of occurrence, physical evidence, fingerprints, footprints etc. **Swapnil Gupta**, in her research paper on the topic of "Forensic Examination of Indian Passport", published in the *Indian Police Journal*, published in 2013 provides that fake Indian Passports can be used for escape into exile, identify theft, age deception, illegal immigration and organized crime. This research also specifies the Technical Specialization as well as recommendations for Indian Passport. Therefore, one can easily distinguish the Genuine Indian Passport by utilizing the effectiveness of this paper.

### 1.13.1. DNA

**Brian Lane** is an expert in the field of true crime. According to him, the most potentially important discovery in the recent scientific history of forensics has been the development of

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57 B.S. Nabar, Forensic Science in Crime Investigation, 2009-10.
58 Laboratory Assistant (Doe), CFSL (CBI), New Delhi swapnil4inspire@gmail.com
59 Vol. LX No. 2 April-June, 2013
60 Brian Lane, Encyclopedia of Forensic Science, 1992
DNA profiling. Dr. AK Bapuly,\(^{61}\) defined and discussed the recent advances on the topic of DNA profiling techniques. B.R. Sharma\(^{62}\) has explained the DNA profiling, evidentiary clues such as bones, flash, skin, hairs etc., and investigator's role and discussed that the technique is costly and time consuming.

James E. Girard,\(^{63}\) has studied the topic of investigating the crime scene, investigating and processing physical evidence and DNA typing etc. The paper published by N. Kala,\(^{64}\) Rajeshe Raghunath,\(^{65}\) and R. Thilagaraj,\(^{66}\) on the topic of "Forensic Data Recovery- Unearthing Lost DNA Evidence" in a Homicide Case- A case Study was published in The Indian Police Journal,\(^{67}\) (2014) where forensic examination of DNA is performed in varying biological samples. Specialized equipment and software are used for doing the analysis and the results are stored in DNA database files. Here in a homicide case that hinged on the DNA evidence, the crime lab was unable to locate the original digital files stored in the DNA data base analysis results. The evidence was very essential since the homicide involved sexual abuse followed by assault and killing of an innocent child. This paper focuses on the method of recovering the unavailable files which are otherwise inaccessible.

\(^{61}\) Dr. AK Bapuly, Forensic Science Its Application in Crime Investigation, 2006
\(^{64}\) N. Kala, Scientific Officer, Computer Forensics Division, Forensic Science Department, Mylapore, Chennai
\(^{65}\) Rajeshe Raghunath, Scientific Officer, DNA Division, Forensic Sciences Department, Mylapore, Chennai
\(^{66}\) R. Thilagaraj, Professor and Head, Department of Criminology, University of Madras, Chepauk, Chennai
\(^{67}\) Vol. LXI No. 3 July-September, 2014
1.13.2. Fingerprinting

*Practical Fingerprinting* by **B.C. Bridges**, revised by **Charles E. O'Hara** with a foreword by August Vollmer was written in 1942, 1963. In this book biological and historical data, procedure for taking fingerprints, classification by the Henry System, Ridge counting and tracing, filing and searching, extension of the Henry system, the Battley Single Fingerprint system etc. are defined.

*A Guide to Scientific Aids in Crime Detection* (For Police Officers and Men) was written by **D.N. Goyle**, in the year of 1952. In this book the writer has discussed on the topic of fingerprints and foot prints also.

**James R. Richardson**, has defined historical background, admissibility of fingerprints, qualification of the expert, qualifying the expert, testimonial procedure, identification procedure, demonstration in courts, purpose served by fingerprint evidence, cross examination of the expert, palm and footprints, absence or lack of fingerprints etc.

In 1975, **Daniel Alexander**, discussed the origin of fingerprints, meaning of fingerprints, latent fingerprints, how to take impressions, equipment needed, main types of fingerprints, ridges and their characteristics, identification of fingerprints, poroscopy, blurred fingerprints, forged impressions, classification of fingerprints and the sequence of the ridges and pen lines etc.

70 James R. Richardson, Modern Scientific Evidence Civil and Criminal, 1961
In 1979, D. Venkaiah, revealed the importance of a fingerprint, science of finger-print examination, method and implements, condition of impressions, patterns of impressions, core and delta in prints, ridge characteristics, comparison of impressions, examination of prints in which core and delta features are absent, classification, impression made on cloth, wood, walls and glass, development of latent impressions, prints taken from dead bodies, photography, competency of experts, experts and bureaus, cheating done in roster rolls and interesting cases etc.

Jerry L. Dowling, has dealt with the significance of casts and prints at the crime scene. According to him fingerprints are inked and latent, plastic and visible. He also described the comparison of fingerprints in criminal investigation, searching fingerprint files etc.

Shiam Narain Sharma, describes a brief history of fingerprints, identification, acceptance of fingerprints in the courts, how to take them, type and ridge characteristics and forged fingerprints are also discussed.

Kaushalendra Kumar, as well has discussed the brief history of fingerprint science, fingerprint patterns, ridge characteristics, classification system, latent fingerprints impressions, how to take finger impressions, method of examination of two fingerprints, fingerprint evidence, expert in court etc.

74 Shiam Narain Sharma, Russell A. Gregory's Identification of Disputed Documents, Fingerprints and Ballistics, 1989
75 Kaushalendra Kumar, Russel A. Gregory's Identification of Disputed Documents, Fingerprints and Ballistics, 1989
**B.C. Bridges**,\(^76\) has pointed out the most important subjects of finger printing, thumb impressions and foot prints etc. Biological and historical data, procedure for taking fingerprints, classification by the Henry system, ridge counting and tracing, filling and searching, Extension of the Henry System, The Battley single fingerprint system and other systems in use are discussed. **B.R. Sharma**\(^77\) discussed the topic of fingerprints. According to him fingerprints are reliable, cheap and quick mode of identification of an individual. He has discussed the general, nature, investigator’s role and possibilities etc. in detail. **James E. Girard**,\(^78\) has taken up the topic of investigating the crime scene, investigating and processing physical evidence and DNA typing etc. **F. Brewester**,\(^79\) has made a detailed study on fingerprints. Historical background, fundamentals of fingerprints, numerical index, problem of the single impression, various problems, presentation of fingerprint evidence, fingerprint jurisprudence, poroscopy, permanence, immutability and variety are discussed in detail. **B.S. Nabar**,\(^80\) too has also discussed the Fingerprints. He has discussed the friction ridges and fingerprints, individuality of fingerprints, historical development, pattern classification, pattern definition, why fingerprints are recorded, method of recording, procedure, fingerprinting deceased persons, chemical methods, other methods of fingerprint development, electronographic method of developing latent fingerprints, prints

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\(^77\) B.R. Sharma, Scientific Criminal Investigation, 2006.


\(^79\) F. Brewester, Fingerprints, 2010.

\(^80\) B.S. Nabar, Forensic Science in Crime Investigation, 2009-10.
on glass, recording of developed latent prints etc.

In view of the above, it can be concluded that there is a dearth of literature on the application of DNA and fingerprints as scientific aids to criminal investigation. No comprehensive research has been conducted on the topic. Therefore the present research work shall aim at discussing each and every aspect of scientific aids used in criminal investigation with special emphasis on DNA and fingerprints.

1.14 Sum up

It is absolutely right that there can be no society without the problem of crime and criminals. Crime is taking place right from the beginning of the civilization. In the 20th century, crimes were committed in a routine simple manner. Lathi, Danda, Bricks or Stones were simply used for killing a person in dispute. In the modern scenario, criminals are making the full use of science to commit crimes. With the advancement in science and technology the concept of crime as well as the methods adopted by criminals in its commission has undergone a phenomenal change. On one hand, the intelligent criminal has been quick to exploit science for his criminal acts; on the other hand, the police investigator is no longer able to rely on his age-old art of interrogation, development of sources and surveillance to detect crime. The barbaric and torturous methods of detecting crime have also no place in a civilized society. In these circumstances, what can the police investigator turn to, except the developing science. It is in this context, Forensic Science has found its existence. Its development has provided a powerful tool
in the hands of the law enforcement agencies and the judiciary. Its object is to aid the administration of justice by correlating such knowledge and applying it to purposes of law.

Scientific aid is an important tool to assist the criminal justice delivery system. Scientific aids to investigation provide general as well as specific technical information on different aids to detection and investigation of crime. There are numerous occasions when evidence recovered from crime scene is forwarded to laboratories for scientific examination. There are a number of scientific aids which are utilized by the police or forensic scene of crime team experts in criminal investigation. It is essential to highlight here that physical evidence and clues when used as a tool for scientific investigation become scientific aids for the purposes to solve the criminal case and are very helpful to send the criminal to prison and safeguard the innocent. Advancement in forensic technology have significantly increased the conviction rate and refined the investigation process as well as make the judicial process transparent. The various types of physical evidence met with in different crimes would be in form of DNA. The utility of DNA test is in the investigation of the following matters- disputed maternity or paternity, baby swapping, missing identity, murder, rape cases, immigration cases, road accidents. Fingerprints also play an important role in providing identification of an individual. The identity of finger impressions has now been accepted by all courts of law.

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82 Quoted from Giriraj Shah, *Scientific Aids To Investigation* (1999)
83 Dr. M. K. Goyal, *FSL BULLETIN* (June, 2008), p. 2