

## Chapter II

### THE POLICE AND INVESTIGATION OF CRIMES

It is rightly said that a well organized police force can be the hall mark of the rule of law and efficient administration of a State. The police is the first and foremost functionary of criminal justice administration of a country. It is a vital and indispensable executive organ of the State for prevention and detection of crimes.

The professional police play a pertinent role in effective investigation of crimes. By effective investigation on professional footing, the investigating police can contain and combat growing menace of crimes and criminal activities. Thus, the investigating police are able to support and strengthen the edifice of criminal justice administration of the State by ensuring law and order, safety and security of the state and overall welfare of the public. Therefore, the erstwhile British Government in India had observed in its preamble to the Police Act, 1861 that: "it is expedient to reorganize the police and to make it a more efficient instrument for prevention and detection of crimes."<sup>1</sup>

The Phrase 'Police Investigation' refers to a systematic way of collection, collation, analysis and ascertainment of facts to a crime by the police. The Code of criminal Procedure has defined the term 'investigation' and empowered the police to investigate cognizable offences independently without the orders of Magistrate. Thus, under CrPC, the power of investigation has remained the province of the police. Investigation is continued to be a venture with the mixture of both artistic and scientific skills. It is an art because

the investigating police are expected to have certain ascribed and achieved skills and expertise. It is a science because its process of enquiry has to be on systematic and scientific footing with due compliance of procedures laid down under different codes and laws.

### **A. Historical Background of Criminal Investigation**

Prior to the 17th century it was believed that the occurrence of crimes and growth of criminals could be controlled by effective police beat patrol and enforcement of the existing laws. This strategy was proved wrong as crimes continued to grow by leaps and bounds. Eventually, criminal activities also grew with scant respect for laws and its enforcement agencies. This trend had stressed the need and necessity for effective investigation on professional footing.

Generally, it was believed that a bit of intuition and a dose of imagination amongst the police would help the detection of crimes. On the other hand, some of the schools of detectives felt that routine and a little plodding leg work of imagination was enough to meet the requirements of investigation. Later, a group of police and the people started to think and advocate that the problems of criminal investigation could be solved quite simply by microscopic examination of and laboratory analyses.<sup>2</sup> But the truth lies some where among the three view points. Criminal investigation involves a close relationship between innovative thinking and diligence; and between the investigating police in the field and the forensic scientist in the laboratory. In addition, advancement in science and technology has come as timely help and solace to enhance the professional efficiency and effectiveness in criminal investigation. Skillful scanning of the scene of crime with the aid and assistance of experts; vetting of documents for evidence; procedural way of custodial interrogations; scientific way of lifting physical evidence; perfect examination of the evidence in forensic labs; and use of Lie-detectors, Brain-printing, truth serum tests have strengthened the hands of the investigating police in the task of effective investigation.

In France, in the beginning of last quarter of 17<sup>th</sup> century ex-convicts like Eugene Francois Vidocq (1775-1857) were employed to detect offenders as the old adage says "set a thief to search a thief." In England, **thief-takers** like Jonathan Wild (1682-1725) were engaged to detect thieves. In 1739, Justice Thomas de Veil (1684-1748) made considerable contribution for criminal investigation by establishing central office at Bow Street Court and had controlled the crime rate to an appreciable extent. He was knighted in the year 1744. Later, in 1748 Henry Fielding established a body of paid police who were later known as the **Bow Street Runners** replacing the thief-takers. In 1780, these runners were allowed to work in plain clothes for the first time. They did a magnificent work in the field of criminal investigation. The Bow street runners were formally abolished by the Metropolitan Police Act of 1839, a brain child of Sir Robert Peel.

Identification as policemen would have handicapped their ability to observe criminals and to gather information in the places frequently visited by thieves and highwaymen. Therefore, Sergeant William Popay, the first officer of London Metropolitan Police, assigned plain cloths to the police who were on the job of detection in the year 1833. Again it was discarded by Commissioner Mr. Richard Mayne as it aroused strong public criticism.

On June 20, 1842 a scheme for separate Detective Force with powers and pays was outlined by the commissioners of Scotland Yard and was approved by the Home Department. Nicholas Pearce was the first Commanding Officer of Detectives in Scotland Yard.<sup>3</sup>

In America, till 1846, no formal detective police was reported to be employed for detection of crimes. Since there was alarming increase of incidence of house breaking, robbery, counterfeiting of bank notes, murder and arson, the American Government appointed Francis Tukey as the Marshal of the Boston Police in 1846. He justified the appointment of detectives because of their "knowledge of rogues and their schemes." Tukey conducted several

raids against premises suspected of harbouring gamblers, prostitutes, thieves and those in which criminals consorted in Boston.

The first American action in developing new techniques of investigation originated in Boston in the year 1851, where the technique of “**show-up**,” a weekly line up of prisoners was started. As the thieves and other criminals filed across the room, Tukey spoke about the crime and criminal career of each offender. He asked the detectives to collect information about criminals operating locally.<sup>4</sup>

So far as private investigation is concerned, the **Pinkerton Detective Agency** was probably the most famous of all private detective agencies in America in the middle of 18<sup>th</sup> century. Allan Pinkerton was the first ‘G-man’ (a government investigator) who protected President-elect Abraham Lincoln by averting a train tragedy. Later, Federal Bureau of Investigation, the central investigative agency, had emerged within the Department of Justice under the Attorney General.<sup>5</sup>

## **B. Advancements in Science and Technology in Criminal Investigation**

In course of time, the sources of information alone proved ineffective and the investigating police began to develop data from the investigation of the crime scene and interviews with witnesses to the crime. This led to the beginning of a rational theory of crime investigation- a searching for clues and traces likely to identify the criminals responsible for the crime by the application of scientific methods to the findings of the investigating police.

The application of science to the problems of detecting and solving crime was later developed. Identification with portrait, fire arms, handwriting, blood, and pathology became research areas of scientists, and new horizons appeared in individualization of physical evidence in criminal cases. The modern criminalistics laboratories started from bullets to blood.<sup>6</sup> Alphonse Bertillon’s Identification by Portraits (based on anthropometrical features);

Francis Galton's Identification by Fingerprints; Colonel Galvin Goddard's Ballistic science; Albert S. Osborn's Questioned Documents; Sir Bernard John Spilsbury's Forensic Medicine; Dr. Karl Landsteiner's Blood and its Traces; Hans Gross's Science of Criminal Investigation; Larson and Keeler's Polygraph are the milestones application of science in criminal investigation.

### **I. Bertillon's Identification**

Alphonse Bertillon (1853-1914), son of a famous French anthropologist Dr. Louis Adolph Bertillon, started his career as a clerk in the Police Department in Paris in 1879. His study concentrated on establishment of identity of convicts and criminals based on a supposition that 'no two persons have identical measurements'. In the beginning of his research he measured heads, arms, legs, feet, ears and other body features of criminals and started to adopt filing system in police records for comparison and opinion.

Alphonse Bertillon's "anthropometrical signalment" became the foremost scientific system of police identification. This system refers to a scientific measurement of the human body and a means to differentiate one person from another. The use of anthropometry as a method of identification depends upon three elements:

1. the almost absolute immutability of the human form after the age of 20;
2. the extreme diversity of dimension the human skeleton presents when compared in different aspects;
3. the facility and comparative precision possible in measuring skeletal dimensions.

With the application of this system of identification of criminals Bertillon could crack Ravachol-Koenigstein case in 1892 in France wherein Bertillon identified bomber Ravachol as Franco's Koenigstein, a wanted murderer and dreadful robber.

Bertillon has to his credit for having created the first scientific system of visual identification from photographs. A verbal description using the phraseology of *portrait Parle* to describe all visible characteristics of a person created a more exact picture of an individual. Bertillon's *Portrait Parle* is being used by the police agencies in almost all countries of the world. Today the same system has been refined with the use of computer technology to develop a suspect **computer portrait** for search. This method is very useful where the accused is not known. With this method physical features of the suspects/accused can be drawn with the help of witnesses or victim to the crime. It will help the police to follow up the offenders.

## II. Fingerprints

Fingerprints form a conclusive proof when the fingerprint expert explains the trial court clearly and convincingly. Positive personal identification in criminal investigation will have a strong effect on successful prosecution.

Francis Galton (1822-1911) for the first time made a specific study of fingerprints and the methodology of classifying them for filing. It is he who initiated the research that served as the first statistical proof of the uniqueness of fingerprints and that set tremendous odds against two fingerprints being similar. Galton, a British anthropologist, in his book "Finger Prints" (1892) outlined this method of personal identification. Later Sir Edward Richard Henry, in 1901, developed a workable classification system to retrieve the fingerprint cards in a record system.

Today, we have Henry Battley's Single-print classification wherein the police investigator or the expert has to lift chance imprints of the fingers of the criminal found at a crime scene and quickly compare them with any print on the file or suspect fingerprints lifted as a sample for comparison. Several computer software companies have developed software to match latent fingerprints found at crime scenes with the fingerprints on file in Police

Records Bureau. Xiagox Software Company in Bangalore has developed software to search, compare and select similar fingerprints in a minute's time with the help of latent fingerprints lifted at the scene of crime.

Fingerprints evidence has been considered as conclusive proof once the testimony of a fingerprint expert is not disputed in the cross-examination. In *Madan Mohan Raj v State of Orissa*,<sup>7</sup> the High Court of Orissa has held that: "presence of blood-stained finger print on the wooden kilani (Material Object II) is also very relevant. Prosecution Witness-11 (finger print expert) has stated that he detected partial chance blood-stained finger print on Material Object II. Since the finger print was stained with blood it was preserved and taken to laboratory and he took the photograph in the laboratory. Material Objects IV and V are negatives of first and second photographs respectively. According to report of the Director, State Finger Prints Bureau (Exhibit-38), finger prints of the accused tallied with finger print on kilini marked Material Object II. Science of identifying thumb impression is an exact science and does not admit any mistake or doubt. It is a great incriminating circumstance. Finger print was noticed by Prosecution Witness-11 much prior to the arrest of the accused as found from the evidence of Prosecution Witness-8."

### **III. Ballistics in Police Investigation**

Ballistics evidence is one of the vital evidence in criminal investigation. In common parlance, ballistics refers to the study of the flight of projectiles from one point to another. In forensic science, ballistics primarily refers to the attempt to identify a suspect firearm by discovering uniqueness by distinguishing markings on bullets, on fired cartridge, cases found at crime scenes, and on sample bullets and cartridge cases fired in the suspect weapons.

Calvin Goddard, (1891-1955) a U.S. army colonel and physician takes the credit for bringing this technique of science into forensic evidence. It was he who coined the word 'ballistics' to identify firearms on technical line. Apart from other benefits, in the area of criminalistics, ballistics, comparison

microscope can study and identify firearms, the patterns of gunshot wounds, identification of weapon and of the range at which the shooting took place; the restoration of obliterated numbers and other markings on firearms; and the identification of a person as one who had recently fired a weapon by recovering gunshot residues from the face (if a rifle is fired) or from the hand (if a pistol or revolver is fired). The use of firearms in criminal offence is of frequent occurrence. In fact they figure prominently in most of the heinous crimes like murders, dacoities, robberies, assassinations and mob violence and also in police encounters and firings.

The firearm evidence, therefore, is important in criminal investigations and trials. The firearm evidence pertaining to their identification through fired ammunition is well established. It is now on the same footing as the fingerprint evidence. The individuality of the marks imprinted by a gun on a fired cartridge or on a bullet is universally recognized. The assertions of the expert that no two firearms even of the same make and batch and made one after the other leave identical marks on fired ammunition are accepted like the assertions of the fingerprint experts that no two fingerprints from two different fingers even from the same person are alike. Convictions have been accorded and maintained solely on the basis of the firearm evidence.

It is, however, necessary that the link between the evidence and the culprit is properly established. The firearm recovered from the culprit, which fired the fatal bullet or the cartridge case recovered from the scene, should be proved to be in the possession of the accused at the time when the crime was committed.

The firearm evidence helps to decide whether the given incidence is a case of murder, accident, and killing in self defence or suicide. It helps to determine the sequence of events and verify versions. It helps to establish the number of directions, ranges and the number of firearms. It also helps to distinguish between real and fake incidence, and to ascertain whether the injury is fatal or non-fatal.

In *Nathu v State of Uttar Pradesh*,<sup>8</sup> the Supreme Court has held that when appellant Nirpat Singh was arrested, gun Exhibit-3 was recovered from his house, and it was found that a part of its wooden butt-end was missing. The broken piece Exhibit -2 of the butt-end had been recovered from the place of the second incident the same day, before the seizure of the gun. So there can be no doubt that it fell down at the place of the incident. The ballistic expert has stated that the broken piece Exhibit -2 belonged to the recovered gun Exhibit -3. The evidence which has been led in this connection lends further assurance to the correctness of the evidence of the eye-witnesses. The Apex Court upheld the conviction confirmed by the High Court of Uttar Pradesh.

#### **IV. Questioned Documents**

Questioned documents form an important piece of scientific evidence in criminal investigation. The trial courts shall admit evidence of questioned documents when they are scientifically explained and proved by the handwriting expert. The phrase 'questioned documents' can be described as documents that are under dispute for their originality, genuineness and truthfulness which demand the opinion of the handwriting expert.

A questioned document is a material, having a symbol or writing on it, which conveys some meaning to a person or persons. It may be a stone, a wall, a wooden piece, a glass, metal sheet, a skin, a piece of cloth or a paper. It may be in the form of letters, financial documents, orders, records, tickets, posters, books, burnt or damaged documents, hand written, typed script, secret writings etc.

It was Albert S. Osborn (1858-1946) who wrote the most acknowledged book 'Questioned Documents' in 1910 and developed acceptable scientific examination of questioned documents. Today, the police, the prosecution, the judiciary and handwriting experts should be grateful to Osborn for pioneering in this field.

Evidentiary Value attached to the questioned documents is corroborative and not substantive piece of evidence. In *Shiv Chand v. Ujagar Singh*,<sup>9</sup> the Supreme Court based on the expert evidence of questioned documents upheld the acquittal of respondent. However, without examining the hand writing expert the trial court cannot convict the accused in forged document cases. The Supreme Court has pointed out in *Ishwari Prasad Mishra v. Md. Isa*,<sup>10</sup> that expert evidence of handwriting can never be conclusive because it is, after all, opinion evidence, which can never take the place of substantive evidence and before acting on such evidence, it would be desirable to consider whether it is corroborated either by clear and direct evidence or by circumstantial evidence.

#### **V. Blood and its traces-Serology**

Blood, as a source of personal identification has emerged in the course of the development of forensic science. Blood and bloodstains gathered during criminal investigation can lead the investigator to draw certain propositions as to the probability level of a group of persons, or an identification of a criminal to the crime, or the victim of the scene to establish the occurrence of crime (*Corpus delicti*). It permits the investigator to reconstruct the occurrence of the crime from the distribution of blood. The investigator can guess the approximate time of crime from the study of the age of stains by the serologist. It helps in the investigation of poaching, maiming and helps to establish the paternity of a child in disputed cases.

It was Dr. Karl Land Steiner, a distinguished pathologist, serologist-Noble Laureate from the University of Vienna who developed the concept of Agglutination in the year 1901. Agglutination is based on the fact that the blood cells developed together are used to identify blood groups of various persons. Land Steiner's concept is applied in Criminalistics to make blood and its traces a unique factor in identification that would trace origin to a restricted group.

The evidence of chemical examiner is corroborative and not substantive piece of evidence. Conviction can be based on the opinion of chemical examiner, if the expert evidence is corroborated by other evidence. In *Shatrughan v. State of Madhya Pradesh*,<sup>11</sup> the High Court of Madhya Pradesh has observed that the unexhibited report of the Chemical Examiner did not in fact require to be formally proved by any witness. It was a document which proved itself under section 293 of the Code of Criminal Procedure and should have been exhibited even if it was not referred to in the deposition of any witness. That report stood on an obviously better footing than an unproved FIR. The defence could be legitimately allowed to make use of it. When so considered, it militates against the prosecution story about any sexual intercourse having taken place with the prosecutrix.

## VI. Forensic Medicine- Postmortem

Forensic medicine is that part of medical science which is employed by legal authorities for solutions of legal problems. It is usually restricted to criminal matters of a specialization by a qualified physician in the investigation of violent, sudden, and suspicious deaths or non-fatal injuries, in abortions and sex offences. The term 'autopsy' or 'post-mortem' in medico-legal cases became a standard practice.

It was Sir Bernard John Spilsbury (1877-1947) who studied medicine at St. Mary's Hospital in London and was instrumental in bringing this area of investigation up to level of any branch of scientific knowledge. He was an autopsy surgeon of unusual skill and an exceptional technician in the laboratory. It was he who profoundly established that '**dead men tell tales.**'

Post mortem of the dead body, when it is a medico-legal case, is very important to the investigators in criminal investigation to establish the identity of the deceased, time of death, cause of death, modus operandi as it furnishes clues that link the criminal with the crime. In *Ronny alias Ronald James*

*Alwaris Vs. State of Maharashtra*,<sup>12</sup> the Supreme Court has upheld the conviction of appellant under section 376 IPC based on the deposition of the doctor who held the autopsy over the dead body with the corroboration of the circumstantial evidence.

## VII. Voice Analysis

Human beings as well as animals produce sound. The former can articulate the sound to produce and create language through which they communicate with one other. The animals cannot articulate their sounds and thus are unable to create a language of the sound which distinguishes him from the other species.

The voice of a person as well as that of an animal is unique, personal and basically non-imitable in its entirety. Therefore, follows that the voice can permit identification of the person under most of circumstances. In the present day context people communicate through telephones, wireless telephones, satellite telephony, mobile phones, tape, wire and disc recording and playing the recorded version and Internet. The modes of recording voice (cassettes, floppies and discs) are becoming legion and increasing.

Identification of voice or sound has always been important. It is becoming increasingly more important when voice mode of communication is being used increasingly in social, entertainment and business matters. It is also becoming an important weapon in the commission of crime. Consequently, to stem the tide of crime, the identification of the voice of the criminal has assumed tremendous importance.

Technically voice or utterance evaluation is important for profiling of criminals, determination of integrity of the utterance, enhancing the intelligibility of utterance, transcription and analysis of the disputed utterance and above all identifying the speaker.

The voice becomes an important clue material in many a case. In recent times the identification of voice has been effectively used to identify criminals, group of criminals, conspirators, abettors and supporters of criminals. In the Bombay bomb blast case of 1993, the main perpetrator, abettors and controllers were identified through telephone tapping and recording their voices. In cricket match fixing case, Hansie Cronje- the South African team captain, was fixed through telephonic conversations he had with the bookies. In the recent terrorist attack on Parliament (i.e. on 13-12-2001), the main organizer a professor of Delhi University was identified through mobile phone tapping and recording of his voice.

Voice identification plays an important role in ransom cases, blackmail, threats, obscene calls, extortion, political or other or intimidation, bomb or fire hoax, block box voice identification, intelligence collections, identification of drug dealers, smugglers, terrorists, corruption cases, murders, money laundering, match fixing, organized criminals etc.

In *N.Sri Rama Reddy v. V.V.Giri*,<sup>13</sup> the Supreme Court has accepted conversation or dialogue recorded on a tape recording machine as admissible evidence.

### **VIII. Lie- Detection or Polygraph**

Lie Detection or Polygraph is primarily based on the scientifically proved theory that there is a close relationship between body and mind. Body and mind keep interacting by the influence of physical and psychological forces. This process is known as 'psychosomatic disorders' by physiologists and psychologists. This theory systematically explains how certain disorders of the body may be caused due to psychological emotions.

Way back in 1895 Lombroso conducted experiments on criminal suspects and demonstrated that there is a variation in the suspects' blood pressure and pulse rate while lying. However, it is for the first time in 1920's Larson and Keeler independently developed a type of instrument, came to be

known as 'Polygraph,' which could at a time record a person's blood pressure, pulse rate and respiration rate while deception. Keeler's Psycho-galvanometer developed in 1930 to record the electrical resistance of the skin is most commonly used today.

By and large, lie-detector evidence has limited judicial recognition. In a few courts of America polygraph test results have been recognized for their value as an aid to investigation and in some cases the expert evidence relating to polygraph has been accepted. The experts in areas like fingerprints, firearms identification questioned documents etc, have been widely acclaimed. The polygraph experts have not received acceptance and recognition from the court. In spite of establishing 95 to 98% accuracy of the lie-detector in detecting deception or the truthfulness of the subject in criminal investigations. On the basis of relevant scientific data on the lie-detector, it is strongly felt the courts should accept deception test results because it can furnish a fairly effective method and technique for the exposure of deception in a subject. Since polygraph interrogation is the best available method to detect deception, the time has come for the courts to admit this type of evidence.

The present position regarding the acceptability of lie detection test results is that in some of the courts of USA it has been accepted as legal evidence. In India, a beginning was made by the Central Forensic Science Laboratory, Central Bureau of Investigation, New Delhi, by providing the facility of polygraph for crime investigation purposes. A number of other institutions have since introduced the facility. In Bangalore the State Forensic Laboratory too provides this facility to the investigating police.

### **IX. Truth Serum or Narco analysis**

It is believed that if a person is administered a drug which suppresses his reasoning power without affecting memory and speech, he can be made to tell the truth. Some drugs have been found to create this twilight state in some

persons. These drugs are actually being administered in some countries including India.

Truth serums (or sera) are no serum at all. They are drugs, sometimes used clinically. A few of the best known drugs are Seconal, Hyoscine (scopolamine), Sodium Pentothal, Sodium Amytal and Phenobarbital. These drugs are administered through injections. They produce a state of semi-consciousness in the subject and reasoning faculty of the individual gets affected.

Truth drug administration suffers from many drawbacks. Firstly, the person to administer them has to be a highly qualified physician. Secondly, it is always difficult to determine the correct dose of the drug, which varies not only due to the physical constitution of the subject, but also his mental attitude and will power. Besides, the clever subject could hoodwink the operator by faking the state of semi-consciousness and tell lies, which are useful to him.

Truth drugs have never been popular in police interrogation anywhere. They have now given way to instrumental methods. They are used to interrogate spies only where dose can be changed and correct dose found by experiment especially when the instrumental methods have failed to extract the truth. The Delhi State Police used truth serum drugs recently to extract information from one of hundred terrorists when other methods failed to get the information.

## **X. Brain Printing**

Another instrument based upon the recognition of associative evidence by the brain, resulting in additional electrical activities have also been developed and patented. When a culprit, victim or witness is shown an object, a scene or a situation, which is connected with the crime, his brain recognizes the entity. The recognition creates activity in the brain. This activity is recorded by an instrument Encephalograph and the trace thus obtained is called Electroencephalogram (EEG).

The brain printing can provide useful information if the following bases are met with:

1. There should be reliable measures to record the brain stimulation-this has been achieved through electroencephalograph (EEG)
2. The existence or absence of the information with the subject. It is indicated by the electroencephalograph response.
3. Brain printing is based upon the premise that the individual cannot control his brain activity. The premise seems to be highly suspect.

The brain is a storehouse of all the information a subject possesses. If the subject is involved in a particular activity he has the information stored in his brain. All the criminals and their associates have information about their criminal acts. Therefore, if we can reach this information, we can establish their involvement or innocence and also the part played by them in a particular act. Thus, it can provide foolproof evidence against them without external sources such as written or oral evidence. The brain of the culprit always records the occurrence, therefore the evidence is always available. Recent advances in neuro-sciences have given a ray of hope that the stored information in the brain can be tapped accurately, non-invasively and objectively which can provide clinching evidence in a crime situation. However, the techniques involved need a lot of spadework before they can provide through brain printing, the big break through in scientific criminal investigations.

Brain printing technique is useful specifically in white collar crimes, burglary, theft, murder and rape cases, identification of terrorist, saboteurs, spies, arsonist and identification of potential criminals/crime situations.

Brain printing technique has the advantages of incessant available evidence which is accurate, cost effective, time effective, non-invasive, quick, non-subjective (computer process the details and interpretation) hence no bias and such evidence is human-right savvy.

Courts in India have not yet attached importance to the evidence brought out by polygraph, truth serum and brain printing technique by deciding any case on the merits of evidence brought out by these techniques. However, from these techniques, there has been a considerable help to the investigating police to elicit information from the criminals to their crimes. There is an urgent need for amendment to CrPC and the Indian Evidence Act for definite procedures to be followed, bearing in mind human rights angle and justice to victim, while application of these techniques and admissibility of evidence gathered from these techniques. Telegi's Stamp Scandal is the best living example wherein the accused Telegi was subjected to these tests and he had revealed lot of information as to stamp scam, conspirators, police officers and politicians who prompted and patronized him to continue with his fake stamp business.

#### **X. DNA Finger Printing or Profile**

DNA Finger Printing is the latest scientific method of identification of criminals to the crime. DNA is the short form for Deoxyribo Nucleic Acid. DNA Finger Printing refers to comparison of DNA from two different sources to establish the identity. This technique was developed in the year 1984 by the British Geneticist Alec Jeffreys. Unlike in finger prints, DNA sources are found in every living cell of human body. Sample sources can be obtained from blood, semen, hair roots, saliva, finger nail pairings, body tissues, skin, bone marrow, urine, facial matter, tooth canal root pulp, foecal material, post mortem samples and blood samples in blood relationship cases.

Of late the courts are considering the DNA Finger Printing as the most dependable of all evidences available and on par with Finger print proof.

On November 21, 1983, Lynda, a girl of 15 years was found murdered. The body was discovered a day after the killing. She had been raped and strangled with her own scarf. Police employed over 100 investigators and interrogated everybody in the locality, but the killer was not discovered. They had taken swabs from the vagina of the deceased and collected semen stains from her person and garments. The murderer continued untraced.

On July 31, 1986 another 15 years old girl Dawn disappeared. She was found raped and strangled to death in a nearby field. The nature of the injuries on the persons of Lynda and Dawn were similar. The Police caught a seventeen-year-old boy who confessed to the crime. The police requested the services of Professor Jeffreys. He obtained the DNA profiles from the semen recovered from the two victims Lynda (in 1983) and Dawn (in 1986) and compared them with DNA pattern from the suspect. He found that whereas the semen from Lynda and Dawn were from the same source, they did not tally with the DNA pattern of the suspect. On their evidence, the suspect who had even confessed to the crime was let off.

The driver of the bus raped a 57 years old woman suffering from Alzheimer's disease in a bus in which she was traveling. The woman when interrogated could not remember who had attacked her. However, police investigations revealed that only the bus staff could have committed the rape. The driver of the bus became the prime suspect. His blood was analysed for DNA profile. The profile matched the DNA profile of the semen recovered from the person of the victim. When the driver was confronted with the evidence, he confessed to the crime without much verbal persuasion.

## **B. Scientific Aids to Investigation**

Keeping in view the importance of the scene of occurrence the Police Departments all over the world have organized scientific aids for the examination of the scene. Scientific aids to investigation consists of Investigator's kit, photography, mobile laboratory, flying squads, expert help and dog-squad.

### **I. Investigator's Kit**

Investigator's kit is a collection of items needed by the investigating officer at the scene of occurrence. It generally contains:

1. Examination kit. A compass, a magnifying glass, a mirror, a torch (with spare bulbs and cells), a scale, measuring tapes, vernier calipers, forceps, tongs and a pair of rubber gloves.
2. Making and breaking kit. Diamond pencil, scissors, scalpel, knife, adhesive tape, twine, wire and tool kit containing a set of screwdrivers, jimmy, adjustable wrench, wire cutter, saw, hammer and pliers.
3. Fingerprint kit. It includes inking slab, ink roller, thumbprint ink tube, powder: grey, graphite and anthracene, camel hair brushes, lifting tape, iodine fuming tube, glass wool, iodine and anhydrous calcium chloride.
4. Casting kit. It contains talcum powder, powder sprayer, lacquer and lacquer sprayer, rubber cup, ladle, plaster of Paris, sieve, aluminum strip frames, wire gauze, salt, scale and a towel.
5. Blood testing kit. It consists of high quality filter paper circles about 10 cm. in diameter, spatula, scalpel, droppers, pipettes, distilled water, saline solution, glacial acetic acid, benzidine, (benzidine tablets are preferable), barium peroxide and methanol.
6. Collection paraphernalia. A set of clamping boards with nuts and bolts, screws, nails, cardboard boxes of various sizes, (economy of space is achieved by placing one into other in the decreasing order of sizes), plastic and paper bags and envelopes, craft paper and cellophane sheets, clean white linen, tissue paper, absorbent cotton, test tubes, bottles of various dimensions (20 ml., 100 ml., 500 ml., and 1 litre) with screw and glass stoppers. So also rubber bands, gummed labels, tags, needles and thread, sealing wax, seal and spirit lamp are needed for sealing and labeling.
7. Recording equipment, writing board, graph paper, noting sheets, carbon paper, drawing paper, various types of forms (for example, fingerprint form, recovery memo forms) pen, pencil, coloured pencils, erasers, scale, mathematical drawing box and compass.

It is not convenient to carry all these items at all time, nor are they necessary in every crime. It is, therefore, convenient if the items are kept ready and those required in a particular investigation are taken there.

## II. Photography

The scene of occurrence should be photographed as a matter of routine. The photography of the scene does not add materially to the cost of investigation and trial. Yet it is bound to increase the conviction rate.

The photographs of scene of occurrence are extremely useful. It is rather rare for the judges, the jury and the lawyers to visit the scene of occurrence. Proper photographs of the scene, however, bring the scene in the court room. They are better than the verbal or written descriptions. The pressure of work may force an investigating officer to overlook certain details. Proper photographs of the scene make these details available to him later also. The investigating officer may be influenced unconsciously by the account of an interested person and examines the scene with a preconceived theory. Later, certain facts lead to different conclusions. If proper photographs are available, the versions can be verified. Sometimes the eyes may not observe certain facts, for example, washed bloodstains and marks of disturbance at the scene. The camera will photograph them and keep a permanent record, verifiable at later stages of the investigation also. Skid marks, tyre marks, foot and footwear marks are found on highways and busy roads. The marks cannot be picked up easily. The evidence cannot be left undisturbed for a long time without serious dislocation of traffic. The evidence is, therefore, best recorded by photography. The photographs prove useful in determining the quantum of responsibility of a particular vehicle involved in accident at the time of trial. Without photographs, the defendant may question the correctness of the allegations.

A Movie camera is very effective in riot cases. It records the identities of the participants and the part played individually by them, such as shouting slogans, inciting people or damaging public or private property. During the murder of a president of United States of America, the movement and actions of the killer were photographed. The film was being prepared as a documentary. The film provided irrefutable evidence.

The perishable evidence like wounds on a dead body, traces of resistance, scratches, tears, rents, swollen flesh in rape cases and strangulation marks, is best recorded and preserved through photographs.

### **III. Mobile Laboratory**

The mobile laboratory is fitted with generator, Investigator's kit, Photographic equipment, an ultraviolet and infrared lamps and small portable X-ray unit and magnifiers, stereomicroscope, hand spectroscope, vacuum cleaner, avometer, electricity tester. The labs can be made use in important cases. Because an average investigating officer does not know the importance of all the traces left at the scene of crime, nor does he know the proper sampling techniques. He may, thus, fail to preserve important items of evidence or specimens. The laboratory personnel prove helpful to him in this regard. They can eliminate some of the exhibits by examination at the spot. They are sometimes able to guide the investigating officer to pursue a particular line of enquiry from the spot on examination. It is, therefore, desirable that the laboratory personnel should examine the scene of occurrence in important cases.

In a multi murder case, the mobile unit of the laboratory pitched tent at the site and extended full co-operation to the investigating staff. The mobile laboratories are very useful for the investigation of crimes. They help to photograph the scene, including fingerprints on the vehicle and foot and footwear marks at the site and on the route of departure of the culprits. They provide photographic facilities to the medical team carrying out the post-mortem examination. They help the police to follow the route of flights followed by the culprits checked, photograph and collect the prints and impressions found enroute. They help to gave possible number, height and built of the culprits from the study of the gait patterns. They help to check the footwear of some suspects and eliminate their presence at the site. They also predict the possible types of firearms used from the size and nature of the

wounds and guide the medical staff to recover all the ballistic evidence intact from the dead bodies. They help to check the bullets at the time of post-mortem examination and give the number, type and possible make of the four firearms used by the culprits in the commission of the crime and eliminate some firearms recovered by the police at the scene.

#### **IV. Flying Squads**

Most of the police organizations have instituted flying squads especially in large cities. A flying squad consists of a team of police officers who reach the scene of occurrence immediately and carry preliminary duties. They are provided with fast moving vehicle fitted with a two-way communication wireless system. These squads are located at various important points. When a report relating to crime is transmitted to them, they immediately proceed to the scene of offence and call in the necessary police and other help. Flying squads work round the clock in teams. Delhi flying squad system is extremely well organized. In many a case the flying squad people has caught the culprits red handed.

The introduction of flying squads in cities has a great demoralizing effect on the criminals. Sometimes the squads made sensational news when they catch the criminal red-handed.

#### **V. Expert Help**

There are several experts who can help the investigating police in the task of efficient and effective investigation of crimes. Accuracy and coherency in collection and analysis of evidence will be enhanced with the prompt services of photographer, medico-legal-expert and forensic expert.

Photographer gives accurate and complete record, as the scene existed before handling. He fixes the location of the scene, the *corpus delicti*, the evidentiary clues, the routes of ingress and egress, the movement of the culprit(s), etc. He indicates the Modus Operandi. He reveals the extent of

depredation and damage. He creates permanent record of the scene, revives and brings the scene to the court room. He reveals the hidden evidence and records the criminal act in riots. He photographs of the dead, before, during and after the post-mortem. Trap cameras at the scene, initiation through tripping, IR rays, making/ breaking connections and automatic recording of the activity. He provides photographic evidential help to medico legal expert, forensic expert, forensic psychologist and others involved, to locate, preserve and present the evidence properly. He records transient evidence and makes visible the invisible evidence through UVIR and other photo techniques.

Medico-legal expert can help to identify whether the scene is real or fake. He can identify death, he can evaluate injury: fatal/non-fatal, grievous/simple, self-inflicted or otherwise, old /recent, and the nature of the weapon, which caused the injuries. He can identify age, sex, height, built, scars, deformity and can indicate the cause of death and the time of death. He can help to identify whether the death is due to suicide, accident, self-defence or due to murder. He can help to locates/collects evidence on the person of the deceased/injured, birth marks, tattoo marks, projectiles, foreign matter, hairs, fibers, bloodstains, semen stains, nail scrapings, digital skin, body fluids as control samples and evidential material for narcotics etc., and visceral material for detection of poisons, narcotics, alcohol. He can help to collect body material specimens, hair, blood, organs etc. He can indicate the survival period and the possibility/impossibility of the acts allegedly performed by the deceased/injured and can give symptoms observed in cases of poisoning. He can determine if an accused person is sane or insane (psychiatrist). He can also help the investigating police to determine the apparent motive in sex, maniac, vendetta, robbery etc.

Forensic Expert can help in investigation to ascertain if the incident is an Act of God, an accident or a criminal act. He can establish genuine/fake nature of the alleged scene of crime. He can help to establish the identity of the deceased through occupational marks or materials. He can find out if the

*corpus delicti* has been moved. He can ascertain if a vehicle has been used in the commission of the crime. If so, determines the type of vehicle used and finds the evidence to identify the individual vehicle involved. He can make quick evaluation of evidence for elimination or holding act. He can help to locate, collect and preserve correct evidentiary and sample clues. He can make the invisible clues visible and reconstruct sequence of events and verify versions. He can fix routes of ingress and egress. He can help to determine the nature of the weapon used for offence. If a firearm has been used, he can determine its nature, number of shots, direction and range of fire. He can also help to determine the motive of the crime, sex, robbery, vengeance etc.

In addition to the above, other experts are also required in certain special situations. These experts are requisitioned whenever they are required. The forensic experts are the bare minimum need. Their services should be requisitioned in all important cases. They can then decide on seeing the scene who are the other experts needed.

## **VI. The Police Dogs**

The uncanny smelling power of dogs has made them very valuable in the examination of the scene. Trained dogs carry out several duties. They guard the sites very well and have proved excellent guards. They guard buildings, compounds, parks and property and track and identify the criminals. A trained dog is made to smell an article left or touched by the criminal at the scene. The dog picks up the scent and follows the route adopted by the criminal to his hideout. The dogs also pick up smell from the track. If the culprit has used some means of transport (horse tonga, motor car or bus) the dog loses the scent and is unable to track. If the time interval between the flight of the culprit and the tracking is appreciable, the scent gets lost and the dog fails to follow the route. The trained dogs are helpful for the search of the scene of offence. They find out buried bodies, hidden items and articles which may have been overlooked by the investigating officers. In Himachal Pradesh (India), some

dogs have been trained to unearth unauthorized hidden distilleries and their products. Quite a few cases are, thus literally unearthed. Trained dogs are being used to smell and trace explosives and narcotics.

The Supreme Court, without reaching any final opinion on the subject has once observed in *Abdul Razak v. State of Maharashtra*,<sup>14</sup> that the dogs are intelligent animals with thought process similar to the thought processes of human beings though the evidence relating to tracker dog cannot be likened to the evidence of scientific experts describing chemical reactions, blood tests and the actions of bacilli. It is relevant to refer to the decision rendered by a learned single Judge of the Bombay High Court in *Babu Maqbul Shaikh v. State of Maharashtra*, the Judge pointed out that if the evidence passes tests of scrutiny and reliability as in the case of any other evidence, there is no warrant to treat it as inadmissible. Some guidelines have been laid down in the said decision. The following observations of the learned Judge are useful in this context as reflecting the correct position on the subject.<sup>15</sup> It is scientifically accepted that dogs are rated as extremely intelligent animals and that some of their sensibilities are very highly developed and are extremely reliable. It is also to be noted that there are some breeds of dogs and some strains which are specially utilized for hunting and tracking because of their abnormally high talents. If the dog belongs to one of these categories and if it is shown to the court that it has been specially trained for purposes of detection, not only would the dog-tracking evidence be admissible, but it will have to be relied upon as being evidence of a very high calibre.<sup>16</sup>

### **C. Criminal Investigation in India**

Several historical references of Kautilya's *Arthashastra*, in the accounts of foreign travelers during the reign of the Mauryas, the Guptas and the Mughals throw sufficient light on the method of espionage that prevailed in those days and also hint at how offences were detected.

However, it was during the British period, more specifically, after the Siphoy Mutiny in the year 1857, a Criminal Investigation Department was formally constituted in the year 1878. Earlier to this, there was a Thagi and Dakaity (Dacoity) Department formed in the year 1835, which was, in effect, a Criminal investigation Department to deal and detect the crimes of Thagi and Dakaiti.

None the less, in 1884, a Bombay police officer, with special qualifications, was relieved of ordinary duties and employed solely on detective work, and a similar kind of arrangement was made in Calcutta.<sup>17</sup>

In the year 1901 the Government of India began to consider the formation of a small detective force under the orders of the Inspector-General in each province.

In the year 1907 a Provincial Criminal Investigation Department was established in every province with separate officers, staff and salary under the head of a Deputy-Inspector General. In the beginning days of its establishment, it did a very good work in detecting very complicated frauds and house breaking thefts. Continuing the tradition, the *Madras Public Gazette* published lists of stolen property and wanted criminals.<sup>18</sup> In 1934 *the Punjab Police Rules of 1934* had described the duties of the Central Investigation Department with an overriding emphasis on detection of crimes.

In India techniques in the investigation of crime improved greatly in the twentieth century as a result of the *modus operandi* system developed by Major Atcherley in England. This system was based on the knowledge that a particular criminal or group of criminals tend to specialize in a particular class of crime, and adopt unvarying methods of operation.<sup>19</sup> Method of crime Mapping based on number, frequency and location of criminal activities was developed in the early part of twentieth century.

In India, potentiality of the fingerprints system was realized by Sir William Herschel, an Indian Civil Service officer in Bengal in the year 1858. He asked a road contractor to put the stamp of his hand upon an agreement of any thought of repudiating his signature on it. Further with the growing incidences of crime of poisoning in India, a Chemical Examiner was appointed in the year 1879.

In 1895, Madras Provincial Fingerprint Bureau was established. In 1904 the post of hand writing expert was permanently created in Bengal province later he was known as the Examiner of questioned Documents.

Ballistic Science with section of photographic equipments was installed in most of provinces in early twentieth century.

Another milestone in the tradition of criminal investigation was the development of Radio Communication in India was started. It was introduced in to police work in Bombay city in 1930.<sup>20</sup>

#### **D. Main objectives of Investigation**

Investigation has its own objectives, which can be met procedurally. The main objectives of investigation are:

1. to collect procedurally all possible evidence relating to the facts and circumstance of a crime;
2. to collate and analyze the evidence collected on systematic and legal footing;
3. to ascertain, whether , a crime was committed ;
4. to identify and apprehend the accused under law for the guilt;
5. to recover the property involved in crime;
6. to assist the state in prosecuting the party charged with the offence ;and
7. to see that justice is done to the real victim and the innocent who is accused.

## E. Qualities of a Good Investigating Police

It is often said that the investigating police should be endowed with all the qualities of a good professional as he should have all necessary qualification, skills, experience and expertise. His approach to the investigation should be skillful and systematic with fairness and impartiality in his attitude and approach. He should be honest and conscientious to the responsible duty that he performs.

Dr. Hams Gross in his classic treatise '*Criminal Investigation*' has observed that: "an investigator should possess indefatigable zeal and application, self-denial and perseverance, swiftness in reading men and a thorough knowledge of human nature, education and agreeable manner, an iron constitution and encyclopedic knowledge".<sup>21</sup>

The investigating police should possess sincerity and sense of promptitude towards his duty and responsibility. He should be dispassionate and disinterested towards players of the crime. He should be a catalyst, unaffected and unanointed by any attractions and distractions. He should be adept at reasoning and to evaluate facts and circumstances to a crime to carefully discern the facts and take right decision.

Further, the investigating police should have an open mind to allow a train of thoughts and ideas to pass through it, without any malignity. A well balanced temper and temperament must always pervade his thought and conduct. He should possess considerable working knowledge of laws and procedures and special skills to wade through investigation process on professional line and lane. He should possess sound mind and strong body to cope with arduous task of investigation with out being slow and sluggish. His quest for latest scientific knowledge and aids of investigation should be ever alive and ready to capitalize on his efforts. He should be honest and hard working with risking bearing firm mind. Not the least is that an investigating police always should be fair and prompt in his job.

A successful investigating police should be self-disciplined and objective in his approach for collection and analysis of facts without prejudice and bias. He should possess a sense of reasoning, so that correct inferences could be drawn on the facts gathered during the investigation.

### **F. The Duties of the Investigating Police**

There are several important duties required to be performed by the investigating police towards achieving the goals of effective investigation on professional footing to curb the acquittal rate. It is relevant to refer to Dr. Hans Gross's, monumental work '*Criminal Investigation*' wherein he observes that: "the police investigator's whole heart must be set upon success, otherwise if he does not allow himself to be beaten today, he will be saved a hundred times over."<sup>22</sup>

The duties of the investigating police, in brief, are:

1. To hold investigation efficiently and effectively in professional fashion;
2. To collect necessary information and intelligence about the wanted criminals;
3. To promptly visit the scene of crime to study and survey the ways and means through which a crime would have been committed;
4. To conduct effective and prompt search and seizure for clues and evidence necessary for investigation;
5. To examine promptly and politely the witnesses to the crime;
6. To apprehend and arrest real the accused and interrogate them procedurally with a sense of respect for human rights and respect for rule of law without resorting to third degree method;
7. To discover the facts from the information furnished by the accused to the crime under section 27 of the Indian Evidence Act;
8. To arrange for test identification parade of the accused, if necessary;
9. To arrange for confession of the accused before a Magistrate, whenever and wherever possible;

10. To prepare all forms and reports of investigation as per law and Procedure;
11. To write comprehensive and prompt case diaries on day to day work of investigation;
12. To prepare properly and promptly charge sheet/ final report in consultation with superior officers and prosecutors;
13. To file charge sheet/ final report promptly with all necessary details and documents before the competent court;
14. To secure the witnesses and other experts to the court to give their testimony; and
15. To assist the prosecutor and the court during trial of the case.

#### **G. Investigative Skills and Attitude Essential for the investigating police**

Investigative skills and attitude are *sin quo non* for the investigating police in their voyage towards effective investigation of crime. The investigating police must profess and foster various skills essential for his successful professional investigative career. Several acquired and ascribed attributes of the investigating police will contribute magnificently for the successful investigation of crimes. Paul B. Weston and Kenneth M. Wells have listed out the following skills necessary for the investigating police to excel in the career of investigation of crime:<sup>23</sup>

1. an unusual capability for observation, objective perception, and recall;
2. the power of deliberation and deduction-unhurried, rational thinking;
3. an extensive knowledge of criminal law, rules of evidence; investigative concepts and techniques, scientific aids and laboratory services, knowledge about people who commit crimes and of the *modus operandi* of criminals;
4. the power of an intellectually controlled constructive imagination or a “native” awareness of the mental process of criminals, and-some times-of their victims; and
5. a working knowledge of social psychology.

The investigating police should be well conversant with many languages and religious ideologies. Knowledge and command over state language and English is very essential. He should be well aware of and conversant with latest laws, procedures, orders and judgments of High Courts and the Supreme Court for not to obviate from the proper course of investigation and be justifiable in his thought and action.

The investigating police must have extraordinary traits and skills to approach the scene of crime as a seasoned professional. He must have acquired the art and craft of making notes of the crime scene; conduct search and seizure; examination of victims and witnesses; and interrogation of suspects and accused to the crime. He must be capable of harnessing human and other resources judiciously. He must possess knowledge of his staff, their special qualities and skills to deploy them properly for the job they deserve and work better within the means available.

The investigating police must not only have knowledge of the laws, but he should be a law abider himself. All his acts and conduct must be within the framework and guide lines of professional code of conduct.

The investigating police must have enough knowledge of availability and application of latest modern gadgets and telecommunication networks. He must have acquired sophisticated skills and capabilities to tackle latest types of crimes such as organized crimes, money laundering, cyber frauds, trafficking in women, children and drugs, terrorism and naxalism, which will invariably have their ramifications and networking spread across states and nations.

The investigating police must be a good protocol officer to coordinate amicably with other wings and agencies to elicit co-operation for the job assigned. Equally, he must be good and cordial with the public, the media, NGOs, advocate fraternity and other groups to negotiate the problems that he comes across in his professional field.

The investigating police must possess basic skills and capabilities for the use of various forms and formats for First Information Report, Station House Diary, Case Diary, witness statement, search list, property seize, charge sheets, log book. He should possess a good and commendable reasoning ability.

The investigating police must also have the basic skills of typing, computer-operation, e-mail and internet operations, handling cell phones and their call analysis to cope up with the changing trends in sophisticated crimes.

## End Notes

1. The Police Act, 1861 (Act No. 5 of 1861) p.1.
2. Paul B. Weston and Kenneth M. Wells: *Criminal Investigation- Basic Perspectives*: Prentice-Hall, Inc., Englewood Cliffs, N.J., 1970, p.2
3. Thompson, Sir Basil: *The Story of Scotland Yard*: New York; Double-day & Company, Inc., 1936, pp.108-9.
4. Lane, Roger: *Policing the City-Boston 1822-1855*: Cambridge, Mass; Harvard University Press, 1967, pp.44-66.
5. Arthur C. Millspaugh: *Crime Control by The National Government*: Washington, D.C.: THE Brookings Institution, 1937, pp.87-149.
6. Paul B. Weston & kenneth M. Wells, op. cit., pp. 12-20.
7. 1996 Cri LJ 2580 (Orissa); Also *Gade Lakshmi Nangaraju v. State of Andhra Pradesh* AIR 2001 SC 2617.
8. AIR 1977 SC 2096; Also see *Husna Vs State of Punjab* 1996 SCC (Cr) 421.
9. (1980) 2 SCC 1977.
10. AIR 1963 SC 1728.
11. 1993 Cri. LJ 122 ( M.P.)
12. AIR 1998 SC 1251.
13. AIR 1971 SC 1162.
14. AIR 1970 SC 283.
15. 1993 Cri. LJ 2808.
16. *Abdul Razak Murtaz Dafdar v. State of Maharashtra*, AIR 1970 SC 283.
17. Sir Percival Griffiths: *The History of the Indian People*: Allied Publishers Private Ltd., Bombay, 1971 p.345.
18. K. Balakrishna Shetty: *The History of Madras Police*: Published under the Authority of the IGP, Madras, printed at the B.N.K. Press Pvt. Ltd. Madras, 1959, p.444.

19. Griffiths, op. cit., p. 316.
20. **Ibid.**, pp. 333-340.
21. Dr. Hans Gross; ***Criminal Investigation***: Universal Law Publishing Co. Pvt. Ltd. Delhi, 5<sup>th</sup> ed. (Second Indian Print-2002) p.15.
22. **Ibid.**, p.4.
23. Paul B. Weston & Kenneth M. Wells, op. cit., p.29.