CHAPTER-IV

Investigation and Use of Scientific Means in It: A Historical Account
INVESTIGATION AND USE OF SCIENTIFIC MEANS IN IT: A HISTORICAL ACCOUNT

I. Introduction

The roots of the present day human institutions lie deeply buried in the past. The same is true with the country’s criminal justice system. The criminal justice system of a country at a given time is not the creation of one man or of one day. It represents the cumulative fruit of the endeavour, experience, thoughtful expressions and labour of people through generations. The age long efforts, to control the criminal activities have resulted in the present Criminal Justice System. Investigation is the important tool in the Administration of Criminal Justice. Criminal Justice System cannot work effectively without investigation. Investigation can be proper and effective with the use of specialized knowledge and scientific means. The scientific fields have developed not in a day but in the course of civilization. Since the ancient time these were used in the investigation with their recognition in the society. However, this relation was not established in a day, but is the result of constant growth in the science and technology and its use in every walk of life including justice delivery system.

To understand, comprehend and appreciate the present Criminal Justice System adequately, it is therefore necessary to acquire a background knowledge of the course of growth and development of investigation and development of those scientific fields which have facilitated the investigation. In this chapter the researcher is trying to find out the history of investigation and use of scientific means in it.
II. Evolution and Development of Scientific Investigation in India

In order to trace the history of investigation, it can be studied under three periods: Ancient Period, Mughal Period and British Period. The Ancient period which is commonly known as Hindu Period. It extends for nearly 1500 years before and after the beginning of Christian era. The Mughal Period with the first major invasion of Muslims is 1100 A.D. The British period in India begins with the consolidation of the British Power in the middle of 18th century and lasts for nearly 200 years.1

A. Ancient Period:

The roots of present institutions lie deeply buried in the past.2 The criminal justice system as has been developed today has its base in the Ancient Period. The important smritis which contributed immensely towards the development of Hindu law are Manu Smriti (200 BC – 100 AD), Yajnavalkya Smriti, Narad Smriti (200 AD), Katyayana Smriti (400-500 AD).3 These Smrities gives a systematic and cogent treatment of existing rules which governed human relations inter-se. The Manu Smriti provides much information as to the duties of the King, the importance and purpose served by the punishment and the manner in which it should be regulated. Manu Smriti greatly emphasized that it was the responsibility of the King to protect administration of justice. Any indifference towards this important function could bring calamity to the King himself and to the people as well.4 The King used to exercise all the powers of legislature, executive and judiciary to impart justice to the people.

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1. Information of Commission of Crime

In the ancient period, there was no complicated code of procedural law like the Code of Criminal Procedure in Modern India. Failure to observe technicalities therefore did not result in miscarriage of justice. There was no clear cut distinction between the Investigating Machinery and the authority entrusted with the task of deciding cases. The King had all the powers of investigation and also of punishment. However, it appears that investigation was in charge of the King\(^5\) and for his help in investigation he could appoint The Lords\(^6\) and The Spies.\(^7\)

(i) Role of King

So far as the King himself\(^8\) was concerned, his investigation began whenever a spy informed him or a complaint was made to him. It seems that he himself used to go out to find what crimes were being committed in his domain and who were the perpetrators thereof.\(^9\) It was also his duty in the court to investigate the cases and to attend the trials. He was bound personally to inspect every year the Gramas (villages), Purah (cities) and Desas (Districts and Provinces) and to know which subjects have been pleased and which oppressed by the staff of offices. If the King for some reason was unable to investigate a case he had to get the necessary information through Stobhaka and Suchaka. Katyayana says that a person who informs the King about the Commission of acts forbidden by Shastras with the hope of getting reward is called Stobhaka. These were non-official informers. There were others category of informers (Suchaka) who were appointed by the King. These were the paid servants and were engaged to find out the wrong doing of the people and these were under a duty to inform

\(^{5}\) Manusmriti, VI, 1 and 9.
\(^{6}\) Manusmriti, VII, 114.
\(^{7}\) Manusmriti, IX, 266.
\(^{9}\) Sukranti Ch. 1, 91. p.224.
the King about the commission of crime. The information or complaint about the offence committed by any individual could be made by any citizen and not necessarily by the person injured, but also by any person where injury was caused to his relatives. The detection of any offence and lodging of first information of offence was considered as an act for which he was entitled to remuneration at the hands of the King. It was not possible for King to gather each and every information of the whole State. So to collect the information and for investigation King used to appoint Lords and Spies.

(ii) The Lords

The King had to place a company of soldiers, commanded by trusty officers, in the midst of two, five or hundred of villages for the protection of Kingdom. He had to appoint a Lord over each village, as well as Lords of tens of villages, lords of twenty villages, lords of a hundred villages and lords of a thousand villages. The Lord of one village himself had to inform the lord of ten villages of the crime committed in his village and the ruler of ten to the ruler of twenty. The ruler of twenty was bound to report all such matters to Lord of a hundred and lords of a hundred had to himself give information to the lord of thousands. Their remunerations were also fixed and it was further provided that the minister of King should inspect the affairs of those officials, who were connected with their villages and their separate business. It was ordained that this high official should personally visit by turns all those other officials and properly explore their behaviour in each district through spies. This was to prevent the servants of the King becoming Knaves and for seizing the property of those officials who with evil mind took money from suitors and could banish them.

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10 शास्त्रेत निदित्तलं त्वर्ग्युक्त्यवार्थं प्रवृत्तिः।
अवेद्यवति येन पुर्वे स्तीमकेश्वरेश्वरमुक्तविन्हः।
तृणभृति विपक्षकः येन परहुनि श्रवणसत्चेत।
रूपाय सुरे ज्ञालेया सुन्दरः। स उच्चतः। Katyayana quoted in Sm. C.III, 1-65.
12 Supra note 8, p.81.
13 Kautilya Arthashasta, IV-79-4, Rule 4 and 2.
(iii) The Spies

The procedure for detection of criminals through secret agents, investigation through interrogation and through torture had been given elaborately in the Kautilya Arthashastra. He classifies the spies into nine types and also mentions role of women spies. The spies belonged to good families. They were loyal, reliable and well trained in the art of disguise. The King used to obtain classified information pertaining to the movement of ministers, priest and commanders so as to assess any possible ‘coup’.

Further, greater details have been given about these spies from whom the King had to get all the information regarding secret conspiracies. The spies had to take the garb of Siddha, Tapasvi Sanyasi, Pariurajak, Minstrels, Magicians, Loafers, those who earn their livelihood by showing through various instruments the abode of God of death, those who showed the auspicious moments, astrologers, men, fools, businessmen, artisans and sweet-meat makers etc. Their duty particularly was to keep a watch on the actions of village officers to see whether they were honest or dishonest.

There were also certain village officers like Katwars and Zamindars whose duty was to report about the events in the village. In fact these persons were similar to spies except for the fact that they had to report the matters to the Lords and not to the King.

2. Role of Police

Our ancients prescribed in great details the duties of police regarding suspicious character particularly like thieves, dacoits, murderers, oppressors of public etc. This was particularly helpful in both detecting and preventing crimes. A watch had to be kept over by the police over those who

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16 Kautilya Arthashastra, IV-79-4, Rule 4 and 2.
17 Supra note 8, p.82.
18 Kautilya Arthashastra, IV-81-6 Sankarupakarmabhigrahah.
did not earn sufficiently for their maintenance; over those who did not give a proper account of their occupation, name, country, family name etc; over those who had secret occupations. Those specially found of honey, meat, scents, good clothes etc; over those who were the associates of spendthrifts, prostitutes, gamblers and drunkards; over those who went often to foreign countries and had no fixed place of residence; over those who visited forests and lonely places at odd hours; over those who roamed round the houses of the rich in a secret manner, over those who got their wounds dressed secretly; over those who turned their backs on seeing a man approach; over those who were specially addicted to women; over those who repeatedly enquired about someone else’s affairs; women, wealth etc., over those who knew about thefts, crimes and weapons; over those who melted ornaments, or changed their forms and improperly sold them; over those who bare enmity to others; over those who hide their identity; over those who were previously accused of theft; over those notorious for wrongful deeds; over those who hide themselves from the gaze of and run away at the sight of city watchman and other government servants; over those frightened by anyone moving about with a weapon in his hands.

Detailed rules were also prescribed by our ancients for detecting a crime; for example, whenever an article was stolen its detailed description had to be written and sent to all the merchants so that if anyone went to sell any such article he would be on his guard. If after receiving this information any merchant failed to inform about such an article brought to him for sale to the person giving the discretion then he had to be fixed in the same manner as those who assisted thieves. If however he had no such information he could be acquitted of the crime, on the article being returned. If a thief was found to have entered from the back door, or after breaking open the joints of a door, or the lower portion thereof, or after breaking upon windows and ventilation, and if it was observed that he had gone directly to the spot where

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20 Supra note 8, p.83.
21 Kautilya Arthashastra, IV, 81, 6 Rule 1.
the valuables were hidden and the earth dug out inside the house is made untraceable, then there would be signs to show that someone connected with the house had committed the theft. If the signs were exactly opposite then it must be taken that an outsider had committed the theft. If both kinds of signs were present then both inmate and outsiders should be suspected. Then, the inquiries must be made from residents of locality and particularly from gamblers, drunkards, bad characters etc.  

Our ancient sources also describe a method of what could be described as 'Spreading the Net'. If it was suspected that someone was committing thefts, robberies, or dacoities. Then a spy could become his servant, or join him in some capacity or other. The spy would then encourage the suspect to commit a crime and keep the police secretly informed about it. During the actual commission of crime the culprit would be caught.

A significant development occurred between the third and fourth century B.C. The Arthashastra of Kautilya, which was the law code of this period, defined the penal laws and regulated the medical practice. The medical knowledge was utilized for the purpose of law. Accordingly, physicians were required to take permission from the King to practice medicine, their practices were regularized and they were punished for negligence. The punishment for inflicting injuries was so elaborate that it was required a medical opinion for making the decision.  

Further, even regarding postmortem examination certain rules were framed and it appear that regarding every kind of investigation there were some instructions. If anyone died without any kind of illness or injury the corpus was immersed in oil and examined. If the dead man had urinated or passed stools or his stomach was filled with air or his hand and feet were swollen and there were marks on the neck it could be presumed that he was

22 *Kautilya Arthashastra*, IV, 6, Rule 2.
killed by suffocation as a result of throat being pressed. If his arms and legs were shrunk, it could be concluded that he was murdered by hanging. If the dead man’s hands, feet and abdomen were swollen, eyes were sunk and the naval was raised, then presumption was that he must have been skipped. If the eyes had come out, the abdomen was swollen, it could be inferred that he had been killed by drowning. He whose corpse was lying in a pool of blood, and there were marks of injuries on his body, could be presumed to have been murdered by whipping or beating with sticks. If the body had in several places cut it could be concluded that the man had been thrown from the house and killed. If the nails, hands and feet had become black and flesh and skin had became loose, and foam was coming out of the mouth, it could be inferred that the deceased was poisoned. If the condition was the same but blood was coming out of same portion cut then it could be understood that either a snake was made to bite the man or some poisonous reptile had bitten him and he was thus killed. In all such cases proper inquiry had to be made as to whether death was due to accident or suicide. In the case of suspected death by poisoning, even the food found in the stomach had to be chemically examined, and if no food there, a portion of the heart had to be cut and thrown in fire. If there was a crackling noise, or the smoke was red and yellow like in a rainbow it would follow that the man had been poisoned. Even an examination of half burnt heart also could be made. Use of medical science in investigation of crime was well established during this period.

3. Proof of Guilt

In ancient India, there was no formal distinction between civil and criminal law as it exists today. So the same court administered civil and criminal justice. Crime was not considered as an offence against the State but against the individual only. Police officials were having duty to maintain law and order and were not required to investigate the criminal cases, as is

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24 Supra note 8, p.85.
25 Tailabhyaktam ashumrtakam Pareekseta niskiramut rakoo risam drastvava.
present practice. The King was responsible for administration of justice. So either he will investigate the matters or will engage spies for detection of criminals, when the matter was of national importance. But in routine/regular criminal matters, the complainant was under a duty to produce the witnesses who lived not far from the court, and other evidences to prove his case. Main emphasis was given to the production of evidence and proof in the court rather than investigation. During this period, four means of proof were admissible/prevalent, i.e. witnesses, documents, possession and ordeals. The first three means were known as human means of proof, whereas the fourth one was called divine proof. The resort to the ordeals was made only when none of the human means of proof was possible or available.

(i) **Witnesses**

In cases where human means of proof were available then only human proof were applied to establish the guilt of accused. The evidence of witnesses was admissible in the Court. Witnesses were to be chosen as far as possible from the caste and race of the parties and from person in the same neighbourhood. The examination of witness took place in the presence of both parties and the opposite party had always the right of cross examination, in order to bring to prominent notice, the defects in the evidence. However, regarding quadrupeds, bipeds and immovable property, it was sometimes considered necessary to question witnesses in the absence of the parties and the absence of the subject matter. Further, the ancients evidences provided that in all judicial acts concerning objects that were to be weighted, counted or measured, witnesses could be examined even in their absence. There were certain conditions given by Manu and

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27 Supra note 14, p.118.
28 Yasminyasminvivede tu saksinam nasti sambhavah I Sahasesu visesena tatra divyani dapayat II
Parmanam likhitam bhuktih saksinascet kiritam I Esamanyatamahave divvanyatamamucyatell
Yaj. II 22.

118. Pitamah q. insm.CA.222.

29 Supra note 14, p.118.
30 Manu Smriti VIII, Saksi Purana, 80 to 122.
Brihaspati,\textsuperscript{31} which were required to be complied with by a witness when he appeared as a witness before the court.

According to ancient Hindu jurists a witness meant a person who has himself either seen or heard or experienced the matter in dispute. It is interesting to note that during this period expert witnesses were unknown or were not recognized. In a matter involving some technicality either the King himself used to apply his mind and decide the case or in some specialized fields, officials of that field were asked to decide the case. Foresters had to be tried with the help of foresters, merchants by merchants, soldiers by soldiers, and in village affairs by a person who lived with both the parties.\textsuperscript{32}

(ii) Documents

The next mode of human proof by our ancients refers to documents, but in criminal cases they were hardly of any importance, except in cases in respect of them particularly for of a murder, or theft or the actual incident itself, there cannot be a document except perhaps a photograph in very rare cases. Only at times, they contained a confession, or were helpful in showing the motive for commission of crime. The ancients have therefore wisely said that after not more than 6 months confession arises through failure of men's memory and God has therefore created letters of alphabet which can be entered on leaves.\textsuperscript{33} Of course a document written by a person is evidence against him without the support of witness, but one not written by him would require parol evidence.\textsuperscript{34} ‘Narada’ says that no oral evidence should be allowed to contradict the document, that the mode of proving by a document is always superior, that a writing can be rebutted only by another document relating to the same matter and not by oaths of witnesses.\textsuperscript{35}

\textsuperscript{31} Brihaspati, V, 33 to 35.
\textsuperscript{32} Supra Note 8, p.90.
\textsuperscript{33} Manusmriti, VIII, 224.
\textsuperscript{34} Manusmriti, IX, 225.
\textsuperscript{35} Kane, P.V., History of Dharmashastra, Vol. III, p.312.
(iii) **Possession**

With regard to evidence about possession, our ancients have said much but in criminal cases unless the offence was concerning immovable property, or the question involved was one of self-defence etc., it was of no value. In civil cases certainly it acquired very great importance as proof of title etc. The general principles regarding possession were (i) that the possession was considered to be valid when it was continuous and of long standing (ii) it should have been un-interrupted (iii) if the title had arisen beyond the time of memory the criterion in proof thereof was long possession. On the point that among these three modes, which one bears more importance/weight, rule was that witnesses were considered superior to inference (circumstantial evidence) document was superior to witness, undisturbed possession for three generations were considered superior to all these.

(iv) **Devine Proof**

In the absence of human proof it was not possible to convict the alleged offender. It was also difficult to acquit him, because popular conscience will not tolerate this either. If the criminal was acquitted in the absence of proof, then it would prove incompetence of the King. Therefore ordeals were used as a means of proof to convince the common sense. There were nine kinds of ordeals and when the methods of the human trial failed, the accused that to be tormented by them in order that truth be distinguished from untruth, taking into consideration the relative importance of the subject matter and the time. The purpose of these ordeals was the satisfaction of doubtful matters which were connected with place, the time, the amount etc. Moreover they had to be applied in serious crimes and that was also only in the cases if the person agreed himself to accept the

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36 Katyayana, S. 329, 331.
37 Anumandguru Sakshi Saksibhya Likhitam guru I
punishment if his complaint was not proved. But in cases of treason or heinous crimes even when the complainant did not agree to take upon himself the punishment if he failed to prove the case, the accused had to go through the ordeal.\textsuperscript{39}

(a) **Ordeal by Balance**

The ordeal by balance was a peculiar one. In essence, it consisted in the accused being weighed for the first time on the day of the preliminary consecration; then he had to fast and the next day he had to be weighed again after the Mantras had been recited. If he rose upwards he won, if not he was defeated. It was ordained that the accused should stand on the balance and experts in weighing should make the balance even by means of counter-weight. If there was any false weighing, the some curse that fell to the share of the murderer of a Brahamana and to a false witness also fell on him who administered the ordeal.\textsuperscript{40}

(b) **Ordeal by Fire**

In this method the suspected person was to take nine steps on fire. Then certain concentrated medicine was applied on his feet. After three days when the medicine was removed, if the feet were found clear then he was declared innocent otherwise guilty.\textsuperscript{41} The another method of ordeal by fire was that, having marked with any dye the wounded parts etc., of the palms that had ground rice, seven asvatha or pipla leaves should be placed on them and encircled with an equal number threads. Then the suspect was to recite a particular mantra. After this the judge should place on both the palms of the accused two red hot iron balls of the size of 50 palas each. With the balls the accused should gradually pass through seven cycles; each cycle is to consist of 16 fingers in extent and is to be severally placed at an equal distance of 16

\textsuperscript{39} Yajnyavalkya, I, 99.
\textsuperscript{40} Supra note 8, p.121.
fingers each. If after having thrown off the burning balls and ground rice it is seen that the palms are not burnt the suspect establishes his innocence. If the balls are thrown with the limit or any suspicion arises the accused must again undergo the ordeal.\(^{42}\)

(c) **Ordeal of Water**

This ordeal prescribed that the accused should submerge holding the thighs of a man who stands still in the water upto his navel. At that very moment a strong man shoot an arrow and another strong man should bring it back. If in the meanwhile the person submerged emerges either completely or even with a single limb he loses the case if not he does not lose it.\(^{43}\) The other method which was used was that the suspected person was required to take out a stone from the bottom of a vessel containing boiling water. The hand was bandaged and later on inspected to determine the guilt. If the hand was found clear then he was innocent, other wise guilty.

(d) **Ordeal of Poison**

In this mode of proof, the accused after reciting certain mantras, should drink the poison found on the summit of the Himalaya.\(^{44}\) If he does not undergo the least physical change his innocence is established otherwise not.

(d) **Ordeal of Holy Water**

The fifth ordeal is of Holy water. In this ordeal Gods have to be worshiped. The water used for bathing them has to be taken. The judge should then consecrate the water by Mantras. The accused should then be made to drink out of it three handfuls. If no great calamity caused by the King

\(^{42}\) Yajnavalkya, II, 103 to 107.

\(^{43}\) Supra Note 8, p.123.

\(^{44}\) Yajnavalkya, II, 110 and 11.
or by fate strikes him within a fortnight he is cleared of doubt, otherwise he is not.45

(e) Ordeal by Rice

In this ordeal rice has to be first dehusked and made white. The grain has to be rice and nothing else. It has to be kept in an earthen pot, and placed in front of the Sun God in his temple. Water after bathing the deities has then to be collected. Thereafter the Mantras of invocation have to be recited and the collected water poured in the earthen pot containing rice which has to be kept there for the whole night. Next morning the person has to go through the ordeals and who has fasted for the previous day is given rice out of this pot by the judge to eat. He has to chew the same. Then he has to spit out the chewed rice on the leaf of Bhurja tree, which are so kept. If the rice is pure white he is cleared, but if it shows any trace of blood, or his chin and palate become dry or if any of his limb shakes he has to be pronounced guilty.46

(g) Ordeal of Hot Gold

The seventh ordeal is of hot gold. An iron pot of perimeter 16 fingers and depth 4 fingers has to be taken. It has to be filled with oil and ghee (butter) of the weight of 20 palas. After it has been made very hot a masa of gold has then to be thrown in it. The person performing the ordeal has then to place a leaf of Bhurja or pipla on his head after having fasted on the previous day and taken a bath. Then he has to recite the mantras of invocation and particularly the one prescribed in yajanvalkya. Then in the presence of judge the accused has to take out the Masa of gold with his thumb and index finger only and place it on the leaf. If his finger and thumb have no ulceration or blood or does not shake he is cleared, otherwise he is pronounced guilty.47

45 Yajnyavalkya, II, 112 and 113.
46 Supra note 8, p 124.
47 Veeramitrodaya, Vya., p.284.
(h) Ordeal of Plough Share

The eighth ordeal is of the plough-share. Cart Iron of the weight of 12 palas constitutes the plough-share. It has to 18 fingers long and four fingers wide. It has to be made red hot. After this the accused who has fasted on the previous day and who has taken a bath has to come there in wet clothes and face the east on his head is to be placed either Bhurja or pipla leaves. He has to then recite the Mantras of invocation to Dharma. After this the person undergoing the ordeal should be made to lick the plough share with his tongue. He is purified if he does not burnt. Otherwise he is of the lower grade and guilty.\(^{48}\)

(i) Ordeal of Dharma

This ordeal is for examining the guilt of those who has killed or have committed heinous crimes, and those who are willing to undergo this ordeal. The two words Dharma and Adharma are each to be written separately on one leaf. It is also said that Dharma should be written on a silver plate and Adharma on an iron plate. Dharma has to be written in white and Adharma in any colour other than white. Then invoking the deities by mantras of the Vedas etc. should be worshipped by incence and white and other colours respectively. They should be sprinkled with the celebrated Holy mixture (i.e. cow’s urine, milk, dung, ghee etc.). Then they should be hidden in two lumps of clay of the same size and put in a new earthen pot when no body is seeing. The person performing the ordeal has to then take out one of lumps. If it happens to be that of Dharma he is cleared, and has to be honoured by the examiner. If the person takes out the lump containing Adharma, he will be declared guilty.

There were specific rules for the undergoing the ordeals. The ordeal by the balance was intended for women, children, old man, blind persons and

\(^{48}\) Supra note 8, p.125.
same persons, the Brahmanas and the diseased. Fire and water ordeals were for the Sudras as also poison of the quantity of seven barely grains. So also in transaction of less than a thousand Panas, there was to be no ordeal of fire, poison, or weighing. However, persons anxious to prove their innocence could always go through ordeals in the case of treason or other heinous crimes.\textsuperscript{49} Narada prohibits the application of ordeals in the case of offences which had taken place by day, in a village or town, or in the presence of witnesses. And, if one party urged human evidence, and the other divine, i.e. an ordeal, Sukranti ordains that the former should be preferred and not the latter.\textsuperscript{50}

Hence, in those cases where the proper information or evidences were not collected during the investigation by spies or king, were proved in the court during the trial by these means of proof. However, the police officials, generally were not under the duty to investigate the case and collect evidences during this ancient period.

B. Medieval Period

The glorious Hindu period was subjected to invasion by the Muslims and the beginning was made by Mohammad-bin-Quasim in 712 A.D.\textsuperscript{51} However, Manu's Code continued in India till the Mohamdan rule was established properly and then the people were forced to the criminal jurisprudence of the Muslims. When the Muslim Sultans established their rule in India, they tried to enforce the Mohammadan Law imported from Arebia on the conquered people. It was however soon realised by them that it was not possible.\textsuperscript{52} The Islamic law was enforced with certain concessions in the procedure and the custom. Though believers were to be considered on equal footing before the law, yet the fact that the law was Islamic, had to be realised for its consequences. The criminal law being the same for all, the

\textsuperscript{49} Supra note 8, p.120.
\textsuperscript{50} Supra note 14, p.118.
\textsuperscript{51} Puri, S.K., 'The Legal History of India, p.20.
administration of criminal justice should have produced no problems. The Muslim King in the Islamic State was required to rule in accordance with the Quaranic law. He was the supreme judicial authority but he could not make the laws. Muslim rulers were bound by basic sources of law like Quran, Hadis, Qiyas and Ijma etc.

The organization of the judicial system of the Mughals was entirely the same as laid down by Muslim Jurists and established in Northern India by the Sultans of Delhi. Territorially the Courts formed a concentric organization with the King as the pivot to which all cases of original jurisdiction could be referred and appeals could be made. The King was at the centre. Under him in the capital were the Dewan-a-ala and the Qazi-ul-Qazat (Chief Kazi). In the proviance were Subedar, the Dewan and the Provincial Qazi, in the Sarkar the Faujdar, the Karori and the Qazi and the Shiqdar, the Amin and the Qazi dispensed justice in the Pargariah. Only the Sovereign or his Wazir could appoint a Qazi by his oral or written order, subject to the acceptance of the individual concerned. The appointments could be general or restricted affecting his jurisdiction. A qazi had to administer justice in accordance with Islamic law. Jurisdiction of a Court was judged by the powers of the Qazi, as per his letter of appointment. He was considered as the judicial representative of the King.

The executive authority on the other hand was the Faujdar or the Kotwal, who assisted him to arrive at a correct decision according to the Qoranic law. Certain amount of confusion and overlapping accrued in respect of the duties of these two officials, but broadly the Faujdar was a rural executive authority with revenue and police functions having an extensive jurisdiction; while the Kotwal was essentially a city officer. They mainly concerned themselves with the keeping peace and preventing turbulence, but detection and prevention of ordinary crime was left entirely to the village

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53 Supra note 52, p.82.
The duty to investigate the case was not on the police officials but on the judges including King. Unlike the modern courts of today, the judges were enjoined to ensure that they used all the methods, spying, enquiry, commissions and intelligent trickery to make the accused confess his fault and to reach at the truth. So the Mughal Judges had to perform the duties of policemen too. If the normal procedure of the court did not produce satisfactory results, it was the duty of the trying courts to start investigation and find out the truth of the matter in the dispute.

In a case the Kazi was put the problem, whether the gold coins recovered from the suspect did belong originally to the complainant, who was oil seller. The Kazi decided the case by dipping the coins in a bucket full of water, wherein the oil sticking to the coins floated on the surface of the water which helped the Kazi in deciding that the coins did originally belonged to the complainant, the oil seller. In another case where a child was to arouse the maternal feelings of the real mother who naturally objected the method of Qazi, i.e. to cut the child in two pieces and give one part to each claimant, and decided to withdraw her just claim on the child. This was not only at the Emperor's level but every judge had to ensure that otherwise, if a complaint of injustice reached the King, the concerned knew that he would not be spared. An acquittal on technical grounds during the Mughal period was unintelligible.

Evidence during the Mughal period was of various types viz. statement of witnesses, oaths and the written documents. There were certain broad principles of evidence, like:

1. Evidence of an eye witness, which if direct, was preferable to heresay evidence.

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56 supra note 52, p.42.
57 Tiwari S.N., Role of Forensic Science in Detecting Crime, 1996 (Cr.LJ), p.139.
(2) Contents of a document written in a language not known by the executor, if denied by him were not to be accepted if the witnesses whose signatures appear on the document, did not testified that the contents were read out to the executor by the scribe after writing it.  

(3) Opinion of experts and persons specially experts in a particular branch of science (Mahiraran-j-fun) were admissible as evidence.

(4) Corroboration was to be insisted upon. The Muslims jurists had attached less importance to women as compared to men. The general rule was that at least there should be two men or one man and two woman. For certain cases, e.g.: Proof as to virginity or child birth, evidence of one woman was required.

(5) Documents executed in the presence of the witness, official records, records of courts of justice, books of account kept in the course of business could be accepted in evidence. Proof by evidence was necessary for the genuineness of their contents.

Hence, during Mughal regime the assistance of experts and their opinion was admissible in Courts. The evidence of witnesses was admissible, provided the witness was competent one. There were certain guidelines to determine the competency of witnesses. The oath was taken by Christians on the Gospel, by the Hindus on the cow and the Muslims on Quran. The witnesses and the oath were to be believed but not completely in a mechanical manner as is done today, and the judge had to exercise intelligence and ingenuity and get the real truth by various suitable methods. In the investigation into the cases of the oppressed Akbar used to place no reliance on the testimony or on oaths which were the resort of the crafty but used to draw his own conclusions from contradictions in statements,

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Footnotes:

60 Nadvi A.S., Al Qaza Fil Islam, pp.53-54.
62 Blind, Insane, Dumb, A Slanderer, Slave, Professional Singers, Drunkards, Gamblers, Immodest, Person Interested in the Parties were not allowed to give evidence.
physiognomy and from sublime ways of investigation and far-sighted conjectures. Akbar once advised his son Prince Murad, who had been appointed Governor of Allahabad to consider the lines of the forehead of the parties to a suit in order to discover who was the culprit. It is clear that the main aim of a trial was not to follow a set of procedure mechanically, but to get the truth. To consider the lines of forehead, the judge should himself be a man who could judge correctly from the demeanour of the witnesses, the accused and the parties.63

During this period, the Muslim law of Evidence was followed, where a witness come to give evidence. The Qazi should not direct him in any way, but quietly record his evidence.64 In civil suits, documentary evidence was frequently produced and was equally important. Eye witnesses were the best type of witnesses and their evidence was admissible. At least two such witnesses were essential to establish a case, and if the plaintiff failed to produce them, the case was dismissed. It was in the discretion of the Court to make further investigation on its own. Independent investigation has made by the emperor through his spies. Sometimes cases were sent to Governors for inquiry and report. Opinion of experts in that particular field was also taken for arriving at a conclusion.

During this period, the primary duty of collection and production of evidences was on the complainant and if failed in that his case could be dismissed by the Court. After that it was the discretion of the King whether he wants to conduct independent investigation in the case or not. Probably during the first two periods the responsibility of producing evidence before the Court was considered that of the complainant and the accused. It took much time to accept that it is the duty of the State to prosecute the accused on behalf of the complainant as the crime is to be considered against the society but not only against the complainant.

63 Supra note 52, p.43.
64 Supra note 54, p.358.
C. Modern Period

Britishers came to India as traders in the beginning of seventeenth century. The first authority, however, for the administration of British law in India was granted by Charles II, who, by Royal Charter in 1661 gave to the Governor and the Council of the several places belonging to the company in East Indies Power, "to judge all the persons belonging to the said Governor and company, or that should live under them in all courses whether civil or criminal, according to the law of Kingdom, and to execute the judgment accordingly".\(^65\) East India Company was empowered by the Royal Charter of 1726 to establish courts in the Presidency towns to try civil matters, and for the trying and punishing of capital and other criminal offences and misdemeanors. With the passage of time, the Weston colonization overpowered the whole Indian territory and came to influence all the aspects of social life of Indians.\(^66\) The Mughal system of administration of criminal justice, which was in use/enforceable was vague. So when the Britishers took over the administration of Bengal, Bihar and Orissa. They did not disturbed for some time the Mohammedan law of Crimes, which was well established but was defective.\(^67\) With the Mohammedan law, they faced with much difficulty. As a result, the Moffussils as well as Presidency towns began to turn to the English law.\(^68\)

Later on the English Government modified the existing law as to be in harmony with the natural justice, order, progress and the good of the society. Earlier, in India, criminal acts were considered as a offence against the individual and not against the State. So liability to prove the case was on the complainant. But when Britishers took over the administration of India, they introduced the concept that a criminal act, is an offence not only against the individual but also against the society. This concept was introduced in English

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\(^67\) In Presidency Towns, English Law of Crimes was in Force.

legal system in thirteenth century. This made necessary for the State agencies to establish a system whereby, the Criminal acts are to be investigated and evidences are to be collected. Earlier, the cases were filed by the individuals in their name but now the criminal case was to be filed in the name of the State and the case was represented by the Government Prosecutor.

The duty of investigation of case was given to the police agencies. The police in their investigation and arrests were supervised by the Magistrates of districts, whose penal powers were initially limited. For the trial of more serious offences, courts of circuit, were created, but their number had to be limited because of the huge salaries demanded by judges presiding over them. This resulted in increase of powers of the Magistrates, so that the number of offences triable by circuit would remain as low as possible.

This resulted in all those evils which are inherent in a Union of Executive and Judicial powers. Positive steps to remove the defects in the criminal law were taken after 1833, which ultimately resulted in the passing of Indian Penal Code in 1860 and Criminal Procedure Code in 1860 based on the English law. These legislations brought uniformity of law throughout the State. Under Criminal Procedure Code, investigation was clearly made police agencies function and for this purpose certain powers were given to them.

Opinion of experts was made admissible in the Muslim Law during Mughal Period. But when Britishers established their administration in India, they applied the same principles in India, as were prevalent in England. In England opinion of experts was made admissible for the first time in the 16th century. But when the third Law Commission submitted its fifth report in (1868) which contained draft evidence bill, which was ultimately passed as

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71 Supra note 66.
Indian Evidence Act, 1872,\textsuperscript{72} specific categories of persons were specifically mentioned as experts. Their opinion was considered as admissible and relevant in the Indian Courts. Over the period of time many amendments have been made both in the Code of Criminal Procedure and Indian Evidence Act, according to the need and with a view to make the laws most suitable for our legal system. However, the foundation of present laws have been laid down by the Britishers. That is why we follow common law system in many fields including Law of Evidence.

III. Origin and Development of Scientific Investigation in England

According to Maine "The Penal Law of Ancient Communities was not of law of crimes, it was the law of wrongs."\textsuperscript{73} This was the saying that the Penal law was civil rather than criminal. Crimes were the wrongs which were recognized by the State as such. Preliminary for the protection of the society as a whole, although this recognition may result secondarily in the protection of the individual. In the early times the weakness of the Central Government compelled it to be offered to the injured party as a remedy as the price for its interference. This remedy had to be something of kind formely enjoyed by the wrong person. It had to satisfy the natural craving for revenge. Criminal Investigation can be traced back to the time when the Roman Empire governed on area from Egypt to Britain. In public prosecution for criminal acts, the local military had the responsibility for apprehending persons suspected of crime, but their role was primarily to arrest and bring the arrested persons before the eirenarcha. The eirenarcha conducted the investigation to determine the guilt or innocence. The report of eirenarcha's examination of the case was known as a Notaria.\textsuperscript{74}

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\textsuperscript{72} Sinha B.S., Legal History of India, (1976), p.239.
\textsuperscript{74} Surender Nath and Vishvanath Sehgal, Importance and Analysis of Physical Evidence in Forensic Investigation, CBI Bulletin, Oct., 2003, p.20.
\end{flushleft}
Under the early English laws the investigation of crime was basically a private function; the victim of the crime had the power to prosecute the criminal. Gradually criminal investigation in early England switched from private to public function. The institution of Franke-pledge made every member of the community accountable for all of his neighbours. In the twelfth century the Henri-I was able to substitute a sample notion of liability. Certain criminal acts were considered by him as wrongs against the society apart from the individual against whom the wrong was committed. The new concept that the investigation of crime a public or government responsibility was inherent in the development of English legal system. Magistrates were armed with new and enlarged powers. They were assigned the responsibility of examining the persons asserted for felonies as well as for examining the persons who brought them into the court and of putting the collected data into writing.

In the early period of common law, there were four methods of proving the fact in the trial. In proof by witness, a party was allowed to produce witness to swear to a belief in his story. The essence of that process was the oath itself and not its probative worth. In compurgation or law wager, if defendant denied the claim on oaths, the plaintiff had to bring certain number of persons or compurgators to rebut the denial with oath. Again the essence of this process was oath itself. In trial by battle, victory could not be obtained, but by physical force as well as by the intervention of almighty on the side of right. In trial by ordeal, there was a process of proof designed to provide for heavenly intervention by some sign or miracle which would determine the question of issue between the parties. In each one of these processes, the function of the Court was simply to determine which party should submit to the selected forms of proof and to see that the forms were properly observed.

75 Supra note 69, p.66.
However, with the development of the institution of jury trial and its gradual displacement of the order from the trial. Adjudications were becoming the result of reasoning process of group of people upon the information which that group had before it, rather than a mere submission to an essentially mechanical process. But early juries were not the juries we know today. They were body of neighbourers, already acquainted with the facts, who partook of the character of witness or much as of judges. But by Act of 1562-1563, it was provided for the first time a process to compel witness to attend and testify in the common law court. Later on a need was felt for specialized knowledge in deciding a case reasonably. Under such circumstances there were certain methods of obtaining the requisite specialized knowledge. During this period investigation process was evolved in the justice dispensation system. It was conducted by the jury members to ascertain the truth. Later on this task was deputed to the police agencies, when State created courts, with the jury members having knowledge of law of the land. However, in certain fields which required specialized knowledge for deciding cases, a jury of persons specially skilled in the field were appointed to pass judgment in a particular case. This was really a jury of experts. During the fourteenth century, there are many instances of jury summoned from tradesman, craft etc. The other method was for the court to summon skilled persons to inform it about these matters which were beyond its knowledge. It is highly probable that the need of expert knowledge was first met by special juries or jury of experts. However, there are also instances where the court summoned skilled persons to aid it on certain problems requiring peculiar experience to understand. Holdsworth say, these witnesses were recognized as experts and their function was to give assistance to the court. Because early juries were expected to decide issues from their own knowledge, therefore, such experts witnesses were looked as assistance until 16th century. They were rather prototypes of the modern expert witnesses.


Modern expert witnesses came in light in 16th century when witnesses began to be treated as mode of proof rather than to decide the case on the personal knowledge of juries. By the middle of 17th century the office of the jurer had became clearly distinct from that of the witness. Then the experts in the present form came to light. These experts were testified by jurers also. Later on experts were called from both sides i.e. Prosecution side and defence side. They were considered as special witnesses. In 1782, for the first time the necessity for skilled assistance was expressly recognized at judicial platform by lord Mansfield in Folks v. Chadd,80 where the use of experts was considered necessary to decide a case. After this the Anglo saxon legal system has never looked back in the field of employing expert witness testimony. Recognition of the value of skilled assistance was realized even before ordinary witnesses could be summoned.81

IV. Role of Science in Investigation: A Historical Account

Use of Science in administration of justice can be traced back to the earlier times. As the various fields of science developed, recognized and adopted by the society. They were being used by the Investigating agencies, may it be King or at the later stage the police agencies for detection of crime and criminals. Gradually these fields of science acquired the recognition of courts also. The relationship between scientific means and investigation is the relationship of use and perfection of science. More perfect will be the science. More it will be used in investigation. These scientific means might have been used by the investigating authorities in the Vedic Period or primitive age to investigate the offence. However, the use of these means before the Court depended upon the perfection of the scientific evidences so as to carry some probative value. The scientific fields have developed drastically during modern period. In the recent times more weight can be

attached to the scientific evidences as they are becoming more certain in nature. These scientific fields have developed separately. Therefore, for the purpose of history it has been divided separately, as per individual scientific fields. Among all these fields medical science is considered to be the oldest. It is as old as the mankind. So, perhaps, it was the first field of science which was used by Courts to settle a dispute. After that as and when other fields came into existence and any dispute involving such field arose, such field of science was used in investigating the related crime and was recognized by the Court. Here the researcher is trying to trace out the history of various fields of science according to their possible series of invention.

A. History of Medical Science

1. India:

Medical Science initially was a wider term which include all the branches. However for the purpose of analyzing the different branches of Science, Medical Science has been included as a separate branch apart from other fields. The early application of medical science for legal purposes can be traced to ancient codes. The Indian civilization is one of the most ancient among all civilizations. During the Indus Valley Civilization (3250-2000 BC), as evidenced from the excavations medicines like 'Silajit etc. were known. Weapons of various kinds were being made of bronze and copper. Three types of burial namely complete, fractional and post-cremation type were known. The King was the ruler of the society.\(^{82}\) Manu (3102 BC) was the first law giver in India. His famous treatise 'Manusmriti' laid down various laws relating to marriages. Which were then allowed at the early age. Mental incapacity due to intoxication illness and age were recognized and such persons were not allowed to make any contract. The Atharva Veda gives detail about remedies for various conditions in the form of charms. There were charms to cure wounds, burns, poisoning, snake bite, insanity etc.

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Dissections of dead animals were done during this period for the sake of knowledge. The first treatise on Indian medicine was the “Agniversa Charaka Samhita” supposed to have been composed in about the seventh century B.C. The ‘Charaka Smahita’ lays down an elaborate code regarding the training, duties, privilege and social status of physicians. It can be considered as the origin of medical ethics. Students were selected for training on a fixed criteria, and instructions were given free. The “Charaka Samhita’ gives a detailed description of various poisons, symptoms, signs and treatment of poisoning.

A significant development occurred between the fourth and third century B.C. The ‘Arthashastra’ of Kautiiya was the law code of this period. Penal laws were well defined, medical practice was regulated and medical knowledge utilized for the purpose of law. Accordingly, physicians were required to take permission from the King to practice medicine, their practices were regularized and they were punished for negligence. Forced sexual intercourse with a minor girl or with a girl without her consent, were punishable offense. The punishment for inflicting injuries was too elaborate that it must have required a medical opinion for making a decision. The book mentions about the examination of dead bodies in unnatural deaths. Cases of poisoning have also been described. Viscera were examined in cases of poisoning i.e. by putting a portion of stomach or heart in fire-the type of flame and sound produced indicated poisoning. Miscarriage, natural and unnatural, sexual offences, kidnapping etc. were punished.\(^\text{83}\)

Shusruta – the father of Indian surgery was another famous authority in the Indian system of medicine. ‘Shusruta samhita’ was composed between 200-300 AD. The chapters pertaining to forensic medicine were so carefully written that they are in no way inferior to modern knowledge on the subject. It also contains a separate chapter on toxicology. The poisons were classified into plant products, animal products and artificial.

\(^\text{83}\) Supra note 82, p.27.
Snakes were classified and named. Not only were the symptoms, signs and treatment of poisoning described in detail, but also modes of administration of poisons, character of the poisoner and examination of suspected poisonous materials. A poisoner could be known from his behaviour and movements – he will not answer to questions, talk irrelevantly and so on. Poisons were administrated through food and drinks, tooth, stick, oils and material for message, medicaments, water for bathing, smoke and surmas. Emetics and their use were mentioned. The duty of the physician was to save the King from any poisoning or visha-kanya – the poisonous damsel. Qualities, responsibilities and duties of physicians were defined. 84

Shusruta was unique on chapters on injuries, pregnancy and delivery. Types of weapons and foreign bodies, the signs and symptoms they manifest in the body had also been described. Wounds and fracture of bones had been classified. Principles of cohabitation, signs in a women fit for conception after periods, signs immediately after impregnation and signs of pregnancy had been mentioned. Foetal development at various months of pregnancy had been very accurately described, so also was delivery and abortions.

The chronological order in which the Medico-legal subject is seen to have developed as are given below:

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Dates</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>400 BC</td>
<td>Oath of Hippocrates</td>
</tr>
<tr>
<td>2</td>
<td>About 450 BC</td>
<td>Medical examination of the body of Julius Caesar and public demonstration</td>
</tr>
<tr>
<td>3</td>
<td>A.D. 200</td>
<td>A text on Medico legal subject</td>
</tr>
<tr>
<td>4</td>
<td>A.D. 600</td>
<td>Chinese Medico-legal text</td>
</tr>
<tr>
<td>5</td>
<td>10th Century A.D.</td>
<td>Chroner, S Office established in England</td>
</tr>
<tr>
<td>6</td>
<td>14th Century A.D.</td>
<td>Autopsy performed in Bologna</td>
</tr>
<tr>
<td>7</td>
<td>A.D. 1635</td>
<td>Paulo Zacchias Medical Text, Questions Medico Legals Rome came into existence</td>
</tr>
</tbody>
</table>

84 Supra note 82, p.27.
With the growth of civilization it was considered a necessity that the practice of medicine be utilized in investigating and proving the crime against the person suspected to have committed the crime. A definite status was granted to the medical evidence in the Courts only in early sixteenth century. During this period Mohammedan laws made the opinion of experts in deciding the case relevant. So the medical science was used in investigation and was acceptable in the courts. The Britishers ruled over the country from the middle of eighteenth century to middle of twentieth century. During this period there was considerable development in the field of medical science, not only in India but throughout the world. As the medico legal system of Great Britain prevailed in India so every new invention which was recognized
by Britishers in England, all those fields were recognized in India also. In 1835, the first medical college was established in Calcutta. A proper procedure for registration of medical practitioners was established by passing Medical Practitioners Act.

2. **Egypt**

Legal provisions controlling medical practice existed in ancient Egypt. Improper treatment and causing death of patient were punished. Egyptians were famous for artificial preservation of dead bodies by mummification. The work of Homer, Herodotus and Diodarus are ancient literatures containing medio-legal matters. The Papyrus of ancient Egypt gives an account of sexual perversions, marriage customs, diagnosis of poisoning etc. All these date back to about 3000 B.C. Imhotep, a celebrated man of this period, was the grand vizier, Chief Justice and Physician to King Zoser of Egypt. He was the first man to combine the science of law and medicine, and is considered by many as the first medico-legal expert.

3. **Babylon**

The first law code of Babylonia was a writing by King Hammurabi in about 2200 BC, which prescribed laws regulating medical practice and punishments for civil and criminal liabilities of physicians, adultery, rape, incest and violent deaths. Sir Sydney Smith (1883-1969) a contemporary of Sir Bernard spilsbury, having studied in Edinburgh, came to Egypt and pioneered the scientific investigation of crime in Egypt. He also wrote a textbook on forensic medicine and edited Taylor’s principles and practice of Medical Jurisprudence.

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86 Supra note 82, p.29.
4. Greece

In Greece, the contribution by Hippocrates (460-355 B.C.) to modern medicine is most outstanding. Besides other things, ‘the ‘Hippocratic oath’ as a part of medical law and ethics will continue to occupy its place in medicine. Aristotle (384-322 BC), fixed the animation of the foetus at the fortieth day, and advocated abortion for population control. Archimedes (287-212 BC), laid the first foundation of forensic science by detecting the gold adulteration in the crown of the King of Syracuse.

5. Rome

In Rome, Numa Pompilious (about 600 BC) made a provision to open the body of a women immediately after death during confinement. An article of the Lex Aquillia (572 BC) deals with lethality of wounds and expert medical opinion in assessing their gravity. In XII tables of 449 BC, a period of three hundred days was set for the duration of pregnancy and birth to take place within ten months. Incapacity of the insane was recognized and disposal of dead was controlled. Lex Cornelia of Sulla (138-78 BC) provides that five midwives should prove the pregnancy. Inducing abortion, administration of aphrodisiacs and a physician causing death of his patient were heavily punished. When Julius Calsor (100-40 BC) was murdered, his body was examined by Antistius, a physician. He opined that of 23, only one injury was fatal. He is another person who is considered by many to be the first medico legal expert. Plini, the Elder, (329-79 BC) wrote of superfoetation, of suspended animation of sudden natural death, or suicide, of the age of menopause and signs of maturity in the foetus. The place of physician in courts and in legal matters has been clearly shown under the rule of Emperor Justinian (483-565 AD). Under the Justinian Code (considered the earliest Medical Code in ancient Europe to define the role of medico-legal problems) Physicians were supposed to prove, pregnancy, time of delivery, sterility, impotence, rape, poisoning, mental illness etc. In the ‘Digest’ it has been
remarked, physicians are not ordinary witnesses but they give judgment rather than testimony, thus recognizing the special status of expert witness, of expertise and implying and establishing that the medico-legal was in impartial abitor.

In the fifth century, the Germanic tribe, while over-throwing the Roman Empire, clearly laid down status for use of medical expert. Wounds were evaluated in the Courts by medical experts for the purpose of punishment. Charlemagne (742-814 AD) brought some uniformity in law and instructed judges to seek medical advice in cases of wounds, infanticide, suicide, rape bestiality etc. Though this was a beginning of legal medicine.87

6. Italy

In Italy Roger II of Sicily in 1140 A.D. brought practice under law and in 1224 A.D. Frederick II obtained public examinations for physicians based on the teachings of Hippocrates, Galen and Avicenna. Rules were framed for the admission, teaching and training of physicians. Dissection of a human body in public every 5 years, was ordered. From the end of the thirteenth century, medico legal work of different kinds, as well as autopsies were conducted by doctors in Bologna and other part of Italy. The first medico-legal autopsy was done by Bartholomeo Devarignana of Bologna in 1302. Thus, it is clear that legal medicine first emerged out as a separate entity in Italy.

7. Germany

A systematized law code was prepared in 1507, at Mainz, Germany, providing medical evidence in violent deaths. The Constitution Criminalis Carolina of Charles V in 1532 AD governed his empire extending over much of Europe. Accordingly, cases of personal injuries, murder, infanticide, abortion, unnatural deaths, medical malpractice, poisoning etc. were being

87 Supra note 82, p.30.
investigated. Courts were compelled to call for medical evidence in certain cases. It allowed the opening of bodies and thus represented progress towards the practice of medico legal autopsies as obligatory. The medical profession became interested in criminal matters, organizing discussions and writing monographs on medico-legal cases.

Thus, legal medicine, which was then included in public health, began to emerge as a separate subject. During the seventeenth century, it became a subject for special instruction and by the beginning of the eighteenth century, Chairs were created in German Universities. In the seventeenth century, much progress was marked in the field of legal medicine. Michaelis in Germany gave the first systematic course of lectures on the legal medicine in 1650 at the University of Leipzig, which was followed by others. Johannes Bohr was another outstanding medicologist of Leipzig. He distinguished between ante-mortem and post-mortem wounds. A full professorship in legal medicine was established in Vienna in 1804, Vienna became a famous center of teaching and practice of legal medicine.

8. United States of America

The development of legal medicine in America took place much later and suffered many setbacks. British colonization introduced the corner system in the seventeenth century. Perhaps the earliest autopsy on record is Etienne, a surgeon, in the early seventeenth century in North America. In 1647, the general court of Massachusetts Bay authorized to hold an autopsy every four years for the benefit of medical students. After this period record of autopsies in medico legal cases are found. The coroner system was replaced by the medical examiner system in 1877 in Boston. In 1915 in New York and then in other parts of America. Until the start of the 19th century, nothing had been written on legal medicine in the United States, nor was it a subject of instruction. James S. Stringham of New York was the first professor in legal
medicine in the United States in 1804 and became the first professor in Legal
medicine in the college of Physicians and surgeons in 1813.

In the modern era, amongst the well known American medico-legist,
Professor Milton Helpern (1902-1977) was very prominent and was at the
forefront of development in forensic medicine. He worked for 50 years in the
office of the Medical examiners in New York. In appreciation of his expertise
and leadership in the field of forensic medicine, the first national medico-legal
library was established in New York in 1962 and was named after him.

B. Ballistics

The evolution of firearms commences with the development of gun
powder and its application as a propelling force. A fire arm is an instrument in
which the potential energy of the gunpowder is converted into Kinetic energy
of the projectile. From one manuscript, it is learnt that an unknown monk,
Marcus Groccus was the inventor of gunpowder. Another story about the use
of gunpowder has been traced back to the year 846 A.D. by Greaks. The
Latin work entitled ‘Liber Ignium’ supposed to have been written during 13th
century, mentions thirty four formula for gunpowder, the most popular
consisted of Saltpetre, carbon and quick sulphur in the ratio of 6:1:1 by
weight. Dr. Oppert, G., a German national, who held the post of a Curator of
Government Oriental Manuscripts library at Madras in 1880, has mentioned
the following facts in his work entitled, ‘Weapons, Arms, Organization and
Political Maxims of ancient India:

1. Shukraniti, a work of contemporaneous with manusmriti, which is
assigned by many scholars as the work of the 2nd century BC,
 prescribes guns and projectiles as standard equipments of a King’s
 was chariot.89

89 Press Trust of India…. Indians Used Gunpowder much before Chinese – Hindustan Times, dated
October 7, 1980.
2. Nitishastra describes an account of smoke balls containing gun powder among weapons to be used against the enemy. This book was written by Vaishampayan who is credited with the authorship of Yajurveda, believed by scholars to have been composed between 1000-800 B.C.

3. A stanza appears in Atharva Rahasya about the existence of mixture containing of charcoal, sulphur and other materials providing fire powder. This is a testimony to the fact that Hindus were familiar with gun powder in remote times.

4. Johaan Beckman, on 18th century German scholar, as stating in his History of Inventions and discoveries that gunpowder invented in India was brought to Europe from Africa by Saraceus and Europeans improved the preparation and found different ways of using it on small arms and cannons.

5. Oppert, G. mentions that gunpowder is known in Sanskrit literature as Agni Choorna or fire powder and the expression ‘Nalika’ in the text refers to the gun made in ancient India out of bamboo pipes.

6. Oppert G. asserts that Indians not only knew from the earliest period, the use of explosive powder for fireworks and for discharging projectiles, they even made clay elephants which could be exploded through a fuse from a distance to destroy an invading army. Alexander as well as Tamerianace had faced such devices in India.  

The first use of gunpowder to through objects without any intention of causing hurt or injuries through penetration but for the sake of fun was made by Romans. This device was known as ‘Roman candle tube”. The device consisted of a hollow tube made of wood or bamboo. The tube was loaded from the muzzle and with alternate charge of powder and an incendiary balls. They were ignited through the muzzle end. As the fire worked around each ball, a quantity of gas was evolved which developed pressure to launch the balls ahead. In order to provide strength to the hollow tube, the outer surface

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88 Supra note 88, p.2.
used to be secured by wrapping with hide, hemp, strong thread or metallic wire.

The earliest firearms were known as cannon lock. These weapons were either of light weight or of artillery type. The loading was done through the muzzle end and the gun powder was ignited by holding a lighted coal or a hot iron placed over a touch hole provided at the rear of the barrel. The loading was done by constant ramming and considerable wadding. The imperfect system of wadding, the poor combustion and the irregular shapes of projectiles made from metals of different densities accounted for the poor and inefficient performance of the projectiles. As the 14th century drew to a close a new form of firing mechanisms began to appear but the cannon lock continued to be in use even in the 15th century. The matchlock was an improvement over the cannon lock. Although the system of loading was the same, the process of ignition differed. It consisted a c-shaped piece of metal pivoted to the side of the shock. It was split to grip a slow match which used to be a card. It was commonly twisted and held in shape by a piece of thread wrapped around it. This development revolutionized the use of firearms. It enabled the shooter to use both hands for holding the weapons and aim in a particular direction. The 'C' form of holding was replaced by a 'S' form of iron piece. This was known as 'serpentine'. The introduction of this type of holder along with a trigger provided a speed to the ignition system and made it easier.91

Martin Marz introduced an improvement in the system of matchlock. He developed a lock plate covering a series of levers and springs which allowed the use of short rears. It brought the burning match forward away from shooters eyes making it convenient to use and aim. In addition to these, it had both front and rear sights which permitted an accuracy in aiming. The development was considered a revolution because most of the weapons of that period did not have even a muzzle sight. An important improvement in

91 Supra Note 88, p.2.
the matchlock action introduced by the Germans came to be known as 'button-lock'.

The Germans adopted a system of pressure-lock during the commencing part of 16th century. This system became popular with the manufacturers of England. The final form of matchlock was the snap lock. This became popular in Europe towards the closing part of the 16th century. It was called the 'light snapping lock' or tinder lock. It was so called owing to the fact that it consisted of a small tube in the jaws of the cock instead of a dangling light. During the matchlock period, many improvements took place. These were in the form of rifling use of sights and the system of interchangeable barrels. Attempts to introduce breech-loading gun was made at this time. The attempts however, failed as a satisfactory gas seal could not be devised. Every type of multi-barrelled weapons were tried. Records shows that there were weapons having four barrels placed side by side. Others were built in the 'Paper Box' principle and were used in USA in the early 1800. This system consisted of a grouping together several barrels and placing the entire piece around a common axis. In the third phase came the wheel lock system. The military and sporting needs could not be met by usual type of ignition system through lighted match or line coal and this led to the development of the wheel lock. The principle of its working is similar to the usual cigarette lighter. That is: spin a serrated steel wheel against a flint to get off a shower of sparks which would ignite the pressing mixture to flash down the touch hole into the power charge in the firing chamber. The true wheel lock principle involved the use of a steel wheel with knurled or grooved edge mounted on a frame and connected with a chain and spring. The other side of the wheel had a projection at its axis over which a wrench was fitted. It was used for winding the chain and compress the spring accordingly. This development was followed by the introduction of safety devices. Some of the systems employed those days continue till today in some form or the other.
In the fourth phase the snaphaunce were introduced. The snaphaunce was an adoption of the old matchlock 'light snapping lock' which replaced the heavy wheel mechanism. In this system a piece of pyrite was fastened in the jaws of the cock. The system was recognized everywhere as a great forward step. Researches to improve it started promptly. However, it took about one hundred years for attaining perfection.

In the fifth phase the flintlock was evolved in France. It was basically a snaphaunce plus a hinged steel right angle pan hinged over a priming pan. They successfully combined the principle of the snaphounce with a rather similar system known as 'Miquelet'. All the European countries adopted this system. Great Britain adopted it towards the close of the 17th century. The flint-lock in America was introduced by the German and the swiss settlers who brought their arms to America from their countries. At that time, the type of weapons used in America used to be heavy arms of large bore diameters having short barrel lengths. The US manufacturers realized the importance of light bore and longer barrel lengths. Sights of very high order were provided on all these in various styles of bead and blade, fant and rear notch of special type.

Faster loading was the biggest development in respect of the speed of loading. The European type weapons of this period required bullets to be loaded as projectiles into the barrel with wallet and then punched down the top of the charge with a ramrod. The Pennsylvania gun makers introduced the idea of wrapping the bullets in linen or buck skin patches which had been soaked in tallow. This system permitted a degree of gas check. This device gave accuracy and check.

The necessity of introducing rifling was felt by the authorities during the time of American war of independence. The flintlock marked the end of a period of mechanical changes to furnish ignition for firearms use. The next stage of development was the introduction of percussion lock. This was a
beginning of the chemistry age wherein the new priming system of firing by
detonation eliminated the need for direct fire through sparks. This was a
considerable development in the field of Ballistics.92

As the field of Ballistics developed and use of fire arms increased in
self-defence and during wars etc. The necessity of identification of firearms
and bullets was also felt for detection of crime. In recent years considerable
study has been given to the subject of bullet identification, which is based
upon the fact that when two metals are pressed together with sufficient force,
the softer metal will confirm to the surface irregularities of the harder metal.
When this principle was applied to ballistic identification, it was found that the
led bullet and the brass primer cap, being softer than steel barrel or firing kin,
assumed the surface characteristics of the latter as a result of the pressure
created by the explosion of the propelling charge or by the hammer. It is
possible therefore, for police officers to compare test bullets fired from the
gun of the suspected criminals with the bullet found at the scene of the crime
and to determine in many cases the identity of the gun which was employed
in the commission of the crime. It is also possible for the ballistic expert to
study the dimensional measurements of bore and bullet diameters, the
number and the depth of grooves and thus to present very valuable evidence
during trial.93

C. Handwriting

When writing was first employed in India and how the Indian Brahmi
alphabet was derived have been moot points for many decades among
scholars. Max Muller's theory that the use of writing for literary purpose was
unknown to Panini was thoroughly exploded by Goldstuckor in "Panini and
his place in Sanskrit literature". Then the Bullar started the theory that
'Brahmi' was derived from a foreign Semitic script about 800 BC and this

92 Supra Note 88, p.5.
93 J. Edgar Hoover, Criminal Identification, Annals of the American Academy of Political and

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hypothesis held the field for a long time. Even Western scholars are now prepared to accept this dating of Bullar.\textsuperscript{94} The process of writing in India started when letters, words and figures were drawn on sand or on the spread of grain. With the invention of the art of writing, use of document for the purpose of preserving ideas and thoughts came into existence. Various religious books e.g. Smritis, puranas were written on palm leaves, but with the progress of civilization, the use of documents as proof of business transactions, literature and other purposes also. So the use of documents as a proof became relevant in case of any dispute also.

Documentary evidence was important part of proof during ancient days. The Ancient law made relevant four kinds of pramana (proof) in any case and document was one of those. Documents were required to be made and produced before the court. But establishing handwriting by expert evidence was unknown under ancient law.\textsuperscript{95}

Narada II, Katyayana and Brihaspati says that no oral evidence could be allowed to the terms of document. When the genuineness of a document was doubted, other means of proof was adopted or the contents of the document were to be adjusted with reference to the fact and circumstances of each particular case.\textsuperscript{96} If the genuineness of documents could not be proved by the above means, Brahaspati prescribed ordeals in such cases.\textsuperscript{97}

Document as an evidence was regarded important fact in any case. Narada says that documentary evidence must be given more weight. A document is superior to witnesses.\textsuperscript{98} However, the fabrication of documents

\begin{itemize}
\item \textsuperscript{94} Kane, P.V., \textit{History of Dharmashastra}, Vol. III, p.306.
\item \textsuperscript{95} Shraddakar Supakar, \textit{“Law of Procedure and Justice in Ancient India}, (1986), p.343.
\item \textsuperscript{96} Sarkar, U.C., \textit{“Epics in Hindu Legal History}, Vishvveshwaranand Vedic Research Instituted, (1958), p.116-117.
\item \textsuperscript{97} लिखिते साक्षात्कारों च राज्यशिल्पक जायले ।
अनुसारे च संभ्रमने तत्र दिन विषयम् \textsuperscript{11}
Br. Quoted in Sm.C. III.
\item \textsuperscript{98} Sandigha Lakhyasuddih Syatsvahartalikhitabibih\textsuperscript{11}
Yuktipiptipriya charam bandhagamahetubhiih II
Yaj II, 92, Badhmu Fh. D. VII, 12, Narada, IV, 143-144.
\end{itemize}
was also not unknown to ancient Indian Jurisprudence and detailed rules were laid down to ascertain the genuineness of a document. Manu says that, "any person who forges a royal edict or corrupts ministers or help enemies should be punished with Death Sentence."

Mohammedan law also recognizes documents as a mode of proof. But it gave more importance to oral testimony. When oral testimony in case could not be recorded then documents were accepted as a substitute for oral testimony. For any document to be admitted in a case as evidence must be free from suspicion. For instance, official document and the record of the Court of justice could be accepted but method of proving handwriting to establish the document was confined to the evidence of person who wrote, saw or witnessed the document.

With the introduction of English law in India and with the invent of scientific means of establishing handwriting new methods of proving the genuineness of documents were established. The authenticity of document was proved firstly by attesting witness, if they were dead then by comparison of handwriting. It was however necessary that the document to be used for the purpose of comparison should be proved to be genuine by three attesting witnesses.

In England, the primary and best evidence of handwriting was that of the writer himself. In the cases of disputed handwriting, Court can accept the evidence of expert in handwriting. But this method is not very old and started only in the latter half of the 19th century. Expert opinion on handwriting arose because juries had to struggle with decisions on the authenticity of the

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99 Narada l. 45, Jha Chakradhar, History and Sources of Law in Ancient India, (1987), p.204.
100 Abdur Rahim, "Mohemmadan Jurisprudence", p.534.
document and thus expert opinion was proposed in an environment where there was nothing better to determine the authenticity of the document.\textsuperscript{104} Until the middle of the 19\textsuperscript{th} century the main method of proving the handwriting was of a person who saw the questioned document being written.\textsuperscript{105} However, there was a general lack of confidence in this form of evidence simply because even if a person saw the questioned writer write a single time, his evidence would be admissible.\textsuperscript{106} The lack of confidence in lay testimony on handwriting created a space, an opening for alternative forms of proof. Expert opinion in handwriting originated in such a backdrop. Thus, expert evidence for proof of handwriting arose not on its own merit as a means of handwriting identification, but due to the lack of other effective means to determine the authorship of a questioned document. Two American cases are of particular importance for development of expert opinion. The first case which necessitated the necessity of expert opinion. The first case highlighted the necessity of expert opinion in handwriting identification and the second firmly established use of expert evidence of handwriting identification.

The Burrel Mystery

This was a high profile murder case in Chicago in 1869, wherein a letter allegedly written by the victim to the letter’s centrality, neither side offered expert testimony on the identity of the handwriting and the lack of the same was noticed in the media.

William Rice’s Death

In September 1900, Willian Rice who was a rich businessman from Texas was found dead in his apartment. Initially it was considered to be

\begin{thebibliography}{9}
\bibitem{106} Supra note 12, p.1769.
\end{thebibliography}
natural death, but later on with the help of expert handwriting evidence it was found that his will, which gave all his property to the accused was a forgery. This lead to further inquiry, which initially lead to the discovery that he had been murdered by the accused.

Ever since this case, expert opinion in handwriting has become a regular feature in the US and has also become firmly established in UK. During the same period, Expert opinion as to identity of handwriting was accepted in India under Section 45 of the Indian Evidence Act.\textsuperscript{107}

D. Fingerprint Identification

In attempting to trace the origin of the fingerprints science a distinction must be drawn between man's realization that the tips of his fingers bear a diversified ridge construction and the application of this phenomenon to the problem of personal identification.\textsuperscript{108} History shows that even in the ancient times man was aware of the peculiar permanent lineation described by the ridges of the finger prints. On the face of a cliff in Nova Scatia, can be found on Indian carving of the outline of a hand with ridges and patterns clearly but crudely marked. So also Chinese had used the impression of the thumb as a counter signature and according to Sir William Harschal, had even applied the idea to bank notes by placing a thumb impression partly on the counter foil and partly on the note itself so that its genuineness might be easily established.\textsuperscript{109}

The first known scientific observation on finger ridges was made in 1686 by Malpighi, the father of histology and a professor of anatomy at the University of Bolonga, who tersely alluded to the ridges which "describe different patterns". In 1823, JE Purkinje, a Professor of Anatomy at the

\textsuperscript{107} Sharma S.S., "Handwriting Identification", p.421.
\textsuperscript{109} Ibid.
University of Breslau, read a Latin thesis with the organs of touch and even evolving a vague differentiation of these patterns into nine varieties.

There is a diversity of opinion as to the first practical application of finger prints as a means of positive identification. It was Doctor Hanry Faulds, an English authority on the subjects of dactylography, to write the first article on the practical use of finger prints for the identification of criminals. Shortly after the appearance of Doctor Fauld's Article, Sir William Harshal of the Indian Civil Service in Bengal, India, firstly used this method of identification in India in 1853. He published an article commenting upon the success with which he had utilized the finger prints for 17 years in identifying Government prisoners and in preventing impersonation and repudiation. However, he neither developed a method of classification suitable for general use nor for intensive application of finger print identification. In 1880, Doctor Fould at Tokyo, Japan conducted experiments which definitely established that the varieties of individual fingerprints patterns were very great; that the patterns remained constant throughout life and that even after the removal of the ridges by use of pumice stone and acid the patterns invariably grew out again "with unimpeachable fidelity" to their originals.

The next great name in the history of fingerprint identification is that of Sir Francis Galton, a English scientist, who became interested in the subject through his study of heredity. He by his extended investigation established that no two fingerprints were alike but he devised the first method of classification that was successfully scientific to subdivide large collections of fingerprint records. As a result of his work, a committee was appointed by the British Government to consider the advisability of employing the fingerprint system in the identification of criminals. In order to lesson the difficulty of dealing with large collection Sir E.R. Henry, Commissioner of Scotland Yard, London, England devised a more simple system of filing and classifying prints. His system was successfully introduced into England and Wales in

\[1^{10}\] Supra note 82, p.27.
1901. According to the 'Henry System' all fingerprint impressions are divided into the following type of patterns: Loop, Twinned Loops, Central Pocket Loops, Lateral Pocket Loops, Twinned Loops, Arches, Tented Arches, Whorls and Accidentals. By utilizing these patterns together with the ridges intervening and surrounding two fixed points known as the core and the delta.

In United States the first authentic record of the use of fingerprints reveals that Mrs. Gilbert Thompson of the United States Geological Survey utilized fingerprints to prevent the forgery of commissary orders and suggested the fingerprint method for the registration of the Chinese whose identification had always been difficult. The first practical introduction of fingerprint for criminal identification in the United States is claimed by the present department of correction at Albany Canton, Fingerprints of State prisoners which show that they were classified as early as in 1903.

During the twentieth century, the modes of communication improved to great extent. Due to popularity of newspapers, invention and popularity of radio, telephones etc., the inventions in one country came in the knowledge of other countries. So, inventions in any field of science could come in the knowledge of scientist of other countries also. If authentic, it got recognition of the whole science faculty. So we see that during this era, inventions of scientists of one country were recognized by the whole scientific faculty, and hence applicable in the courts of law as a aid for detection of criminals also.

E. DNA Fingerprinting

In 17th century English Botanish Dr. Nehemiah Grew, fellow of the College of Physicians and of the Royal Society, was the first person to document his findings about the ridge on the hands in his findings about the

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111 Supra note 108, p.12.
112 Ibid., p.13.
ridge on the hands in his paper published in 1684. This was the primary source for identification of individuals for 150 years. But later it was found that even fingerprints can be altered by surgery. The other problem of the fingerprint is that two individuals can have the same fingerprints although the chances are very low. Karl land Steomer got noble price in 1930 for dividing blood into four distinct groups and this formed the basis for identification of an individuals. Today more than 100 different factors of human blood are known which may vary in different individuals.

There was a need for another marker which is conclusive in inclusion so as to minimize the high increase in the error rate in wrongful convictions and acquittals. This need was fulfilled by Alec Jeffreys and his colleagues at Leicester University, who named the process for isolating and reading DNA marks as DNA fingerprinting. The forensic use of DNA technology in criminal cases began in 1986 when police asked Dr. Jeffrays to verify a suspect's confession that he was responsible for two rape murders in the English Midlands.

The most important early case involving DNA testing is spencer v. Commonwealth. The multiple murder trial in Virginia of Timothy Wilson Spencer was the first case of the United States where the admission of DNA evidence led to guilty verdicts resulting death penalty. The Virginia Supreme Court upheld the murder and rape convictions of Spencer, who had been convicted on the basis of DNA testing that matched his DNA with that of semen found in several victims.

This was just the beginning. Once it was admitted by the Court as a established scientific field, which could be used in proving the case. The same trend was adopted by the other countries including India. Today DNA
Fingerprinting is admitted in Indian Courts as a established science and considerable value is given to this field.

V. Conclusion

Administration of justice is considered as primary task of every sovereign since the vedic period. For imparting justice to the people, ascertainment of truth was must. Under Indian legal system, during the ancient period, the role of the King and the persons appointed by him was to obtain information about the Commission of Crime and to impart Justice on the basis of evidence produced by both the parties to the case. During the Mughal period also the same system existed with slight changes. However, the investigation as the State function did not developed till the introduction of British Law in India. In England, Investigation as State function got recognition during eleventh century in the regime of Henry I. He declared certain wrongs against individuals as wrongs against the society. So it was the duty of the King/State to investigate and prosecute the matter against accused. When Britishers started ruling over the territory of India, they applied the same legal principles as were applied in England. Hence, investigation became the duty of police. They enacted specific Acts for the guidance of police and public in criminal cases.

With the development of society and the development of various scientific investigations, the need was felt for application of these fields in investigation, as the criminals were becoming sophisticated and using the new techniques for commission of crime. Scientific means though were not employed for collection of evidence during investigation. But there are evidences that they were used for proving a case before the Court or deciding the innocence or guilt of accused. Medical science is considered to be oldest science which was used in the investigation, from the very early stage and have been recognized by the Courts for ascertainment of truth. Then with the invention of firearms, the field of Ballistics came into existence.
and was used by investigating agencies as well as by courts to discover the truth. Unique formations of ridges in the palms and fingers were known to our ancients. But it was only in the beginning of 19th century that detailed study of fingerprints was made and the field was used for detecting the criminals. The techniques which have been recognized recently are DNA finger printing, Narco Analyses. The techniques like Biometric tokens etc. have been recognized by very few countries and still needs recognition of the modern world.