Hundred Years of Forensic Science in India (1849–1947): A Historical Perspective^

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1 Introduction

Attainment of scientific knowledge has always been intrinsic to human nature since the beginning of civilization. The word 'forensic' has been derived from the Latin 'Forensis' meaning belonging to the market place or forum. In ancient Rome the forum was the place where legal cases were tried and pleaded. The term 'forensic science' means the application of the knowledge of science for the purpose of law and justice. It is a multi-disciplinary subject stemming from biology, chemistry, physics, geology, psychology and so on. In the Indian context, inadequate attempt has been made to trace the beginning of forensic science with its socio-historical context and diversity of scientific application for crime detection. The scant endeavour emphasizes the two way interaction between science and society and the development of forensic science specifically in the colonial India.

The present project aims to trace the historical background, development and use of forensic science in civil and criminal investigation during British period and secondly to explore the extent to which the forensic science has proved useful in investigations and trials. To explore the scientific history of this discipline, the present attempt started its enquiry from 1849 when the British first established Chemical Examiner's Laboratory at Madras and extended its horizon up to the end of the British Empire in India i.e. up to 1947. Historicizing the perception of crime investigation and its development through ages along with the historical beginning of forensic science under the shadow of colonial administration, the project seeks to highlight the following– (i) whether the concept of forensic science existed in Ancient India at all? What methods were applied for crime detection? (ii) how the application of forensic science had been attested in the ancient western texts? (iii) are there any similarities or differences between Indian and western concept of forensic science? (iv) what socio-historical and socio-political contexts instilled the British to introduce forensic science in their empire? (v) what kinds of crimes happened and what kinds of tools and technology were used in crime investigation and trails in the 19th century and early part of the 20th century British India? (vi) what scientific necessity compelled the British to introduce finger print for crime detection instead of anthropometry? (vii) how finger prints were classified and what was the way to detect the criminals through finger print? (viii) what kind of systematic development of forensic science took place from the beginning of the 20th century India up to the end of the colonial period?

The methodology followed in carrying out the study included survey of literature from both primary and secondary sources. The archival sources were of immense help. Personal papers, diaries, letters of correspondence, minutes of meetings, newspaper articles, government reports, proceedings, micro-films etc. not only helped to think in an in-depth manner but also helped to understand the perspective with varied connotations. The theoretical and conceptual understanding was based on published books, papers in different national and international journals, personal interviews and newspaper articles. To understand this research comprehensively the study was carried out in the following chapters:

1. Concept of *viṣa*, crime and punishment in ancient India
2. Concept of crime and crime detection in the western world
3. Beginning of scientific measures for criminal identifi-

DOI: 10.16943/ijhs/2020/v55i1/152345

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^The project was carried out under the sponsorship of Indian National Commission for History of Science between the periods June 2016 to August 2019.

cation in British India
4. Development of forensic institutions in colonial India
5. Forensic science in India with special reference to the origin of fingerprints
6. From body to laboratory: development of forensic science in 20th century India
7. Summary and conclusion with Bibliography.

2 Detailed discussion of the work

The 'Introduction' systematically covers the entire gamut of investigation of scientific enquiry since the beginning of civilization. It also highlights how science and society are interconnected and crime was interwoven with society with its changing perspective. To understand the concept in a holistic manner the project commences with the concept of crime, justice and punishment not only in ancient, medieval and British India but also in different civilizations of the world.

2.1 Concept of *viṣa*, crime and punishment in ancient India

The first chapter highlights the concept of poison, their types and application, poison in Indian mythology and classical Indian texts, different types of crimes and types of punishment in ancient texts. The ancient Indian society followed some specific measures for crime identification prescribed and governed by the norms and rules of the society. Application of poisons and death due to poison was very common for different types of crimes. References to poison have also been found in Ayurveda which had a specialized discipline called '*Agadatantra*' or toxicology. It mentions the way to get rid of poisoning in the body. A wide range of poisons of animal, plant and mineral origin like arsenic have been mentioned.

Ayurvedic *Saṃhitās* of Caraka, Suśruta, Bāgbhaṭa and even Bhavamishra's *Bhāvaprakāśa* mention the use of poison, its types, mode of administration, its effect on the body and preventive remedies against it. *Caraka Saṃhitā - cikitsāsthāna* refers to *viṣacikitsa* while *kalpasthāna* of *Suśruta Saṃhitā* describes several modes of poisoning. *Aṣṭāṅga Hṛdaya* (vol II, *uttarsthāna*, chapter 35) mentions antidotes of poison. Bhavamishra in *Bhāvaprakāśa* talks about basic classification of poison. All these treatises contain a detailed description of the signs, symptoms and treatment for commonly found poisons. *Aṣṭāṅga Saṁgraha- sūtrasthāna* (8/74) contains reference to the poisoning of kings and the works of professional poisoners (*viṣkanya*). However, forensic as a scientific tool of crime detection was not used in Ancient India, but crime was detected according to scientific perception, observation and analysis of the situation as mentioned in Kautilya's *Arthaśāstra*. It provides useful information about the classification of the methods of murder and use of forensic medical investigation into such cases. Fourth volume, chapter VII of *Arthaśāstra* describes the ways of examination of sudden death. The chapter VII describes the ways of investigations of different unnatural deaths like – death by suffocation and suppression of breathing, killing by hanging, drowning, iron weapon, and also by poison.

In ancient India the term 'crime' was defined in a broader sense which included the violation of rules and regulations of the state and the society. The *Ṛgveda* mentions the degeneration of early religion and morals and recorded the anti-social behaviour on the part of the members of the society. *Manusaṃhitā* mentions that *dharma* prevailed in perfection but gradually *adharma* made its headway and gave rise to different antisocial activities and crimes like theft, fraud, pick pocketing, forgery and robbery. *Manusmṛti* also talks about many sexual matters and their examination under the law. Further chapter VII directs the judge to use the primary level of forensic psychology while observing the accused. It is evident that these evil activities affected the society and people wanted to get rid of them.

During medieval India, the Sultans implemented Shariat or the Islamic law of crime based on *Quaran*, *Hadia* and *Ijma*. Muslim criminal law was the law of the land for the administration of criminal justice during the Mughal period. It classified crimes into three categories – (i) crime against gods, (ii) crime against sovereigns and (iii) crime against individuals. However, the Muslim criminal law had no separation between the executive and judiciary. In many cases, it was not certain and uniform in practice. The law of evidence under Muslim law was very defective, unsatisfactory and primitive in nature because no Muslim could be given capital punishment on the evidence of an infidel. The most ridiculous thing was that punishment never depended on the intensity of crime. The entire legal system was unable to establish its genuinity rather it was identified as a reverse criminal procedure

of Hindu legal system.

2.2 Concept of crime and detection in the western world

Second chapter highlights the concept of crime and crime detection in the western world. It was observed that development of forensic science in western world had a distinct chronological order. The roots of western forensic science are found in ancient Greek and Roman society. Written records of law and medicine are found in Egypt, Sumer, Babylon, China dating back to 4000 to 3000 BCE. Historically, Archimedes was considered as the father of forensic science. The earliest application of forensic methodology was recorded in 44 BCE and the event was assassination of Julius Caesar. Germanic and Slavic societies in 5th century CE were believed to be the first to employ medical forensic expertise to determine the causes of any unnatural death. In 13th century China, a manual was prescribed for examination of injuries. In 1609, a French Army Surgeon Ambroise Pare studied the effects of violent death and documented pathology report. Mathien Orfila, in the early part of the 19th century established scientific methods of poison analysis. In 1879, Alphonse Bertillon of France developed anthropometry for criminal identification. In 1892, Juan Vucetich presented a workable system of fingerprint identification, named dactyloscopy. In 1901, Karl Landsteiner discovered blood groups. In the 20th century we got the Federal Bureau of Investigation. During the Post-World War period, Locard's success in the application of scientific methods in criminal investigation served as an impetus for formation of police laboratories in Berlin, Vienna, Sweden, Finland, Holland and Los Angeles. Though the Second chapter has tried to portray the developmental consequences of forensic science in different countries of the world, special emphasis has been given to understand the development of forensic science in China, Rome, Egypt, England, America and Latin America. The detailed discussions on the developmental perspectives of forensic science in these six countries reveal that the historical consequences of the development of forensic science in different countries of the world were unique and mostly depended on their socio-economic and socio-historical contexts. Due to different administrative set up and nature of crime, developmental consequences were also different in different countries of the world. It was observed that for crime identification and criminal investigation each country tried its level best to use scientific tools and technology which ultimately proved their scientific certainty in the courtroom.

2.3 Beginning of scientific measures for criminal identification in British India

Third chapter chronicles the beginning of scientific measures for criminal identification in British India for the period between1849–1947. It tries to highlight that socio-historical unrest acted as major catalytic agent for initiating forensic science as a scientific tool by the colonial empire for crime detection in British India. Besides, colonial perception about crime and how criminal justice reforms for crime investigation in the mid 19th century British India were implemented have also been discussed in the present research.

The initiation of forensic science in British India was a new scientific venture but its historical connectivity with other socio-historical consequences was in depth and long standing. The historical beginning dates back to the decline of Mughal Empire and the entry of the East India Company for trade. The East India Company reached at the western coast of India at Surat in 1608 and established an industry house there. The English East India Company had initially started as a trading power but gradually became a political power. Thereafter, the Company started looking for various administrative ways to establish its control over India. The first reflection was the victory of British at the battle of Plassey over Siraj-ud-Daula in 1757. After that the company not only gradually took the administrative control but also promoted its business and introduced several means to enhance profit. But in spite of having the administrative control, it was not so easy to rule the country peacefully. For urban centric administration, inaccessibility was the main reason to control both rural and tribal areas. Political turmoil and agitations kept the Company continuously disturbed. As a result, since the beginning of late 18th century a series of actions were taken to protect social instability such as prevention of child sacrifice by Lord Welleslay, Sati Prevention Act in 1829 by Lord Bentinck, Thugee Prohibition by William Sleeman in 1939 etc. Besides, Peasant movements, Tribal movements, Dacoity prevention movements among others perturbed the East India Company administration to a great extent.

All the native movements were directed towards gain-

ing autonomy by discarding Company administration. As a consequence of this, after 1757, series of legal reforms and criminal laws were implemented in order to create new administrative regulations. In spite of all these efforts, neither investigation of crime nor criminal identification was administered properly. When the British fully took over the administrative control after 1857 rebellion, they realized that instead of a single reform, the whole criminal justice system needed to be reformed. They drastically altered the whole Indian Penal Code and Criminal Procedure Code in 1860 and subsequently New Police Regulation Act came into being in 1861. All these ventures lead to paradigm shift in the whole legal system which helped to pave the way for imperial supremacy and control over the whole Indian subcontinent. From this time around, the British administration defined the term 'crime' according to their new justification. To establish the justification by scientific certainty new scientific venture called 'forensic science' was introduced by the empire.

2.4 Development of forensic institutions in colonial India

Chapter four provides a picture about the development of forensic institutions in colonial India. The British didn't stop their venture up to crime detection and criminal identification only. Different ventures were taken by establishing different forensic institutions from 1892 to 1930 in different parts of India. This was marked by the establishment of Chemical Examiner's Laboratory at Madras in 1849. At that time murder by inserting poison was prevalent in different Presidencies of colonial India. But due to lack of sufficient evidence, the criminals could not be punished. For this reason, the role of the chemical examiners became important in order to successfully analyze and report the proper reason for poisoning, nature of poison administering and causes of death etc. A chronological study of the establishment of different forensic science institutions by the British reveals that the colonial masters were enthusiastic about criminal identification and investigation for their administrative convenience only. They established different forensic institutions for applying new technology in the field of crime detection (Figure 1). In course of time, the nature and trend of crime also changed according to social and political contexts and to prove it scientifically, different forensic institutions were established in different parts of India.

Anthropometric Bureau: Since mid-19th century onwards and even after the establishment of the chemical examiners' laboratories in different parts of India, still criminal identification posed a challenge to the British administration. New types of crime like dacoity, burglary, thievery and even murder became very common phenomena which harassed the administration in many ways. In spite of the invention of photography (1826), the Criminal Investigation Department (CID), very often faced a common problem of true criminal identification because in most cases, the criminals changed their appearance after crime. It drew the attention of Inspector General's attention which in turn led to the introduction of 'anthropometric system' for the purpose of true criminal identification. Like other countries of the world, India also adopted Alphonse Bertillon's anthropometric system in 1878 (Bengal Police: Criminal Identification by Means of Anthropometry, India Office Records/L/PJ/6/416, File 436 : 1895, British Library, London) (Figure 2).

Finally, for maintaining anthropometric records of habitual criminals and offenders, an Anthropometric Bureau was established at Writer's Building, Calcutta in the year 1892 (Report on Anthropometric measurement System for the Identification of Old Offenders, Judicial Department, Police File. P3-R/18,1-3 No. 48-51, 1896, West Bengal State Archives).

Finger Print Bureau: Even after the official application of anthropometric system of criminal identification, still some incidences happened where anthropometric system could not prove its excellence for criminal identification. For this purpose a committee was formed and finally passed a resolution of the Governor General in Council dated June 12th 1897, where it was directed that finger printing will be introduced throughout British India as the official mode of criminal identification. This was a remarkable milestone for the application of science for identifying the truth. In 1897, the world's first finger print bureau was established in the Writers' Building, Calcutta, known as *Bengal Fingerprint Bureau*. The main aim of this bureau was to standardize the methods of recording, detecting, classifying, developing and preserving finger prints (Figure 3).

Explosive Department: The introduction of nitrocompounds was causing several blasts and explosions in different parts of the country. Among these the promi-

Figure 1 Map showing the establishment of Forensic Institutions in different parts of British India.

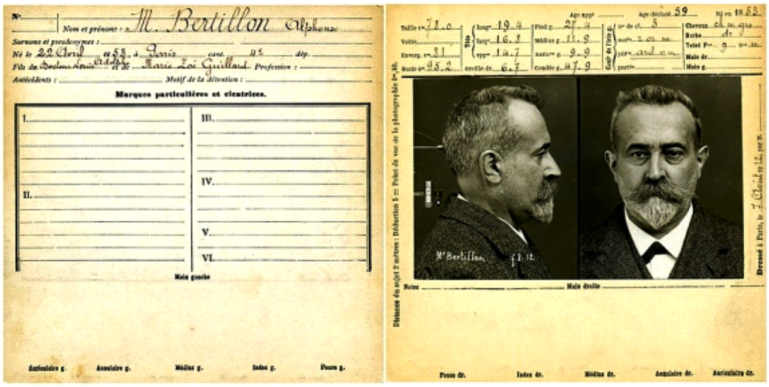

Figure 2 Anthropometric data sheet used by Alphonse Bertillon.

Figure 3 Instruments used for analyzing fingerprints in British India.

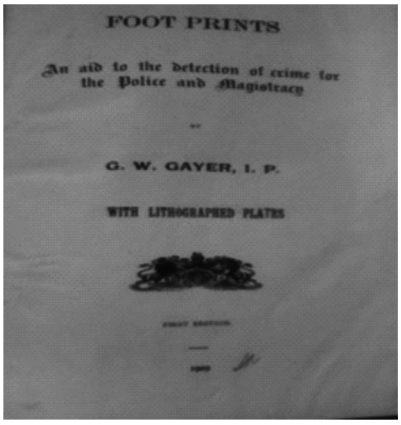

Figure 4 Foot Print Manual by G. W. Gayer.

nent ones are explosions of two magazines at Nari Gorge and Kach on the Sind-Peshin Railway in 1888, and explosion of a magazine at Antop Hill, Bombay in 1891 (Explosive Act, vide Government of India, Home Department, Notification No. 1747 (Public) dated 11th August 1899, Appendix – I, Petroleum and Explosive safety Organization Archive, Pune). The British Government appointed Major C. A. Myspratt Williams as the first Chief Inspector of Explosives on 9th September 1898, with his headquarters at Nagpur (First Annual Report, Department of Explosives, 1900). This department made necessary instructions for handling explosive materials which helped the police officers in criminal investigations.

Handwriting Department: From the late 19th to the beginning of the 20th century several nationalistic movements created hindrance for the smooth running of the British administration. The colonial administration established a handwriting department to resist all the freedom movements and to decipher all nationalistic secret documents. C. R. Hardless, Superintendent in Account General's Office was appointed to this position (Government Examiner of Questioned Documents, IOR/L/PJ/6/1994, File:218, India Office Records, British Library, London). During World War II, this department of science took over the responsibility of secret censorship including the revealing of invisible writing and training of military personnel. In a way this department laid the foundation for scientific enquiry in crime investigation.

Serology Department: Serology Department was established to identify any red spot at the crime scene and to ascertain whether it is human or other animals' blood or something else, in the 3 Kyd Street of Calcutta in the year 1912 which was later renamed as Imperial Serologists Department on 1st March 1916. Dr. E. H. Hankin was appointed as an Imperial Serologist (Proceedings of the Department of Imperial Serology, Assistant Surgeon employed in the Serology Department, Financial Department, Medical, K.W. File No. 3-C/13,22-25 May 1913, West Bengal State Archives, West Bengal). Since its inception, this institute worked in the field of forensic serology. Most importantly the analysis was carried out through chemical examination and not through any immunological process.

Foot Print Section: The British administration felt the necessity of identifying the foot prints available at the crime scenes since the end of the 19th century. For scientific investigation of footprints, G. W. Gayer, Inspector General of Police, published a manual named *Footprint: As an Aid to the Detection of Crime for the Police and Magistracy* in the year 1909 (Figure 4) with lithographic plates of footprints.

Ultimately in the year 1915, a Footprint section was formed under the CID Department of Bengal. The basic objective of this section was to provide scientific clue obtained by analyzing footprint for criminal investigation.

Note Forgery: Since the late 19th century, the cases of forged currency were forcing the attention of the British Government. They were reproduced apparently with fraudulent intent by means of photography. To resist such a crime, the British Government took a strong step and finally in the year 1917, established the *Note Forgery Section* under the Criminal Investigation Department, Gov-

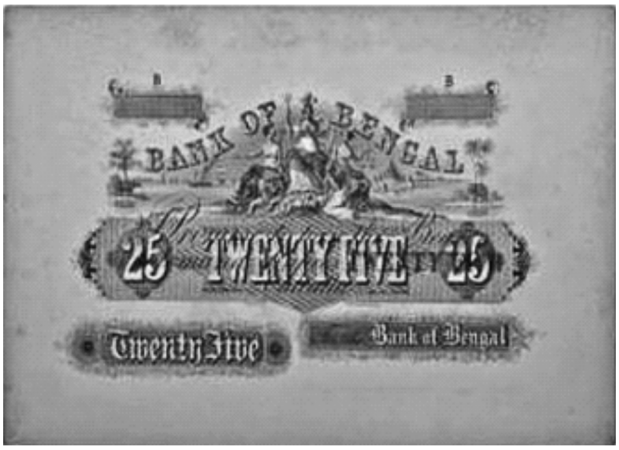

Figure 5 India's first currency note.

ernment of Bengal. The basic objective of this department was to identify the forged currency notes and to create awareness among the common people to identify the fake currencies (Figure 5).

Ballistic Department: Since the beginning of the 20th century, several nationalist movements were started whose main aim was to free the country from the shackles of the British Raj. These nationalist movements became more intensified after the First World War and specifically before the emergence of Second World War. During the war period, the application of fire arms increased. Most of the unlicensed fire arms were either locally made or easily available in the local market. Even the cartridges used in these fire arms were mostly unlicensed. This socio-political turmoil compelled the British administration to control the misuse of fire arms. As a result, a Ballistic Laboratory was established under the Calcutta Police Department in the year 1930 and a fire arm expert was appointed to help the administration in the criminal investigation.

2.5 Forensic science in India and origin of Fingerprints

Chapter five of the report describes the history of fingerprint in India. The earliest known written reference to palm reading are found in two ancient literatures of India– *The Laws of Manu* and *Vasishtha Rules*– which include a list of rules given to guide the ascetic to lead the religious life in the correct way. Around that time an Indian Sanskrit text, titled '*Śarīraka Śāstra*' was published describing '*hasta samudrika śāstra*' or 'the body knowledge of the hand', and how it had evolved in the early days of human kind. The text was translated by an Indian palmist (V. A. K. Ayer) and published in 1960 under the title: "*Śarīraka Śāstra– Indian Science of Hand Reading based on Kartikeyan System*". In ancient India some texts called *Nāḍi* were written by a Ṛṣi named *Agastya* which predicted the past, present and future lives of all humans from thumb print. *Nāḍi* palm leaves are based on the thumb impressions (right for men and left for women). In ancient India either palm or fingerprints or both were used mainly for astrological purpose and not for any criminal investigation. But during medieval period of the Mughal rule, a common practice among rulers was to sign the routine documents and put their handprints on official documents (*farmān*). For example – Jamie Byrom and Michael Riley in their book *The Mughal Empire 1526-1707*, mention that Mughal Emperor Aurangzeb's handprint on *Farmān* were meant to confirm that the royal order genuinely came from him, which was guided by Islamic Law. He insisted that his opponents must face trial thus providing the opponent a realistic chance of not being found guilty.

During the British period in spite of the invention of photography (1826), the Criminal Investigation Department (CID), very often faced a common problem of true criminal identification because in most cases, the criminals changed their appearance after crime. In such a situation, the necessity of devising some means for identifying the more dangerous criminals drew the Inspector General's attention. This in turn led to the introduction of 'anthropometric system' for the purpose of true criminal identification. Like other countries of the world, India also adopted Alphonse Bertillon's anthropometric system in 1878. For maintaining anthropometric records of habitual criminals and offenders, an Anthropometric Bureau was established at Writer's Building, Calcutta in the year 1892. But the rapidly changing socio-historical contexts compelled criminals to change their nature of crimes, which ultimately made anthropometric system obsolete. To prevent this occurrence, the British Government (specially Edward Richard Henry, the Inspector General of Police) felt the necessity to invent some identifying marks which is inimitable (Letter to the Chief Secretary, Government of Bengal from E. R. Henry, Inspector General of Police, Judicial Department, File P 3- R/18 1, 1896, West Bengal State Archives). Governor General in Coun-

Figure 6 Khan Bahadur Azizul Haque (left) and Rai Bahadur Hemchandra Bose (right).

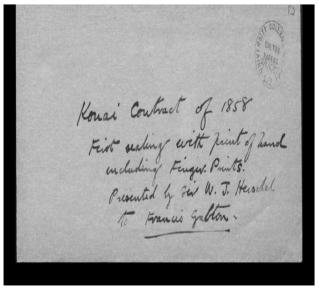

Figure 7 Contract Form of William Herschel and Rajyadhar Konai (a Bengali contractor) (left) and Handprint of Rajyadhar Konai (right).

cil passed an order dated 12th June 1897, where it was directed that finger printing will be introduced throughout the British India as the official mode of criminal identification. This was a remarkable milestone for the application of science for identifying the truth. In 1897, the world's first finger print bureau was established in the Writers' Building, Calcutta, known as *Bengal Fingerprint Bureau*. The main aim of this bureau was to standardize the methods of recording, detecting, classifying, developing and preserving finger prints. For this purpose two police sub inspectors namely Khan Bahadur Azizul Haque and Rai Bahadur Hem Chandra Bose were appointed who worked for the advancement of the science of fingerprints (Figure 6).

Henry's System of Fingerprint Classification was named after their supervisor, Sir Edward Richard Henry but in reality it was actually worked out by Haque and Bose. Azizul Haque developed a mathematical formula which helped Edward Henry to sort 10 digit fingerprint forms into a '*pigeon hole*' cabinet system based on fingerprint patterns (File IOR/L/PJ/6/1752). Hem Chandra Bose developed an extended system of sub classification of fingerprints, a telegraphic code for fingerprint impression (published in the form of a book *Hints on Finger-Prints with a Telegraphic Code for Finger Impressions in 1916*) and also a system of single digit classification (Bose, Rai Bahadur, Hem Chandra, File 1891-1898, Police Fingerprint Expert in India History, Calcutta Fingerprint Bureau, Mss. Eur F161/ 230:1896, India Office Library, London). Finally, in the year 1899, the British Government declared a special act which replaced Bertillon's system of anthropometry and established the proficiency of the fingerprints for identifying the true criminals.

A contract between Rajyadhar Konai and William Herschel: In July 1858, William Herschel and Rajyadhar Konai, a local contractor, impressed handprint on the back of a contract. Herschel was impressed with this and made a habit of requiring palm print on every contract made with the locals (Figure 7) [Source: IOR/V/27/151/196A: 1858].

> Sir William Herschel was one of the first to advocate the use of fingerprinting in the identification of criminal suspects. While working for the Indian Civil Service, he began to use thumbprints on documents as a security measure to prevent the then-rampant repudiation of signatures in 1858. In 1877 at Hooghly (near Calcutta) he instituted the use of fingerprints on contracts and deeds and he registered government pensioners' fingerprints to prevent the collection of money by relatives after a pensioner's death. Herschel also fingerprinted prisoners upon sentencing to prevent various frauds that were attempted in order to avoid serving a prison sentence.

Classification of fingerprints: The one and only inimitable and infallible marks of identification in human is fingerprint. The scientific study of fingerprint as a means of identification is called *dactylography*. Finger ridges are present on the epidermal layer of skin. The depression between two ridges is called a furrow. These ridges and furrows ultimately make a curved pattern on the fingertips called fingerprint pattern. In each pattern,

ridges run parallel to each other and parallel ridge flow interrupted by seven types of irregularity. These interrupted points are local ridge characteristics which occur at either a ridge bifurcation or at a ridge ending known as *minutiae*. This combination of *minutiae* makes each fingerprint unique and identical even in case of identical twins. However, finger ridges have specific contours and exhibit three fingerprint patterns which are –Arch, Loops and Whorls (Figure 8). In a Whorl pattern, the ridges are usually circular. In a Loop pattern, the ridges enter from either side, re-curve and pass out or tend to pass out the same side they entered. Among these three, the most common pattern is loops (60–65%), next whorl (25–30%) followed by arch pattern (about 5%) which is uncommon among the Indians. There are about eighty ridge characteristics found in a fingerprint and at least one tenth of these can establish the identity of a person.

Even before they began work on fingerprints, Henry, Haque and Bose realized that if criminal records were to be streamlined, it had to be on the basis of a mathematical formula. They described that mathematical formula in the following manner (Figure 9). The mathematical formula was invented by Azizul Haque but in the main report the credit went to Richard Henry. The ten fingers are grouped into five pairs (Table 1). The right hand (R) is placed left with palm down, while the left hand (L) is placed right with palm up. Loops including arches are written as **L** and Whorl is written as W. The pairs are arranged in the following pattern:

In the first pair, consisting of right index and right thumb, there are four possibilities - (i) Right index is L, right thumb is W ; (ii) Right index is W, right thumb is L; (iii) Both are L and (iv) Both are W. These four possibilities exist in all the other pairs as well. Therefore, total numbers of possibilities are $4 \times 4 \times 4 \times 4 \times 4 = 1024$. The figure 1024 is the square of 32, i.e. $32 \times 32 = 1024$. The criminal record room has 32 cabinets (numbered 1 to 32) and each cabinet contains 32 files (numbered 1 to 32). Whorls occurring in the 1st, 2nd, 3rd, 4th and 5th pairs are accorded a value of 16, 8, 4, 2 and 1 respectively. Loops (including arches) are assigned a value of zero, irrespective of the pair in which they occur. We now take example of a convict whose right thumb, right ring, left middle, left index and left ring fingers have whorl patterns (W), and the remaining have loop patterns (L). The filing formula may be worked out as shown in Table 2):

The fingerprints of this person would be found in the *11th file* of the *20th cabinet* [Source: Haque, Azizul, f 1897, Khan Bahadur, Mss Eur F 161/185,1898].

It may be noted that following the above mentioned principle, in the first criminal case of murder in colonial Bengal, the convict was identified by fingerprint (Figure 10).

2.6 From body to laboratory: development of forensic science in 20th century India

Chapter Six uses a metaphor 'From Body to Laboratory' to understand the whole gamut of development of Forensic Science in India from mid-19th to 20th century. Except anthropometry, the rest of the enquiries which came into use were mostly laboratory based. This was a paradigm scientific shift from 'Body to Laboratory'. The proposition tries to highlight that how changing socio-historical and socio-political circumstances changed the concept of crime which altered the whole criminal motivation perspective to a great extent. Consequently, the forensic institutions were transformed into intelligence bureau which later became the authority of crime regulation under provincial autonomy. The crime identification became an integral part of the administrative system.

There has been increased emphasis on the use of forensic technologies in crime investigation and trials in 20th century India. The Commissions appointed on reforms of criminal justice have reiterated that the infusion of technology in crime detection can help the system to function efficiently. The relevant laws have been amended from time to time to make way for the use of forensic technologies in crime investigation and trial. Yet, it may be noted that there are existent flaws in the laws which need to be addressed. Sometimes, courts are also reluctant to rely on scientific evidence due to their restrictive approach, or certain inherent defects in the evidence produced in courts which deter them from entirely relying on it. The main motto of criminal justice system is to provide fair justice. Undoubtedly, forensic evidence is more authentic than ocular evidence. Forensic science being scientific is a boon for criminal justice system. We have to overcome the existing flaws to move forward. We must learn from the past and strengthen our resolve to remove the scientific deficiencies within existing forensic evidence thus providing a firm basis for introduction of new innovative technologies into the forensic science ecosystem. At the

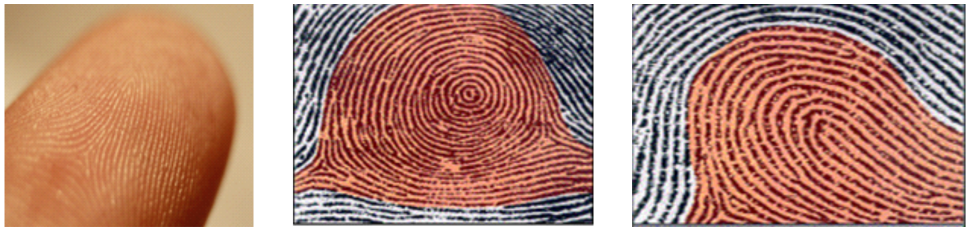

Figure 8 Fingerprint patterns–Arch (left), Whorls (center) and Loops (right).

Table 1 Grouping of fingers in pairs.

Pair I	II	III	IV	V
Right Index	Right Ring	Left Thumb	Left Middle	Left Little
Right Thumb	Right Middle	Right Little	Left Index	Left Ring

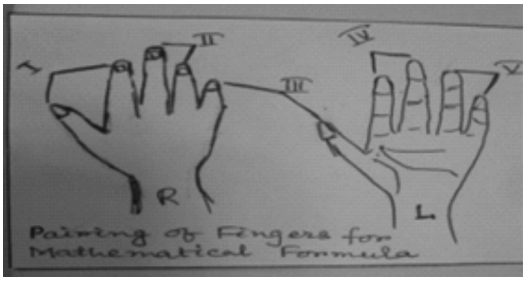

Figure 9 Pairing of Fingers for Mathematical Formula.

Figure 10 Fingerprint of Kangali Charan (Alias / Rajan Singh),1898.

same time, we need to ensure that the law enforcement and investigative agencies once again recognize and use forensic science to its full potential as a holistic problem-solving tool.

3 Conclusion

British rulers introduced forensic science as a scientific tool to establish the new system of criminal justice. The ideology behind this scientific supremacy was nothing but a colonial mission to pave the footsteps of western scientific thoughts of criminal identification more rigidly in the colonial state. The British intention was that this new field of science will not only assist in producing an obvious, consistent and authoritative evidence in the courtroom but will also ground the colonial superiority in an authoritative manner. Institutionalization of crime investigation became new colonial discourse and forensic institutions in different Presidencies were established. In such a context, enactments of different legal acts were of great importance which not only created a new vista in criminal identification with scientific certainty but also drastically altered the concept of crime. It is worth mentioning that from mid-19th to mid-20th century, this span of hundred years witnessed the making of a profession to which the label 'forensic science' could reasonably be attached. In present day it is one of the most vibrant and fastest growing segments of global science which caters to the justice of the teeming millions.

Table 2 The filling formula used for maintain fingerprints.

Pair	I	II	III	IV	V
Arrangement	L/W	W/L	L/L	W/W	L/W
Numerical value	0/16	8/0	0/0	2/2	0/1
Add	10/19				
Further add	1/1	11/20			

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