The history of fingerprint identification in India

Jasjeet Kaur, Gurvinder S. Sodhi and Ritika Sayal

During the ancient era, the Indians, Chinese, Japanese and Argentinians had a fairly good knowledge of the science of fingerprinting. However, the oldest documents on this subject are found in India and Argentina, and probably, this discipline evolved contemporaneously in these two countries. Indians were not only aware of the importance of this discipline but were also quite passionate about taking it to great heights. This passion brought about the metamorphosis of fingerprinting from a mere curiosity stage to a more sophisticated stage, replacing all other trivial identification systems. This note traces the evolution of fingerprint identification from the ancient era through the medieval era to the modern era of Indian history.

Whether one believes in the theological origin of man or agrees with the anthropological school of thought, there can be no doubt that each person is individualized by their fingerprints[1]. Today, fingerprint individuality is accepted and taken for granted worldwide, but only when we go back into the history of this discipline do we realize that Indians knew about the relevance and significance of fingerprinting before any other civilization had an inkling of it. Since the dawn of recorded history till the present, Indians have consistently studied and researched this branch of knowledge, traversing from initial speculation through interpretation to its development into one of the most infallible means of identification[2].

Ancient era

Since ancient times, fingerprinting has remained intertwined with Indian culture. An Indian scripture, *Samudra Shastra*, compiled by sage Samudra Rishi in 3102 BC, tells us a lot about fingerprinting[3]. At present, forensic scientists classify fingerprint patterns into three broad types: arches, loops and whorls. It is also observed that statistically, 5% of fingerprints have arch patterns, 60% are loops, and 35% are whorls. *Samudra Shastra* also identifies three types of fingerprints. It mentions that two common types, viz. sankha (corresponding to loops) and chakra (corresponding to whorls), while the third type, seep (corresponding to arches), is rare[3]. Figure 1 depicts these patterns.

Unsurprisingly, the fingerprint examiners of the modern era and Samudra Rishi of the ancient era had reached the same conclusion. The astonishing fact is that what the experts inferred merely 100 years ago, the sage could ratiocinate more than 5000 years ago. There is no written record on the description of fingerprints prior to *Samudra Shastra*.

It is obvious that the author of *Samudra Shastra* could not have studied such minor details directly from the fingers since that would have required a lens, which was invented much later. So he must have developed a method to record finger impressions on a suitable surface with the aid of a dye or a version of modern-day ink pad[4].

Medieval era

In the medieval era, Indians became cognizant of the fact that the handprint of each person is unique. Several edicts and documents of this period bear the handprint of the author instead of or in addition to his seal/signature. However, the hand-impression signatures were put only on those official documents sent to individuals of status. These were generally rulers of other provinces, so they may recognize the sovereignty (read individuality) of the sender. Hence, such deeds were outside the purview of commoners[5].

Figure 2 *a* shows the hand impression of Mughal emperor Shah Jahan[6]. This has been reproduced from a farman (royal edict) addressed by the Emperor to Dalan Singh, the King of Gidhour (in present-day Bihar).

Shah Jahan sealed another treaty with his handprint, as a consequence of which he received the Kohinoor diamond from Abdullah Qutb Shah, the ruler of Golconda, in 1656. One and a half centuries later, Maharaja Ranjit Singh, the ruler of Punjab, bequeathed the coveted jewel from Shah Shuja, the ruler of Kabul, by placing his palm print signatures on the covenant of friendship[7]. Figure 2 *b* shows the handprint of Maharaja Ranjit Singh on another treaty which he entered with Fateh Singh, the King of Kapurthala (in present-day Punjab)[8]. Figure 2 *c* shows a royal edict bearing the handprint of Raja Brajraj Dev of Jammu. This followed the conquest of Basohli by Raja Raj Singh of Chamba in AD 1782. Dated 18th of Bhadon of Sastra year AD 59 (1783), the edict restores the parganas of Jundh, Bhalai, Diur, Bhundal and Kihar to the kingdom of Chamba[2].

Modern era

The practice of palm print authentication continued even after India came under British rule. Sir William Herschel (1833–1917), an English officer, started studying fingerprints when he was posted in India during the latter half of the 19th century. He propounded the concept of ridge persistency, according to which the patterns of criss-cross lines on the fingertips or palms of an individual remain unchanged from birth till death. He also made it mandatory for the natives to impress their handprints or fingerprints on official documents.

In 1858, while being posted at Jungipoor, Herschel, on the government's behalf, entered into an agreement with a local contractor, Rajyadhar Konai, to supply material for road construction. In order to authenticate the covenant, he asked Konai to place his right handprint on the agreement (Figure 3). He later wrote: '….I was only wishing to frighten Konai out of all thought of repudiating his signature hereafter.'[9]

Konai obliged by the contract's conditions since he, as an Indian, understood the importance of handprint authentication.

Subsequently, Herschel realized that applying printer ink on the entire palm can be both tedious and messy. He, therefore, advocated that instead of a handprint, the impression of the first and third fingers impinge on official documents. In 1877, Herschel was appointed Magistrate and Collector of Hooghly. The courts, prison, deed registration office and pension office

now fell under his purview. He, therefore, decided to put the fingerprint system to practical use. Herschel introduced the practice of taking pensioners' fingerprints to avoid impersonation by others after their death. He also made it mandatory for the concerned individuals to put their finger impressions on the legal deeds.

The two-finger impression system recommended by Herschel was further simplified in 1895 when it was notified that a thumbprint alone would suffice for identification purposes. A circular (No. 4655, dated 12 October 1895) issued by the Inspector General of Registration, Bengal, stated: '…The thumb mark alone is most suitable for the purpose of …ready identification because (a) its impression is much larger and clearer than that of fingers, and the pattern can be read easily without magnifying power, and (b) the question would never arise as to which digit was actually used in making the impression if the thumb was used…With the use of 1st and 3rd fingers, as advocated by Sir William Herschel, the obvious objection arises that evidence is necessary to prove that the 1st and 3rd fingers, and not the 2nd and 4th, were really applied. With the thumb, there can be no such possibility of doubt. It carries conviction on the face of it.'[10]

With that, the registrants and pensioners were required to give a single-digit impression, preferably that of the right thumb, as proof of their identity. A government note dated 31 May 1895 stated: 'The suggestion that the very characteristic mark made by a finger or thumb shall be utilized as a means of identity of pensioners appears….to be one which may be very usefully adopted. It will be specifically valuable in the case of illiterate persons and of those who, like *purdah* (veiled) females, are exempted from personal appearance.'[11]

At this juncture, applications of the fingerprint system were all but set to be extrapolated from financial institutions to crime record bureaus. The world's first fingerprint bureau was established at Calcutta (now Kolkata) in 1897. It was named the Bengal Bureau[12,13]. The world's first conviction on the basis of fingerprint evidence also took place in India[14]. In fact, the earliest reference to fingerprinting in a legal report appears in Section 45 of the India Evidence Act 1872, as amended in 1899 (ref. 15).

Classification of criminal records

When a person commits a crime and is arrested, he is fingerprinted by the police. The fingerprint record is then passed onto the nearest fingerprint bureau. There are about 25 state-level fingerprint bureaus in India. Their functioning is coordinated by the Central Fingerprint Bureau, Ministry of Home Affairs, Government of India. Each bureau maintains a fingerprint record of a few lakh criminals.

Just as the books are catalogued in a library, it was realized that the fingerprint records, too, must be classified. The need for this exercise arose because criminals use fresh aliases whenever they shift the scene of their operation in order to obscure their past history. This means that if a person gave a wrong name, each set of fingerprint forms would have to be examined to ascertain the identity of the offender[16].

The experts were consentient that, unlike library catalogue cards arranged in alphabetical order, indexing based on a mathematical expression alone would be able to maintain criminal records. The mathematical formula was worked out at the Bengal Fingerprint Bureau, the world's first fingerprint bureau established in 1897 at Calcutta by an English Inspector General of Police,

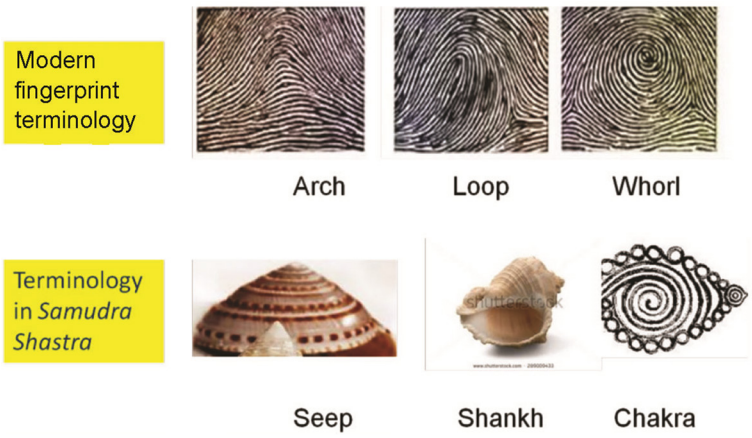

Figure 1. Nomenclature of fingerprint patterns in the modern and ancient era of Indian history.

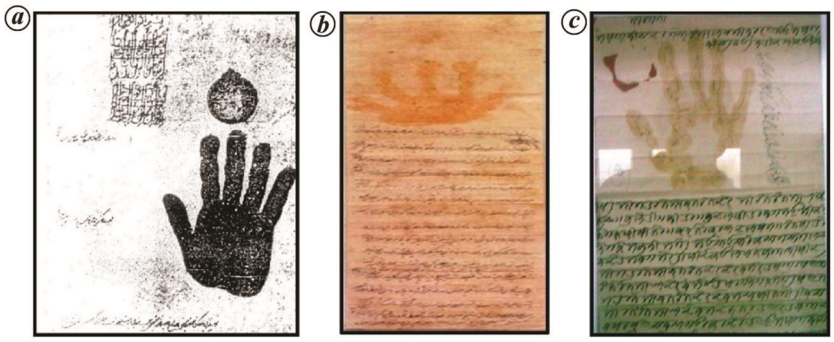

Figure 2. Palm print of (***a***) Shah Jahan. (***b***) Maharaja Ranjit Singh. (***c***) Raja Brajraj Dev on royal edicts.

Figure 3. Handprint of Rajyadhar Konai.

Edward Richard Henry. It is universally known as Henry's method of fingerprint classification[17,18].

On 13 March 1897, Henry informed the Chief Secretary, Government of Bengal, that his team had classified over 8000 sets of fingerprint impressions by subjecting the newly developed formula to severe tests. Advocating that the classification method be adopted not only in India, but also in Europe, he wrote: 'I venture therefore to ask that the Government of India be moved to appoint a small independent committee to enquire into and report on the system.'[19]

Accordingly, on 26 March 1897, the Government of India constituted a two-member committee, comprising Major General C. Strahan, RE, Surveyor-General of India and A. Pedler, FRS, Principal, Presidency College, Calcutta, to examine the validity of the system. The committee scrutinized the slips classified by Henry and his team, and was satisfied by the merit of the system. The members found it simple and accurate, and therefore approved its usage in crime record offices. In this context, L. M. Thorton, Deputy Secretary to the Government of India, wrote to J. P. Hewett, Esq., CIE, Secretary, Government of India on 15 May 1897, stating: '…In view of the favourable opinion expressed by General Strahan and Mr. Pedler, it appears to the Government of India that the system may be universally adopted.'[19]

On 12 June 1897, the Council of the Governor General of India formally approved the method for its usage in fingerprint bureaus[20].

Henry took it upon himself to impart training to the fingerprint examiners of different provinces on the classification system. In a report (no. 1641, dated 22 February 1899), he wrote to the Chief Secretary to the Government of Bengal: 'In December (1898) I proceeded to Poona and explained to the Bombay, Central Provinces and Hyderabad assigned District Police the system of classification, and in January (1899) went to Allahabad and explained the system to the North-west Provinces and Punjab Police. At both places, a considerable number of finger impression slips were classified by me as a nucleus for their records, and all the officers who attended acquired a fair working knowledge of necessary details. During the course of next month, the system will be explained to the Burma and Madras Police, so that by the end of March the order of Government of India will have been given effect... .'[21]

In June 1900, L. Luson, Deputy Secretary to the Government of India, directed the British Indian provinces to streamline the crime record by the fingerprint classification method: 'It has been suggested to the Governor General in Council that fingertip impressions should be taken of persons convicted under sections 170, 171 and 415 to 420 of the IPC…The suggestion commends itself to His Excellency in Council, and I am to request that with the permission of the Governor in Council, it may be adopted.'[22]

By February 1901, the crime record bureaus of Madras, Bombay, NW Provinces, Oudh, Punjab, Burma, Central Provinces, Assam and Hyderabad had adopted the fingerprint classification methodology to catalogue criminal data[23]. Subsequently, nations outside India recognized the merit of the system and began to adopt it. As of now, virtually all the civilized countries of the world classify their crime records using this method[16].

Recent developments

It is alleged that the so-called Henry's method of fingerprint classification was actually invented by Sub-Inspectors Azizul Haque and Hem Chandra Bose of the Bengal Police. Henry, being their superior and an English officer, hoodwinked them to falsely claim the invention in his name[24]. However, we concede that before the classification system could be implemented, it had to be approved successively by the Chief Secretary, Government of Bengal; Chief Secretary, Government of British India, and finally by the Governor General of India. The protocol did not allow Sub-Inspectors of police to directly approach these officials. It was, therefore, left to Henry to do the necessary paperwork and seek the approbation of the system from the authorities. It has also been proved that Bose modified the classification method and came up with a cataloguing system based on the ridge design of any one of the ten fingers[25]. He also invented a technique of telegraphically transmitting fingerprint records from one bureau to another[26].

Conclusion

A person who traverses through the story of fingerprinting in India can, in all likelihood, sit back in gratification. India was the first country to realize that each person can be individualized by means of fingerprints. It is, therefore, not surprising that the oldest official documents bearing fingerprints/handprints can be found in India. It was here that the world's first fingerprint bureau was established, and the formula for classifying fingerprints was invented. It is a matter of pride for every Indian that, more than 100 years later, this classification system is still being used all over the world. On this note, we have endeavoured to prove that since antiquity, the science of identification through palm printing or fingerprinting has remained entwined with Indian culture and civilization.

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ACKNOWLEDGEMENTS. We thank the National Archives of India, New Delhi for providing Home Department Proceedings for the survey; the Maharaja Ranjit Singh Museum, Amritsar and Bhuri Singh Museum, Chamba for permission to reprint the photographs of palm prints of Maharaja Ranjit Singh (Figure 2 *a*) and Raja Brajraj Dev (Figure 2 *c*). This study was carried out under the Vidya Vistar Scheme (Education Extension Scheme) of the University of Delhi.

Jasjeet Kaur is in the Department of Chemistry, Shaheed Rajguru College of Applied Sciences for Women (University of Delhi), Vasundhara Enclave, Delhi 110 096, India; Gurvinder S. Sodhi is in the Forensic Science Unit, S.G.T.B. Khalsa College, University of Delhi, Delhi 110 007, India; Ritika Sayal is in the Department of Physics, SSM College, Dinanagar 143 531, India.*
**e-mail: jasjeet.kaur@rajguru.du.ac.in*

Edited by S. K. Satheesh and printed & published by the Current Science Association, Bengaluru 560 080.
Typeset by WINTECS Typesetters, Bengaluru and Printed at Lotus Printers Pvt Ltd, Bengaluru (Ph: 2320 9909)