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FINGER PRINTS AND FINGER PRINTING

An Historical Study

Cyril John Polson

Cyril John Polson, M.D., F.R.C.P., Barrister-at-Law, is Professor of Forensic Medicine at the University of Leeds, England, and was recently elected a Corresponding Foreign Member of the Société de Médecine Légale de France. The Department of Legal Medicine, of which he is head, conducts courses for both medical and law students at the University, and material for teaching and research is drawn in particular from the medico-legal autopsies made in behalf of H. M. Coroner of the City of Leeds. This second part of this paper concludes Prof. Polson's excellent discussion of finger printing.—EDITOR.

(Concluded from November-December, 1950, issue.)

SIR EDWARD HENRY (1850–1931)

Sir Edward Henry was appointed an assistant magistrate collector in the Indian Civil Service in 1873, and became Inspector General of Police at Bengal in 1891. At that time Bertillonage was the mode of identification of criminals. He visited Galton during 1893, and, having gained first hand knowledge of the current work on finger printing, he introduced it as an additional aid to identification, when he returned to India. At first he made use only of thumb prints and then added a separate record of the ten digits. In his Circular of January 11, 1896, he indicated that he was still working on a system of classification which he hoped, after severe tests, would supersede Bertillonage (Galton, 1896). Soon after this he asked for a committee to be appointed to consider the relative merits of the two methods. The Government of India appointed Strahan and Pedlar to be members of the Committee, which sat in Henry's office on the 29th March, 1897. Their report was published two days later. The Committee had been most favourably impressed in favour of finger printing, and, in consequence of this report, a Resolution of the Governor General in Council, dated June 12th, 1897, directed that finger printing be introduced throughout British India as the mode of identification, a step which was soon taken in other parts of India. This promptitude by all concerned stands in sharp contrast to the British experience. Faulds had given the lead in October, 1880. The British committee was not appointed until October, 1893, and reported favourably in March, 1894. Even then, it was not until July, 1901 that finger printing was in effective use, when Henry had returned from India, as Assistant Commissioner of Police of the Metropolis, to be in charge of Criminal Investigation.

Henry described his classification before the British Association when it met at Dover in 1899. He illustrated its value by special reference to

the case of Charan, who was charged with murder and theft in 1898. A calendar bearing "two faint brown smudges" was found at the scene, and these were later identified as impressions of the accused. The Court acquitted him of murder since it was felt unsafe to convict, "as no one had seen the deed committed." The accused was, however, convicted of theft, and the conviction was upheld on appeal to the Supreme Court. (Bateson's (1906) account differs in detail from that of Henry.)

Henry first published his "Classification and Use of Finger Prints" in 1900, when it was sponsored by the Government of India, but all subsequent editions, of which the last was the eighth of 1937, were published by H. M. Stationary Office. It is now out of print but second-hand copies are to be had. It has become an outstanding classic in the literature of finger printing.

The precise share of credit due to Henry is a matter of opinion. His classification is considered by some to be wholly original, whereas, as already stated, others prefer to describe it as the Galton-Henry system. There appears no reason to suggest that he borrowed from Vucetich, but it is difficult to deny that he was appreciably indebted to Galton. At the outset he had had the benefit of a visit to Galton's laboratories. Henry's own words are the best guide in this matter. In his "Classification" he wrote, "In the system here described, many of his (i.e., Galton's) terms have been adopted, his definitions accepted and his suggestions followed whenever practicable." Henry drew attention to certain changes he had introduced, for example, the increase of type patterns from three to four and a system of classifying not dependent upon the employment of suffixes. "But these are details, which can be more conveniently treated later on, and are only noticed now when referring to the great value and to the extent of Mr. Galton's inquiries into the subject." The justice of this full acknowledgment is confirmed when Galton's "Finger Prints" and Henry's "Classification" are examined.

Henry's principal contribution was to add improvements, which made the classification, devised by Galton, workable. Similarly, although in lesser manner, a succession of experts have since modified Henry's classification. The accumulation of prints, sooner or later, compels breaking down of major groups, and this is a frequently recurring problem. Henry's classification whatever its faults, and it has not been without its critics, was essentially practical, and, once introduced, it was soon widely accepted. Moreover, after half a century of trial, it continues to hold its own in Great Britain and the U.S.A., as an outstanding method. It is the basis of many modifications, notably single print systems.

Henry's other claim to remembrance lies in the drive which he gave to the introduction and development of finger printing in Britain. Although Garson (1900) was originally appointed to undertake this task, he was, as a follower of Bertillon, too wedded to that system, then well-established, to show appreciable enthusiasm necessary for its replacement by finger printing. By 1900 he had taken only tentative steps to introduce finger printing as an adjunct to Bertillonage. Henry, who in 1900 succeeded him as Assistant Commissioner of Police of the Metropolis, caused finger printing to be in practical use. Bertillonage was abandoned by July 1901, and finger prints were evidence in criminal trials shortly afterwards.

It is only right to couple with Henry's the names of those who assisted him in this task. Mr. Stedman, when Detective Inspector, together with Police Sergeant Collins and P. C. Hunt, joined in 1901 by P. C. Alden, were the initial staff of the bureau. Mr. Stedman, Mr. Hunt, and Detective Inspector Alden are still alive. Mr. Stedman retired on March 2, 1908 and was succeeded by Inspector Collins, who remained in charge until February 27, 1925, when he retired with the rank of superintendent and the award of the M.B.E.; he died on December 29, 1932. Mr. Battley succeeded him, and Chief Superintendent Cherrill is the present head of the Finger Print Bureau (Cherrill, 1950).

Although Henry introduced his method of finger print classification, it seems that "beyond some basic instruction, the staff were left very much to their own devices and developed their limited knowledge with the aid of some finger print forms which Henry brought with him from India." In cases of doubtful classification, "Henry was insistent that the pattern should be drawn and studied according to the definition of the pattern which he had laid down." It fell to Inspector Stedman to tour the prisons in order to instruct Prison Officers in the method of taking finger prints (Cherrill, 1950).

These several experts have each made their own contributions to finger printing. Collins, for example, like his successors at the Yard, and those in other Bureaux, introduced subdivisions when primary groups had become unwieldy. His "Telegraphic Code for Finger Print Formulae" is now out-moded by the Air Mail Service and the transmission of finger prints by radio, but in the past it was frequently used (Cherrill, 1950). This publication also included "a system for sub-classification of single digital impressions." Its date of publication, namely 1921, shows it to be one of the first of its kind. Even though it was not a success, nor even the basis of Battley's system, it could have initiated successful research. Collins (1921) and Jørgensen (1923) used similar methods,

both of which were open to the objection that differences in the amount of pressure used to make impressions caused differences in the amount of skin pattern included within the standard field of observation. Collins's system of filing was also unsatisfactory because the single prints were filed with corresponding complete sets. For this and other reasons, the method entailed a long and difficult search. It was calculated to require search of some three-fourths of the collection, then one of some 45,000 slips. After a trial lasting seven years, it proved too cumbersome, and there had been few identifications (Battley, 1930).

When Battley published his "Single Finger Prints," he acknowledged the "invaluable assistance" he had received from Cherrill. Between them they devised a system which, under trial, proved a success. It is still in use at New Scotland Yard, and has also been adopted in other parts of the world (Cherrill, 1950).

They replaced parallel lines by a series of concentric circles to enclose the area of observation. Their apparatus was a fixed focus lens above a glass plate inscribed with concentric circles; a red spot on the under side of the glass marked their centre. With the exception of arches, for which they devised special methods, all other patterns include a core, the centre of which is a fixed point. Deltas are also considered. Formerly these had been disregarded on the ground that chance impressions, being touch or plain, did not include deltas. Battley and Cherrill showed, however, that at least five-eighths (i.e., 531 out of 849) of the chance impressions, which they examined, included deltas. This classification of single prints is an adaptation of Henry's classification.

The ever growing collection of finger prints calls for recurring modification in classification in order to simplify search. The main finger print collection at New Scotland Yard, for example, now exceeds 1,000,000 slips (Cherrill, 1950), while that at Washington, D.C., even in 1929, covered 1,744,483 current records and over 2½ million alphabetical record cards (Hoover, 1931). Its present scope has increased beyond all recognition. The F.B.I., still under Hoover's guidance, now files more than 114 million finger print records (Hoover, 1950).

From time to time, attempts are made to invent systems superior to those of Henry or Vucetich. The numerical index suggested by Brewster (1936), although not without its advantages, has not found favour. His "spider's web" test plate does not appear superior to Battley's apparatus. Moreover, any new system, which endeavours to replace loops, whorls and arches by new terms, is bound to labour under a grave handicap at the outset.

The system known as the Conlay, or Conlay-Fleck, system, had made

some headway. "It can be asserted with confidence that it is the best system employed in any bureau to-day." It gained Fleck's approval and was introduced by him into America, where it is known as the "Conlay-Fleck" system.

A description of the Conlay system is given in some detail by "Tipstaff" (1949), and it suffices to say here that it appears to have one notable advantage over Henry's system. In order to qualify as a Court witness in England, it requires seven years' experience with Henry's system (Studdy, 1947), whereas it is claimed that "an intelligent English-reading constable can be taught the Conlay system in three weeks and should be capable of being able to carry out searches on his own without supervision after two months practice."

W. L. Conlay visited Scotland Yard in 1904, in order to study the Henry system. It appears that he recognized faults in it, and, upon his return to duty in the Federated Malay States, he devised a new system. This was submitted to Henry for his opinion, who failed to find that it had any advantages over his own system. In consequence, Henry's system was introduced into Malaya but, six months later, Conlay's system was given trial, and it became the method of choice. "Tipstaff" (1949) reports that after forty-two years, the only modification required in Conlay's system was a breaking up of certain larger groups which, as is not surprising, had by then become unwieldy.

FINGER PRINT EXPERTS ABROAD

The Argentine: Juan Vucetich (1858-1925). This adopted citizen of the Argentine ranks with Sir Edward Henry as an outstanding contributor to the development of finger printing. Most sources of information concerning his work, and his notable "Dactiloscopia Comparada" of 1904, are written in Spanish, but Wilton (1938, 1949) and Preller (1949) give comprehensive accounts in English, and these are the basis of the present note.

Vucetich was a Dalmatian who emigrated to the Argentine in 1884, when aged 26, at a time when Bertillon had introduced his system of identification. The then Chief of the Argentine Federal Police, General Capdevila, sent a representative to France to examine the system, and Dr. Drago, upon his return early in 1889, reported favourably upon it. By an Order of the Day, dated April 3, 1889, Capdevila established a Bureau of Anthropometrical Identification and appointed Drago as its head. Vucetich was appointed head of the corresponding Bureau of the Buenos Aires Provincial Police, also in La Plata.

In 1891, de Varigny published an article, which was substantially a reproduction, with due acknowledgment, of Galton's (1891) lecture on "Patterns in Thumb and Finger Marks." This was brought to the notice of Vucetich by Nunes, his superior. The significance of these patterns was at once apparent to Vucetich, who was prompt to apply them to problems of identification. By September, 1891, he had devised a ten-digit system based upon Galton's classification, and on September 1, 1891, twenty-three persons were recorded by means of this new system. Some of the original record cards are in existence to-day in the Vucetich Museum (Preller, 1949). This date is now commemorated by identification officials in the Argentine, when a pilgrimage is made to the grave of Vucetich in La Plata.

The system was first published at the Second Latin-American Congress of Science, held at Montevideo, in March, 1901. It was then approved by eminent delegates, including Sa Nanna, of Brazil, President of the Congress. The system was adopted by the Police of Rio de Janeiro, Santiago, and Montevideo, but the Argentine police deferred its approval. It may be, as Preller suggested, that opposition was not uninfluenced by the fear that those who were experts in Bertillonage might lose their jobs. Support for Bertillonage remained strong, if not fierce, for some time.

On September 8, 1901, Vucetich delivered a lecture on "The Dactyloscopic System" in the Hall of Acts in La Plata. It was attended by Rossi, representing Beazley, the then Chief of the Federal Police. Next day he reported in favourable terms and concluded by saying, "Chief, I am one of those who think that the finger print system should be incorporated in every identification bureau because its indications are precise and its application simple." Rossi was ordered to study the method, but his favourable reports had a poor reception at headquarters. Eventually, news of success abroad showed that the official disregard of finger printing was hindering progress in the Argentine. On October 10, 1905, Fraga, then Chief of Police, ordered the establishment of an autonomous finger print bureau. It had taken some fourteen years to win official recognition.

Vucetich, during these years, had persisted with his research and "many times he had to defray out of his own pocket, the expenses entailed" (Preller, 1949). His early success with the case of Francesca Rojas in 1892, was duly appreciated by Rossi. This is now recognized as the first occasion on which finger prints were evidence in a case of murder.

A woman, Francesca Rojas, was found wounded in the neck, and two

of her sons were dead, when the police visited her ranch. She accused a neighbour of the crime. The police noticed blood-stained prints on a door, and the part bearing these prints was removed and sent to Vucetich. Impressions were also taken of the woman and the accused. It was then established that the chance impressions were those of the woman. She was charged with murder and attempted suicide. In due course she confessed and her statement left no room for doubt of her guilt; the innocence of the neighbour was also established (Rossi, 1909, cited Preller, 1949).

Vucetich published the details of his system in 1904 in his "Dactiloscopia Comparada" of which, unfortunately, there is no English translation. In October, 1905, when the delegate of the Buenos Aires Provincial Police at the South American Police Conference, Vucetich advocated a standard filing system. The format and size of his record cards were adopted, and it appears they were unchanged until 1920, when the length of the cards was reduced from 21 to 20 cm. He pleaded for civil identification cards but even to-day, a national finger print register is not yet adopted in the Argentine, although his recommendations were implemented in Brazil (Ribeiro, 1938).

Vucetich was honored by the title of "Perito Identificator," confirmed in 1909 by decree of the President of the Argentine Republic. A little before his death in 1925, he made a triumphal world tour. Since his death a Vucetich museum has been established in La Plata, and as already said, the anniversary of his application of finger printing is remembered by his successors. His outstanding pupil, Almandos, also achieved fame as a finger print expert.

France: Forgeot (1891), when associated with Lacassagne, described the technique of development of latent finger prints, which, in turn, was based upon Aubert's (1874) micro-chemical tests for the analysis of sweat. Forgeot's study of special steps to demonstrate latent prints was primarily concerned with the use of ink as a developer, but, in the second part of his paper, he discussed the value of other reagents, notably iodine, and silver nitrate, which are to-day in frequent use.

Locard of Lyons, besides being the author of notable contributions in legal medicine, invented poroscopy. He demonstrated that the pores of the skin are peculiar in shape, size, and position in each individual. Like the finger pattern, the features of the pores are unchanged throughout life and they can only be obliterated in the same fashion as finger prints. Major injuries will destroy but a limited number, whereas they are completely restored by the repair of minor injuries. The method is a refinement of finger printing; since the latter is itself excellent, poroscopy is

rarely necessary. It may be undertaken, however, when only a fragment of the skin pattern is available. Locard applied his method with notable success in the now classic Boudet-Simonin case, which led to a conviction of burglary. The accused was identified by a finger print on a piece of furniture at the scene. The study proved a coincidence of 955 pores in the impressions of the accused and those of the chance impression (Locard, 1913).

Identification of murderers by finger prints in France dates from the case of Henri Scheffer (1902-03). Bloody finger prints on a window were proved by Bertillon to be those of Scheffer, who later confessed to the crime. It appears that the conviction rested also upon other evidence and, for that reason, Locard (1911) claimed that his case of the "Affaire de la rue Ravat" of June, 1910, was the first in France to turn solely upon finger print evidence. This was one of house-breaking, and Locard found the prints on a glass vase and other articles at the scene.

The United States: J. Edgar Hoover, Director of the F.B.I., is the outstanding champion of finger printing in the United States. In 1924 at the early age of 29, he was appointed director of the Federal Bureau of Investigation of the United States Department of Justice.

Under Hoover's guidance, it has become the most notable finger print bureau in the world. During the past 25 years, its files have increased from 810,188 to a collection of no less than 111,466,729 cards in March, 1949, and a year later the total exceeded 114 million (Hoover, 1949; 1950).

Hoover has adhered to the Henry system as the basis of his classification but, inevitably, there have been additional subdivisions. A single print file is also maintained. Even in the face of this stupendous collection, "an expert technician can establish an identity within a few minutes by examining a limited number of the millions of individual cards on file" (Hoover, 1949).

Their criminal files represent less than 20% of the total of the "ten finger files." Since 1929, there have been 132,642 identifications, and there are now about 12,000 each year.

"Personal Identification" by Wilder and Wentworth (1918) has for long been a classic and the more recent book by Söderman and O'Connell, "Modern Criminal Investigation," first published in 1935, is a valuable reference; the book by Cummins and Midlo (1943) on "Finger Prints, Palms, and Soles" is also outstanding.

An American, S. L. Clemens, who wrote under the name of "Mark Twain," was the first to introduce finger printing into fiction. His "Life on the Mississippi" was published in 1883, only three years after Faulds

had written to "Nature," but it cannot now be determined whether that letter did in fact inspire Mark Twain. His own version, in Chapter 31, i.e. the tale of "A Thumb Print and What Came of it," was that he had the idea from an old Frenchman, "who had been a prison-keeper for thirty years, and he told me that there was one thing about a person which never changed from cradle to the grave—the lines on the ball of the thumb; and he said that these lines were never exactly alike in the thumbs of any two human beings." The text is embellished with a wood cut of two impressions, one a whorl and the other a loop. In 1893 Mark Twain published "Pudd'n Head Wilson," which is an excellent detective story, based upon identification by finger prints.

Germany, Belgium, and Spain: Heindl of Berlin is an expert of international repute, and the author of "Daktiloskopy," which ranks as a classic. It is unfortunately difficult to acquire, even on loan, and there appears to be no English translation. Wilton's (1938) monograph was honoured by an introduction by Heindl.

Belgium is represented by Stockis, whose contributions included a single finger print system (1914, cited Söderman and O'Connell, 1938). Brussels is the origin of a system of finger print classification, which is derived from those of Henry and Vucetich. It was adopted by Proti-venky for use in Czechoslovakia (Srp, 1950).

Ferrer (1921), author of a manual of identification, and Oloriz, who devised a single finger print system, were notable in Spain.

FINGER PRINT LAND MARKS IN BRITAIN

The first case of murder to be established by finger print evidence in England was that of *Rex. v. Stratton* and another, May, 1905, commonly known as the Deptford Murder. An impression of a finger, found on a cash-box at the scene (Fig. 9), was proved by Sgt. Collins to have been made by the elder Stratton (Oswald, 1931; Wilton, 1938).

Scotland Yard's first case, other than murder, to be based on finger print evidence, was one of burglary in June, 1902. The accused had left an impression of his left thumb on a newly painted window-sill (Wilton, 1938).

According to an anonymous author (1903), in "The World's Work," finger prints were material in the Leyton case in March, 1903. The police were without a lead to the identity of the murderer, but one Edwards was arrested on suspicion. His prints were taken and coincided with those of a man known to have a criminal record. In this case the finger prints proved no more than the identity of the accused, who had

used aliases, and the fact that he had a criminal record. It was not a matter of coincidence of impressions of the accused and chance impressions at the scene.

Bradford, Birmingham, and Wakefield were among the first provincial cities to have early success with finger printing. In February, 1905, a conviction for theft was established at Bradford, in the main, by a finger print on a tumbler at the scene. A year later, in another case of theft, an accused had left a finger print on a window pane (Wilton, 1938).

The Bradford City Police also have the credit for an early contribution to finger print technique. Sgt. Oliver Cromwell (1907), of that force, published one of the first accounts of finger print photography.

The West Riding Constabulary began its collection of finger prints in 1905, and the first success of that force, in conjunction with the Bradford City Police, was in October, 1906 (Wilton, 1938). Since then, Wakefield, the headquarters of the West Riding Constabulary, has become a principal centre of criminal identification. A comprehensive finger print file, comparable to that at New Scotland Yard, is maintained, and the associated photographic studio is the best in the country. The force issues a journal containing details of wanted persons and other matters, twice daily, for circulation amongst the other police forces. There is a close liaison with the Home Office Forensic Laboratories, directed by Mr. L. C. Nickolls, M.Sc., F.R.I.C.

Although the Glasgow City Police do not appear to have established a finger print bureau in 1908, at the time of the Gilchrist Murder, theirs is now a principal centre. The evidence of Detective Lieutenant Hammond in the case of *Rex v. Ruxton* (1936) established "beyond any reasonable doubt that the remains found near Moffat and reconstructed as Body No. 1, were those, or part of those of Mary Rogerson." Not the least interesting aspect of this investigation was the proof of identity by a comparison between chance impressions at Ruxton's house and a dermal print of the right thumb of a hand found at Moffat. The epidermis had gone, but the ridge pattern of the underlying corium, or true skin, was still capable of reproduction, giving a "dermal" print. Hammond's identification was confirmed by three experts in Hoover's bureau. This was the first occasion on which this technique was used in a case of murder (Wilton, 1938; 1950; Glaister, 1950). The Department is now in charge of Detective Chief Inspector George Maclean, F.R.M.S. It covers finger printing, photography, and forensic science. The finger print files relate to the whole of Scotland and their classification, although based on Henry's has been modified. The Department is unique in

Britain in that it maintains a file of palm prints.³ In the section of Forensic Science, comprehensive collections for reference are maintained, of which the most notable relates to ballistics.

The Lancashire Constabulary, under the late Sir Archibald Hordern, C.B.E., A.F.C., created a notable criminal investigation bureau. Mr. J. H. Duncan, when Detective Chief Inspector, published "An Introduction to Finger Prints," in 1942. Under Detective Chief Inspector Campbell, this bureau played a notable part in the detection of Griffiths, and Mr. Campbell (1950) has contributed to the development of latent finger prints. He invented "Lanconide" a non-poisonous dusting powder, which has valuable properties and, apparently, no faults. It is the best "all-purpose" powder yet devised (Campbell, 1950).

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3. Since this article was prepared I have received a copy of "The Classification and Identification of Palm Prints," by Sergeant Douglas Grant of the Glasgow City Police (privately printed in 1950 for the Chief Constable of Glasgow). This is a notable contribution in which the value of palm printing is well shown. The classification is of practical importance and represents an advance akin to that of Battley in the field of single print detection (Grant, 1950).

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