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Facilities Still Primitive For Tracing Fingerprints

THE FINGERPRINT is an expression of the unique quality of each individual which has been recognized for millennia. The authoritative book on "Finger Prints, Palms and Soles" by Harold Cummins and Charles Nidlo, which is still fresh and useful 26 years after its first publication, shows a Chinese clay seal with a clear thumb print that dates at least as far back as the third century B.C. Petter's clay would obviously have been an excellent medium in which to recognize these characteristic impressions.

The systematic use of fingerprints for personal identification, however, dates to the publication of a note in *Nature* magazine by Henry Faulds in 1880 and the development during the following 20 years of a practical system of classifying the various patterns. The English geneticist Francis Galton laid the groundwork for establishing the principles that fingerprint patterns are immutable during the lifetime of an individual and that no two individuals, even "identical twins," would have identical fingerprints.

SINCE 1900, fingerprints have become an indispensable tool for criminal investigation and personal identification. In addition, few people can escape some fascination with an attribute that smacks of a scientific stereotype of an individual's soul. In the circumstances, it is surprising how little we know of the biological basis of the human fingerprint and how primitive are the facilities available to the police for using fingerprints

for the apprehension of criminals.

The largest file of fingerprints is the FBI's records on over 62 million citizens in the Civil Service and the armed forces and 16 million connected with arrests. A print from a single finger, or even part of one, could tag or exclude an individual in comparison with a given record. It is a mistake to believe, however, that a single print enables the FBI to trace a culprit through its huge files.

These are organized by the "Henry system," which depends on the major patterns (arches, whorls or loops) on each of the ten fingers as the first and major breakdown of the file. Tens or hundreds of thousands of records must then be examined visually for the details of the prints that characterize each individual.

Law enforcement agencies do keep smaller special files of latent prints, often classified according to various types of crimes indulged in by habitual offenders.

IN A REPORT by the Institute for Defense Analyses for the Katzenbach crime commission, Dr. Thomas C.

Bartee pointed out the advantages of establishing a more rational classification of fingerprint records to facilitate the use of computers for identification.

In principle, computers should also be used for the direct examination of the original prints, but this appears to be uneconomical at this time in comparison with visual inspection. Nevertheless, the use of computer pattern-recognition, along lines similar to the large-scale processing of photographs of particle tracks generated in high-energy physics work, should be invaluable in fingerprint classification.

The efficient design of a modern classification system must be based on further studies of the statistics of different detailed characteristics. Studies following Dr. Bartee's recommendations are evidently under way for law enforcement needs. It would be a mutual loss if they did not also take into account a growing interest in the biomedical aspects of fingerprints and the related patterns found on the palms and soles, all of which go under the name of dermatoglyphs.

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