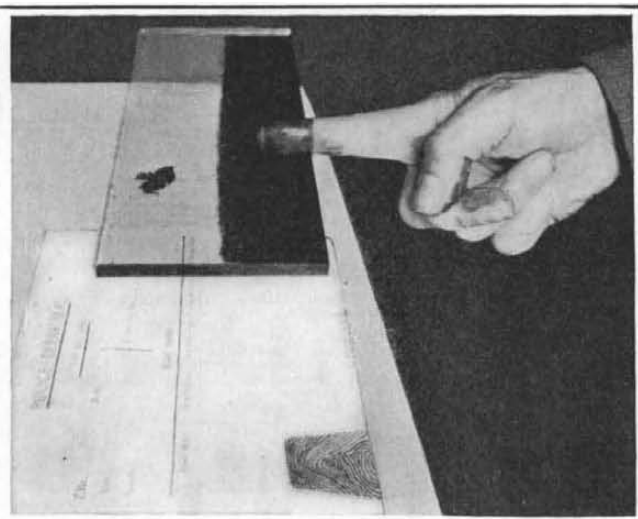


Inking the thumb before making a print



Taking the impression of a finger



Rolling the index finger upon the ink slab

The Origin, Classification and Uses of Finger Prints*

An Ideal System of Identification for the General Public

By Sergeant Frederick Kuhne, Bureau of Criminal Identification, Police Department, City of New York

DURING the last few years numerous articles have appeared in various magazines and newspapers relative to the identification of individuals (principally criminals) by the method known as the "Finger Print System," with no intention of the writers of such articles to convey to the public the information as to the manner in which finger prints are classified and identifications made, nor as to the value of finger prints in cases other than criminal.

When finger prints were first adopted as a means of identification, under a system of classification whereby a print could be filed and readily found, the subject was treated as a science and made to appear technical and difficult. This was done perhaps to keep it confidential for police purposes, no thought having been given to its future possibilities or to the fact that a system, the use of which is indispensable to the Departments of Justice all over the world, would make an ideal system for any institution, department, bureau, firm, corporation, etc., desiring to prove identity or prevent impersonation.

In order to interest the public in this comparatively new system, an endeavor will be made to cover the omissions of previous articles, by explaining the finger print system as concisely as the subject and space will permit by showing that there is nothing difficult or mysterious about the system and how valuable it would be, not only for the police, but for themselves, if everybody had their prints taken and filed for future use.

The only requirements for proficiency in the knowledge of finger prints are ordinary intelligence and practical experience.

Origin

According to the record of researches by prominent criminologists, the individuality of the finger print, or better known as the thumb print, and its value in proving identity was discovered by the Chinese over 200 years B. C., an impression of the thumb being used by them in lieu of their signature in all legal and business transactions; later this method was also adopted in India, and while from time to time various systems for the classification of impressions were advanced, they were not considered until the English government, realizing its value, adopted the "Henry System" in 1901. Since then finger prints under some system have been installed by the police of all the principal cities throughout the world.

A Finger Impression

Before entering upon the explanation of classification, I wish to instill into the minds of those not familiar with the finger print work, the real meaning of a finger print or impression.

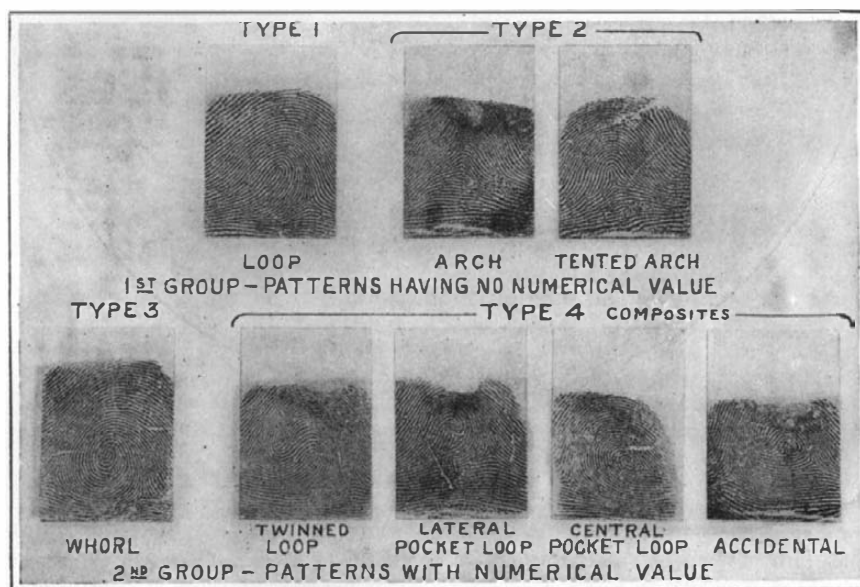
The dictionary defines the word impression as being the mark, or a mark of anything, such as a stamp, mold, etc.; but as a mark made with the finger is not necessarily an impression and valueless to experts unless it shows the peculiarities of the ridge formation upon which the classifications and identifications are based, it fails to convey the real meaning.

The term finger print or impression, as used by experts, means the reproduction of the ridge formation on

the bulb surface of the outer or nail joint of the finger in any manner whatever, whether it be made with ink, blood, or the greasy substance which is emitted by the sweat glands, the outlets of which are situated on the summits of the ridges; whether it be a photographic reproduction or printed by means of what is known as a line cut; or whether impressed in clay, wax, putty, etc. All are impressions within the full meaning and can be used by experts in making identifications. A smudge made with the finger would be a mark but no impression in accordance with the finger print system.

Classification

Although there are various systems for the classification of finger prints, such as the "Conley," the "Flak-Conley" (an improvement on the Conley) and the "French System," the system I am about to explain is



The "Henry System" of classifying finger prints

the "Henry System," which is the one most universally adopted. Any person who acquires experience enough to be recognized as an expert can create a system of his own, which accounts for the variety of systems.

All systems are based upon the peculiarities of the ridges, such as their formation into various patterns (by which the primary classification is determined), and by the formation of two fixed points (known as core or inner terminus and delta or outer terminus), together with the ridges intervening and surrounding these two points (by which the sub-classification, and in some cases the final classification, is determined).

All impressions are divisible into one of two groups, of four types and eight distinct patterns, the first group being patterns to which no numerical value is assigned (except as explained later), consisting of two types and three patterns, such as loops, arches and tented arches (tented arches being included under the type of arches), the second group being those patterns to which a numerical value is assigned in accordance with their position in a set of prints and consisting of two types and five patterns, such as whorls, twinned loops, lateral pocket loops, central pocket loops and accidentals, the last four patterns being classed as composite.

A set of finger prints (ten fingers), consisting wholly

of patterns to which no numerical value has been assigned (first group), is given a primary classification of 1 over 1, expressed in the form of a fraction, as $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, etc.; for impressions consisting wholly or partly of patterns with a numerical value (second group), the primary classification is determined in the following manner:

The ten fingers are divided into five pairs (the first finger of each pair representing the denominator of the fraction and the second of each pair the numerator), the first pair being the right thumb and right index finger, with a value of 16 for denominator if appearing in thumb and 16 for numerator in index; second pair, the right middle and right ring finger, with a value of 8 for denominator in middle and 8 for numerator in ring finger; third pair, the right little finger and left thumb, with a value of 4 for denominator in right little finger and 4 for numerator in right thumb; fourth pair, the left index and middle fingers, with a value of 2 for denominator in index and 2 for numerator in middle finger; fifth pair, the left ring and left little fingers, with a value of 1 for denominator in ring finger and 1 for numerator in little finger; the value of 1 which, as previously stated, is assigned to prints consisting of patterns having no value, is always added to the result obtained by the addition of the values as assigned to patterns of the second group, so as to account for the 1 which is borrowed for such prints. The following examples will show how the values are applied and the primary classifications determined.

If the right and left thumbs were both patterns of the second group and the other eight fingers of the first group, irrespective as to which pattern, the result would be 16 plus 1, giving 17 for the denominator, and 4 plus 1, giving 5 for the numerator; thus we have the primary classification of 5 over 17 for impressions in which both thumbs are represented either by a whorl, a twinned loop, a lateral pocket loop, a central pocket loop or an accidental; if the right thumb, right ring, right little, left index and left little fingers were represented by patterns of the second group, the primary classification would be 10 over 23. When the ten fingers are considered under the same conditions, the classification is the result in addition of 16, 8, 4, 2, 1 plus 1 for both numerator and denominator, or 32 over 32. By this arrangement of values we have the square of 32 or 1,024 primary classifications, running from 1 to 32 over 1; 1 to 32 over 2; 1 to 32 over 3, and so on, up to 1 to 32 over 32.

The primary classifications are further subdivided by the use of letters, as A for arch, T for tented arch, R for radial loop, U for ulnar loop, for patterns of the first group in the index fingers and I for inner, M for meet, O for outer, determined by tracing the ridges of patterns of the second group; but as this part of the system is very lengthy, I will not attempt to explain it in detail owing to limited space.

Prints with a loop appearing in the right little finger would have what is termed a final count or classification in the form of a numeral representing the number

(Concluded on page 365)

* Finger Print Instructor, by Frederick Kuhne. Munn & Co., Inc., Publishers.

Creek and, taking a position southwest from this bridge, partially sheltered by trees, opened fire upon the advance guard of the enemy.

The main body of the enemy immediately changed direction in order to gain other bridges, while their advance guard deployed and occupied stretch between railroad and Nehaminy River.

At 8:50 A.M., enemy artillery opened fire from Chester Hill with two guns, upon squadron.

At 9:30, Captain C retired from his position to nearest edge of Pine Forest.

At the same time, our own artillery, from Lookout Hill, responded to enemy's fire.

* * * * *

The Fourth War Game will deal with the combat between these two detachments, first showing our own, then the enemy's action.

The Origin, Classification and Uses of Finger Prints

(Concluded from page 357)

of ridges in such loop between the two terminal points (core and delta), these two points being excluded from the count.

Making Identifications

After the primary classification, sub-classification and final classification (if any) of a print have been determined, they are compared with the prints on file having the same classification, by taking into consideration all the peculiar formations of the ridges and patterns in the print; if they do not agree in the minutest detail they are not of the same person.

As an experiment, take your own print by using an ink pad instead of printers' ink, and examine it under a magnifying glass and you will see the numerous characteristics of the ridges, such as a single ridge separating into two ridges, termed ridge bifurcation; ridges that end abruptly, short ridge lines or dots, etc.; upon these points the identifications are based, they being exactly alike in duplicate prints, even though taken years apart.

How Used

Although finger prints are utilized with success in the Army and Navy Departments of the United States for the apprehension of deserters and to prevent the burial of soldiers as unknown in case of war and by a few savings banks for the protection of depositors who are unable to write, thereby preventing the withdrawal of funds by unauthorized persons, its greatest success perhaps has been in the Police Departments, where positive identifications are being made daily, whether the person be alive or dead (good impressions of the dead being obtainable until decomposition sets in), irrespective of name, age, sex, color or nationality.

It also aids them in apprehending and identifying criminals who unconsciously leave their impression or impressions on some article at the scene of a crime, these impressions very often being submitted as the only evidence of guilt.

When impressions of three or four fingers are unconsciously left, a classification is possible by considering each of the missing fingers under both groups of patterns; but where the impression is of one finger only this is not possible, as no system has been devised for its classification, nor do we know of a method to determine which one of the ten fingers it might be. When identifications are made of one impression, it is usually done in one of two ways; either by comparing the print with those on file of persons suspected of the crime, or by the arrest of some person charged with the crime, in which case the finger prints are taken and a comparison made. If no identification should be made at the time under either of the preceding circumstances, the impression is preserved for future use.

How Finger Prints Could Be Used

As previously stated, the Police Departments make positive identifications of the dead as well as the living, but unfortunately at the present time such identifi-



Are You Trucking in a Fog?

GETTING to be quite a problem—this trucking— isn't it? You know to a penny how much it costs to transport a ton from your freight house to San Francisco, but can you tell what it costs to truck the same ton across the yard?

Do you know how much you lose per day on a horse?

Do you know that electric trucking is, roughly, about 50% cheaper than gas trucking?

One brewer saved nearly \$400,000 in real estate alone by changing from horses to electric trucks. This brewer operates 65 electric trucks and 27 gas trucks. Three attendants keep the 65 electrics in perfect condition, whereas it takes nine men to look after the 27 gas trucks. In other words, it would require eighteen men to take care of 65 gas trucks as against three men on the same number of electric trucks.

A gas truck is usually laid up for repairs twice as many days in a year as an electric truck. The depreciation on an electric is much less than on a gas truck. As to cost of operation, "juice" costs a lot less than gas. The electric uses power only when running, while a gas engine often runs idle.

A lot of men seem to harbor the idea that electric trucks are more or less experimental—sort of uncertain as to results. The truth is that an Electric Truck is just about as complicated, mysterious and uncertain as a wheel barrow.

Our organization has been built up, unit by unit, over a long period. Our recommendations have the weight of experience—of practical knowledge—behind them.

Now the situation is this: if it comes to a contest of conversation, there are plenty who can talk rings around us, but on the other hand, if you will go into the matter scientifically with us—get down to figures—in 85% of average city and suburban uses we'll make out a case for G. V. Electric Trucks that will convince you.

Understand us on this: we don't mean general figures, but figures on your kind of business. We show you in dollars and cents the relative saving of electric trucking in *your business* before we permit you to install our electric trucks.

You couldn't buy, for any price, the expert information on your trucking problem, which we gladly give you. Simply because there is no other organization that knows as much as we know about electric trucking. During our fifteen years' experience we have analyzed practically every possible trucking problem. The results—as applied to your business—are yours on request.

Honestly, would it be good management to ignore such help?

*Never mind about giving details now—let them come later—
just tell us your line of business.*

Address :

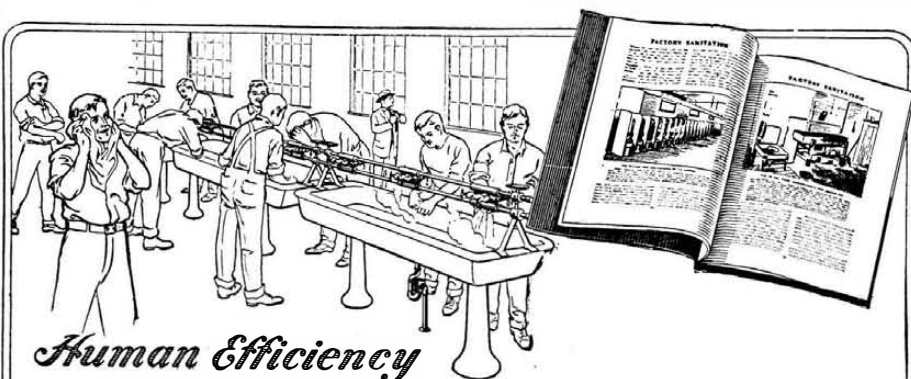
Trades Bureau B

General Vehicle Co., Inc.

General Office and Factory: Long Island City, New York
New York Chicago Boston Philadelphia

Six Models: 1,000 to 10,000 lbs. Capacity





Human Efficiency

Determines Factory Efficiency

A SKILLED WORKMAN differs in no way from an athlete and, like the athlete, to be at his best, must have a clean body, bright eye, clear mind, steady hand, quick judgment, and a reserve of muscular and nervous energy. These he cannot have if he is lacking in good food, working in cold rooms, suffocating in foul air, working in dark corners or handicapped by the lack of proper toilet equipment or facilities. Sound economic principles dictate that all the necessities be supplied, not for reasons of philanthropy but to keep the labor equipment up to the highest standard. No single element is more necessary than good plumbing.

WE CAN HELP SOLVE YOUR SANITARY PROBLEMS

We specialize in sanitary equipment and service. Many of the best equipped manufacturing establishments are fitted with "Standard" Plumbing Fixtures.

We are prepared to give expert advisory service. In nearly every part of the country we have practical, trained service men. You may have their assistance without obligation. In addition we have show-rooms or "service stations" where you can see all types of fixtures.

No matter what size your sanitary problem may be, we want you to benefit by our service. Send for our book "Factory Sanitation" and tell us what your problems, plans or possible requirements are and we will co-operate with you.

Standard Sanitary Mfg. Co.

FACTORY SANITATION DEPT.

PITTSBURGH, PA.

Showrooms and Service Stations

NEW YORK.....	35 W. 31ST	LOS ANGELES.....	MESQUIT AT SEVENTH
BOSTON.....	186 DEVONSHIRE	LOUISVILLE.....	319 W. MAIN
PHILADELPHIA.....	1215 WALNUT	NASHVILLE.....	315 S. TENTH
WASHINGTON.....	SOUTHERN BLDG.	NEW ORLEANS.....	846 BARONNE
PITTSBURGH.....	106 SIXTH	HOUSTON.....	PRESTON & SMITH
CHICAGO.....	900 S. MICHIGAN	DALLAS.....	1200 JACKSON
ST. LOUIS.....	100 N. FOURTH	SAN ANTONIO.....	212 LOSOYA
CLEVELAND.....	4409 EUCLID	FORT WORTH.....	FRONT & JONES
CINCINNATI.....	688 WALNUT	TORONTO, CAN.....	59 E. RICHMOND
TOLEDO.....	311-321 ERIE	HAMILTON, CAN.....	20 W. JACKSON
COLUMBUS.....	243 S. THIRD	SAN FRANCISCO OFFICE.....	RIALTO BLDG.
YOUNGSTOWN.....	N. CHAMPION	DETROIT OFFICE.....	HAMMOND BLDG.
ERIE.....	128 W. TWELFTH	KAN. CITY OFFICE.....	RESERVE BANK BLDG.

cations are only possible where the deceased person has been previously finger-printed for some crime or violation for which finger prints are authorized by law.

What a valuable file the police could control if the public would only realize the latitude of finger print possibilities and the benefits to be derived therefrom not only by themselves, but their families and relatives, if the police were equipped (by reason of having their prints) to identify all persons coming within their jurisdiction, irrespective of circumstances; whether it be a criminal, a person who was murdered or killed accidentally, an unconscious person, or one suffering from aphasia. Would it not save them considerable anguish if the police were in a position to notify parents or relatives in all such cases?

The unsuccessful attempts of the police to establish such a file is due to the fact that there is no law compelling it, and that whenever mention is made of finger prints the majority of persons not familiar with the system connect it with criminals, forgetting that the individuality of prints is not limited to criminals and that prints differ from photographs, inasmuch as they cannot be identified except by a duplicate set of prints, and then only by an expert.

Let us take into consideration the "Slocum" disaster on Long Island Sound a few years ago, when hundreds of human lives (mostly women and children on a church outing) were lost by drowning. How easily the bodies could have been identified and the parents or relatives notified; how it would have saved them the disagreeable and heartrending task of visiting the morgue every day in an endeavor to identify the bodies of their beloved ones as they were brought in. By finger prints all this could have been avoided and identifications made in a short time, whereas without them it required several days, and even then a large number were buried unidentified.

It would also be an aid to the public in the collection of life insurance, by supplying them with a positive proof of death of the insured, which no insurance company could ignore.

The Hon. Arthur Woods, Police Commissioner of the city of New York, is heartily in favor of establishing a general file of finger prints for Greater New York, and I have no doubt that permission will be granted upon application for the taking of finger prints in duplicate, so that a copy may be retained at home for future use to all persons who desire to aid in its establishment. The only persons who could have good reasons to object to finger prints are those with criminal tendencies.

The possibilities of the finger prints are numerous and varied, as they can be adopted wherever identity is to be proven or impersonation prevented, either under a system or classification, for which the services of an expert would be required, or without a classification, as in places where fictitious names are not resorted to.

A very interesting case in which a lone finger print was the important factor, even though it was not used for the purpose of obtaining a conviction, was the arrest of one John Bernauer.

On the night of January 25th, 1914, some person (unknown at the time) entered and burglarized the home of J. P. Morgan, Jr., at 231 Madison Avenue, New York city, without arousing the occupants, and succeeded in securing loot to the value of several thousand dollars, leaving no clew save the impression of one finger on a cigar lighter, which the perpetrator of the crime had handled but left behind as valueless. This impression was photographed by the police and compared with the prints of various suspects on file at the Bureau of Criminal Identification with unsuccessful results.

This impression took the course as many others had done before and was filed for future reference, when on September 20, 1914, seven months after the Morgan burglary, Detectives Doyle, O'Neill, and Tierney, who had been shadowing Bernauer for several days, ar-

rested him on general principles as he was leaving a pawnshop, he seeming to have an over-supply of clothes and money for a baker out of work, when to their surprise they found upon his person a match safe and several other articles with the initials J. P. M., Jr., but as they could not at the time of arrest prove him to be the thief, he was charged with having stolen goods in his possession, which is a minor crime.

At the time of his arrest Bernauer denied all knowledge of the burglary, stating that it was given to him to pawn by one Muller, who could not be located, but after he was brought to police headquarters, finger-printed and shown that the print on the cigar lighter and the impression on his right middle finger were identical, he readily admitted his guilt; thus the impression of one finger was the direct cause of charging him with the burglary (a felony) and for which he was sentenced to not less than five nor more than ten years in Sing Sing Prison by Judge Swann on October 28th, 1915.

In Europe provisions were made for the admission of finger-print evidence as relevant, and while no such provisions exist in the United States, the judges and juries generally accept it as such, as shown in the case of one Charles Connors, alias "Ice Wagon Connors," who was arrested and convicted on evidence of a single print on the balcony railing of the home of Ernest R. Ackerman of Plainfield, N. J., which was entered on January 3rd, 1914, and jewelry to the value of \$17,000 stolen. He was sentenced to serve from three to seven years, but as counsel did not believe the finger print evidence would hold, his case was appealed, with the result that on June 22nd, 1915, the Supreme Court at Trenton, N. J., confirmed the conviction and sentence, on the grounds that finger prints are proper and admissible as evidence.


A Successful Experiment in Skunk Farming

(Concluded from page 346)

skunks taken from the wild showed that for the most part the animals live on insects. Some were found to have dined off field mice, rats, squirrels and pocket gophers, carrion, lizards or salamanders, crawfish, fungi, earthworms, berries and fruit of various kinds. So fond are they of an insect diet that in the season when this provender is plentiful it has been found that they live on it to the exclusion of everything else. As the insect pest largely predominated in the stomachic contents of the skunks thus examined, the liking of the animal for grasshoppers, crickets, cicadas, army worms and such enemies of the farmer being apparent, the result proved that the skunk is a much maligned animal when he is classed among the wild things whose extinction would benefit the human family.

The skunk breeders take care that all the food they feed to their skunk family is well cooked; they claim this precaution is necessary to prevent stomach trouble. So they feed their colony on cooked vegetables and boiled horse flesh, with the remains of the family dinner and supper as a filler-in.

The captured skunk is rendered harmless by a simple operation. This operation sometimes takes the form of the removal of the scent sac, but more often resort is had to a method that is claimed to be just as efficacious and much more simple. The scent glands are located at the base of the tail. A contraction of the muscles enables the animal to eject the fluid. In extracting this scent sac the animal is put in a bag to keep him from biting and clawing and the gland is then removed. The wounds soon heal. The other method that the brothers use, and the one that is simpler than the complete extraction of the scent sacs, is the cutting of part of the duct. When a piece of this is snipped off the wound heals and closes the duct so that the skunk is perfectly harmless for the rest of his life. Deprived of this means of offense the skunk is as easy to manage as a cat or dog.



CHANDLER

The horizontal arrangement of cells is your identification of the

HARRISON

ORIGINAL HEXAGON

Cellular Radiator

Regular Equipment for

Chandler	Hudson	Hupmobile
Mitchell-Lewis	Oldsmobile	and others

Book on Radiator History and Efficiency for Automobile Engineers, Sales Managers and Dealers on Request.

The Harrison Manufacturing Co., Inc.

Lockport, N. Y.