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The publishers do not pay the rewards offered for wanted persons advertised in this magazine nor do they guarantee the payment of same. All reward notices, to the best of our knowledge are bonafide and official at the time the magazine goes to press.

APPREHENSION NOTICE

The reward notice which was published in this magazine last month for Fred Earl Anderson, who had escaped from the Kansas State Penitentiary at Lansing, Kansas, should now be cancelled. The subject has been apprehended and is in custody.

A Real Public Service

In September, 1926, a group of leading correspondence schools banded together and formed the National Home Study Council for the purpose of "promoting sound educational standards and ethical business practices within the home study field." Ever since, the Council has done great work in protecting the public by raising the standards of correspondence school operation among its member schools.

Somewhat over two years ago, after months of study and deliberation, the Council decided to take a big step in raising the business and educational levels of the entire correspondence school field even still further by setting up an accreditation program similar to those established for accrediting high schools, colleges, and universities. In March of this year the Council announced the names of the first nine-member accrediting commission which will direct the program, and it includes a very impressive list of educators.

The primary purpose of accreditation, according to the Council, is "to stimulate professional growth and continuous improvement of the educational materials and services of home study institutions."

A second purpose is to provide a basis on which the Commission can assure the public that accredited schools maintain sound educational standards and ethical relationships with their students.

In formulating the new plan, the NHSC sought the advice of the foremost authorities in the accreditation field. Persons who have examined it say that it is one of the most forward-looking accreditation plans of any educational association.

The Council looks upon the establishment of its accrediting commission as its biggest forward step in a generation. Ultimately, it should result in material benefits to the half million persons who annually enroll in private home study schools in this country.

When considering enrollment for a correspondence course, a person should select the school with care. If it displays the National Home Study Council emblem shown here, either in its advertising or prospectus, you can be sure that it operates on a high business and educational level.



The Institute of Applied Science is proud to have been a member of the Council for over fifteen years, and congratulates it for the truly splendid accreditation program it has instituted. The plan will undoubtedly prove to be a real public service.

T. DICKERSON COOKE Editor



A New Method of Evaluating Ridge Characteristics

By Florentino Santamaría Beltrán Chief of the Technical Police Laboratory Madrid, Spain

The article which follows was originally presented by Mr. Santamaría before the 22nd General Assembly of the International Criminal Police Commis-

sion in Oslo, Norway, in June, 1953. A discussion of it was published in the International Criminal Police Review, No. 70, August-September, 1953. The



FLORENTINO SANTAMARIA B.

report itself was published without illustrations in Revista de Policia Técnica of Lima, Peru, Nos. 187-194, July, 1953, to February, 1954.

Although the report has been received with widespread interest among the members of the International Criminal Police Commission, it has not been widely circulated among finger print technicians in the United States of America and other countries. Having received correspondence and inquiries about it in recent months, we are publishing the report in its entirety for the interest and benefit of English speaking finger print men and women. This publication is being made through the cooperation of Mr. Santamaría and Mr. Marcel Sicot, Secretary-General, International Criminal Police Commission, Paris,

In publishing the report we are not necessarily endorsing it in full. We are printing it because of the new approach to the matter of comparing finger prints advanced by Mr. Santamaría. The reader may not agree with the author, but it cannot be denied that his paper offers some worthwhile ideas to think about. We should be pleased to hear from our



FIGURE 1



readers and receive their comments about Mr. Santamaría's paper in general and about the conclusions he presents at the close of his report. Editor.

I would first of all like to give my hearty greetings to those of my colleagues of the countries here represented by the delegates of the member countries of the I.C.P.C., which includes practically all countries in the world.

The first congress of forensic medicine was held in Madrid in May, 1942. During the time devoted to the Spanish technical police, I read a paper which was not published, in spite of the requests made that I should do so.

Only a résumé, which was

made while I was reading the of these countries belonging to paper, was published in the Madrid Police journals Investigación and Policía.

Circumstances prevented my giving the results of my work in Spain to other countries. This was the only reason for my refusal to publish my work,

Since the war, I have not had the opportunity of communicating it to the specialists of other countries. Only a few South American countries have received an incomplete version in the form printed in the journals already mentioned. International relations between Spain and the rest of the world having become normal, I am submitting this work to the specialists motives. I renounce in advance

the I.C.P.C.

The form in which it is now given benefits from the experience of the last few years, and I hope that you will consider it in the same frame of mind as the one in which I offer it. The work, in my opinion, still is just as original as it was when I first presented it.

Qualitative Standard

If this method of evaluation is accepted by the world and put to use, I must say that I shall be very gratified, though my pleasure will be for the triumph of lophoscopy, not from any personal

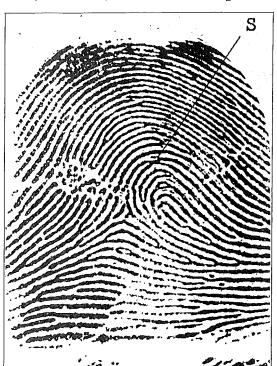




FIGURE 2

FIGURE 3







FIGURE 4

without the slightest regret any personal triumph which may ac-

The subject of the evaluation of ridge characteristics and the part this plays in print comparison is not only very important, but also very interesting.

It would, if generally accepted, revolutionize a universally used concept in lophoscopic identification, a process on which the reputation, even the very life or liberty, of a person may depend, or on which a person guilty of an offence against society may go unnunished.

The criterion up to now adopted by all specialists in evaluation of print characteristics has been one of quantity. The purpose of my work is to show why this should be replaced by a qualitative stand-

In 1953, of course, it is not ment. necessary, before an audience such as the present one, to mention the evidential value of prints based on their characteristics (Fig. 1).

Opportunity for Experiment

I am of the opinion that, although a great deal has been written on this subject, the last words have not been spoken about ridges. On the contrary, I con- the great expert on the system of

sider that much has still to be said and discovered and that this field is one of great scope, offering the realistic worker great opportunity for study and experi-

The characteristic elements of a pattern are to the print-whether from the finger, the palm or the foot-what identification papers are to the individual. They both serve to differentiate one thing from another of the same kind. However, the characteristic points of a print have the advantage of being unchangeable, permanent, and infinite in variety.

Dr. Federico Oloriz Aguilera,



identification adopted in Spain, established the following ten ridge characteristics of prints:

Ridge Ending-Fork-Convergence - Deviated Break - Interjunction - Fragment - Interruption - Enclosure-Dot-Branch.

One of the most distinguished pupils of Dr. Oloriz, Don Victoriano Mora Ruiz, a worthy successor to his master, discarded one of the above, the "branch," and added another, the "changeover."

In 1942, I suggested to the Spanish experts that another point should be added, the intersection. This is a rarity, and consequently of greater value than some of the other characteristics (Fig. 2).

New Point Discovered

In 1950, an old pupil of mine, Don Antonio G. Valcarcel, who works in the laboratory of which I am in charge, published the discovery of a new point of great value, considering its great rarity. He calls it the "vuelta" or "return." This is a ridge which suddenly turns upon itself and returns the way it has come, without forming a core (Fig. 3).

These new points, the intersection and the return, have been accepted by the Spanish and are now included in this list used in Spain:

A-RIDGE ENDING:

This is a ridge, situated between two others and more or less parallel to them, which ends abruptly and does not reappear (Fig. 1, A). B-BIFURCATION (or diverging fork):

A ridge which leaves the left of the pattern and divides for a certain length into two parallel ridges (Fig. 1, B). C-CONVERGENCE (or converging fork):

This is similar to the bifurcation, but its reverse or mirror image. It is formed by two parallel ridges which start on the left of the pattern and fuse to form a single ridge (Fig. 1, C).

Ridge Characteristics

D-DEVIATED BREAK:

An interruption formed by two ridges which, instead of stopping just before they meet, suddenly deviate, forming two ridge endings with a furrow between them (Fig. 1, D).

E-INTERJUNCTION:

The junction of two parallel ridges by a short, diagonal ridge which meets the ridges at a very acute angle (Fig. 1, E). F-FRAGMENT:

A ridge with ends which finish abruptly, and of variable length. The fragment which is up to five times as long as it is wide is called "small," while when from five to ten times as long, it is called "large" (Fig. 1, F).

I-INTERRUPTION:

This is a natural break or interruption in a ridge. The hiatus is approximately twice as long as it is wide, while the ridge ends are rounded (Fig. 1, I). It is similar to two ridge endings facing each other.

O-ENCLOSURE:

This is in the shape of an ellipse, and is formed by a ridge which bifurcates only to fuse again almost immediately (Fig. 1, O). The size of the enclosure may be indicated as for the fragment. P-POINT (dot or spot):

A very small part of a ridge, only as long as it is wide, which

is usually found in the middle of an interruption or delta or between ridges (Fig. 1, P). S-INTERSECTION:

This is simply what its name indicates—one ridge cut by another (Fig. 1, S and 2).

T-CHANGEOVER:

This is a case where two parallel ridges change places. One ridge is interrupted, while the other takes its place by passing through the break (Fig. 1, T).

V-RETURN:

A single ridge which suddenly turns upon itself and returns the way it has come, forming a rounded loop but no core (Figs. 1, V and 3).

For two prints to be considered identical, they must have a certain number of characteristic points in common. The number of such points varies slightly from country to country. In Spain, it is from ten to twelve. However, it is universally agreed that the identificational value of the characteristic points is purely quantitative.

Identification Value

Characteristic points are spoken of generally, without any distinction being made, as though their identificational value were the same. Now, logically speaking, their value should vary according to whether the point is constant or not in its shape and dimensions, and also according to the frequency with which it occurs.

For example: The point and the ridge ending are invariable. They all have the same characteristics. However, the fragment and the enclosure have varying sizes (Figs. 4 and 5).



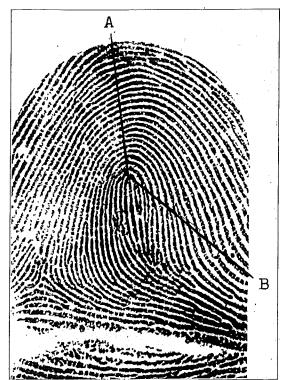




FIGURE 6

Furthermore, ridge endings, bifurcations and convergences are very frequent while the intersection and the return are very rare.

Must we, therefore, continue to consider that any one of these three points which occur so frequently, has the same value from the point of view of identification, as either of the other two, which are extremely rare?

Considered Equal

If the value of each characteristic point is different, will it not be equally so for each collection of points?

And if they are different, then

why should we say: "You must have ten to twelve points to establish identity," taking no account

of their individual value, as though all points had the same value?

In other words, in the face of all logic, the total identificational value of ten to twelve ridge endings, bifurcations or convergences (which, in addition to being invariable, occur very frequently) is at present considered to be equal to that of a collection of an equal number of characteristic points, one or more of which are very rare. This is a state of affairs which I consider should be corrected.

We know that the value of char-

FIGURE 7

acteristic points is not intrinsic, but results from their combination, their association with other points and their positions among them.

Not Absolute

I feel that the old form of evaluation should not be considered as absolute and that we should not continue to accept it. Consequently, I propose that each of the characteristic points should be given a fixed value, according to its frequency and variability. That would then make it possible to admit as a sure proof of identity a collection of five or even less than five points, according to their



types and taking into considera- is guilty, but the proof which will tion their relative values.

for example, which are extremely rare, are found present with three or four other characteristics, or even with one of those classified as rare, as we shall see later, why should we not give to this combination the same identificational value as the ten to twelve points at present required? Moreover, these latter points might very well belong to the class of characteristics which occur very frequently.

Smudged Prints

At the scene of a crime it is not unusual to find superimposed finger prints, or prints which are smudged or produced by a moving hand. It is for this, or some other reason, such as a reduced or unsuitable surface, that these traces do not have the number of characteristic points at the moment considered necessary to prove identity.

Merely A Clue

The expert is very often convinced that the impression found and the print of the accused belong to the same individual, but if the requisite number of common characteristics has not been found, he cannot affirm that they really do. In this way, conclusive proof becomes merely a clue, and if other more convincing evidence cannot be offered (as a conviction cannot be obtained on simple clues), the criminal will evade justice. Judges and magistrates have plenty of experience with this type of case. They are often morally convinced that the accused

allow them to punish the violation If the intersection or the return, of principles laid down for the protection of social life is not available.

> The terms characteristic points, peculiarities and morphological varieties should not be confused. for they are not synonymous.

> Morphological varieties are, for example, the type and sub-type of palm and finger prints.1 A Peculiarity is a scar, the visibility of pores, etc.

Characteristic points are those individual peculiarities which distinguish one print from another, considered either singly or in conjunction with the rest of the print.

Defines Summary

As a summary: Variety and peculiarity are proper to the print itself, as a whole, while the characteristic point refers to ridge formation.

Certain characteristics of prints. such as the pores and the absence or rarity of points in a particular part of the print, are surely noteworthy facts which increase the value of the points, for the simple reason that they are rare. Are not these reasons for the rejection of the erroneous criterion of a minimum of any ten to twelve points?

In Fig. 6, for example, the area of the right upper segment (about one quarter of the print) has almost no ridge characteristics, and the few that do exist are on the periphery.

It must be admitted in theorylimits cannot be imposed on nature-that it is a possibility that one day a print may be found without any characteristic points. Is there a finger print technician who has not seen one or more ridges which start on one side of the print and end on the other without bifurcating, fusing or forming any characteristic point? (Fig. 7). The rarity of such an occurrence naturally increases with the number of such ridges per print. This is not peculiar to patterns with parallel arcs; it is also found in loops and whorls. Thus, if two, three, four, five or even more ridges of this type may be found in print, why should it not be possible to find a print with all sixty or so ridges without special features? Are characteristic points a physiological necessity?

Further Reason

We shall not here try to solve this complicated problem, but we may note its possibility. If it did happen to occur, some other point among the numerous peculiarities offered by ridges, apart from the pores and characteristic points normally available, would have to be studied. This is a further reason for the need to abandon the present criterion, which is at present a minimum of from ten to twelve common ridge characteristics for identification of a person from a

We have already mentioned the characteristic points generally accepted, to which I will add those accepted in Spain under the names

(Continued on Page 16)





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¹ Although in Madrid we made the first identification of a criminal by means of a print produced by a naked foot in powder, we shall not consider foot prints. as it is unreasonable to establish records based on foot prints. Consequently, the foot prints found have to be compared with those from the suspect,

Evaluating Ridge Characteristics

(Continued from Page 8)

of intersection and return. The names given to them, in addition to being explicit, have the added advantage that the initial letters of the Spanish terms (secante and

vuelta) are different from those of other points, which allows them to be expressed by their initials.

Let us now consider the frequency with which the ridge characteristics occur.

The examination of one thousand prints of the different types included in the Spanish identification system gives the data record-

D = 2 A

E = B & C

= 2 A

=B&C

F =

ed in the following tall
ed in the following table, expressed
as so many per thousand ridges. ²
Ridge Ending534
Bifurcation151
Convergence131
Deviated break 22
Interjunction 13
Fragment 54
Interruption 16
Enclosure 42
Point 22
Intersection 2

Changeover 13

Return VERY FREQUENT:

> Ridge ending Bifurcation

Convergence

FREQUENT:

Enclosure

Fragment

RARE:

Deviated break

Interjunction Interruption

Point or dot

Changeover

VERY RARE:

Intersection

Return

Taking into consideration their variability, we now obtain a new subdivision formed by the two main sub-groups:

VARIABLES	Deviation Interjunction Fragment Interruption Enclosure Changeover
INVARIABLES	Ridge ending Bifurcation Convergence Point or dot Intersection Return

value of characteristic



points is really based on their frequency and variability. The former is shown by the irrefutable evidence of the figures of the first table. The latter is deduced from their formation.

Let us consider two variables, the enclosure and the fragment. What is the enclosure, if it is not a bifurcation followed by a convergence? The second may be considered to be two ridge endings.

The deviated break, the interruption and the changeover are. practically speaking, composed of two ridge endings. The interjunction is nothing else but a bifurcation and a convergence having a common arm which joins the two main ridges, which are parallel.

Consequently, all these points are called variables because when they appear in incomplete prints they may themselves be incomplete, and because of this, appear to be something quite different from what they really are.3 All these points, as I say, have, because of their variable nature, the value of two different points, since they may be divided up as follows (see Fig. 8):

Deviated breaktwo ridge endings	
nterjunction bifurcation and	
convergence Fragmenttwo ridge endings	
nterruption two ridge endings	
Enclosurebifurcation and	
convergence Changeovertwo ridge endings	

the value of characteristic points is based is thus firmly established.

We have still to determine the value of ridge endings, bifurcations, convergences, points, intersections and returns, all of which are included in the group of invariables.

Inverse Proportion

For the evaluation of the final six characteristic points I use the statistics given above, whose evidence, as I have already said, is irrefutable, thus their value will naturally be in inverse proportion to the frequency with which they occur. Thus we get a list of values which are in perfect harmony, effective and overwhelmingly logical:

Because of their Ridge ending \frequent occur-Bifurcation lence, have been Convergence given the value of 1 Point or dot...Because it is seldom found .. 2 Intersection ... Because it is very rarely found 3

The characteristic points have already been given values, I shall now deal with the other peculiarities which I have referred to above.

Special Circumstances

Peculiarities are often found in isolated finger prints. Even should there be more than one, it may be impossible to make a definite identification from them.

The presence of a great number The second foundation on which of pores without sufficient clear-

ness, the rarity of characteristic points in proportion to the area of print visible, the scar with its many characteristics (of great value unless smudged), etc., are all peculiarities which should not be definitely despised, especially when there are not enough characteristic points to prove identity. In such special circumstances, the data just mentioned should be used. I classify them as identification aids and give them the value of

Ample Details Obtained

From what has already been said, this may seem to be going too far. However, if I had included the special work done on identification by means of these peculiarities (scars, pores, etc.), it would appear just the reverse. You may take any one of them, and from it may be obtained more than ample details for sure identification, if only this were practicable. It would indeed be quite sufficient should the clear outline of a permanent scar be present. even though the more minute details of identification were absent. The results of all that has been

² The return was not included in this particular examination, as it is an isolated point which deserves special consideration. It was therefore dealt with more fully by my pupil, Señor Valcarcel.

8 For example, if an enclosure is present in a finger print trace, and because of its marginal position, is only partially shown, it will appear to the observer to be either a convergence or a bifurcation, depending on its orientation.

Similarly, an interjunction might be interpreted as a bifurcation or a con-

The fragment, for the same reason. could appear to be a ridge ending, etc.



said are summed up in the following tables:

TABLES OF VALUES I. CHARACTERISTIC POINTS

Didne Pedica

mage maining(A)	
Bifurcation(B)	 1
Convergence(C)	 1
Deviated Break (D)	 2
Interjunction (E)	 2
Fragment(F)	 2
Interruption(I)	 2
Enclosure(O)	 2
Point (P)	 2
Intersection (S)	 3
Changeover(T)	 2
Return(V)	 3
T DECITE LETTER	
II. PECULIARITIES	
Rarity of characteristic	

points 1

Scar 1

Abundant pores 1

To conclude this report, taking into account the arguments which have been put forward, the convincing contents of the tables, and my thirty years of continuous identification work, I come to the following conclusions:

- 1) The present method of considering the characteristic points from a quantitative point of view for the purposes of identification should be dropped,
- 2) Characteristic points should henceforth be considered from a qualitative point of view and given special values for the work of identification of individuals.
- 3) When there are not enough Characteristic Points to satisfy legal requirements for proof of identity, or when the clarity is insufficient to allow proper identification by means of the many small details of the *Peculiarities*, then these peculiarities should be taken into

New York IAI Division Schedules 1955 Conference

With the selection of the Sheraton-Ten Eyck Hotel in Albany as official headquarters, definite plans are now being developed for the 1955 annual conference of the New York State Division of the International Association for Identification, scheduled for June 6, 7 and 8, according to William E. Cashin, Director of the Division of Criminal Identification, N. Y. State Department of Correction, who is serving as chairman, with Paul D. McCann, Secretary of the New York State Commission of Correction, as co-chairman.

This year's conference program, which will be highlighted by speakers from the various fields will include tours through the Scientific Laboratory of the New York State Police and the Division of Criminal Identification.

At the laboratory, under the guidance of Director William E. Kirwan, the delegates will examine various types of scientific equipment and witness demonstrations in the fields of handwriting and laundry mark identification, lie detection, firearms, spectrology, and toxicology.

At the Division of Criminal

Identification, the delegates will have an opportunity to examine at first hand the recently developed electronic finger print searching machines, introduced by Director Cashin in 1953, The machines, which make possible the searching of sets of finger prints in only a fraction of the time formerly required for employees to make similar searches manually, will also be demonstrated to show their value in searching physical descriptions and portions of single finger prints found at scenes of crimes.

Joseph C. Hector of the Identification Unit at Griffis Air Force Base, Rome, New York, is currently serving as president of the State Chapter, Lieutenant Walter B. Hoetzer of the Bureau of Identification of the Utica Police Department is secretary-treasurer.

In stating that the complete program will be announced in the near future, Mr. Cashin pointed out that the conference in June will be open to all persons interested in identification work, and that delegates from adjoining states will be urged to come to Albany to take part in the sessions.

account and evaluated as in the table above.

4) If there is no natural dissimilarity between two prints and if the total sum obtained from the Characteristic Points, with or without the addition of the Peculiarities, reaches the total of at least ten, then identity should be considered as proved.

5) That for the reasons given in this report and for the application of that which has been suggested in the foregoing conclusions, the evaluation made of the characteristic points and peculiarities as laid down in the tables of values I have had the pleasure of submitting to you, should be adopted.



New Slant on Finger Print Table

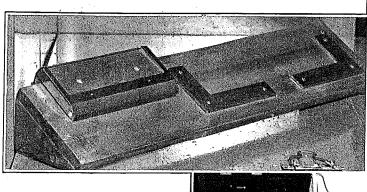
Designed and built by IAS grad- Material required consists of one and increased speed.

it produces good results with sub- slab and card holder. jects from 5 to 6 feet tall which In addition to building one of includes the average height.

uate Allen F. Walker, of Spokane, piece of 1"x6" white pine, 26 Washington, an ingenious small inches long for the top; two pieces table for finger printing provides of 2"x4" cut on a 35 degree a valuable addition to any identi- slope; two pieces of " ply board fication department. An improve- cut in 6"x4\%"x1\%" lengths to hold ment over a horizontal surface, a 4"x12" ink slab; 12 screws of the 35 degree slope of this table varying length; 4 rubber pads for enables the technician to produce the bottom to prevent marring clear, readable prints with facility desk tops; and varnish enough for three coats. The total cost of The small size and light weight the foregoing materials amounts of this table make it very port- to about 60 cents. The dimenable and especially convenient for sions can be changed if a larger smaller offices where space is limit- ink slab is to be used or if more ed. Placed on the usual office desk, space is desired between the ink

these finger print tables for his

own use, Mr. Walker made another, a similar one for Carl C. Zibulka of the Spokane County Sheriff's Office, Chief Identification Officer Zibulka commends the new table as a definite asset to every identification department. Mr. Walker generously offers his idea to all those interested in improving methods of obtaining clear finger print impressions.



The view above is a close up of the finger print table designed by Allen Walker. Note the 35 degree slope of the inking and printing surface.

In the view to the right Mr. Walker is shown using his table which has been placed on the top of an office desk.

