

# CLASSIFICATION AND IDENTIFICATION OF HANDWRITING

BY

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## Graphology Can Benefit You

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Graphology reveals personal weakness and moral defects, genius or mediocrity, enabling you to cultivate your talents, and avoid pitfalls, by suppressing your faults. It is a mirror reflecting the trustworthiness of friends or business associates; the congeniality of those seeking life mates.

A graphologist cannot tell your fortune; but as truly as chemistry reveals the component parts of liquids and minerals, showing the destructiveness of certain combinations, the benefit of others, so graphology scientifically characterizes you from your handwriting, teaching that if your faults, pettiness, sensuality, selfishness and pessimism predominate, you will probably be shipwrecked upon the sea of Life; while, if you possess more good than evil traits, intelligence, force, energy, ambition and honor, with power to conserve and concentrate your forces, you will become "Master of your Fate."

One whose expert work as a reader of character has won unstinted praise from the press and people of many lands is Mrs. Franklin Hall, M.S.G. The degree, "Master of Scientific Graphology" having been conferred upon her by a well known western college, several years ago.

Mrs. Hall is a descendant of scientists and scholars whose names are revered by students and philosophers. On her father's side she traces her lineage directly back to one of the nobles who was a trusted ally of Robert Bruce; the crest upon the family coat-of-arms having been bestowed upon this ancestor for having saved the life of the Bruce.

A pupil of the once famous San Souci Seminary, Ballston Spa, N. Y., Mrs. Hall early developed a love for science and literature. For several years she held important editorial positions, until her success as a delineator of character from handwriting made such exacting demands upon her time that she was obliged to limit her literary work to occasional contributions of poems, stories and articles to well known papers and magazines. Her fame as a

graphologist has penetrated even into "Darkest Africa;" in fact, into different parts of the globe where little English is spoken, thus necessitating translation.

During the Roosevelt-Parker campaign, Mrs. Hall was honored by a request from a prominent syndicate, for delineations of character from the writing of the rival candidates. These were so favorably received that they were copied and given prominence by all of the leading newspapers of the country.

The following are a few of the American newspapers which have given generous space to personal articles and interviews regarding Mrs. Hall's achievements in science and literature.

Leslie's Weekly, New York Herald, Chicago Times-Herald (now Record-Herald), Success, Opportunity, New York Evening Telegram, Los Angeles Times, The Troy Press, Hartford Globe, Troy Daily Times, Pittsburg Post, Toledo Blade, Rochester Democrat, Indianapolis Star, etc., etc. To the above list could be added thousands of personal testimonials, were there space.

A gentleman writes from Wiesbaden, Germany: "Your name is as well known on this side of the Atlantic as at home. Not to have had a reading of character from Mrs. Hall, is to be out of date."—E. L.

One of the most noted philologists from Paris, France: "Mrs. Hall, your work is marvelous; your readings are of priceless value to the seeker after knowledge."—Prof. J. Sulzbaché.

From the Alps in Switzerland: "I am resting here; do send me one of your character delineations from the enclosed slip, the writing of a wayfayer in whom I am interested. I trust no one until you have analyzed them for me."—Mrs. S. R.

From London: "I have always laughed at the folly of any one being able to decipher character from handwriting. I am no longer a skeptic; Mrs. Franklin Hall has convinced me it can be accurately done."—F.

"Mrs. Hall, permit me to thank you; your readings have benefited me mentally and physically and made me a better and stronger man."—F. T. G., Hawaii.

"You startled me and compelled me to turn over a new leaf. Yes, I am untruthful and possessor of the other bad traits mentioned. If I become worthy in the future, to you—one whom I have never seen—belongs the praise."—T., Milan, Italy.

If you, like the writers quoted, desire to learn more of self, write thirty words or more with pen and ink upon unruled paper, enclosing necessary fee. Disguised writing is valueless. Sex is not always discernible in writing, owing to the present day masculine mentality of many women and effeminacy of an equal proportion of men.

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From three days at a church fair in Brooklyn: "We cleared more from your little room set aside for Graphology, which was continually crowded, than from anything else. Thanks."

After an Orphan's Fair, New York City: "We are unceasingly grateful for the large sum realized from your character readings at the Tuxedo."

Make all checks, postal and express orders payable to—

**Mrs. Franklin Hall**

160 E. 91st St.

NEW YORK CITY

THE CLASSIFICATION  
AND IDENTIFICATION

OF

*Handwriting*

By

C. D. Lee

Superintendent of Records

and

R. A. Abbey

Handwriting Expert

of the Police Department of Berkeley, California

Brings the treatment and handling of handwriting to a level with that of finger-prints. This is the first book published in this country to describe a complete, scientific and practical system for classifying and filing handwriting so that specimens may be readily available for reference, comparison, and identification.



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## PREFACE

Twenty years ago a system for the classification of fingerprints was devised by Sir E. R. Henry, Commissioner of Police of London. Many years before the advent of the Henry system scientists had discovered the value of fingerprints as a simple and certain means of identification, but it remained for a man acquainted with police problems to perfect a scheme for the systematic filing of thousands of these records so as to be readily available for identification purposes at all times.

The position of the A-L System of Classification and Identification of Handwriting is to-day analogous to that of the Henry system twenty years ago. That in every one's handwriting certain definite and fixed characteristics exist which serve to establish the writer's identity has long been recognized, but to date nothing has been published in this country on the subject of their classification. Dr. Hans Schneickert of the Metropolitan Police of Berlin describes a system for the classification of handwriting in the "Archive for Court Investigations of Handwriting." His system is adapted to the German script and is divided into two parts, the primary classification being based upon a crime category and the secondary upon graphic characteristics.

## PREFACE

In the present system a crime category has been dispensed with in order that a single search of the files may suffice to establish whether or not a duplicate exists therein, which is believed to conform more closely to the modern idea of centralization of records. Thus, as with fingerprints, the writing specimen itself contains all the elements necessary for its correct classification, regardless of the criminal proclivities, name, description, etc., of the author. A thief to-day may turn forger to-morrow or blackmailer the next day; so were his specimen filed first according to criminal specialty, and second according to the graphic characteristics of his writing, search would be necessary under a number of crime divisions in order to make his identification certain.

A great amount of research work covering thousands of signatures was found necessary in perfecting the present system. The authors are indebted to their chief, August Vollmer, at whose solicitation the work was undertaken, for his many helpful suggestions; also to Osborn's *Questioned Documents*, Ames on *Forgery*, Frazer's *Bibliotics*, Hagan's *Disputed Handwriting*, Blackburn, Douglas, Caddell, and Warthman on *The Detection of Forgery*, and others, without which their efforts would have proved futile. Many factors tested for classification purposes were found wanting in some particular and had to be abandoned; while with others that were finally adopted it was found necessary to change their relative positions on the chart with a view

## PREFACE

to giving first place in the classification to those factors least susceptible of change or disguise.

No system will ever supplant fingerprints for the purpose of direct personal identification—that is, for the identification of the man under arrest. But for indirect identification, that is, for the fixing of guilt upon the unknown offender, in the commission of whose crime handwriting constitutes the *corpus delicti*, it is the belief of the authors that an efficient system for the classification and identification of handwriting will surpass in usefulness the fingerprint system.

However, as between the two systems, there is this essential difference, that, whereas in the latter the minutiae, or the elements upon which identification depends, are unchanged from birth to death except through accident, in handwriting many of the identifying characteristics are susceptible of change by design, and some show natural changes due to fatigue, sickness, age, etc.

So infallibility for any system of handwriting classification can never be attained; but society will be rendered a real service if the present system succeeds in bringing to justice an occasional transgressor of its laws.

## ACKNOWLEDGMENT

The authors and publishers desire to give special thanks to Mr. Albert S. Osborn for his work, *Questioned Documents*, which has been of invaluable service in preparing this volume, *Classification and Identification of Handwriting*. The following sections contain material quoted from or based upon Mr. Osborn's work.

| <i>Page</i>            | <i>Reference in text or diagram</i>  |
|------------------------|--|
| 5, 6                   | last line of page 5 and first line of page 6   |
| 18                     | lines 14, 15, 16   |
| 20, 21, 22             |  |
| 23                     | from line 7 to line 24   |
| 24                     | lines 3 to 8   |
| 30                     | first 3 lines in second paragraph  |
| 40, 41, 42, 43, 44, 45 |  |
| 46                     | lines 8, 9, 12, 13, 14   |
| 47                     | entire paragraph on "Alignment of Writing"   |
| 71                     | lines 2 to 7   |
| 72                     | lines 5, 6, 9, 12, 13, 14, 16, 17, 22, 23, 25, 26, 27  |
| 73                     | lines 1, 2, all of paragraph "7"; first 2 lines of paragraph "8"; lines 4, 5, and 6 of paragraph "9"; lines 1, 2, and 3 of paragraph "0" |
| 74                     | lines 1 and 2; 7 to 13   |
| 76                     | chart  |
| 77                     | lines 8 to 15  |
| 82                     | chart  |
| 84                     | last 6 lines   |
| 85                     | first ten lines; lines 17, 18, 19, 20  |
| 86                     | paragraph "3"  |
| 87                     | lines 1 to 8; 16 to 22   |
| 88                     | lines 5 to 12  |
| 93, 94, 95, 97         | charts   |

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## INTRODUCTION

A great amount of handwriting material in the form of checks, fraudulent, fictitious and forged; blackmailing letters, threatening and anonymous letters, letters from beggars and swindlers, is accumulated each year by the police, who have been handicapped through lack of adequate means for filing it, except numerically by the case number, or alphabetically under the name of the writer, if known, or of the recipient, or perhaps by the particular crime. Under these conditions, when a document of unknown authorship came under police scrutiny, the only hope of identifying the writer lay in obtaining the services of a handwriting expert, who must go through the thousands of specimens in the files in order to attain his end. The inordinate amount of time and labor required to do this often precludes the possibility of any practical results being obtained in the way of identification, as a result of which there has long been felt among identification experts and police authorities generally the need of a system for classifying and filing this material.

The purpose of the A-L System is to provide an orderly means for the filing of specimens of handwriting, whether a single signature or a voluminous docu-

## INTRODUCTION

ment, so that should the same writing come into question at any future time, it may be found and the author identified in much the same manner as is done with fingerprints. By means of this system and with the knowledge of handwriting identification to be gained by a study of this work, any one can readily locate in a file the duplicate of any specimen at hand provided it exists therein; or, with equal ease, place the specimen in the file under its proper classification for future reference.

At the time of writing, the system has been in actual operation in the Police Department at Berkeley, California, for three months, where practical results have already been obtained in the way of several important identifications; and the system has just been installed by the California State Bureau of Identification and Investigation at Sacramento.

**CLASSIFICATION AND  
IDENTIFICATION  
OF HANDWRITING**

# CLASSIFICATION AND IDENTIFICATION OF HANDWRITING

## CHAPTER I

### COLLECTING MATERIAL FOR THE HANDWRITING FILE

In the ordinary police procedure when a person is arrested for a serious offense his photograph and fingerprints are taken for the purpose of present and future identification. For the purpose of the handwriting collection the prisoner is now required to sign, with a medium flexible pen, in his natural hand, a specimen card at the time he is fingerprinted. An 8 x 5 inch card is used, which may be white, or a color scheme may be utilized to designate sex and race as explained in Chapter IV. Headings may be printed on the card as follows:

| Classification . . . . .           | Hair | Eyes | Height                  | Weight | Age |
|------------------------------------|------|------|-------------------------|--------|-----|
| Name in full . . . . .             |      |      |                         |        |     |
| Address . . . . .                  |      |      |                         |        |     |
| City . . . . .                     |      |      |                         |        |     |
| Occupation . . . . .               |      |      | Date of birth . . . . . |        |     |
| <i>(To be written by prisoner)</i> |      |      |                         |        |     |
| Crime . . . . .                    |      |      | Case Number . . . . .   |        |     |
| Record Number . . . . .            |      |      | Date signed . . . . .   |        |     |
| Modus Operandi . . . . .           |      |      |                         |        |     |
| <i>(To be filled in by police)</i> |      |      |                         |        |     |

## CLASSIFICATION OF HANDWRITING

In due course this specimen card is given to the handwriting classifier, who classifies, searches and files it in its proper place in the collection. In the course of the search, former writings of the same person may be turned up in the form of a forgotten check or a threatening letter; whereupon the system is credited with an identification and an additional charge may be filed against the defendant.

Another source from which our material may be collected is the writing of various kinds, as already suggested, which is submitted to or taken by the police as evidence. This may be pasted or otherwise fastened to the specimen card or, if bulky, placed in a 8 x 5 folder for filing, as explained in Chapter IV. While the material derived from this source is usually of unknown origin, it is treated in exactly the same manner as that just described where the author is known. And here, too, the search may result in a speedy clearing up of the case. When such evidence is to be used in court and there may be difficulty in securing it later for the collection, it should be photographed before leaving the hands of the police; but, of course, the best material for our purpose is the original writing itself.

Other material is derived from the numerous police circulars containing copies of checks and other fraudulent documents submitted by other departments. These are treated as before, and when an identification is made the issuing department is notified thereof.

## COLLECTING MATERIAL

The police bureaus of identification receive many duplicate fingerprint records of the same man, which ordinarily bear his signature, and the signature may be clipped from these, pasted on a specimen card and filed in the regular way.

From whatever source a specimen of handwriting is derived, it represents the work of either a known or an unknown writer. The purpose of filing writings of known origin is to make possible the identification of future writings by the same author under whatever circumstances of *modus operandi* or name. Therefore, we should make certain, as far as possible, that the specimen to be filed is in the natural hand of the writer; and new specimens should be obtained for the files at each subsequent arrest if a period of more than four years has elapsed.

The object of filing writings of unknown origin is obvious, that is, the discovery of the author and the clearing up of the case. If the search fails to reveal a duplicate of the questioned writing in the files, then the specimen is filed in the hope of future identification.

Several specimens of the same unknown writer may be received from different sources at different times and brought together in the files. In such case the specimens may be clipped together or they may be filed separately under different classifications as reference

## CLASSIFICATION OF HANDWRITING

cards when the necessity arises, as explained in Chapter III, where they will remain in the files until the writer is identified. It should be understood at the outset that the more writing material available in a given case, the more correct classification and positive identification are facilitated.

## CHAPTER II

### FUNDAMENTALS OF THE SYSTEM

A great deal of the writing material collected by the police consists of a mere signature, such as found in pawnbroker's books, hotel registers, fraudulent endorsements on stolen checks, etc.; so any system of classification to be successful for general police use should be workable with even so small an amount of material as a single signature. A single signature may consist of as few as two capitals and two small letters. Therefore the A-L System is based on general writing characteristics found in any combination of letters rather than on individual characteristics occurring in certain letters only.

In the process of perfecting the present system the difficulty of selecting suitable criteria for classifying a single signature became at once apparent. Thus in testing the most significant of the handwriting characteristics, it was found that many of them could not be applied in any manner to the classification of a mere signature. For instance, a single signature in the majority of cases would fail to furnish any index to possible faulty alignment; and the same is true of arrangement; any system of measurements and aver-

## CLASSIFICATION OF HANDWRITING

ages to be of value must be based upon a considerable amount of material; evidence of muscular incoördination does not manifest itself in classifiable form in all writings, which is to be regretted, as this is one of the most difficult of writing characteristics to be concealed, because one of the most unconscious and inconspicuous, and often quite beyond the power of the writer to control.

So that where a considerable amount of writing material is available in a given case many factors are applicable for purposes of classification, in a single signature we find ourselves limited to but a few. It is the belief of the authors that in the present system this difficulty is completely surmounted.

Referring to the Classification Chart, Fig. 1, it is seen that eight factors are utilized, each of which is divided into three classes. The fundamental principle underlying this tripartite scheme is that each factor is considered from the viewpoint of two extremes, or, it might be termed in some cases, two departures from the normal, i.e., classes 1 and 3; and that where the specimen under consideration does not fall clearly into one or the other extreme, it is placed in the middle or Class 2. Generally speaking, the occurrence of a single characteristic in a handwriting specimen does not warrant its classification in accordance therewith, but rather the general appearance of the writing as a whole is the guide,

## FUNDAMENTALS OF THE SYSTEM

Thus, in the matter of skill, the appearance of a single—probably accidental—misshapen letter would not justify the classification as poor (Class 1) or medium (Class 2) of an otherwise legible, symmetrical and pictorially pleasing specimen; nor a single superfluous stroke warrant its classification as an embellished writing.

With the specimen card before us we study it first as to its Form. If we determine from the explanations and rules set forth in Chapter III that it is an angular writing, we place a figure 1 at the top of the card after the heading "Classification." Next we take up the second factor and examine it as to the degree of Skill with which it was written, and we may find all the elements of a good or medium hand lacking; so we classify it as poor and place a figure 1 after the 1 already noted. Next, examined as to Connections, we find several of the small letters disconnected, so we add a figure 3 to our classification number. And so we proceed through the eight factors, determining the class of each, until we have a classification number consisting of eight digits, under which number the specimen is filed away as explained in Chapter IV.

It is to be noted that the determination of the class of five of the factors, Form, Skill, Movement, Embellishment and Terminals, does not require the use of any instrument whatever. In the matter of Connections, lines may occasionally have to be examined under some

## CLASSIFICATION OF HANDWRITING

magnification to detect overlapping resulting from lifting the pen and starting a new line over the end of the disconnected stroke. Shading may sometimes require scrutiny and measurement under low magnification, and the degree of slant is determined by the use of a transparent protractor. Thus the system of classification presents no difficulty in the way of technical or complex procedure; and we are confident that once certain standards are firmly fixed in the mind of the classifier, it will prove very simple and highly efficient. It is important, however, that the classifying all be done as far as possible by one person who will specialize in this work, since here, as with fingerprints, opinions may occasionally differ as to the classification of certain transitional types, and efficiency demands consistency in such cases.

By way of practice in classifying, it is suggested that the student secure a number of different signatures on small cards and number each card. Then on a separate sheet of paper opposite the card number write the handwriting classification of each. Repeat this operation at intervals and compare the results with those first obtained, and in a short time it will be found that the classification number will always be the same. This procedure will develop confidence and will be of assistance in establishing in the mind of the classifier the standards necessary to success.

## CHAPTER III

### CLASSIFICATION

#### I. FORM

What is here meant by Form is the general appearance of the writing from the viewpoint of angularity or rotundity as seen in the arcs of such letters as m, n, v, y, etc., and in the ovals of such letters as a, d, g, and q; also in the loops of loop letters and in the connections between letters within words. In the modern systems of penmanship the rounded forms are taught and this form is here considered as normal, giving two classes for the factor.

What we term the eyed form, our third class, is illustrated in Fig. 2, and is seen to be a small loop which may make its appearance in almost any small letter and is sometimes found in the capitals. This is a small thing to look for, but a big thing to find, being a persistent characteristic with many writers and likewise a very significant one. Being a greater departure from normal, it is given first consideration in the classification; in other words, look for the eyed forms first, and if present, classify as No. 3; if not present, then base the class on the angularity or rotundity.

## CLASSIFICATION CHART

*(To be kept before the classifier until memorized.)*

| Factor   | Class 1            | Class 2               | Class 3                    |
|--|--------------------|-----------------------|----------------------------|
| <b>I. FORM</b><br>If eyed forms are present classify as No. 3; otherwise according to whether angular or rounded.  | Angular            | Rounded               | Eyed                       |
| <b>II. SKILL</b><br>Legibility, symmetry and pictorial aspect considered.  | Poor               | Medium                | Good                       |
| <b>III. CONNECTIONS</b><br>If small letters show disconnections classify as No. 3; otherwise according to whether capitals are connected or disconnected | Capitals connected | Capitals disconnected | Small letters disconnected |
| <b>IV. SHADING</b><br>Determined by difference in width of the lightest and heaviest strokes.  | Light              | Medium                | Heavy                      |

- 3 -

CLASS 1

I Norman Johnson.

CLASS 2

Norman Johnson.

CLASS 3

Norman Johnson

II Norman Johnson

Norman Johnson

Norman Johnson.

III Norman Johnson

Norman E. Johnson

Norman Johnson

IV Norman Johnson

Norman Johnson

Norman Johnson

FIG. 1A.—Illustrations of Factors I, II, III, IV.

**CLASSIFICATION CHART** *(Continued)*

|  |                      |                  |                      |
|--|----------------------|------------------|----------------------|
| <p><b>V. MOVEMENT</b><br/>Finger movement lacks freedom, is slow and usually shaded; forearm shows speed, force, dash, freedom and little shading.</p> | Finger               | Compound         | Forearm              |
| <p><b>VI. EMBELLISHMENT</b><br/>Determined by degree of ornamentation.</p>   | Plain                | Intermediate     | Embellished          |
| <p><b>VII. TERMINALS</b><br/>Inclination of terminal strokes.</p>  | Upward               | Horizontal       | Downward             |
| <p><b>VIII. SLANT</b><br/>Degree of slant above horizontal</p>   | Less than 60 degrees | 60 to 80 degrees | More than 80 degrees |

CLASS 1

V Norman C. Johnson

CLASS 2

Norman C. Johnson Norman Johnson

CLASS 3

VI Ramon W Butler

Ramon W. Butler Ramon W Butler

VII Norman Johnson

Norman Johnson Norman Johnson

VIII Norman Johnson  
Ramon W Butler

Norman Johnson  
Ramon W Butler

Norman Johnson  
Ramon W Butler

FIG. 1B.—Illustrations of Factors V, VI, VII, VIII

## CLASSIFICATION OF HANDWRITING

**Rule I.**—If eyed forms are present in sufficient number to indicate they are habitual and not merely due to accident, classify as No. 3.

If eyed forms are not present and the writing is angular, classify as No. 1.

If eyed forms are not present and the writing is not angular, classify as No. 2.

### II. SKILL

For the determination of the class under this factor, legibility, symmetry and pictorial aspect are considered. Thus a writing may be legible and yet lacking in symmetry, or it may be symmetrical and still wanting in legibility. Most writings which possess legibility and symmetry have a pleasing pictorial aspect, though not necessarily so. Fig. 3 illustrates the three classes of Skill. A little practice will soon overcome any difficulty the student may have in determining the class of Skill if the fundamentals of the system are kept in mind. That is to say, if the specimen under consideration does not fall clearly into Class 1, poor, or into Class 3, good, it is to be placed in the middle or Class 2. The standards presented in Fig. 3 may not fulfill the student's conception of what is poor and what is good writing; but here again there will be no difficulty if the classifier having adopted a higher or lower standard is consistent in his decisions.

CLASS 1  
Angular

**First National Bank**

Pay to the order of 1000 \$ 1000.  
Wm. D. Nathan  
Cashier

Yours very truly,

Wm. D. Nathan  
Cashier

Wm. D. Nathan  
Cashier

Wm. D. Nathan  
Cashier

CLASS 2  
Rounded

66157 Berkeley Branch

**The Oakland Bank of Savings**

Berkeley, Cal. July 1921 No. 442  
Pay to the order of 1000 \$ 1000.  
Subscribed by Wm. D. Nathan  
Cashier

Berkeley Branch

**The Oakland Bank of Savings**

Berkeley, Cal. July 1921 No. 442  
Pay to the order of 1000 \$ 1000.  
Subscribed by Wm. D. Nathan  
Cashier

This is a specimen of my  
unatural writing. (SEE)

1 2 3 4 5 6 7 8 9 10

John Hancock

CLASS 3  
Eyed

John Hancock

John Hancock  
Cashier

John Hancock  
Cashier

John Hancock  
Cashier

John Hancock  
Deputy Sheriff

FIG. 2.—Illustrating the three classes of (1) Form. The check in Class 1 is conspicuous for its angular connections. The lower illustration in Class 3 has all its eyelets at bottom of capitals. Letters d, p and t are considered eyed when their staffs are looped instead of merely retraced.

# CLASSIFICATION OF HANDWRITING

**Rule II.**—If the specimen lacks either of the elements of legibility or symmetry, classify as No. 1.

If the specimen possesses the three elements of legibility, symmetry and pleasing pictorial aspect, classify as No. 3.

If the specimen does not fall clearly into classes No. 1 or No. 3, classify as No. 2.

## III. CONNECTIONS

The habitual disconnecting of certain small letters within words as found in some writings is a characteristic of no small importance and is a greater divergence from the normal than the connecting or disconnecting of capitals. Therefore, first consideration is given to the connections of small letters, and if these are found to be normal, that is, connected consistently, then the connections of the capitals to the following letters are considered.

Scrutiny under low magnification may sometimes be necessary to bring into view the overlapped lines resulting from only a slight disconnection between letters, but any dropping of the connecting line between letters, however slight, is here considered a disconnection.

Where the habit of the writer in regard to capitals appears uncertain, i.e., where some are connected with and some disconnected from the following letter, preponderance of one form or the other is the guide.

CLASS 1  
Poor

Chief of Police August Volmer  
City Hall  
Berkeley  
CALIF.

F3-IT-1

A. Volmer in 1892  
Chief of Police  
P.O. Box 130  
Berkeley, Calif.  
(7-2-13)

Mr August Volmer  
P O Box 130

F3-IT-1

Berkeley  
Mr. A. Volmer  
Berkeley, Calif.

CLASS 2  
Medium

Mr August Volmer  
Chief of Police  
Berkeley  
CALIF.  
Cal State Univ I.A.I.  
Berkeley  
CALIF.

F1-IT-2

Mr August Volmer  
City Hall  
Berkeley

F1-IT-2

P. D. Lewis  
Supt. H.S.  
Police Dept  
Berkeley  
CALIF.

F2-IT-2

CLASS 3  
Good

This is considered good  
skill for a man in  
class 3. (IT-3) (F3)

August Volmer  
Chief of Police  
Berkeley, Cal.

F2-IT-3

John Adams

E. O. Kinnick

U. S. Grant

FIG. 3.—Illustrating the three classes of (IT) Skill.

## CLASSIFICATION OF HANDWRITING

**Rule III.**—If any small letters within words are habitually disconnected from the following letter, classify as No. 3.

If no small letters are disconnected from following letter and any capital letters are connected with following letter, classify as No. 1.

If no small letters are disconnected from following letter and capital letters are disconnected from following letters, classify as No. 2.

### IV. SHADING

The pictorial effect produced by one who habitually writes with very slight pen pressure is often materially altered by changing from a fine to a coarse pen or vice versa. Likewise the degree of shading is affected by the flexibility of the pen. A shaded line may be only slightly heavier than an unshaded one or may, with a flexible pen, be from four to ten times as wide. Whether the change of pen be a matter of fineness or of flexibility, the habitual shading impulse of the writer will not be affected but the degree of its manifestation as seen in the writing will vary with the degree of flexibility of the pen.

Therefore, the shading impulse of the writer is the object to be determined for classification purposes here, and this is measured by the difference in the width of the lightest and the heaviest strokes, this element remaining more or less constant despite changes of pen.

CLASS 3  
Small letters disconnected

with you  
D. W. G. (P. 4-30-3)

Chief August C. Vollmer  
Police Department  
Berkeley  
California

Please excuse the time  
I was in the hospital  
to get to you again before  
you leave for France.  
Yours sincerely  
G. P. ...

P. 4-30-3  
G. P. ...

CLASS 2  
Capitals disconnected

August Vollmer  
Berkeley  
Calif.

Chief of Police  
(P. 4-30-3)

Joseph P. ...  
P. 4-30-3

Joseph P. ...  
Grand Secretary Young Ladies Institute

Mr. C. D. Lee

Calif. Dept.

Berkeley  
Calif.

P. 4-30-3

CLASS 1  
Capitals connected

Chief of Police  
Berkeley, Calif.

Thomas ...  
P. 4-30-3

Mr. August Vollmer  
Chief of Police  
Berkeley  
Calif.

P. 4-30-3

Mr. August Vollmer  
Elks Club  
Berkeley

P. 4-30-1

FIG. 4.—Illustrating the three classes of (III) Connections.

## CLASSIFICATION OF HANDWRITING

In the case of a stiff, unyielding pen, it may occasionally be necessary to resort to some magnification to obtain a true concept of the difference in pressure as evidenced by the *depth* of the nib impressions in the paper.

In the case of pencil writing the line of demarkation between the lightest and the heaviest strokes will not be so well defined but should, nevertheless, be sufficiently evident when magnified to permit of their ready differentiation. See Fig. 5.

**Rule IV.** Where the difference in width between the lightest and heaviest strokes is imperceptible or very slight, classify as No. 1.

Where the difference in width between the lightest and heaviest strokes is great, classify as No. 3.

Where the specimen does not fall clearly into class No. 1 or class No. 3, classify as No. 2.

### V. MOVEMENT

Osborn says of movement:

In the finger movement the letters are made almost entirely by the action of the thumb, index, and middle fingers, the actual motion involving the second, and to a slight degree the third joints. This movement gives but little freedom of any kind, and especially but very slight lateral freedom. It shows lack of clear-cut, smooth strokes, and contains numerous broad curves marked by somewhat irregular connections between letters and parts of

CLASS 1  
Light

Mr. August Vollmer,  
Chief of Police,  
Berkeley Calif  
F-3-H-3

Edward M. Henderson  
F-3-H-1

Augustus

Mr. August Vollmer,  
P. O. Box # 129,  
Berkeley,  
Calif.  
F-3-H-1

J. J. Lawrence

CLASS 2  
Medium

BANK STATE  
IDMARTORY  
N.Y.  
C. A. Lee  
Inspector  
Berkeley  
F-3-H-2

Mr. August Vollmer  
Hotel Vollmer  
Berkeley  
Calif  
F-3-H-2

Hall  
F-3-H-2

Mr. August Vollmer  
Chief of Police  
Berkeley  
Calif.  
F-3-H-2

W. J. Standa

CLASS 3  
Heavy

Mr. August Vollmer  
Chief of Police  
Berkeley California  
F-3-H-3

Mr. August Vollmer,  
Chief of Police  
Berkeley California  
F-3-H-3

J. J. Lawrence  
F-3-H-3

1924  
NUMBER  
Mr. August Vollmer  
Chief of Police  
Berkeley  
California  
F-3-H-3

J. J. Lawrence  
EREST  
CALIFORNIA

FIG. 5.—Illustrating the three classes of (IV) Shading.

## CLASSIFICATION OF HANDWRITING

letters, and is usually slow and labored. The hand movement is produced in most part by the action of the hand as a whole, with the wrist as the center of action, with but slight action of the fingers. What is known as the forearm or muscular movement really comes from the shoulder, but is the movement of the hand and arm, with the arm supported on the muscular portion of the forearm with the elbow as the center of lateral motion. It is possible to write entirely with the forearm movement without any separate action of the hand and fingers, and many superior penmen write in this manner; but the easiest, most rapid, and most perfect writing is that produced with the forearm movement used in connection with a slight action of the hand and fingers by which the small parts of the writing are produced. In the forearm movement, the stroke itself shows speed, force, freedom, continuity of motion, uniformity of pressure, and usually a uniform base line. The whole arm movement is the action of the entire arm without rest. In the forearm movement it is obvious that the motion and its source are nearly the same as in the whole arm movement, but the forearm rests on a support of desk or table. This rest restricts somewhat the extent of the movement, but with such support the movement is under somewhat better control. The whole arm movement is employed in ornamental penmanship, in blackboard writing, and by a few writers in forming all the capitals.

## CLASSIFICATION

Consistent with the fundamentals of our system, we have adopted the finger movements as one extreme and the forearm movement as the other; between these two extremes is what we call the compound movement, which includes the hand (or wrist movement as it is sometimes called) and any combination of the three movements. The whole arm movement is not often used in the ordinary writing, except perhaps with the writer standing and without arm support or under other unusual conditions; and as there is no well defined line of demarkation between the writing produced by the whole arm and by the forearm movements, they are both classed here under forearm or No. 3.

The finger movement is the one first employed in childhood; it is generally used by illiterates and by those unskilled in the art of penmanship. Most of the new vertical writing is executed with this movement. Finger writing appears formal, slow and labored; is usually shaded and without dash or flourish, having but little lateral freedom; shows lack of clear-cut, smooth strokes; often shows irregular connections and uneven spacing between the letters and uneven alignment with the writing line; sometimes contains broad curves and ovals; frequently evidences decreasing size of letters due to the restricted motion between the shifts of the hand necessary to carry the writing to the end of the line.

On the other hand, writing executed by the forearm movement is conspicuous for its speed, force, freedom

## CLASSIFICATION OF HANDWRITING

of strokes, continuity of motion, uniformity of pressure which manifests itself in lack of shading, except, perhaps, on the terminals; it usually shows a uniform base line. While it is true that the most perfect writing is produced by this movement, it is also true that where the writer lacks natural or acquired facility in penmanship, the forearm movement will result in a greater departure from copy book standards than will the finger movement. Thus, were the first writing efforts of the child executed by the forearm movement instead of the finger movement, legibility would be much harder to attain.

To one who writes with the forearm movement or who has practiced the exercises used in teaching the movement, there should be no difficulty in differentiating it from the finger movement if one but recalls the easy swinging motion imparted to the hand by the movement of the arm with the under muscles of the forearm resting on the desk. A little forethought and some practice will render the classification of this factor simple. Fig. 6 shows several specimens of each movement.

**Rule V.**—If the specimen appears slow and labored, shows lack of freedom and clear-cut, smooth strokes, contains numerous broad curves, with irregular connections, heavy shading, and decreasing size, classify as No. 1.

CLASS 1  
Finger

William A. Seward  
J. Hamilton  
E. P. Hayward

Thomas L. Vignum

Tom J. Powers  
Public Labor Council

R. E. Lee

Mrs. Sumner J. Post  
The Associated  
San Francisco Callers

W. A. Swan  
Sheriff.

CLASS 2  
Compound

M. C. Young  
F. 2, 2, 3

C. C. Roberts

W. W. Stanford

L. B. Smith  
My Dear, (a)

Yours very truly,  
J. M. Clark,  
President Bank of Italy

Public Use of Banknote Co.

CLASS 3  
Forearm

William C. Young

James July

Samuel J. Jones

Chas. S. Lee,  
Supt. Bureau's Police Dept.

Amos P. Lee  
Berkeley Cal.

Lee J. Kelly  
Yes  
Portland  
Cal.

F 6  
F 3

Chairman  
F. 2, 2, 3

FIG. 6.—Illustrating the three classes of (V) Movement.

## CLASSIFICATION OF HANDWRITING

If it does not appear slow and labored, shows some freedom and medium shading, classify as No. 2.

If it shows speed, force, freedom, continuity of motion, uniformity of pressure (that is, little or no shading), classify as No. 3.

### VI. EMBELLISHMENT

The older systems of handwriting show a much greater degree of embellishment than the modern ones; in fact, some of the copy books of the modern vertical system appear to aim at extreme simplicity of form, both as to capitals and small letters. We are here concerned only with those flourishes, grace lines and superfluous strokes useful for ornamentation exclusively; that is, strokes not essential to legibility. Fig. 7 should convey the idea clearly as to what is here meant as Embellishment.

**Rule VI.**—If flourishes or superfluous strokes appear in capitals or small letters in sufficient number to indicate they are habitual, classify as No. 3.

If no such strokes are found, classify as No. 1.

If such strokes appear only occasionally, classify as No. 2.

### VII. TERMINALS

We are here concerned with the general inclination of the terminal or finishing stroke of both capitals and small letters. Generally speaking, the terminals of the

CLASS 1  
Plain

CLASS 2  
Medium

CLASS 3  
Embellished

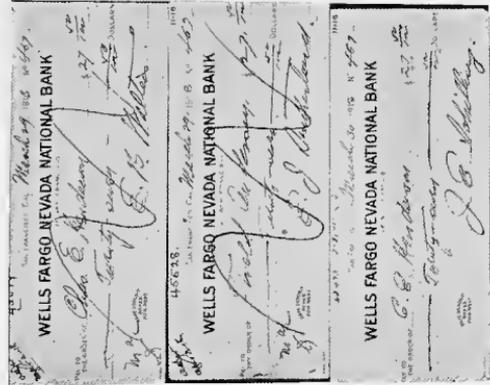
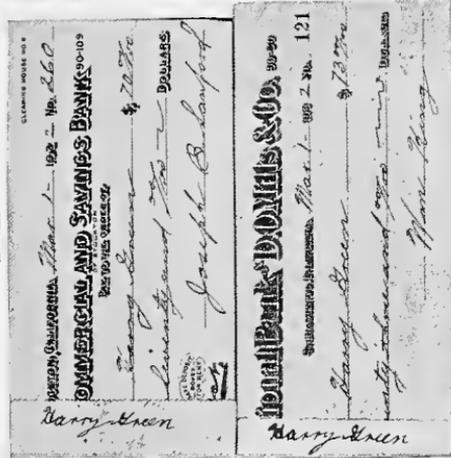


FIG. 7.—Illustrating the three classes of (VI) Embellishment.

## CLASSIFICATION OF HANDWRITING

small letters give a truer index to the habit of the writer than do those of the capitals, the latter showing a greater variation in the majority of writings than the small letter terminals. Dropped terminals, that is, finishing strokes not completed as found frequently in letter s, occasionally in letter o and in the lower loop letters f, g, j, y, and z, are not considered here.

With a sufficient amount of material this factor presents no difficulty but it may occasionally happen that a single signature may lack an ample number of terminal strokes to definitely determine the habit of the writer, some terminals having one inclination and some another. Preponderance of the one or the other is the guide in such cases. If necessary recourse may here be had to a reference number (as is done in fingerprint classification in doubtful cases) by first noting the class number that appears most applicable, and then noting above or below this the next class number, and searching the specimen both ways. See Fig. 8.

**Rule VII.**—If the inclination of the terminal strokes is upward, classify as No. 1.

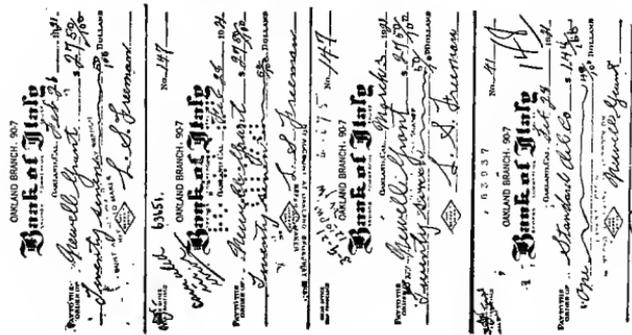
If horizontal, classify as No. 2.

If downward, classify as No. 3.

### VIII. SLANT

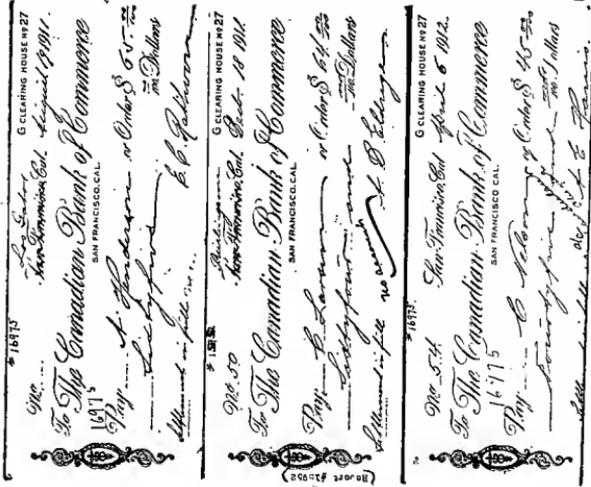
The degree of slant above horizontal, or the base line, is measured with a transparent protractor, as illus-

CLASS 1  
Upward



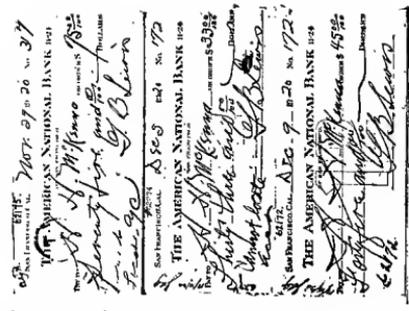
This is a further specimen of the slow and deliberate handwriting of Dowdrey.

CLASS 2  
Horizontal



In August 1910  
Out of office  
Wm. H. Dowdrey, Cal.

CLASS 3  
Downward



This is a specimen of my natural handwriting.

Wm. H. Dowdrey  
San Francisco, Cal.

Fig. 8.—Illustrating the three classes of (VII) Terminals. It is readily seen that the four checks in Class 1 were all written by the same person. The same is true of the three checks in Class 2 and the three in Class 3.

## CLASSIFICATION OF HANDWRITING

trated in Fig. 9. In making these measurements be sure that the horizontal line of the protractor lies parallel with the writing line and then note the slant of the various letters. In loop letters such as b, f, h, k, and l, the axis of the loop is measured rather than the upward or downward strokes. The measurements of a few, preferably double-space, letters will suffice to give the average slant of the writing.

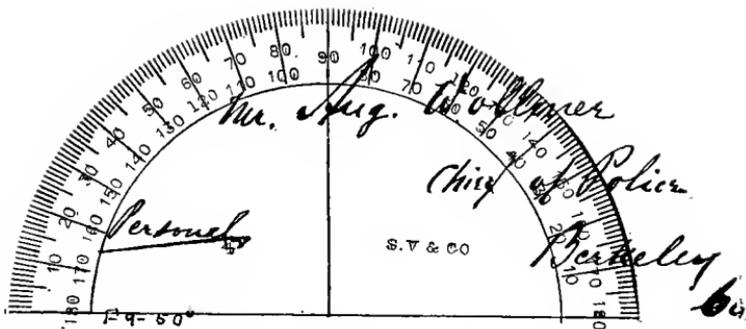
Slant is a characteristic that becomes quite significant under certain conditions and with many writers is one of the most fixed of habits. Writing ranges in slant all the way from 35 degrees above horizontal to the right to 50 or more degrees to the left of vertical. The limits set for classification purposes here should give a fairly even distribution in the files for all systems of writing in vogue at present.

**Rule VIII.**—If the average slant measures less than 60 degrees, classify as No. 1.

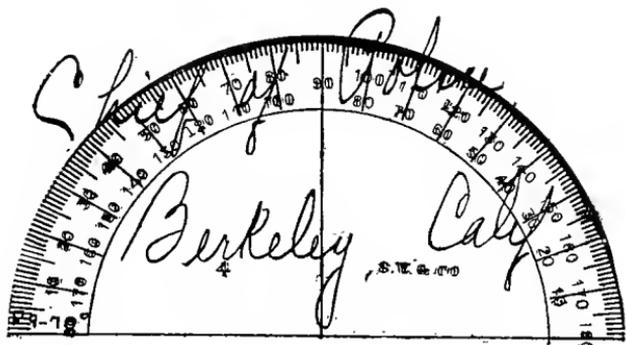
If between 60 and 80 degrees inclusive, classify as No. 2.

If greater than 80 degrees, classify as No. 3.

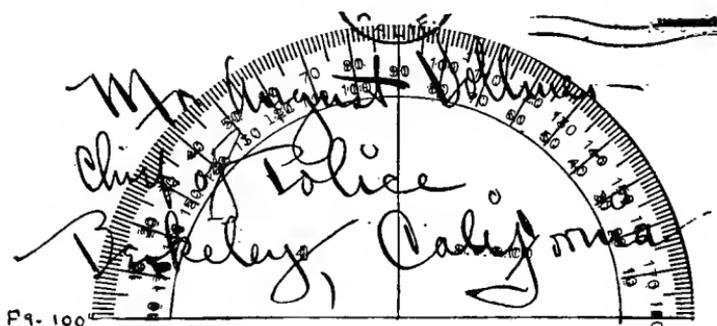
Where there are a considerable number of specimens to be classified at one time, it is our experience that the operation is greatly facilitated by examining all of them from the viewpoint of one factor only at a time; that is to say, they are all studied first as to Form, and the 1, 2, or 3 designating the class of that factor noted on each; next they are studied as to Skill, and the 1, 2, or



CLASS 1.—Less than 60 degrees. Note that the 50-degree line is parallel to the axes of "ll."



CLASS 2.—60 to 80 degrees. Note that the 70-degree line subtends the axis of "l" in "Police."



CLASS 3.—More than 80 degrees. The average slant is about 100 degrees. It varies from 95 to over 110.

FIG. 9.—Illustrating the three classes of (VIII) Slant.

## CLASSIFICATION CHART (Continued)

| Factor   | Class 1                 | Class 2   | Class 3                 |
|--|-------------------------|-----------|-------------------------|
| <b>IX. WIDTH</b><br>Width of small letters, especially those containing ovals and loops. | Small                   | Medium    | Great                   |
| <b>X. SPACING</b><br>The spacing between small letters within words.                     | Small                   | Medium    | Great                   |
| <b>XI. SPEED</b><br>As determined by the quality of strokes.                             | Slow                    | Medium    | Rapid                   |
| <b>XII. PROPORTION</b><br>Proportion of single-space letters to capitals.                | Less than $\frac{1}{3}$ | One-third | More than $\frac{1}{3}$ |

# CLASSIFICATION

3 designating the class noted on each, and so on until each specimen bears a figure consisting of eight digits.

|   | I  | II | III | IV |                                    | V | VI | VII | VIII |
|---|----|----|-----|----|------------------------------------|---|----|-----|------|
| 1 | 19 | 9  | 29  |    |                                    |   |    |     |      |
| 2 | 18 | 27 | 10  |    | Edge End Inn                       |   |    |     |      |
| 3 | 13 | 14 | 11  |    | Twilight Park - Haines Falls, N.Y. |   |    |     |      |
|   | 50 | 50 | 50  |    |                                    |   |    |     |      |

|    |        |    |        |    |        |
|----|--------|----|--------|----|--------|
| 1  | 13, 21 | 18 | 22, 32 | 35 | 31, 13 |
| 2  | 13, 23 | 19 | 31, 22 | 36 | 22, 33 |
| 3  | 22, 13 | 20 | 23, 12 | 37 | 23, 12 |
| 4  | 21, 12 | 21 | 12, 12 | 38 | 13, 32 |
| 5  | 22, 12 | 22 | 32, 13 | 39 | 12, 12 |
| 6  | 22, 13 | 23 | 22, 11 | 40 | 23, 11 |
| 7  | 32, 12 | 24 | 22, 32 | 41 | 23, 31 |
| 8  | 21, 13 | 25 | 21, 31 | 42 | 32, 13 |
| 9  | 23, 11 | 26 | 21, 33 | 43 | 12, 13 |
| 10 | 32, 11 | 27 | 11, 12 | 44 | 12, 32 |
| 11 | 33, 12 | 28 | 12, 32 | 45 | 11, 21 |
| 12 | 23, 33 | 29 | 12, 22 | 46 | 13, 21 |
| 13 | 32, 23 | 30 | 12, 33 | 47 | 12, 22 |
| 14 | 12, 21 | 31 | 32, 12 | 48 | 23, 11 |
| 15 | 12, 11 | 32 | 13, 21 | 49 | 32, 12 |
| 16 | 33, 11 | 33 | 32, 12 | 50 | 11, 12 |
| 17 | 12, 12 | 34 | 32, 13 |    |        |

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lass 9

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t

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id

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re than  $\frac{1}{3}$

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## CLASSIFICATION

3 designating the class noted on each, and so on until each specimen bears a figure consisting of eight digits.

The eight factors here utilized, each divided into three classes, will give 9,840 divisions in our file, which should be adequate for a collection of 100,000 specimens, since with an even distribution of this number in the files there would be approximately only ten in each group. However, other factors may be added from time to time as required for larger collections and for this purpose the additional factors mentioned in the table on page 32 are suggested.

Thus we find that by using these additional four factors we would have 1,190,640 divisions in our file, which would more than care for a collection of 10,000,000 specimens.

## CHAPTER IV

### INDEXING AND FILING

It will occasionally become necessary to take from the files the writing specimen of a particular known author for comparison with writings of unknown origin or for other purposes, and to enable one to locate in the files the desired specimen, every specimen of known origin is indexed alphabetically by the name or names used by the writer. This is done on a 5 x 3 inch card after the specimen has been classified and made ready for filing. These indices should bear, near the top of the card, the name of the writer, his criminal specialty, the police case number and his record number respectively; and near the bottom, the handwriting classification number. It is suggested that this classification number be preceded by the initials "H. W." (handwriting) to prevent the possibility of these indices being confused with others of a similar nature. These indices are filed alphabetically.

An 8 x 5 inch vertical file is recommended for storing the handwriting collection, as this is a standard size in filing cabinets and will be found to answer the ordinary needs. Specimens consisting of a signature only, or of a name and address and other data, may be writ-

## INDEXING AND FILING

ten or pasted on an 8 x 5 specimen card, as suggested in Chapter I. But where the specimen consists of a considerable amount of writing, it may be conveniently enclosed in an 8 x 5 folder, with a sample of the writing on the front of the folder, thus frequently avoiding the need for opening it and unnecessarily handling the contents. The classification number, and the other data suggested in Chapter I, should also be noted on the front of the folder. Most written documents by folding lengthwise in their original condition, or by trimming down to eight inches wide, may be conveniently enclosed in an 8 x 5 folder.

At the outset the collection may be stored in a single drawer and filed numerically without guide cards. As the collection increases in size, it will, of course, be necessary to install guide cards for convenience in searching and filing but a complete set of guides will not be needed until the collection has grown to considerable proportions. A complete set would be numbered as follows:

|            |            |            |
|------------|------------|------------|
| 11,111,111 | 11,111,112 | 11,111,113 |
| 11,111,121 | 11,111,122 | 11,111,123 |
| 11,111,131 | 11,111,132 | 11,111,133 |
| 11,111,211 | 11,111,212 | 11,111,213 |
| 11,111,221 | 11,111,222 | 11,111,223 |
| 11,111,231 | 11,111,232 | 11,111,233 |
| 11,111,311 | 11,111,312 | 11,111,313 |
| 11,111,321 | 11,111,322 | 11,111,323 |
| 11,111,331 | 11,111,332 | 11,111,333 |

## CLASSIFICATION OF HANDWRITING

And so on until the guide numbered **33,333,333** is reached. Three- or nine-cut guides may be used for this purpose. If three-cut are used, they should be numbered in the order shown above, which would result in the numbers on the first-cut guides ending in **1**, the second-cut in **2**, and the third-cut in **3**.

Another simple scheme for numbering and arranging the guides consists in using eight-cut guides, each cut representing one of the eight factors. Of the first-cut three are used and numbered **1**, **2**, and **3**, to represent the three classes of the first factor. Behind each of these three guides are placed three of the second-cut, of which each set of three is numbered as before, **1**, **2**, and **3**, representing the three classes of the second factor. Behind each of these nine are placed three of the third-cut guides, of which each set of three is also numbered **1**, **2**, and **3**, representing the three classes of the third factor; and so on until we have used all of the eight cuts. The guides required to inaugurate this scheme are shown in table on page 37.

An ideal cabinet for use in connection with this latter arrangement would consist of nine drawers, 8 x 5, three rows of three drawers each, the lower portion of the cabinet adapted for filing the 5 x 3 alphabetical indices, similar to the cabinets used for filing Bertillon records. The upper row of three drawers would all contain specimens of Class 1 of Form; the middle, or second row, would all contain specimens of Class 2 of

## INDEXING AND FILING

| Position                          | Factor represented   | Numbered | Guides required |
|-----------------------------------|----------------------|----------|-----------------|
| First cut.....                    | I. Form.....         | 1 2 3    | 3               |
| Second cut.....                   | II. Skill.....       | 1 2 3    | 9               |
| Third cut.....                    | III. Connections.... | 1 2 3    | 27              |
| Fourth cut.....                   | IV. Shading.....     | 1 2 3    | 81              |
| Fifth cut.....                    | V. Movement.....     | 1 2 3    | 243             |
| Sixth cut.....                    | VI. Embellishment.   | 1 2 3    | 729             |
| Seventh cut.....                  | VII. Terminals.....  | 1 2 3    | 2,187           |
| Eighth cut.....                   | VIII. Slant.....     | 1 2 3    | 6,561           |
| Total number guides required..... |                      |          | 9,840           |

Form; and the bottom, or third, row would all contain specimens of Class 3 of Form. In the upper row the first, or left-hand, drawer would contain only specimens of Class 1 of Skill; the middle, or second, drawer would contain only specimens of Class 2 of Skill; and the third, or right-hand, drawer would contain only specimens of Class 3 of Skill, the same order being observed for the second and third horizontal rows of drawers.

Thus we have disposed of our first two factors, Form and Skill. In each drawer would be a set of six-cut guides arranged as follows: The first-cut numbered 1, 2, and 3. Behind each of these three guides are placed three of the second-cut, of which each set of three is numbered 1, 2, and 3; and behind each of these nine are placed three of the third-cut, of which each set of three is numbered 1, 2, and 3; and so on until we have used all of the six cuts, giving 1,092 guide cards in each drawer, or 9,828 guides in the nine drawers.

## CLASSIFICATION OF HANDWRITING

Now supposing our specimen to be searched or filed is numbered 11,111,111, we would first turn to the upper horizontal row of drawers; then to the first or left-hand drawer of that row; then to the first or No. 1 of the first-cut guides in that drawer; behind that we would next select the first or No. 1 of the second-cut guides; behind that No. 1 of the third-cut guides and so on until we came to the group of cards filed behind the last or sixth-cut guide. In this group would be found specimens agreeing in eight significant particulars with the writing in question, and all that remains of our task is to determine whether any of these are the product of the same hand. Bearing in mind that we have nearly ten thousand divisions, even in so large a collection as one hundred thousand specimens, assuming they are evenly distributed throughout the files, actual comparison would have to be made with only ten in each group.

Our search in each group may be further facilitated by the use of colored specimen cards to segregate the specimens according to the race and sex when known. For this purpose specimen cards containing colors mentioned in list on page 39 may be used.

If the color scheme is not utilized, the same results may be obtained by noting the race and sex of the writer in the upper right-hand corner of the card and segregating the cards in each group in accordance therewith. See Fig. 36. Occasionally anonymous writ-

## INDEXING AND FILING

ings will bear a sufficiently conclusive indication of a foreign hand to justify their being filed on a "foreign" card.

| <i>Card Color</i> | <i>Race and Sex</i>      |
|-------------------|--------------------------|
| White.....        | White male               |
| Green.....        | White foreigners         |
| Pink.....         | All females              |
| Chocolate.....    | Black male               |
| Red.....          | Indian or Mexican male   |
| Yellow.....       | Japanese or Chinese male |
| Brown.....        | Brown (Malay) male       |

Search may be further facilitated by the simple expedient of noting at the top of the specimen card the hair-color, eye-color, height, weight and age when known, and segregating the cards of each color in each group according to height and age in increasing order. Thus, supposing our questioned document were known to have been written by a negro of six feet or more, we would turn to the group corresponding to the classification number, select only the chocolate-colored cards and make comparison only with those bearing a height of five feet and ten inches or more and of the approximate age of the unknown writer. The hair and eye color will frequently prove useful in eliminating some of the specimens bearing descriptions otherwise approximating that on the card being searched, and the weight may occasionally be useful for the same purpose.

## CHAPTER V

### IDENTIFICATION

We have learned something of the theory of classification and filing and we now come to what is perhaps the most difficult phase of our problem—that of identification of handwriting. With our specimen properly classified, we proceed to a definite group of specimens in the file, all of which agree precisely in eight particulars with the one in question, but this concurrence of identifying characteristics does not, of course, establish or constitute identity. So we are here confronted with the question, “To what extent must the characteristics of two writings coincide to positively establish their identity?”

Osborn states:

Two writings, one of which is disputed, may appear very different in general appearance, but may contain so many small but peculiar and persistent characteristics that the conclusion of identity is irresistible; and again two writings may be very similar in certain general features, but may differ in so many significant but inconspicuous particulars as to show that they were undoubtedly written

## IDENTIFICATION

by two different writers. When inconspicuous characteristics persistently and consistently diverge, the conclusion must be reached that two such writings are not by the same hand; when they coincide in sufficient number the conclusion is reached that they were by the same writer.

In another chapter Osborn further states in this connection:

The principle underlying the identification of a handwriting is the same as that by which anything with a great many possible variations is identified as belonging to that class or being that particular thing. It is first necessary to establish the standard, and then identity or difference is shown by a careful comparison of all elements, features or characteristics which altogether constitute the basis for a conclusion. The force of the conclusion is naturally governed by the number and significance of the points under consideration, ranging from a mere conjecture up to what amounts to moral certainty.

There are many close analogies between the identification of an individual by bodily characteristics and the identification of a handwriting by examination of its various elements. As we know, in some instances identification is practically certain, but in others only probable, or there may be insufficient basis for any opinion. If an individual is sought for who is definitely described as follows:

## CLASSIFICATION OF HANDWRITING

(1) exactly five feet, eleven and one-fourth inches in height, (2) blue eyes, (3) brown hair, and in addition has (4) lost his left thumb, and the (5) lower part of his right ear, and has (6) a mole on his left temple one-half inch in diameter, and (7) a tattooed anchor on the back of his left hand, and (8) a narrow scar five inches long on his right forearm, and an individual is found who exactly matches these eight points of identity, we say without hesitation that we have undoubtedly found the man described. We promptly conclude on these eight points alone that this man differs from all the other millions of men on the earth. Theoretically there may be other such men, but we say confidently that it is so strongly against common sense and all experience to expect it that it is practically impossible.

This problem is capable of a mathematical solution if we first agree on the basis for the calculation. It is possible to show mathematically how vastly improbable it would be for these eight separate points of identity to coincide in two individuals. We must first determine how often, or rather how seldom, each feature will be found separately, and then by a mathematical formula as fixed as the multiplication table, we determine how often coincidence of all the features may be expected. This formula, as given by Professor Simon Newcomb, is as follows: "The probability of concurrence of all the events is equal to the continued product of

## IDENTIFICATION

the probabilities of all the separate events." If one thing will occur once in twenty times and another once in twenty times, the probability of the two occurring in conjunction is represented by the fraction which is the product of one-twentieth and one-twentieth, or one four-hundredth.

For the purpose of showing the practical impossibility of these eight personal features all being exactly duplicated in two individuals we can make so small the fraction representing how frequently each point may be found that it is certainly within the fact and will be promptly granted. For number one, the exact height, we will say that in every ten men we shall find one who exactly measures as therein described; of the second or eye color, one in three; of the third, one in four; of the remaining five points, we will say that out of every two hundred men, one will be found precisely answering one of each of the peculiar descriptions specified, although for some of these accidental and unusual features more than one in ten thousand would certainly be too many to expect.

We now have our separate events represented by eight fractions, one-third, one-fourth, one-tenth, and five fractions each of one two-hundredth. Now, assuming that our problem is to determine how frequently all these peculiarities and elements that have accidentally combined in this one individual would be likely to be exactly duplicated in another individual, we find by apply-

## CLASSIFICATION OF HANDWRITING

ing Professor Newcomb's rule that the continued product or the mathematical probability is one in 38,400,000,000,000, or more than thirty thousand times the population of the globe, and we naturally conclude if we find an individual who answers the description, that we have found the man, and that there is not another man who has had the same things happen to him.

Let us see just what a proposition it is to expect complete identity in two handwritings. We must imagine groups of the variations of each of the eighty or more characters in English script with from a dozen to a hundred or more variations in each group. Then we take one variation of each of the eighty characters until we have a complete set. The proposition now is to go out and find a writer who will duplicate in his writing every one of these selected characteristics. The improbability is simply ridiculous and we say at once it cannot be done. Even if the probability of making a particular form in each group were as low as one-fifth, to have this combined on the same ratio with a particular form in all the other groups would make a probability represented by a fraction with one for the numerator and the eightieth power of five as a denominator.

We may conclude from the foregoing that in any given case we should be able to state with some degree of accuracy the chances of a questioned writing being

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identical with or different from another writing by using as a basis for our computation the very conservative figure of one-fifth (that is to say, one chance in five of the same particular writing characteristic being produced habitually by two different writers) as suggested by Osborn.

As a practical application of this theory, let us suppose our specimen in question consists of a name and address in which the letter "a" occurs, say, six times, and five of them are found to possess some inconspicuous identifying characteristic, such as an eye at the end of the oval. We set this down as one habitual form. Next we find the Greek form of letter "e" with the top half larger than the lower half in sufficient number to prove it is habitual with this writer; we note this as a second habitual form. Looking further, we discover several "f's" with the lower loop about twice the size of the upper loop and we note this as a third habitual form. And so on until we have found, say, eight characteristic forms of this nature in our questioned writing. In the group of specimens bearing the same classification number, we may find one that arrests our attention by bearing some resemblance to the questioned writing and we proceed to check this over. We discover that while the pictorial aspect has been somewhat altered by the adoption of a backslant and heavier pressure, together with a change in the more conspicuous features of the capitals, there is a concurrence in the eight par-

## CLASSIFICATION OF HANDWRITING

particulars noted in the questioned writing and we may state definitely that the chances of the two writings having been produced by two different individuals is one in 390,625, or five raised to the eighth power.

But we must bear in mind in this connection that all genuine writing shows some natural variation—that is, the same forms and characteristics will not invariably be used—but this variation is usually manifested only in the more superficial parts. An identifying characteristic, therefore, to be of value, must be proven to be *habitual* with a particular writer and not merely occasional or exceptional; but since the writing process as a whole is one of the most permanent and unconscious of human habits, we should be able to establish a convincing number of these habitual traits even in a small amount of writing. In the above example the eight identifying characteristics are assumed to be habitual. Now supposing that instead of the differences enumerated (pictorial aspect, slant, pressure, and capitals) we had found a divergence in a number of inconspicuous features (even two or three would suffice in this case) and these divergencies persisted throughout, our estimate of the probabilities of identity would be materially changed. Therefore, we must look for *differences* of form and other features as well as *similarities*, before we can determine the chances of identity or non-identity of two writings.

However, in actual practice we will find that the

## IDENTIFICATION

procedure outlined above will seldom be necessary for the reason that once we have become conversant with handwriting analysis, we will know more or less intuitively when two writings are the product of the same hand, especially in those cases where only an unskillful attempt at disguise has been made which, fortunately, are largely in the majority. But this faculty of direct cognition must be developed by systematic study before it can be relied upon implicitly, and this developmental process will best be enhanced by a consideration of all the elements that go to make up individuality in handwriting.

1. **Alignment of Writing.**—This is the relation of the letters of a word or a line of writing to an actual or imaginary base line and it is largely dependent upon the movement, manner of holding the pen and the design of letters. With the elbow acting as the pivot and the arm perpendicular to the writing line, the alignment is often perfectly straight across the page even on unruled paper. With the wrist as the center of motion, the lines may be made up of short arcs, representing the reach of the hand with the wrist at rest when moved around to the right as far as the hand will reach. The most uneven alignment results when the arm is too far around to the right or the paper too far to the left so that the lateral motions of the hand to the right extend above the base line of the writing. Certain letters are frequently made too high or too low by some writers.

<sup>25.50</sup>  
**THE FIRST NATIONAL BANK** 90-42  
12  
OF BERKELEY  
 BERKELEY, CALIFORNIA November 26 1919 No. 478  
 PAY TO THE ORDER OF William S. Morrison \$ 27.50  
Twenty Seven <sup>50</sup>/<sub>100</sub> DOLLARS  
E. S. Johnston

<sup>55.50</sup>  
**THE FIRST NATIONAL BANK** 90-42  
12  
OF BERKELEY  
 BERKELEY, CALIFORNIA December 27 1919 No. 237  
 PAY TO THE ORDER OF William S. Morrison \$ 20.00  
Twenty <sup>00</sup>/<sub>100</sub> DOLLARS  
E. S. Johnston

<sup>#52139</sup>  
**THE FIRST NATIONAL BANK** 90-42  
12  
OF BERKELEY  
 BERKELEY, CALIFORNIA Dec 31 1919 No. 777  
 PAY TO THE ORDER OF F. J. Saylor \$ 10.00  
Ten <sup>00</sup>/<sub>100</sub> DOLLARS  
William S. Morrison

**THE FIRST NATIONAL BANK** 90-42  
12  
OF BERKELEY  
 BERKELEY, CALIFORNIA Jan 2 1920 No. 314  
 PAY TO THE ORDER OF R. J. Reid \$ 10.00  
Ten <sup>00</sup>/<sub>100</sub> DOLLARS  
William S. Morrison

FIG. 10A.—Illustrating faulty Alignment. The four checks, all written by the same person, illustrate irregular Alignment.

Classification No. 31,121,112 (Slant variant).

*Nedderman*

*Wickie F. Humphrey*  
Lent & Humphrey, Atty.

Yours truly,

*W. M. Dwyer*  
Chief of Police.

*Daniel C. Murphy*  
President State Federation of Labor.

*M. B. Clarke*  
President.

FIG. 10B.—Illustrating faulty Alignment.

- The first signature has a downward inclination. Classification No. 32,122,121. 1  
Both names in the second signature have a downward inclination. Classification No. 33,123,221. 3  
In the third there is a slight upward trend. Classification No. 32,122,321. 3  
There is a slight upward trend in the fourth. Classification No. 22,121,231. 2  
The bottom signature is convex upward. Classification No. 31,122,222. 1  
3



FIG. 11A.—Angles. (a) Illustrates the uniformity of Angle Values found in copy-book style and manner of drawing the lines.

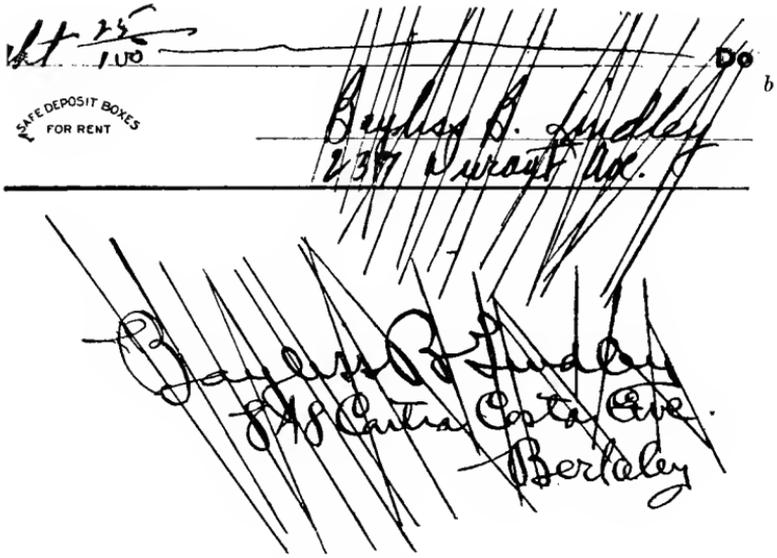


FIG. 11B—Angles. (b) Mr. Lindley claimed the signature shown above was a forgery. The Angle Value test alone proved this a forgery. Each of these lines should be compared with the preceding line, with which it may be parallel or form an angle at top or bottom.

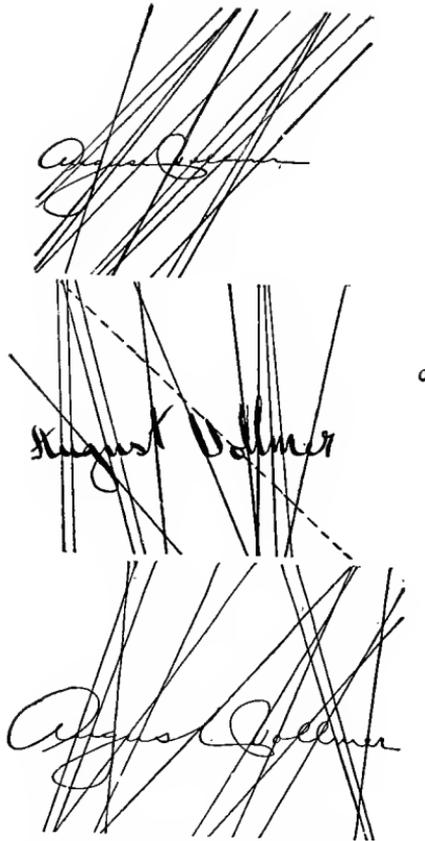


FIG. 11C.—Angles. (c) The upper is a natural signature. The middle, by the same writer, is effectively disguised as to Alignment, Form, Line Quality, Movement, Pen Position, Proportion, Skill, Slant, and Spacing, but the dotted line is the only one of the thirteen that departs radically from the Angle Values of the natural writing. The lower is a simulation of the upper by another writer and here quite a different picture is presented.

BERKELEY, CAL. Sept 15 1921 No 28  
**TELEGRAPH AVENUE BRANCH**  
 Berkeley Bank of Savings and Trust Company  
 ASSOCIATED WITH THE FIRST NATIONAL BANK OF BERKELEY  
 PAY TO THE ORDER OF Pacific Tel. Co 54.05  
 Four +  $\frac{05}{100}$   
 Franklin C. Moore

BERKELEY, CAL. Sept 28 1921 No 36  
**TELEGRAPH AVENUE BRANCH** 12  
 Berkeley Bank of Savings and Trust Company (90/41)  
 ASSOCIATED WITH THE FIRST NATIONAL BANK OF BERKELEY  
 Cash 7.00  
 Seven +  $\frac{00}{100}$   
 Franklin C. Moore

**TELEGRAPH AVENUE BRANCH** 12  
 Berkeley Bank of Savings and Trust Company (90/41)  
 ASSOCIATED WITH THE FIRST NATIONAL BANK OF BERKELEY  
 PAY TO THE ORDER OF Carl 55.00  
 Five +  $\frac{00}{100}$   
 Franklin C. Moore

FIG. 11D.—Angles. (d) Mr. Moore claimed the middle check to be a forgery and submitted a number of his canceled checks for comparison, of which the upper and lower were selected at random for the Angle Value test. Tracing paper was placed over the checks and the axis lines drawn thereon. Checks were photographed, then the tracing paper removed and this latter photographed separately as shown in the reduced illustration. Note that in the two standard signatures lines 20 and 21 are the only ones between which there is not complete coincidence, whereas in the questioned signature lines 1, 2, 3, 14, 15, 16, and 21 depart more or less from the Angle Values found in the standard writing.



FIG. 11E.—Angles. *See especially 11D.*

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The alignment may be straight but with an upward or downward tendency; it may be convex or concave or irregular or sinuous. See Fig. 10.

2. **Angles.**—Dr. Locard, Director of the Police Laboratory of Lyons, France, states:

If a person imitates the slope of a handwriting he preserves, in spite of himself, the proportions of the angle values peculiar to his own hand. The result is that as the average axes of the different letters are not parallel their prolongations will meet; and by assembling all the points of intersection a characteristic design will be obtained.

In order to apply the angle value test effectively, it is best to select from the two writings being examined, the same words, or words having the same letters in as nearly the same sequence as possible. For the purpose of determining and illustrating angle values, the specimens under consideration are placed on a table or board and covered with a piece of tracing paper of sufficient size, which is fastened down firmly with thumb tacks or by other means. Lines are then drawn on the tracing paper over the straight lines of the letters or their axes as shown in Fig. 11. This is a very effective test for forgery.

3. **Arrangement.**—The arrangement of the writing on the page is often characteristic with reference to indentations, paragraphing, spacing at top and bottom,

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date line, signature, etc. This element is of especial importance in the analysis of questioned checks, wherein the following points should be noted:

(a) Manner of writing the date; whether month is expressed by numerals or spelled out in full or abbreviated; also manner of writing check number.

(b) Distance of the beginning of the writing from the printed headings.

(c) Manner of writing the amount in figures and in words, and the various positions of the word "and" and the sign "&" with its variations.

(d) The varying forms of dash line between the amount in words and the printed heading "dollars."

(e) The manner of denoting cents.

Fig. 12 illustrates several characteristic arrangements of the writing on checks.

4. **Averages and Divergencies.**—In an article describing methods devised and used by Dr. Locard, Director of the Police Laboratory in Lyons, France, Mr. E. Weiss states:

For a given subject, his handwriting possesses, in spite of himself, in spite of all disguises, a certain number of constant peculiarities that may be measured and that furnish to the expert indications that are unmistakable. By means of this method, which is called graphometry, we compare the measurements of the heights of the different letters and their propor-

San Francisco, Jan. 21, 1921 No. 96  
 CLEARING HOUSE No. 16.  
**Union Trust Company of San Francisco** 11-61  
 Pay To (the order of) Harold C. Lacey \$15.00  
Fifteen and no/100 Dollars  
 Mark V. Frank

a

San Francisco, Jan. 29, 1921 No. 96  
 CLEARING HOUSE No. 16.  
**Union Trust Company of San Francisco** 11-61  
 Pay To (the order of) Harold C. Lacey \$10.00  
Ten and no/100 Dollars  
 H. W. Walker

a

65248. MARKET STREET BRANCH 11-38  
**Bank of Italy** No. 96  
 SAVINGS COMMERCIAL TRUST  
 SAN FRANCISCO, CAL. Jan. 21, 1921

a

570  
 4-11-20-21  
 6-11-21

PAY TO THE ORDER OF Harold C. Lacey \$9.50  
Nine and 50/100 DOLLARS  
 Mark V. Frank

63097 MARKET STREET BRANCH 11-38  
**Bank of Italy** No. 96  
 SAVINGS COMMERCIAL TRUST  
 SAN FRANCISCO, CAL. Jan. 21, 1921

a

4-11-20-21

PAY TO THE ORDER OF Harold C. Lacey \$8.00  
Eight and no/100 DOLLARS  
 Mark W. Frank

: Hon. A. Vollmer

Chief of Police  
 City Hall

Berkeley, California

c

F12

FIG. 12A.—Arrangement.

- (a) Note characteristic dash after name of payee and after amount in words; also double curve to horizontal line for fractions. Classification No. 12,222,222.  
 (c) Unusual arrangement. Classification No. 22,122,212.

appt. - 5-22-15 #55453  
SAN JOSE, CAL. Dec. 12<sup>th</sup> 1915. No. \_\_\_\_\_  
**THE FIRST NATIONAL BANK OF SAN JOSE, CAL.** 90-70  
UNITED STATES DEPOSITARY

PAY TO THE ORDER OF J. Wilson \$ 3<sup>25</sup>/<sub>100</sub> b  
Three and 25/100 DOLLARS  
[Signature]

L.W. 33009  
12-29-15  
SAN JOSE, CAL. Dec. 15<sup>th</sup> 1915. No. 432  
**THE FIRST NATIONAL BANK OF SAN JOSE, CAL.** 90-70  
UNITED STATES DEPOSITARY

PAY TO THE ORDER OF E. B. Welby \$ 5<sup>00</sup>/<sub>100</sub> b  
Five DOLLARS  
7. 1/2  
[Signature]

C.S.M. 24712-12-15 38542  
OAKLAND, CAL. Dec. 17 - 1915. No. 652  
**CENTRAL NATIONAL BANK** 90-4  
OF OAKLAND

PAY TO THE ORDER OF J. Wilson \$ 1<sup>00</sup>/<sub>100</sub> b  
One DOLLAR  
UNITED STATES DEPOSITARY  
[Signature]

33537  
7-11  
**THE OAKLAND BANK OF SAVINGS** 90-1  
OAKLAND, CAL. Dec. 24<sup>th</sup> 1915. No. 252

PAY TO THE ORDER OF J. Wilson \$ 1<sup>50</sup>/<sub>100</sub> b  
One and 50/100 DOLLAR  
SAFE DEPOSIT BOXES FOR RENT  
[Signature]

Mr. August Vollmer  
City Hall.  
Berkeley  
California

File

FIG. 12B.—Arrangement.

(b) Note proximity of writing to printed headings; long, sinuous dashes and location of fractions as well as flourish line under signature. Classification No. 22,221,113 for body of check, No. 22,122,331 for signature.  
(d) Also unusual. Classification No. 32,122,133.

## CLASSIFICATION OF HANDWRITING

tions to each other. For a given letter, the average height is constant relative to that of the other letters, even if the general scale of the writing be changed. One who habitually makes large "s's" and small "i's" will maintain these same proportions.

In difficult cases it may occasionally be necessary to resort to this test of averages and divergencies therefrom in order to form a definite conclusion as to identity or nonidentity between two writings. The procedure is this:

Measure the height of *all* the single-space letters with a finely divided rule, say 50ths of an inch, and find the average thereof. Proceed in a similar manner with the double- and treble-space letters.

Next find the average height of each individual single-, double- and treble-space letter.

Suppose the average height for all the single-space letters is  $\frac{5}{50}$  and we note that the "a's" average  $\frac{7}{50}$ , that is,  $\frac{2}{50}$  above the general average; and the "e's" average  $\frac{3}{50}$ , or  $\frac{2}{50}$  below the general average for single-space letters. Next we find that the double-space letters average  $\frac{15}{50}$  and that the "h's" average  $\frac{13}{50}$ , or  $\frac{3}{50}$  above the general average; and that the "l's" average  $\frac{8}{50}$ , or  $\frac{2}{50}$  below the general average; and so on with the treble-space letters.

Next we proceed in a similar manner with the second document in question, in which the writing may be

## IDENTIFICATION

larger or smaller than in the first, but this fact will not alter the results. After finding the general averages of the three size letters and the averages of the individual letters in each group, we proceed to note which of them diverge from the general average and whether above or below. Thus we may find that the "a's" are below the general average for the single-space letters instead of above, as in the first document; that the "e's" are above the general average; similarly that the "h's" are below, and that the "l's" possibly do not diverge whatever from the general average. We may now summarize our findings as follows:

|  | Questioned    | Standard      |
|--|---------------|---------------|
| General average of s-s letters . . . . . | 5             | 6             |
| Average of a . . . . .                   | 7 or 2 above  | 4 or 2 below  |
| Average of e . . . . .                   | 3 or 2 below  | 7 or 1 above  |
| General average of d-s letters . . . . . | 10            | 14            |
| Average of h . . . . .                   | 13 or 3 above | 12 or 2 below |
| Average of l . . . . .                   | 8 or 2 below  | 14 no diverg. |

These same facts may be shown graphically by grouping together on a chart the single-, double- and treble-space letters, drawing a curve representing the general averages of each group and another curve to show divergencies therefrom of individual letters. Treat

# CLASSIFICATION OF HANDWRITING

the questioned and the standard writing in the same way. If it is found that the divergencies are approximately equal and in the same direction, that is, above or below, this is a very strong indication of identity; but if in opposite directions, as shown above, it is positive

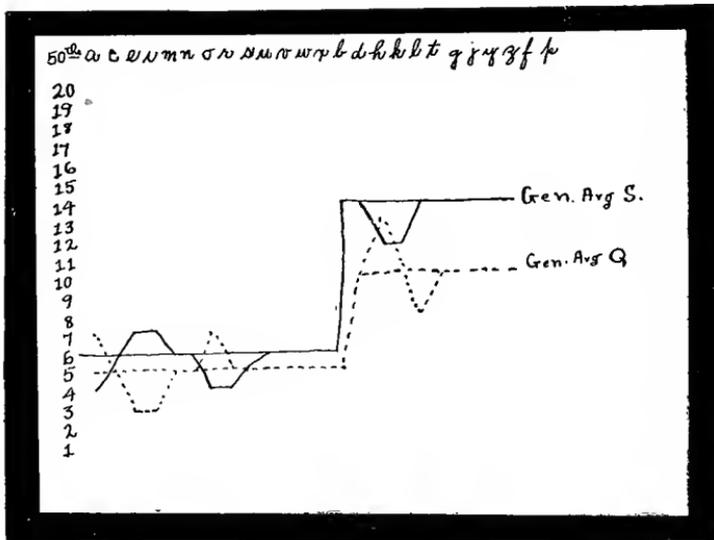


FIG. 13.—Averages and Divergencies. Solid line represents the standard writing; dotted line the questioned. In each case the straight lines represent the general average for letters of the same height and the curves show divergencies therefrom of individual letters.

proof of nonidentity if based on a sufficient amount of material. See Fig. 13.

5. **Characteristics.**—The term characteristics in its application to handwriting embraces all those elements that go to make up individuality but what we are here concerned with under this heading are those original form characteristics which differ or depart from copy-

*Handwritten scribbles*

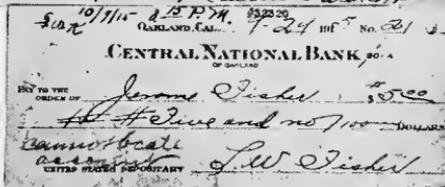
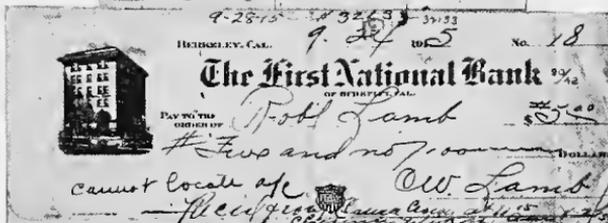
## IDENTIFICATION

book standards, called "trade-marks" in the parlance of the expert, and which are frequently met with in checks and other writings. Strange to say we have seen some of these persist throughout a series of checks in which there was a strenuous attempt at disguise made in other particulars in an effort to lead the authorities to believe that the checks were not all the work of one man. In Fig. 14 are illustrated a few of these trade-marks.

6. **Curves.**—With the majority of forearm writers and with some finger writers the degree of curvature found in parts of certain capitals is a somewhat constant and therefore an important factor. A simple method for testing this element is illustrated in Fig. 15. The document is placed under a sheet of tracing paper, as explained for (2) Angle Values, one of the points of a draughtsman's compass is placed at the center of the arc and the projection of the arc is represented by light or dotted lines drawn with the other point of the compass. Parallelisms or differences of degree of curvature between two writings are graphically shown in this way.

7. **Form.**—The particular form of each letter in the two writings in question should be studied minutely, each document separately, individual characteristics tabulated and then the two compared with each other. It should be borne in mind, however, that even frequent coincidence in the general form of letters in two writings does not establish their identity where there is





extending over a period of nearly three years, yet all "trade-marked" similarly and characteristic form of "no/100." Classification No. 23,223,211.

# CLASSIFICATION OF HANDWRITING

marked dissimilarity in other important features, as there must necessarily be a considerable agreement of form displayed by two different writers of the same system of handwriting. Here, as with other factors,

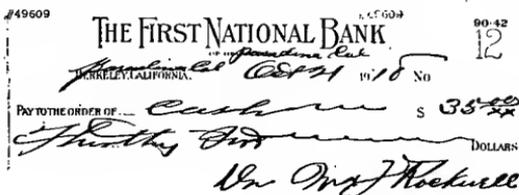
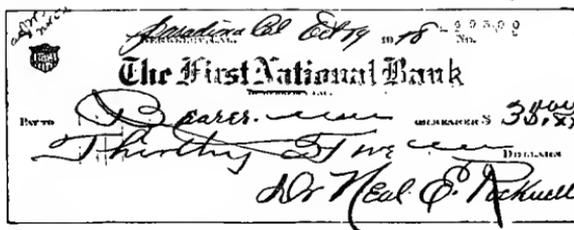
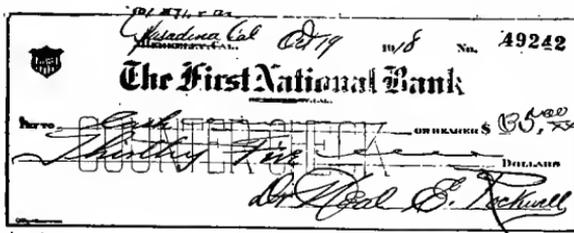


FIG 14B.—(b) Note trade-mark “XX” for expressing cents. Classification No. 31,232,311.

the small inconspicuous characteristics are the most important in individualizing handwriting.

(a) Small “a” should be examined as to the form of its initial stroke, if present; the form of the oval, whether circular or elongated and, if elongated, the direction of its axis; whether open or closed at the top

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and whether the first stroke of the oval is higher or lower than the last; and the form of its connecting stroke with the succeeding letter.

(b) Examine "b" as to the height at which the up stroke and the down stroke of the loop cross; the width of the loop and particularly the shape of the top of the loop, whether broad and rounded or flat, or whether

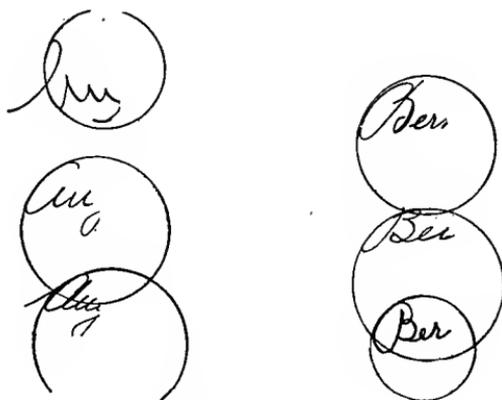


FIG. 15.—Curves. Note that degree of curvature of first "A" is smaller than the other two and second slightly smaller than the third. Also note that position of the circle relative to the arc it subtends is different in each case. Similar differences are to be found in the "B's."

angular or irregular; whether the first down stroke goes clear to the writing line; height above writing line at which the horizontal bar is made and the shape of the bar, which may be straight or may be sufficiently curved to give the "b" the appearance of "li."

(c) Letter "c" may be begun without an initial stroke and it has several distinct forms; it may start with a small eyelet, a mere dot or a tick; when connected with

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the preceding letter, the link may make the “c” into an “e.”

(*d*) Examine letter “d” relative to the oval the same as “a”; note also whether the staff (the part following the oval) is looped and at what point relative to the oval the down stroke of the staff separates from the up stroke. The terminal stroke of final “d” is often dropped.

(*e*) Note the width of the eyelet and the shape of the top, whether broad or narrow, whether rounded or angular. Very narrow “e’s” often have the appearance of “i.” The Greek form of “e” shows considerable variation; the top half may be larger or smaller than the lower half; between the two halves there may occur an eyelet; the lower half may be a complete circle.

(*f*) Examine letter “f” as to the relative size of the two loops; as to the point at which the up and the down strokes of the two loops cross; as to the shape of the loops, the same as for letter “b”; and the shape of the connecting link with the following letter.

(*g*) Examine letter “g” relative to the oval the same as for letter “a”; and relative to the loop the same as for “f.”

(*h*) Examine letter “h” relative to the loop the same as for letter “b”; note the shape of the arc forming the latter half of the letter, whether rounded or angular; how far it is retraced back up the staff and

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the form of the connecting link with the following letter.

(i) Letter "i" is sometimes made in the form of "e"; note how far the down stroke retraces the up stroke; note position of the dot as to its height above the letter and whether to right or left; note particularly the form of the dot, which may be wedge-shaped and sloping in any direction, a horizontal dash, a small circle or semicircle, a small "v," a perfect dot or comma-shaped with the tail in any direction.

(j) Examine the first half of the "j" the same as for letter "i" and the lower loop the same as for letter "f."

(k) Examine the loop of letter "k" the same as for "b." The last part of this letter is known technically as a "buckle" and this has a diversity of forms, which should be carefully noted; note also relative height of the buckle to the loop.

(l) Examine the loop of letter "l" the same as for "b."

(m) Examine letter "m" as to the shape of the three arcs of which it is composed; as to their relative width and height; as to their relative separation and the extent of the retrace at the bottoms of the middle arc.

(n) Examine letter "n" the same as for "m." When the arcs of this letter are angular it has the appearance of a "u."

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(*o*) Examine letter "o" relative to its oval the same as letter "a"; and relative to the bar, the same as for "b." The bar, or link, may be carried down too far, giving it the appearance of letter "a."

(*p*) Note whether letter "p" has a loop at top or bottom; note point of separation of first up and down strokes and the same for the down and up strokes below the line. The normal form for the last part of this letter is the same as for letter "h" but it may take on the form of an oval or circle, which should be carefully noted as should also the form of the connecting link.

(*q*) The form of the oval of letter "q" should be examined the same as for letter "a." The lower loop is sometimes written the same as in letter "g" but the normal form is the reverse thereof, in which latter case the point at which the last up stroke touches or crosses the preceding stroke should be noted; also note form of the link.

(*r*) Letter "r" has several forms, the normal having an angular top with a small tick formed by the first up stroke passing slightly above the body of the letter; another form has an angular top without the tick; another has an eyelet in place of the tick; and still another is rounded at the top, this latter form sometimes having the final stroke retracing the preceding stroke. The angular top, with or without tick, may be nearly or quite square or the top part may be curved downward to such an extent that it assumes the appearance of

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letter "u." The rounded top may be followed by a horizontal bar, the same as letter "b."

(s) Examine letter "s" as to the form of its initial stroke; whether it has an eyelet at the top or a tick, or an eyelet at the bottom; the shape of the down stroke and the point at which the down stroke terminates and the final stroke commences. This letter is frequently made in the form of the printed "s," especially at the beginning of words; and at the end of words may have its terminal dropped.

(t) Note whether letter "t" has a loop and at what point the up and down strokes cross or part. The crossing of the "t" takes on a great variety of forms, which should be carefully noted; they may be straight, sinuous, or curved; horizontal or inclined up or down; very light or heavily shaded or shaded on one end or the other; long or short; or may be ticked on either end. The crossing may be placed entirely above the staff of the letter or to the right or left or may cross the staff at any point between the top and bottom; final "t" is often crossed by retracing the staff with the terminal stroke or by a small backward loop or buckle, with a horizontal terminal, or there may be no crossing whatever.

(u) Note whether the two tops of the letter "u" are even in height and whether they are eyed and note distance between them; note form of the arc, whether curved or angular.

(v) Note the form of the arc of the letter "v,"

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whether angular or rounded, and the same of the arc at the bottom; note whether the beginning of the horizontal bar forms an eyelet; note distance above writing line of the bar and whether bar is straight or curved—it may be sufficiently curved to give the letter the appearance of letter “u.”

(w) Apply same tests to letter “w” as to “u” and “v.”

(x) Letter “x” has several variations of form, any one of which may be quite characteristic. Note particularly the crossing, if the crossed form is used, as to its length, shape, position, shading, and slant.

(y) Apply same tests for letter “y” as for the first part of letter “v.” Note at what point the down and up strokes of the lower loop cross each other and the length and shape of the lower loop. The lower loop letters are frequently finished with the downward stroke only—that is, the loop is not completed with an upward stroke or the stroke may be discontinued before returning to the writing line.

(z) The first part of letter “z” may be angular or curved. The eyelet may be large or exaggerated or merely suggested. The lower loop should be examined the same as in letter “y.”

Being much more conspicuous and “conscious” than the small letters, the capitals have much less value in the identification of handwriting than the former. Without actual reference to our own writing, we can picture

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in our mind's eye the peculiarities of most of our capitals, but not so with the small letters. In disguised writing, the capitals receive first attention because of their conspicuousness and because radical changes therein will often effectively alter the pictorial aspect of the writing, while the more inconspicuous individual details of the small letters are usually overlooked.

The form of the capitals will depend largely upon the system of handwriting learned. The Spencerian system of 1855 contained excessive flourishes and ovals on the initial and final strokes and the same system of ten years later contained double ovals at the beginning of letters H, X, Z, Q, W, V, U, Y, and M. The Modern Vertical system contains very simple forms of capitals. Capital letters are especially susceptible of accurate test, as explained under the heading "2. Angles" of this chapter and also "6. Curves" and "10. Muscular Habits."

The figures have an equal value with the small letters for purposes of identification and are therefore here treated with the same degree of detail. The copy book forms are modified in many different ways by different writers and combinations of these modifications will often point conclusively to a particular writer.

1. Note whether figure 1 has a tick at the top or bottom of the staff; whether the straight portion, or staff, is straight as viewed longitudinally, or curved to

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left or right, or has a double curve, or is sinuous; note its relative height to other figures.

2. Note the presence of an oval at the beginning of figure 2; note shape of the staff and whether eyed at bottom of staff; and note the length, direction, and horizontal position of the last stroke.

3. Note the presence of an oval at the beginning of figure 3; whether eyed at the junction of the upper and lower halves; the proportion of the upper and lower parts; the shape and point of termination of the last stroke with relation to the balance of the figure.

4. Examine figure 4 with reference to the comparative height of the two upper parts and the comparative slant of its parts; note shape and length of each straight stroke; note whether eyed, angular, or rounded at bottom of the first stroke; note distance above the writing line of the second, or horizontal, stroke. The final stroke of this figure is frequently carried below the writing line.

5. Note whether the first downward stroke of figure 5 is vertical or slanting, straight or curved; whether at point of beginning of the oval it is eyed, angular or rounded, and whether retraced at this point; note shape of the oval and point of termination of the final stroke with relation to the oval; note the length, connection or disconnection, and the inclination of the upper horizontal stroke. This figure is sometimes executed without lifting the pen.

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6. Note the degree of curvature and the height of the first stroke of figure 6; the shape and size of the oval and whether the final stroke of the oval intersects the first stroke, just touches it or whether the oval is open.

7. Note whether figure 7 is begun with a tick or perhaps an eyelet; note shape and inclination of the horizontal stroke; whether eyed, angular or rounded at junction of horizontal and downward strokes; note proportion of the two strokes; examine the staff the same as for figure 1 and note how far it extends below the line.

8. Figure 8 may be made in the direction of printed "S" or in the opposite direction; note shape of the two ovals and their relative size and the point of intersection of the initial and final strokes.

9. Note the form of the oval of figure 9 and whether same is open or closed; note whether an eyelet is formed at junction of the oval with the final straight stroke; note length and shape of the final straight stroke, the same as for figure 1, and the degree of extension below the base line.

0. Note the size of figure 0 in proportion to other figures and whether open or closed; note whether circular or elliptical and whether finished with an eyelet.

8. **Instrument.**—The particular kind of writing instrument used has its effect upon all writing; pencil writing shows more facility with most writers than that

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produced with the pen. The ordinary pen point in reality consists of two points, which yield to pressure and allow a thin film of ink to be deposited upon the paper. Under proper magnification the actual tracks of each point may frequently be plainly seen and the relative pressure exerted on each may often be determined. Stub pens measure across the tips as wide as one-twenty-fifth of an inch and make an ink stroke as wide as one-thirtieth of an inch without pressure. The finest pens measure as small as one-three-hundredth of an inch, which may make an ink stroke when applied without pressure as small as one-three-hundred-and-thirtieth of an inch wide.

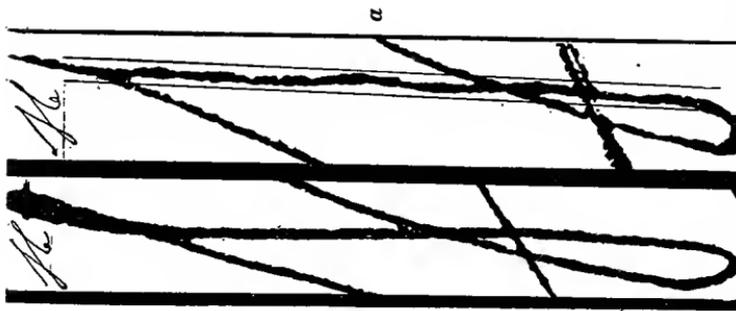
Stub pen writing is quite characteristic and easily identified as such, due to the fact that all curves will show what appears to be shading at every point where the direction of the stroke is perpendicular to the wide point. Writing produced with the ordinary pen may frequently be differentiated from that produced with a fountain pen from the fact that with the former when the supply of ink on the pen becomes nearly exhausted the film deposited on the paper becomes thinner and lighter in appearance, and often ink is deposited only in the two nib tracks, the space between the two remaining unstained. After the pen has again been dipped into the ink the writing will have a darker appearance, which peculiarities will not be produced by the fountain pen.

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Individual writing habits are not so easily determined in pencil writing as with pen writing, as in the former we can learn but little regarding line quality, pen position, speed, pen pressure and like elements, but we may be consoled by the fact that most important writings are done with pen and ink. Stylographic and quill pens are very little used in this country but in England quill pens are still used occasionally.

9. **Line Quality.**—The examination of a single line of pen writing under a low power microscopic will reveal several interesting facts regarding certain minute elements which are none the less valuable for identification because otherwise hidden. Frazer in his *Bibliotics* lays great stress on the importance of the indentations or serrations found at the edges of the strokes, even suggesting that in some cases identification might be established thereby. The depth, frequency, and location of these serrations are probably dependent upon the variations of the nerve force exerted on the muscles of the fingers and, being quite beyond the control of the writer, are very significant characteristics. The most pronounced serrations may occur on one edge or the other or they may be approximately equal on both sides; their number may be greater on one side or the other, or equal in number on both sides. Fig. 16 will convey the idea of their appearance under considerable magnification.

Among the grosser of the line qualities are tremor



(a) Portion of standard letter at left and similar part of traced forgery at right. Note frequent, pronounced serrations on right side of traced line, sufficient to differentiate the two writings. Viewing this line with paper held nearly even with the line of vision we see that it was produced by a slow, drawing movement.

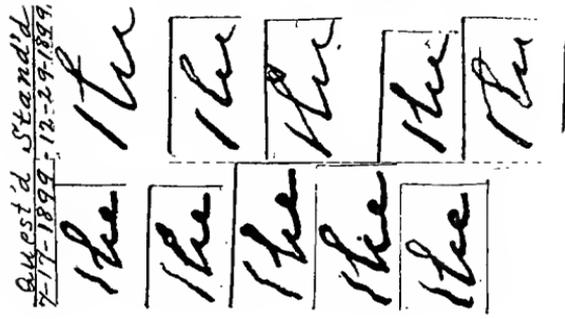


Fig. 16.—Line quality. (From Osborn.)

(b) A camera lucida enlargement of the ten terminal strokes on the left. This leaves no doubt that the blunt ends were produced by a slow movement, while the sharp ends result from lifting the pen from the paper while still in motion.

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of old age or weakness; irregularity or change of direction of straight strokes, which are best seen when viewed with the writing held nearly parallel to the line of vision, and which are due to uncontrollable variations in the movement impulse; and spasmodic shading due to change in pressure. The depth of the nib tracks may indicate more pressure on one nib than the other or equal pressure on both. The movement impulse begun before the pen is applied to the paper or continued until after the pen is raised from the paper will result in a sharp beginning and ending of the stroke; and, conversely, if the pen is applied to the paper before the movement is begun or remains on the paper after the movement ceases, the beginning and ending of the stroke will be blunt. A smooth, continuous straight or curved line indicates a free uninterrupted motion resulting from speed in execution, as usually found in the forearm movement.

### 10. Muscular Habits.—Hagan states:

The prehensile functions were earlier developed in the human hand than other muscular functions, and the latter subsequently evolved by which, after grasping, the object held could be moved with accuracy and precision. When the hand is engaged in writing it is a question of personal muscular organization whether (1) the prehensile capacities of the hand do the work without the intervention of the muscles adapted for more delicate uses, or

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(2) whether both act connectedly, or (3) whether the prehensile functions of the hand coöperate with the forearm and do not call into action the more delicately organized functions of the hand. The mind imparts the writing impulse to the hand; in some individuals the index finger is the most responsive, in others the middle, and in others the two coöperate as one factor. . . .

If there should appear in the writing of a person evidence that the pen rotated on the cushion of the thumb on the down strokes, this would indicate that some of the muscular factors were deficient in prehensile function. When writing is mainly done by the movement of the fingers and thumb, without the forearm movement any more than comes from the oscillation of the hand and forearm, the pen is usually grasped as a prehensile act by the thumb, index and middle fingers; and, as thus held, is moved over the paper, with the ball of the thumb acting as a supporting cushion, against which the pen bears when the fingers and thumb in coöperating action turn inwardly toward the palm to make the downward heavy lines, while the lighter lines are produced through the upwardly and outwardly directed action of the thumb and fingers by which the pen is grasped. All the curves and lateral movements of the pen, when thus held when directed upwardly and slanting to the right, are produced by the muscles of the thumb acting against the yielding functions of the fingers in the

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direction of the thumb impulse; and all the curves in the letters thus written, as well as the lateral movements of the pen in slanting or curving to the left are produced by the action of the fingers against the yielding movement of the thumb in the direction of the finger impulse. In either instance where the thumb is one of the factors, and the fingers co-operating together is the other factor to grasp and move the pen laterally as against each other, the facility with which the yielding of one set of factors to the other is harmoniously accomplished the less prominent will be the delineation and emphasis of habitual details in this line of examination; and the more want of harmony and coördinate action there is, the more prominent will be the details of personal habit.

When writing is mainly done by the flexure of the fingers and thumb, the index and second finger usually act as one factor in some pen movements and separately in others; while the thumb as the other factor operates in giving direction to and in producing the bottom and up curves of letters, as well as the lateral movement of the pen to the right when the prehensile muscular functions are employed; but every time a lateral movement is made one of these factors must yield to the other and immediately change its action and function from that of a factor creating an impulse, to a factor receiving one with reverse movement, and still retain its pressure in the opposite direction to

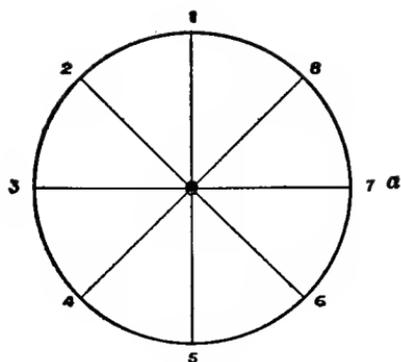
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that in which it is yielding with reverse motion to hold the pen in position. Every time each of these factors changes its function from one which creates an impulse with direction to one that receives an impulse with reverse motion, there is a center or intermediate point caused by this change of function, a condition which will be visible in the writing and generally be accompanied with an habitual detail. While these conditions occur between the coöperating action of the index, second finger, and thumb when writing with their prehensile muscular functions, the fingers themselves seldom act in harmony, and generally do not cooperate without making details that are prominently characteristic of the writer; in fact, their want of harmonious action when occurring produce very positive details of personal habit. When yielding to the thumb impulse by a movement to the right in one direction of curve, the index and second fingers may do so gracefully and without marked discordance; but when thus operating to produce a longer curve or one in another line of direction, the fingers may yield grudgingly and irregularly. Again, where parts of the letters are produced by movement of the fingers downwardly to the left, although the thumb may yield without discordance, yet between the fingers there may be a struggle as to which shall do the major part of the work, and this want of accord will be peculiar in each person's writing and cause the appearance of

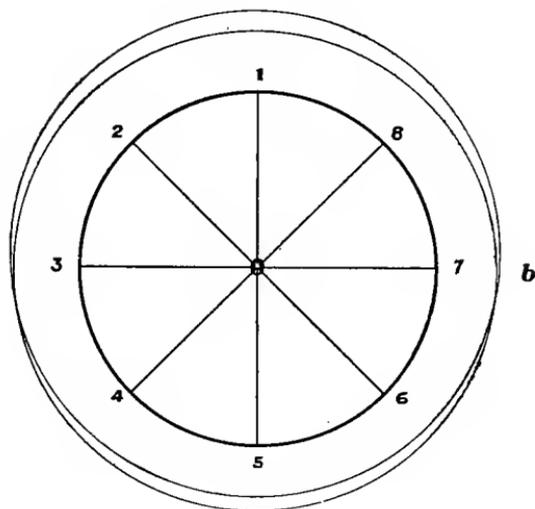
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details having strong individual characteristics. This lack of harmonious coöperation between index and second fingers will be found to more prominently occur in the downward and heavy lines forming the staffs. The index is generally more facile in its ordinary work than the second finger from having a muscular faculty developed in its organization that is not found in the second finger, but this additional function is of little use in writing. The position of the thumb as a factor in the combination is a prominent one in giving character and form to all curves in writing extending from left to right, all up curves connecting the letters, and all loops produced at the top and bottom.

To illustrate what has been said above, let us consider the actual functioning of the fingers in a writing produced by the finger movement. Referring to Fig. 17, in writing the curve represented by 1, 2, 3, 4, 5, we find that the impulse comes from the index and middle fingers coöperating together, the contractor muscles pulling them toward the palm; and that the thumb yields to the impulse, offering only sufficient resistance thereto to retain the pen in position. At about point 5, continuing the curve to 6, 7, 8, 1, the operation is reversed, the thumb becoming the factor of impulse, the extensor muscles pushing away from the palm, the index and middle fingers yielding. Supposing there were lack of smooth coördination between the muscles of the



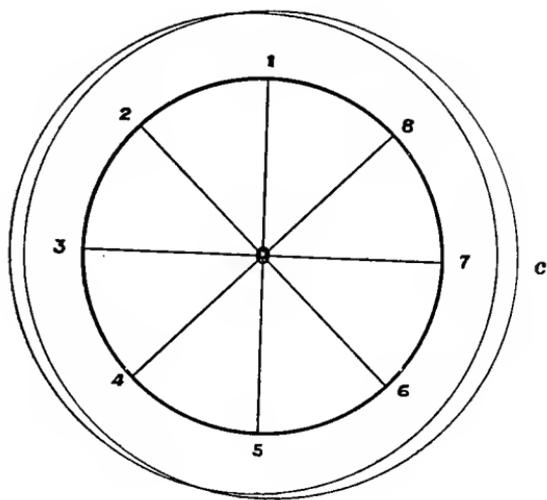
(a)



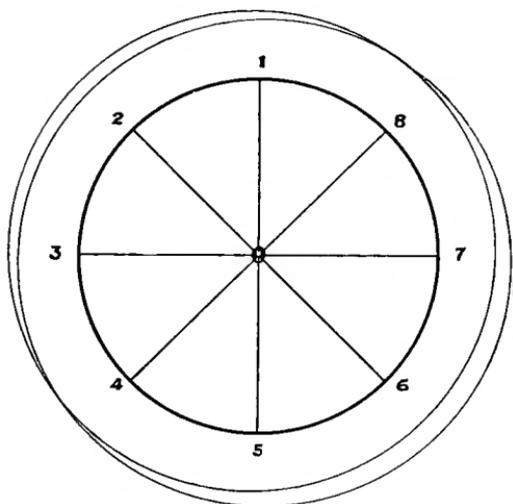
(b)

FIG. 17.—Muscular

(a) For localizing evidences of muscular incoördination. (b) Illustrating the right. (c) With concavity of pen toward the palm. (d) With concavity far to the left as it can be held to the right, the



(c)



(d)

habits and pen position.

where nib tracks cross each other with concavity of pen held well over to of pen to left. Were it possible to write with concavity of pen held as nib crossings would be about the same as in (b).

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thumb and fingers involved there would almost certainly be manifested at or near point 5 some evidence thereof. At point 1 in the curve 3, 2, 1, 8, 7 or by 7, 8, 1, 2, 3 the operation changes similarly and the same sort of evidence is to be looked for there. Thus we may find angles instead of curves at the top of loops or of arcs in such letters as "m" and "n" or irregularities or sudden changes of direction in any curve or straight line. The ovals may show angularity at certain points or lack of symmetry at others. The straight strokes may show an offset to right or left at the beginning or ending of the strokes or slight but sudden changes of direction between these two points.

11. **Pen Position.**—The manner of holding the pen in writing is regulated by the muscular organization of the hand and is influenced to a lesser degree by training, but no amount of training can overcome an innate lack of balance and coördination between the various muscles of the hand and fingers used in the writing process. Therefore, the particular manner in which the pen is held becomes a highly important matter in the investigation of questioned handwriting.

Pen positions are of great variety but vary in three principal ways: (1) In the angle of the pen to the surface of the paper, (2) in the angle of the pen to the line or direction of the writing, and (3) in the uniformity of pressure of the two nibs of the pen.

1. A pen held in a nearly vertical position will make

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a fine line of uniform width without pronounced shading, often with a tendency to a broken or scratched effect and frequently a digging in of the pen on the up strokes. With the pen held nearly parallel to the paper, a broader track will be made; the ink will follow the pen back at the angles; loops will often be filled in at the top where the strokes go to the left and the lower edge of such strokes will be seen under the microscope to be very rough. Frequent and heavy shading is common with the pen held thus. It may happen that the pen will be held so low that one of the shoulders of the pen will drag on the paper, depositing an extra ink line near the line made by the point of the pen, thereby giving a "shadow" effect to the writing.

2. The angle of the pen to the line of writing can be determined by a study of the tracks made by the nibs of the pen. The pen may be held well around to the right, that is with the concavity of the pen parallel to the writing line; or with the concavity toward the palm, or to the left. Referring again to Fig. 17, in writing the circle 1, 2, 3, 4, 5, 6, 7, 8 with the concavity of the pen to the right, the pen nib tracks would cross each other at or near point 3, from which point they would begin to separate and would reach their maximum separation at or near point 5; at about point 7 they would again cross and again reach their maximum separation at about point 1. In writing the straight line from 1 to 5 with the pen in the same position the

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nib points would track, that is, would show no separation; and in drawing the straight line from 3 to 7 they would show maximum separation. With the concavity of the pen toward the writer, in executing the same circle, the nibs would reach their maximum separation at or near point 3; they would cross each other at or near point 5; at point 7 they would again reach their maximum separation and again cross at point 1. In writing the straight line from 1 to 5 they would show the maximum separation, and would track in executing the line from 3 to 7. With the concavity of the pen around to the left in executing the same circle the nib tracks would cross at about point 4, reach their maximum separation at about point 6 and again cross at about point 8; they would show maximum separation in writing the straight line from 8 to 4, and the minimum from 2 to 6. In addition to the foregoing, the relative position of the nibs when the pen is first applied to the paper will often serve as an index to the angle of the pen to the line of writing and the same fact may frequently be determined by the position of the nibs at the finish of downward strokes.

3. With the pen in any position with relation to the paper or the line of writing, it may be slightly tilted so as to exert more pressure on one nib than on the other or the pressure may be even on both nibs. Examination under the microscope, the degree of magnification depending on the operator, will reveal the facts

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in this particular. With the pressure on the left nib the left nib track on the shaded strokes will be more pronounced and deeper; with the pressure on the right nib the results are reversed; with equal pressure on both nibs the line margins are uniform and a line on smooth paper will appear clear cut and smooth if executed with a free movement.

A great deal may be learned by the student regarding nib tracks and their significance in relation to pen position by the simple procedure of fastening two pencils together by means of a rubber band, with the points even; then considering each pencil point as representing one of the nibs of a pen, circles and straight lines are executed in various pen positions, and the tracking of the points studied in their relation thereto.

12. **Proportion.**—The proportions of the various letters of the alphabet differ in different systems. The Spencerian system was arranged on a scale of fifths, three above and two below the base line, the longest letters being three spaces high and the shortest one space high, the lower loop letters extending two spaces below the line. The modern vertical copy books make the longest letters only twice as high as the shortest letters and the longest letters extend below the line only one space, the system being arranged on a scale of thirds, two above and one below the line.

Locard states that for a given letter the average height is constant relative to that of the other letters,

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even if the general scale of the writing be changed; and by means of a system of measurements, which he terms "graphometry," the proportion of the various letters to each other is determined.

The proportion of the height of single-space to double-space letters and to capitals, the proportion of the height of letters to the length of the word in which they appear and the proportion of the width to the height of certain letters is one of the constants of handwriting and is therefore a very important element and a valuable determining factor in close cases. The procedure is similar to that outlined under "4. Averages and Divergencies." Where there is only a limited amount of material in the questioned writing the best method is to obtain the average height of *all*, rather than of each, single-, double- and treble-space letters, ascertain their proportions to each other and then compare these with the proportions obtained for the standard writing.

Suppose our questioned writing is a signature in which there are ten single-space letters. We measure the ten, add their separate heights and divide the result by ten to obtain the average height, which, let us say, we find to be  $\frac{5}{10}$  of an inch. We next proceed in a similar manner with the double- and treble-space letters, the former of which we find to be  $\frac{10}{10}$  and the latter  $\frac{15}{10}$ . Thus the proportion of the single- to double-space letters is 5 to 10 (on the basis of 50ths of an inch), or 1 to 2;

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and the proportion of the single- to treble-space letters 5 to 15, or 1 to 3. We may discover after proceeding similarly with the standard writing that the proportion of single- to double-space letters is 1 to 2.5 or 1 to 3; and to treble-space letters 1 to 4 or more. Here, as with averages and divergencies, we have convincing proof of nonidentity; whereas, had we found complete agreement of this factor between the two documents it would have been strong corroborative evidence of identity.

13. **Punctuation.**—The accuracy with which a document is punctuated, like correct arrangement, correct spelling and grammar, may sometimes prove a reliable index to the educational attainments of the writer. But here we are more particularly interested in the exact form the various marks of punctuation may take and in their location with relation to the words and to the writing line.

So simple a mark as the period may be made in quite a variety of forms. In making the period if the pen is applied to the paper without pressure it may be the merest dot, circular or slightly elongated. When pressure is applied it may be heart shaped, right side up or upside down, caused by the spreading of the nibs. It may take on the form of a comma, with the tail in any direction, or it may be a small horizontal dash. The period may be placed close to the letter it follows or some distance away; it may be in its normal place on

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the writing line or even with the top of the single-space letters or even higher.

The comma may be made in the form of a simple dash, with any degree of obliquity, or it may be made in its normal form with somewhat elongated tail and the concavity of the tail may be reversed. It may be placed in any of the positions suggested for the period. The colon and semicolon may be made in any of the forms suggested for the period and comma and may be placed in any of the positions enumerated above.

The interrogation point may be made in a variety of forms. The oval at the top may be made in the normal direction or may be reversed; the oval may be open or closed; the period at the bottom of the staff may be omitted or may take on any of the forms suggested above.

The exclamation point may be made in the form of a figure 1 with a period at the bottom; it may depart from the standard form in having the shading at the bottom of the staff or the staff may be barrel-shaped.

The dash is sometimes used habitually in the place of any other punctuation mark. It may be over long or too short; it may be straight, curved or sinuous, or inclined upward or downward and may be placed too high above the base line.

Quotation marks are sometimes made in the form of a single comma instead of double; they may take on any of the forms enumerated for the comma and may

## IDENTIFICATION

have the tails up or down; they may be placed too far above or too near the writing line.

14. **Retrace.**—In executing letters containing acute angles, the second line of the angle may overlap or

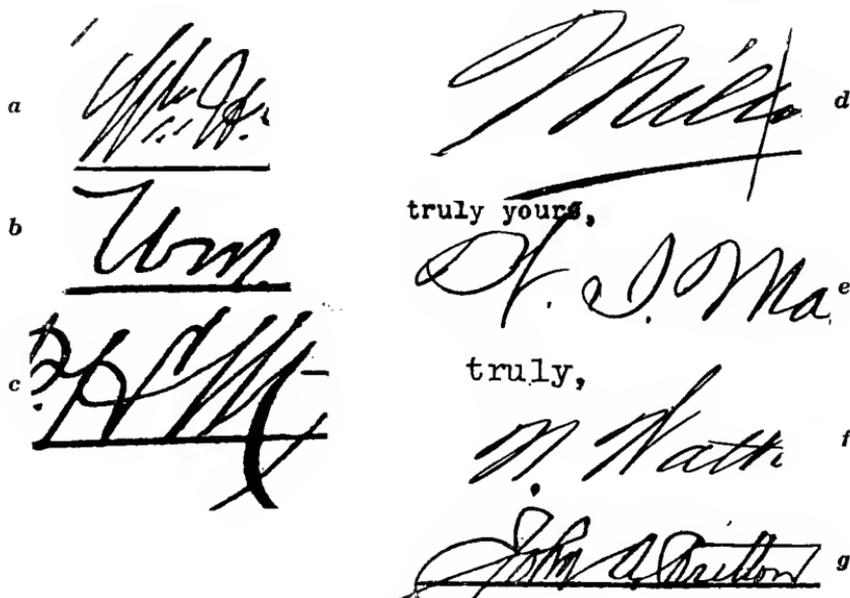


FIG. 18.—Retrace.

- (a) No retrace.
- (b) No retrace in capital; slight in small letter.
- (c) Small retrace.
- (d) Half retrace in capital and "i" and "t."
- (e) Half retrace.
- (f) Full retrace in capitals.
- (g) Full retrace in "A," "h," "n," and "t."

retrace the first line back for a considerable portion of its length or the two lines comprising the angle may separate at the point of the angle. Fig. 18 will make clear what is here meant by retrace. This feature should be especially noted in the examination of capitals.

## CLASSIFICATION OF HANDWRITING

15. **Spacing.**—On the spacing between letters within words depends the compactness or lack thereof of the writing and the spacing is influenced by the slant of the upward or connecting strokes. Spacing is also closely correlated with movement, the forearm movement as a rule exhibiting greater spacing than the finger movement. Speed likewise has its influence.

Spacing may be tested by the same process as suggested under "4. Averages and Divergencies," but here the greatest possible degree of accuracy is required. The average distance between letters may be determined and the proportion of this average to the average height of the various letters noted. Likewise, the divergence from this average of the spacing between certain letters will be of value. Thus if we found in one document that the average spacing were  $\frac{\kappa}{50}$  of an inch and that letters containing horizontal bars, such as "b," "o," "v," "w," diverged  $\frac{2}{50}$  above this average, and that in the second document the same letters did not show such divergence from the average, this would be very strong proof of nonidentity.

Fig. 19 shows a variety of spacing habits.

16. **Straight Lines.**—Lines apparently straight at first glance are frequently found to be otherwise when viewed with the paper held nearly parallel to and nearly on a level with the line of vision. This fault is due to lack of perfect coördination between the muscles involved in the writing process and is somewhat beyond

## IDENTIFICATION

the control of the writer, for which reason it is a valuable identifying characteristic and should be carefully looked for. Lines intended to be straight may be found,

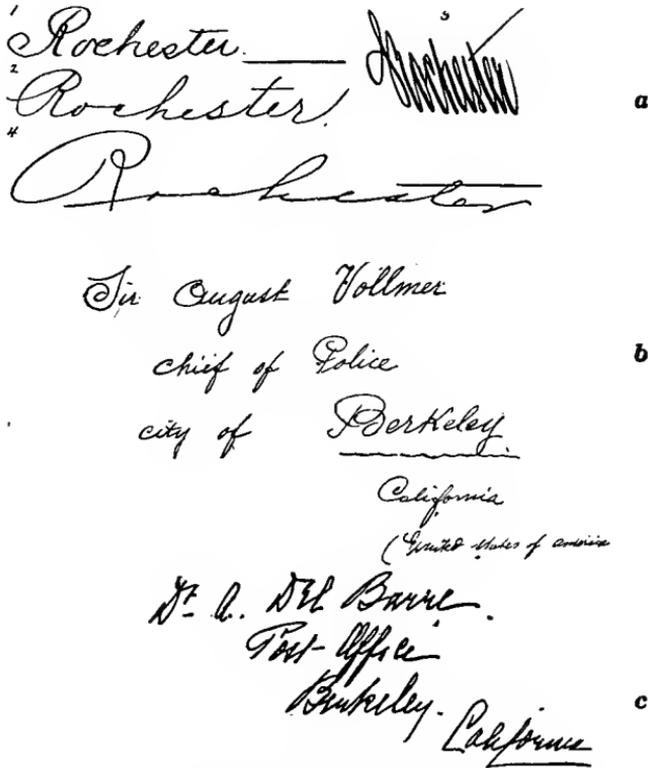


FIG. 19.—Spacing. (From Osborn.)

(a) 1. Might be called normal. 2. Medium great. 3. Condensed. 4. Great or extended.

(b) Normal between letters, great between words. Classification No. 32,321,321.

(c) Condensed. Classification No. 31,111,221.

when thus viewed, to be sinuous or wavy or they may be curved to one side or the other; they may have a tick or offset at either end and on either side. Speed

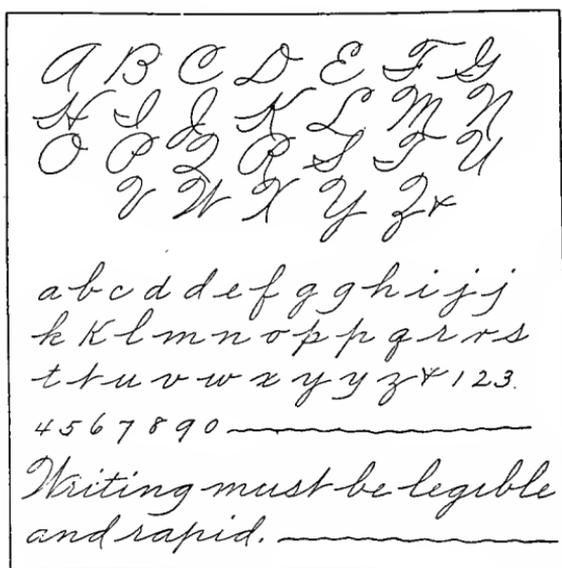
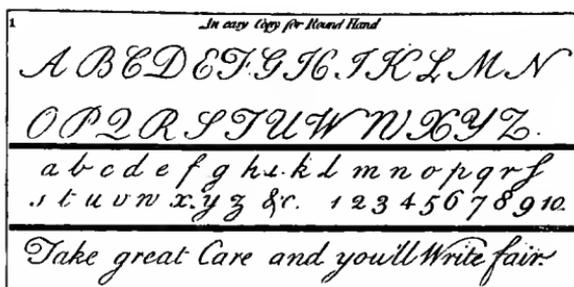


FIG. 20.—System.

(a) Round hand.

(c) Commercial.

*S. J. H. L. & M., and J. D.*  
*Sometimes, in writing, trouble me!*  
*V. B. P. & F. S. C. D.*  
*and O. W. W., may bother W.*

b

A B C D E F G H I J

K L M N O P Q R S

T U V W X Y Z

d

a b c d e f g h i j k l

m n o p q r s t u v

w x y z

FIG. 29.—System.

(b) Spencerian.

(d) Modern vertical.

## CLASSIFICATION OF HANDWRITING

and movement have their influence on straight lines, the greater the speed and the freer the movement the straighter the line.

17. **System.**—Osborn states:

The framework or general character of the handwriting of the average writer is of the style or design acquired in youth and in general use during the formative period of life. This style is afterwards modified by individual taste, physical characteristics, and environment, but through all these changes the original system will visibly protrude as a foreign accent will show in speech.

Four distinct systems of handwriting were taught in America in the nineteenth century:

1. The **Round Hand** introduced in the early part of the century which retained the old English round hand characteristics and resembles in numerous ways some of the English writing of to-day.

2. **Spencerian, 1840-1865**, with its various modifications.

3. **Modern American or Commercial**, about 1885.

4. **Modern Vertical**, about 1900.

See Fig. 20.

It should be understood that different writings of the same system will of necessity bear some resemblance to each other, but on close inspection this will be found to be merely pictorial and superficial and the expert will not be deceived thereby.



FIG. 21.—No question of identity here. Classification No. 32,322,311.

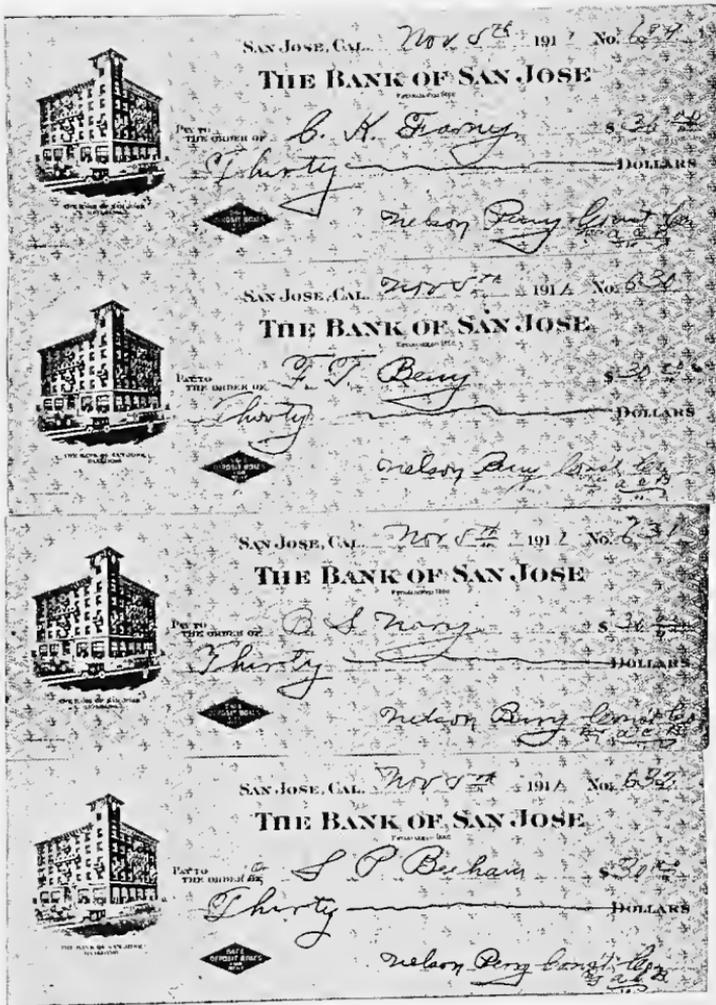


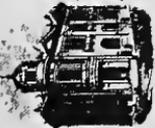
FIG. 22.—All trade-marked with double dots under fraction line and under the signature. Classification No. 22,111,231.

Redwood City, Cal., 12-1-1902 No. 32

**The First National Bank**  
OF SAN FRANCISCO

Pay to the order of *Thomas Babers* \$26.50  
*Christy - Sixty* Dollars  
*H. C. Blake*

24330  
 1014 No. 38



**The First National Bank**  
OF SAN FRANCISCO

Pay to the order of *George M. Lake* \$26.90  
*Christy - Sixty* Dollars  
*H. C. Fiske*

24330  
 1014 No. 38



**ANGLO-CALIFORNIA TRUST COMPANY**  
OF SAN FRANCISCO

Pay to the order of *Thomas Babers* \$26.50  
*Christy - Sixty* Dollars  
*H. M. Smith*

24330  
 1014 No. 38



OAKLAND, CAL. 4-26 1904 No. 1904 N9

**THE FIRST NATIONAL BANK**  
OF OAKLAND, CALIFORNIA

Pay to the order of *Thomas M. ...* \$18.00  
*One Hundred Dollars*  
*H. H. Bliss*

1014  
 5 83.50 Dollars



**Security Bank**  
OF OAKLAND, CAL.

Pay to the order of *John M. ...* \$50.00  
*Eighty Dollars*  
*H. H. Bliss*

907 Oakland, Cal.



**CENTRAL NATIONAL BANK**  
OF OAKLAND

Pay to the order of *John M. ...* \$86.30  
 Balance due on account.  
*H. H. Bliss*

34356  
 8991152 - 1019 No. 826



FIG. 23.—More versatility displayed here and not so conspicuously trade-marked as some of the previous series. Note penchant for certain names and initials. Classification No. 23,123,271

For which I have received \$ 7.00

NAME Elmer St John (True name - John St)

ADDRESS 2316 Allston Way

Wesal Book

---

NAME Elmer St John (True name - Elmer St)

ADDRESS 2316 Allston Way

Wesal Book

\$ 2328 Telegraph Avenue Be

557 Robert Fitz Gerald

2832 Ellsworth

Berkman Califene

Fig. 24.—Two pawnbook signatures above and exemplars below. Classification No. 21,121,121. 2

Have described property, but as an assumed estimated value for same, I am over 21 years same. James Snow 646 81

---

James Smith

1524 7th St

James Harding

James Snow

George Smith

Fig. 25.—One pawn-book signature above with exemplars below. Classification No. 21,121,111.

(C2.62490)

M. Goddard  
2117 Center

This check is hereby accepted by the payee  
in full payment of the within account, and the  
endorsement of the payee below operates as a  
receipt and release accordingly.

A. H. Wright  
2420 Channing

Born August 13, 1901 - Wis.  
Of American parentage, Scotch  
little known of them - father,  
have not seen since I was pr  
three yrs old. - mother, have i

FIG. 26.—Above forged endorsements on two stolen checks with exemplar of  
forger below. Classification No. 23,222,111.

C.D. #62159  
 WEST OAKLAND BRANCH  
**FIRST SAVINGS BANK OF OAKLAND** 00-15  
 COMMERCIAL  
 No. 127  
 OAKLAND, CALIFORNIA Dec. 15 1930  
 PAY TO THE ORDER OF Wm. W. Fair \$10 <sup>00</sup>/<sub>100</sub>  
Ten and no/100 DOLLARS  
 Roy E. Anderson

C.D. #62169  
 BERKELEY BRANCH  
**FIRST SAVINGS BANK OF OAKLAND** 90-46  
 COMMERCIAL  
 No. 127  
 BERKELEY, CALIFORNIA Dec. 15 1930  
 PAY TO THE ORDER OF Wm. W. Fair \$10 <sup>00</sup>/<sub>100</sub>  
Ten and no/100 DOLLARS  
 Roy E. Anderson

Dan S. Bryant  
 1742 West 8<sup>th</sup> St.  
 Oak.

Roy E. Anderson  
 Roy E. Anderson  
 William W. Fair

FIG. 27.—Two worthless checks and standard writing of author. Classification No. 31,321,231. Note trade-mark consisting of double horizontal lines.

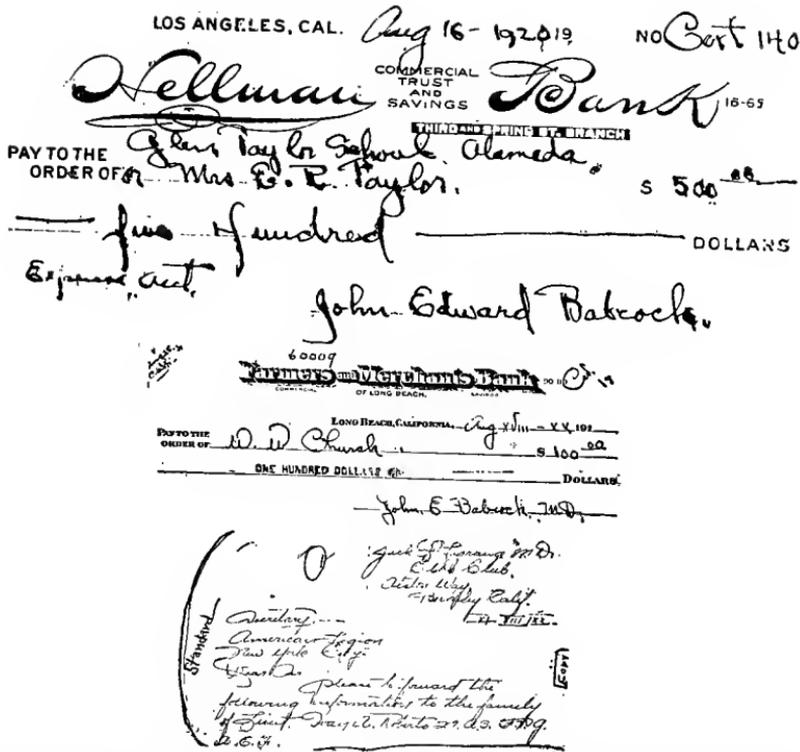


FIG. 28.—Two checks written by same person whose standard writing appears below. Checks differ pictorially from the standard, but an analysis of details leaves no doubt of their identity. As to Form note complete or nearly complete closing of top of "A"; unusual form of "B," "P," and "R"; identity of last "D" in second check and first in exemplar, even to tick on end of terminal; similarity of "E"; printed form of "S" in first check and same form in next to last line of exemplar; finishing back stroke of "f"; that "h" and other loop letters are frequently angular at top; upward finishing stroke of "w." The second check and exemplar are trade-marked with Roman numerals for date. Proportion is the same. Most terminals have pronounced downward tendency. First check could not be called embellished and the slant varies from Class 1 to Class 3, hence the references in the classification. Classification No. 22,322,333.

Sacramento, Sept 19<sup>1912</sup> No 48  
 The California National Bank  
 of Sacramento  
 Albert P. Morton \$2,500.00  
 Two Thousand + Eight Hundred +  $\frac{00}{100}$   
 Albert P. Morton  
 SAFE DEPOSIT BOXES  
 Albert P. Morton Sacramento  
 Albert P. Morton 48  
 Two Thousand + Eight Hundred +  $\frac{00}{100}$   
 Sept 1912 2,500  $\frac{00}{100}$   
 (Standard) Robert Spiegel  
 Peter James  
 A. A. Bander  
 Nine Thousand Nine Hundred + Two

FIG. 29.—Worthless check and standard writing of the author. Classification No. 32,221,113.

26435

**THE FIRST NATIONAL BANK**  
OF BERKELEY

90-42  
**12**

BERKELEY, CALIFORNIA, Sept. 27, 1924 No. 12

TOTHE ORDER OF Wm. H. H. H. H. \$ 6

Six DOLLARS

Mrs. Jimmy Peck

Mrs. Jimmy Peck      21 1/2 14th way  
Six      Berkeley  
Mrs. Jimmy Peck      Berkeley 4461

FIG. 30.—Attempt at forgery by a feeble-minded boy of twenty-one. Classification No. 21,111,112.

1

intended as either a pledge or mortgage of the above described

NAME Fred C. Nolan

Residence Milton Hotel

rtgage of the above described property, but as an absolute sale.

61422

Fred Harrison Residence Grand Union

FIG. 31.—Two signatures on pawnbooks by same person. Classification No. 31,221,121.

Name Thomas Rose

Residence 720. 10<sup>th</sup> St.

**NAME** M. Brief

**ADDRESS** 2167. 14<sup>th</sup> St.

Extended..... Extended.....

Name James Adams

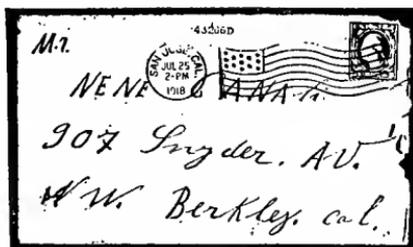
Residence 2167. Haight St

68816

**NAME** Harold Mason

**Residence** 1611 Market St

FIG. 32.—Four signatures on pawnbook by same person. Note identity of "St" in each.



CARO AMICO dopo un po di mese  
 vegno di novo avertiti avai sap  
 che a Milano sono scordato No  
 No via scuto per la morte di  
 vostra Mogli Ma ora se ve  
 venite Al doveu pensa rano  
 Noi Meglio che venogite con  
 amici che Meglio per voi e tutto  
 Non v'ha sciamo piu povero  
 stanna signe di requera  
 Ma per voi se laenge grato  
 ab stige tutto  
 Mi dirai  
 & Guzza i furro

FIG. 33.—Blackhand letter, author unknown. This would be mounted on a “foreign” specimen card. Classification No. 21,321,111, based on the script.

|  |                 |          |
|--|-----------------|----------|
| <small>HAVE READ ALL THE TERMS OF THE CONTRACT ON THE BACK</small> |                 | P. 52496 |
| NAME   | P. J. Maddipati |          |
| ADDRESS  | Atlas Hotel     |          |
| DATE   | DEC 22 1921     | AMOUNT 6 |

FIG. 34—Conspicuous for its large eyelets. Classification No. 31,121,132.

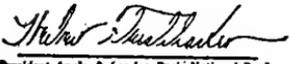
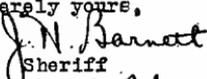
 A  
 SHERIFF  
 B  
 Secretary Labor Council.  
 C  
 Deputy.  
 D  
 President Anglo & London Paris National Bank.  
 E  
 Prominent in Women's Civic Affairs.  
 Sincerely yours,  
 F  
 Sheriff.  
 G  
 Under Sheriff.

FIG. 35.—Classifications

- |     |                                |     |                 |
|-----|--------------------------------|-----|-----------------|
| (A) | Classification No. 21,232,222. | (B) | No. 22,123,231. |
| (C) | No. 31,112,321.                | (D) | No. 31,122,212. |
| (E) | No. 32,111,221.                | (F) | No. 32,122,223. |
| (G) | No. 31,122,223.                |     |                 |

H *D. Morree*  
Superintendent. -

I *D. B. Newell*  
" "

J *James C. Byers*  
Sheriff.

K *W. C. Weale*  
fraternally,

L *J. W. Morrison*

M *Albert Schneider*

N *Albert Schneider* (L-E-1)

(H) No. 32,123,221.

(I) No. 32,223,211.

(J) No. 32,322,131.

(K) No. 32,122,221.

(L) No. 22,122,121.  
2

(M) No. 31,121,112  
2

(N) No. 31,121,113.

(M) Written in a natural hand and (N) disguised. Note that there is an agreement in all the classification factors except slant.

| Classification No.   | Hair | Eyes | Height                             | Weight | Age   | (Foreign Male) |
|--|------|------|------------------------------------|--------|-------|----------------|
| 21,211,111   | Blk  | mar  | 5-4                                | 140    | 41-22 |                |
| Name in full <u>Edward Vermuzzi</u>  |      |      |                                    |        |       |                |
| Address <u>1525 Fifth St</u>   |      |      |                                    |        |       |                |
| City <u>Berkeley</u>   |      |      | State <u>California</u>            |        |       |                |
| Occupation <u>Vegetable Dealer</u>   |      |      | Date of birth <u>Dec 4, 1881</u>   |        |       |                |
| Crime <u>Blackhand</u>   |      |      | Case No. <u>71423</u>              |        |       |                |
| Date signed <u>3-15-22</u>   |      |      | Record No. <u>2041</u>             |        |       |                |
| Modus Operandi <u>Wrote anonymous letters to several Italians in att. to extort money.</u>   |      |      |                                    |        |       |                |
| BLK. MAR 5-4 41-22<br>VERNUZZI, Cesare<br>1 U IIO 14<br>1 U IIO 16<br>HW 21,211,111  |      |      |                                    |        |       |                |
| Classification No.   | Hair | Eyes | Height                             | Weight | Age   | (Wh Male)      |
| 32,123,111   | Ch   | Blue | 5-10                               | 155    | 24-22 |                |
| Name in full <u>Charles A. Graham</u>  |      |      |                                    |        |       |                |
| Address <u>2730 Broadway</u>   |      |      |                                    |        |       |                |
| City <u>Oakland</u>  |      |      | State <u>California</u>            |        |       |                |
| Occupation <u>Machinist</u>  |      |      | Date of birth <u>July 24, 1898</u> |        |       |                |
| Crime <u>Pict Cks</u>  |      |      | Case No. <u>70423</u>              |        |       |                |
| Date signed <u>3-1-22</u>  |      |      | Record No. <u>2003</u>             |        |       |                |
| Modus Operandi <u>Buys mdse sent to phony address for cks from \$5 to \$10, receiving change. (Specimen check on reverse side)</u> |      |      |                                    |        |       |                |
| CHEST BLUE 5-10 155<br>24-22<br>GRAHAM, Charles A.<br>1 B IO 15<br>17 U IO 15<br>HW 32,123,111                                     |      |      |                                    |        |       |                |

FIG. 36.—Specimen cards reduced from 5×8 and their index cards reduced from 3×5.

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*The Engrossing  
Studio*

BROOKLYN, N.Y.

NEW LOCATION: 374 FULTON ST.  
OVER  
GAGE & TOLLNER'S RESTAURANT

TELEPHONE  
TRIANGLE 6694

**W**HEREAS,  
It has pleased  
Almighty God  
to remove from  
us our friend and associate.

**Charles A. Moore**

who has served as a Di-  
rector of this Company  
and as a member of its Fi-  
nance Committee for more  
than Twenty Years and  
during all that time he was

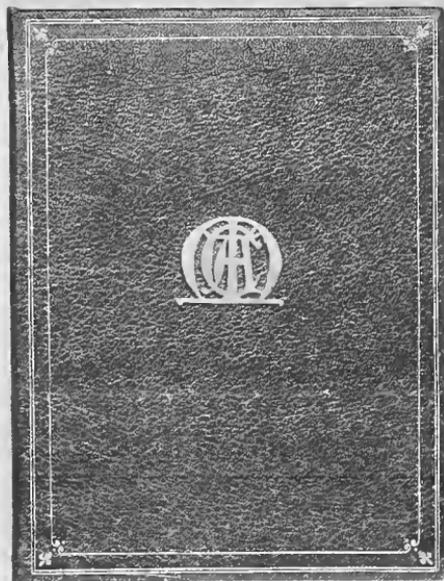
rarely absent from our  
meetings and took a most  
active interest in the affairs  
of this Company. Be it

**R**ESOLVED,  
that in the death  
of Mr. Moore  
this Company is  
deprived of a Director of  
unusual ability, the City  
of Brooklyn, an enter-  
prising, upright, charitable  
citizen and we Directors  
a dear personal friend:

**R**ESOLVED,  
That this trib-  
ute of respect to  
our late associ-  
ate be entered upon the  
minutes of this Board  
and a copy suitably en-  
grossed be presented to  
the bereaved family.

President

Secretary



The above represents three pages of very elaborately engrossed resolutions in Book Form, and also shows the cover of the book, which was of finest French Levant leather, elegantly hand tooled in gold. A gold monogram was fastened into the cover, adding considerably to its general appearance. The pages of the book were of vellum and the borders and large initials richly embellished in gold and appropriate colors. We will be glad to show a similar book and many other beautiful specimens to anyone interested.



At a regular meeting  
of the  
Board of Directors

# The Ferris Bros. Co.

held on this twelfth day of January  
nineteen hundred and twenty-two

the following resolution was unanimously adopted:

**Whereas:** The Board of Directors desires to express its appreciation of the manner in which the President of the Company

**Mr. John H. Magovern**

has conducted its affairs during his first year in office.

**Resolved,** That the Company is deeply indebted to the president for the enthusiasm and whole-hearted effort of his work, his fairness to those associated with him and his personality which makes it a pleasure to work with him.

Assuming his duties at a time when the management and direction of the business were especially difficult due to unfavorable conditions in all lines of business and handicapped by many demands upon his time from other sources, the president has proven himself ready and capable in every situation.

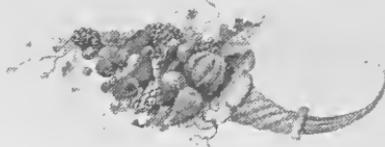
His many years of experience in the business and his unselfish devotion to the best interests of the company at all times made him especially valuable at a critical time.

In addition to assuming the larger responsibilities of his office he devoted himself unsparingly to the many important details of manufacturing.

It is an indication of his ability that he has improved the organization both from the manufacturing and selling ends of the business. We are on a better working basis to-day than at any time since the business was established forty-four years ago and we owe this in large measure to Mr. Magovern.

The company is fortunate in having his leadership and we hereby extend our hope for its continuance through many successful years and our sincere wishes that these years may bring to the president his full share of good health

**Happiness and Prosperity**



New York, December 18, 1918.

Messrs. DENNIS & BAIRD,  
374 Fulton Street,  
Brooklyn, N. Y.

Gentlemen:

I want to thank you, in behalf of Acanthus Lodge, for the exquisite workmanship in the memorial which you illuminated and engrossed embracing the preambles and Resolution relative to the death of Lieut. Scott.

I have no hesitation in saying that it is the handsomest work of its kind that I have ever seen, and this judgment is shared by all who saw it. We are all very much delighted with it and I desire to thank you personally and for the Committee for the work of art which you did for us.

With the compliments of the season, I am,

Yours very truly

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