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THE MICROSCOPE AND THE CAMERA IN THE DETECTION OF FORGERY.

EXEMPLIFIED BY PHOTOGRAPHS OF SIGNATURES IN THE JEROME WILL CASE.

The subject of this paper is one of great practical importance in the administration of justice; and while not undertaking to treat the subject exhaustively, we shall endeavor to give some points which may be of value in subsequent cases.

The modes of committing forgery are various: (1) By alteration of the document in question, which may consist (a) of an erasure or erasures; (b) of additions to the instrument; (c) of both erasures and additions. (2) By the forgery of the entire writing, or of the signature. This may be accomplished in several methods:—(a) by tracing a fraudulent signature over a genuine signature by means of the pen or pencil; and (b) by copying or imitating the genuine signature otherwise than by tracing.

The methods of detecting frauds thus committed are various, according to the nature of the fraud:

First: Composite Photography has been proposed as a means of determining the authorship of disputed docu-

ments. While this method seems to be founded on correct scientific principles, yet in our opinion the cases in which it may be applied in practice will be very few, if any. In order to apply this method for the identification of a writing, whose authenticity is questioned, very much more material is required than is usually available in any case presented in court. As a rule, questions of authenticity arise principally with reference to disputed signatures; and under the rules of evidence applicable in England and in most of the States, it is very difficult, if not impossible, to procure other similar signatures, as a means of identification; and without a very considerable number of similar signatures, this method can not be adopted. Moreover, the difficulties of technique are such as to render it impracticable in the hands of an ordinary observer.

Second: Another means of identifying the authorship of a document is that proposed by Prof. T. C. Mendenhall, and published, I believe, in *Science* some years since. This method consists in what may be styled "Curves of Literary Style," the co-ordinates of which, if I remember correctly, consist of the number of words and the number of syllables which they respectively contain. This method, although very interesting and probably of considerable scientific value in cases to which it is applicable, is not, in the opinion of the writer, of any practical value in the ordinary administration of justice as cases are presented for adjudication in court; for the reason that it requires vastly more material than is ever accessible in ordinary practice.

Third: The ordinary method of identifying writing in use in courts of justice is that styled "Comparison of Hands." In this connection a brief review of the rules of law applicable to this case may not be inappropriate. By the English common law, a witness is competent to testify respecting the genuineness of a disputed writing—(1) if he has seen the party alleged to have made the writing in question, write; and it is sufficient for this purpose that the witness has seen him write but once, and then only his name.

(2) The second mode of acquiring knowledge of the hand-writing of another, is by the receipt from such person of written communications purporting to be in his hand-writing, either in the usual course of business or in reply to letters written by the witness, provided such communications have been acted upon as genuine by the parties, or adopted as such in the regular course of business. (3) Another method is by means of the comparison of the specimen in question with fairly selected, undisputed specimens of the alleged hand-writing. With respect to this third method, there is considerable conflict of authority. By the English common law such comparison was permitted in two cases —(a) where the writings in question are of such antiquity that living witnesses can not be had, and yet are not so old as to prove themselves. Here the course is, to produce other documents, either admitted to be genuine or proved to have been respected, treated and acted upon as such by the parties, and to call experts to compare them and to testify their opinion concerning the genuineness of the instrument in question. (b) Where other writings admitted to be genuine are already in the case.

Considerable diversity of practice at present prevails in England and in the various States of the Union; this diversity has been brought about partly by statutory enactment, and partly by decisions of the courts. Without undertaking to go into the details of the subject, we may state that in the State of Illinois the English rule is applied with some strictness, and excluding the case of ancient documents, the only case, as we understand it, in which a comparison of hands by experts is permitted, is where other writings admitted or proved to be genuine, are properly in evidence and pertinent to the case: *Brobston* v. *Cahill* (1872), 64 Ills. 356, in which the rule laid down in *Jumpertz* v. *The People* (1859), 21 Id. 408, is explained and qualified. See also in general, 1 Greenleaf on Evidence, Sec. 577 *et seq.*; Chamberlayne's Best on Evidence, Sec. 232 and Note; Roger's on Expert Testimony, Sec. 139, 140 *et seq.*

With reference to this third method, by comparison of hands, two cases arise—First, Where the material upon which the judgment is based consists of the disputed and genuine signatures, and, Second, Where the material at hand consists of a letter or letters, or other documents more voluminous. In the former case, the judgment arrived at does not, of course, possess the same weight as where more material is at hand upon which to form a judgment; nevertheless, cases do arise in which the expert is warranted, upon a comparison of the signatures, in expressing a very clear opinion that the signatures were or were not made by the same person.

As to the method of arriving at an opinion upon the comparison of one or more other signatures, the cases are so diverse that no general rules can be laid down. Each case must be decided upon its own particular facts.

In the second case, not unfrequently a conclusion can be arrived at having a high degree of probability amounting almost to a moral certainty. In arriving at a conclusion, many things are to be considered—not only is the form of the letters important, but their manner of combination to form words is even more important. The use of capitals, punctuation, mode of dividing into paragraphs, of making erasures and interlineations, idiomatic expressions, orthography, mechanical construction, style of combination, and other evidences of habit, are important elements upon which to form a judgment. An interesting case of this kind occurred in the Greenwich County Court; the party denied most positively that a certain receipt was in his hand-writing. It read: "Received the Hole of the above." Upon being asked to write a sentence containing the word 'whole'; he took pains to disguise his hand; but used the above phonetic style of spelling, even writing the capital "H"; and then he ran away to escape prosecution for perjury: Roger's Expert Testimony, Sec. 146; Taylor on Evidence, Sec. 1669. Note; I Greenleaf on Evidence, Sec. 581. Note.

Some years since, two anonymous letters, together with a

number of letters written by several different persons, and the minutes of a scientific meeting written by a party not suspected of being the author of the anonymous letters, were submitted to the writer for his opinion. A careful study of the documents led the writer to the conclusion that the anonymous letters were written by the writer of the minutes above referred to; this conclusion was so much at variance with the opinion of the party who submitted the documents for examination that he was disposed to reject it. The writer, however, persisted in his opinion, and upon confronting the supposed author of the anonymous letters with the opinion, and accusing him of the authorship of said anonymous letters, he broke down and acknowledged himself to be their author. In this case, while the form of the letters in the several documents was not by any means identical, yet the manner of combining the several letters to form the more common particles, such as "the", ' and", "of", "to", "for", etc., was identical in every instance, thus demonstrating to the mind of the writer the identity of their authorship.

Perfect identity of two signatures is very strong, if not conclusive, evidence of fraud. No two autograph signatures by the same hand will be exactly alike. In the famous Howland Will case (*infra* page 562), Professor Pierce, at that time professor of Mathematics in Harvard University, testified that the odds were 2,866,000,000,000,000,000,000, to 1, that an individual could not with a pen write his name three times so exactly as were the three alleged signatures of Sylvia Ann Howland, the alleged testatrix of the will and two codicils. If, therefore, upon superposition against the light, two signatures exactly coincide, it is morally certain that one of them is a forgery.

(4) Another means of detecting forgery is by the internal evidences of fraud, afforded by the writing itself, with or without the aid of comparison with other and genuine writing.

These internal evidences may consist of alterations, such as erasures, additions, etc., above described, or of tracings of

the genuine signature by means of a pen or pencil, which tracings are afterwards inked over with a pen; or they may be found in a copy of a genuine signature otherwise than by tracing in the several manners above described. The copy or imitation of the genuine signature may be either free-hand or composite, by which latter is meant that the signature is made discontinuously or by piece-meal. The detection of frauds attempted in the manner first above described is comparatively easy. A very low power of the microscope will readily reveal the erasures, and not unfrequently, the word erased may be made out. When the signature has been traced over a genuine signature, usually the forger will be found to have failed to entirely cover the original tracings, the character of which, by the aid of a low power can usually be satisfactorily made out. In this case, also, the signature will usually be found to be discontinuous, and the places where the pen has been put upon and removed from the paper in endeavoring to cover up the original tracings can be readily made out, and when thus made out this fact is strong, if not conclusive, evidence of fraud. When the signature has not been traced, but is composite or made by piece-meal in the manner above described, this can almost always be satisfactorily made out by the use of a low power, and when this composite character is so made out it is likewise strong, if not conclusive, evidence of fraud. Not unfrequently, by the aid of the microscope it can be determined that alterations of the instrument were made with a different pen and with different ink; and, not unfrequently, the order in point of time in which they were made, can likewise be determined. In questions of this sort, and in general in cases of disputed signatures, photography is of very great service. In the comparison of disputed signatures, the writing in question should, if possible, be compared with the original and not with a photographic copy, such copy being considered by most courts as secondary evidence; nevertheless, photographic enlargements of genuine and disputed signatures, the correctness of which is established by testimony, are very useful as a means of illustrating the evidence of the expert.

Not unfrequently also, by the aid of photography, differences in ink may be made out which are insensible to ordinary observation.

Many of the points above discussed were well exemplified in the Jerome will case recently decided by the Probate Court of Cook County. In this case a most audacious attempt was made to impose upon the Court a forged for a genuine will. The case turned upon the authenticity of the signature to the will, there being no dispute as to the handwriting in the body of the will. The signature in question (a bromide enlargement of which is herewith presented for consideration) was what I have above styled as a composite signature.

At what I may style the cardinal points of the signature there appeared upon the paper, in immediate juxtaposition to the signature, numerous indentations, which appeared to have been made with an instrument with a somewhat rounded point; these indentations with two or three exceptions, did not come in contact with the writing; the writer was clearly of the opinion and so testified, that in his opinion, from their position, they were made as caliper marks or guides to the signature subsequently written. In one instance, namely, at the top of the initial "L," the mark took the form of a line extending across the loop of the letter "L," and the writer was able by microscopic examination, to testify to the opinion that it was made before the signature was written. As also was the case with respect to one or two other of these indentations. The signature was likewise a composite one from the fact that the pen of the writer appeared to have been removed from the paper at unusual places, forming breaks in the continuity of letters which are usually made by a continuous motion of the pen. This is well exemplified by the photographs. An examination under a low power likewise revealed the fact, that in a number of instances, the signature had been patched, or the lines re-traced in certain portions where such patching or re-tracing would not ordinarily occur if the signature were a natural or genuine signature.

Plate I: Genuine Signature on a Check.

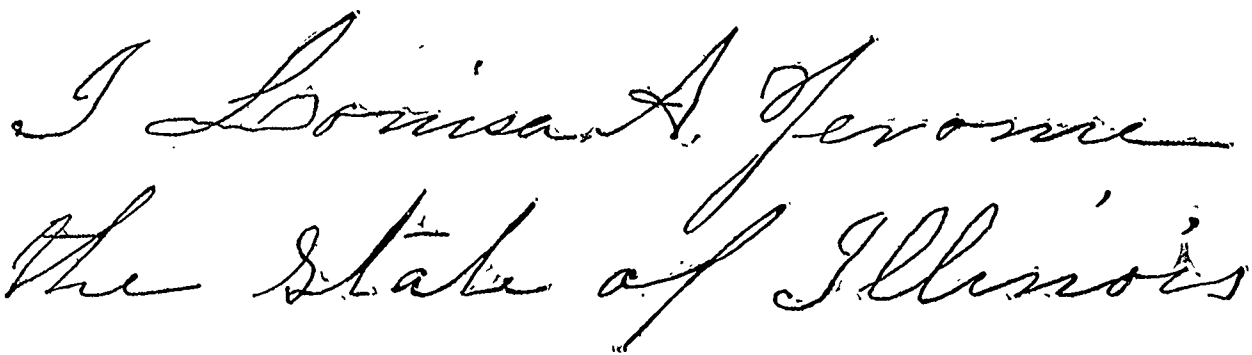

Plate II: Genuine Signature.

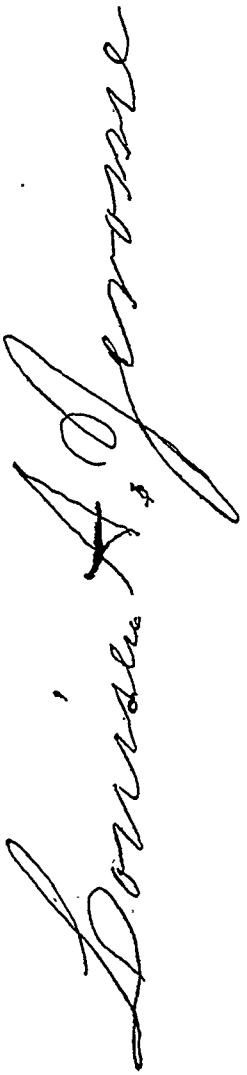

Plate III: The Forged Signature.

From the combination of these three different classes of facts, the writer was able to testify to the opinion that the signature was a forgery. At this time, there was not in the case any genuine signature with which the signature in question could be compared, and under the laws of the State of Illinois, as I have already stated, no signature could be used for such purposes unless properly in evidence in the case. This want, the proponent's counsel supplied by his manner of cross-examination of one or more witnesses put upon the stand by the party opposed to the probate of the will. Enlarged copies of two of the signatures thus received in evidence are herewith presented. The differences between the forged and the genuine signatures will be apparent from the examination of these enlargements.

The Court was of the opinion that the signature was not a genuine signature, and probate of the will was refused.

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[The above was read before *The American Society of Microscopists* at their meeting in Detroit, August 12, 1890, and in connection with appended statement of the Howland Will Case, will assist in establishing the limit upon this use of expert evidence.—ED.